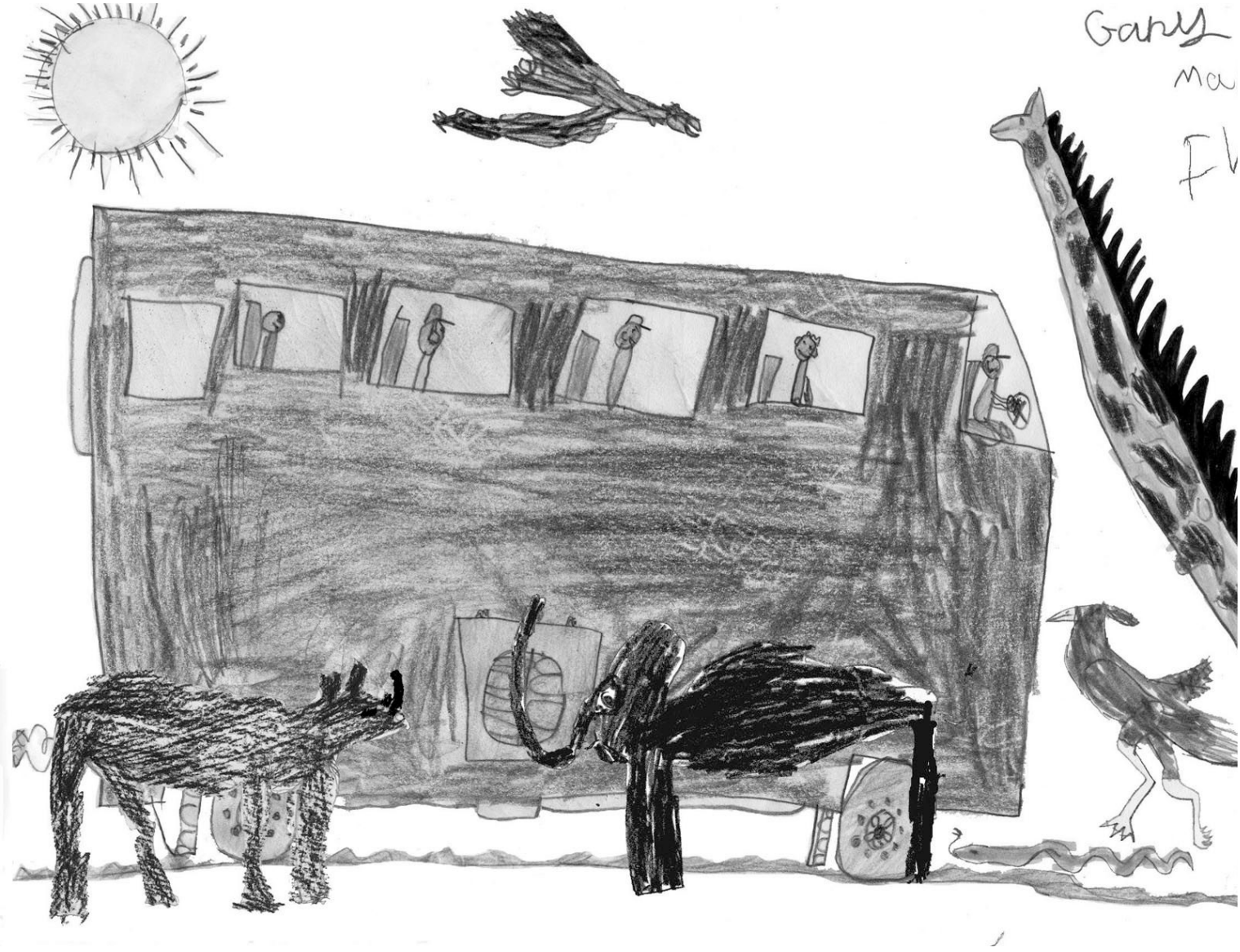
Cover



Save the rhinos

EAZA Rhino Campaign 2005/6

Contents

Foreword

Evolutionarily, rhinos are ancient and perhaps archaic species extending back millions of years in geological time. Nonetheless – archaic as they may be – those African and Asian species of rhino that have survived until present times are amazingly vital and impressive creatures. Their recent and rapid decline is purely the result of human interference with nature.

Rhinos have always been extremely popular zoo animals, in the eyes of both visitors and zoo staff. Let us now make optimal use of this popularity and mobilise it for the sake of the survival of the last rhinos in the wild. This can be done by participating in **Save the Rhinos**, the EAZA Rhino Campaign 2005/6.

EAZA has formed a partnership with a UK-based charity, Save the Rhino International, specifically for this Campaign. Save the Rhino International has effectively contributed 55,000 euros to the EAZA Rhino Campaign by recruiting a full-time Campaign Manager, Renaud Fulconis, for 18 months. We are very grateful for this support. Renaud is working closely with the Campaign Core Group and EAZA's Executive Office, which continues to be involved in the annual campaigns. I would also like to thank Save the Rhino and the International Rhino Foundation for paying for a design and marketing company to develop the print for the Campaign; chiefly, the Info Pack, the posters, leaflet and certificates. Although all the funds raised by zoos will be banked and then distributed by Save the Rhino International, I would like to make it clear that 100% of the funds raised by EAZA members for the Campaign will be granted to the *in situ* rhino conservation projects described in this Info Pack.

I sincerely hope that all EAZA member institutions with rhinos in their collection will join this Campaign, and that those without will use their creativity to participate as well. All together, we can make this into another very successful EAZA campaign, and demonstrate our dedication to the conservation of wild species and habitats.

Leobert E.M. de Boer
Chairman
European Association of Zoos and Aquaria

Foreword

The news in 2005, of the likely extinction of the Northern white rhino and a dramatic reduction in the number of rhinos in Nepal, highlight how vulnerable rhinos across their range continue to be. However, whilst these are tragic events, there is encouraging news in many rhino range states. What is very apparent is that rhinos, wherever they exist, will be vulnerable to environmental change, whether it be human-induced or natural, and to hunting pressure as it seems that the demand for rhino horn will always be with us. Despite the enormity of the task it is very exciting that EAZA has selected rhinos for the focus of its 2005/6 conservation campaign, **Save the Rhinos**.

When we set the target to raise 350,000 euros with at least 150 participating members, we had not anticipated the incredible response we got to our invitation for proposals. In all, 53 proposals were submitted totalling over 2.6 million euros and although our total seemed a drop in the ocean compared to the demand, it was apparent that we can still play a significant role in rhino conservation in the wild through the projects that we have selected for funding. We are also very confident that focusing public awareness on the problems, with which rhinos and other species that share their habitat have to contend, will have a benefit to long-term survival of all species.

This EAZA Campaign can be seen as an extension to some tremendous support given to rhino field conservation by a number of EAZA members in recent years. Despite encouraging signs that the wild populations of the three species we hold in our zoos are increasing, it is recognised that holding sustainable populations within Europe is important. Each EEP is developing well and we can be confident that our zoo populations will increase and continue to play a crucial role in the conservation of these magnificent species.

Each campaign that EAZA has run has proved to be extremely successful in achieving their goals and we are very confident, with your support, that **Save the Rhinos** will continue that tradition. We hope that this Information Pack provides you with everything you need to run a successful Rhino Campaign and provide material that will be of value in years to come. Whilst developing the Campaign, we have formed an extensive network of experts in all aspects of rhino work so, if you need more information than we have in the Pack, please feel free to contact us. We will do all we can to answer your questions or provide extra information.

The Campaign has been pulled together with excellent support and input from a large number of people and I would like to thank all of those, including the team from Save the Rhino International, Tom Foose and the International Rhino Foundation, the representatives from the African and the Asian Rhino Specialist Groups and members of the Rhino TAG Committee and Advisors. In particular, I would like to thank you for joining us in the Campaign and being key to its success over the next 12 months.

Nick Lindsay
Chair, EAZA Rhinoceros Taxon Advisory Group
Chair, "Save the Rhinos", the EAZA Rhino Campaign 2005/6 Core Group

Introduction to the Info Pack

As you will read in this Info Pack, four of the five species of rhino are classified as Critically Endangered: in other words, they are facing an extremely high risk of extinction in the wild. **Save the Rhinos**, the EAZA Rhino Campaign 2005/6, is an excellent opportunity for European zoos and aquaria to contribute to the survival of these animals. We hope that this Info Pack will provide you with the necessary information to get involved with this year's EAZA conservation campaign.

The Info Pack is divided into six Sections, all containing necessary information on different subjects.

Section I, "Campaign guidelines", informs you how you may participate and register for the Campaign, provides practical and legal guidelines, describes the certificates and awards offered to participating institutions, gives contact details for the Campaign Core Group and regional representatives, and, finally, thanks and acknowledges those who have contributed to the Campaign so far.

Section II, "Awareness, education and fundraising" gives reasons why both rhino- and non-rhino-holding EAZA members should become involved in the Campaign, and goes on to suggest how they might do so. Formal and informal education activities are outlined – some completely ready for you to use, others that can be developed by each zoo – together with some fundraising ideas.

You will probably find Section III, "Rhino Information" most helpful when developing your own displays and educational programmes. In it, you will find information about the evolution of the rhinoceros; the history of the European discovery of rhinos; descriptions of the five rhino species; the threats facing their survival, which are common to so many other species; ways in which *in situ* conservation efforts are protecting the rhino; and a couple of complex issues to inspire further discussion and debate.

Section IV, "Beneficiary projects", describes how we selected the 13 projects that will benefit from the Campaign, the projects themselves, and also sets out short introductions to other, very worthwhile *in situ* conservation projects that will benefit if and when the Campaign exceeds its fundraising target. 100% of the funds raised by participating institutions will go to the beneficiary projects.

We have developed a wide range of merchandise products related to the Campaign, and you will find details of these, and how to order them, in Section V.

Finally, for those who want to look further, Section VI, "Reference material", points you towards the Campaign website, selected books and a specialist reference facility.

This Info Pack contains a CD-ROM, which not only contains an electronic version of this Pack, but also includes educational activities, logos images that you can use, but also templates for posters and a leaflet that each zoo or aquarium can adapt for its own needs. Four different versions of the poster have been created, in turn featuring the black, white and greater one-horned rhino, and the last starring Douglas, the Campaign mascot.

We hope that there is something for everyone in this Info Pack, and that you will enjoy using it to run a fun and successful **Save the Rhinos** Campaign.

Section I:
Campaign guidelines

I.I Participation and registration

Save the Rhinos, the EAZA Rhino Campaign 2005/6, was officially launched on 7 September 2005 at the EAZA Annual Conference in Bath.

All EAZA members are invited to join this fifth EAZA conservation campaign. A registration form for participation is available in this Info Pack. The form should preferably be completed and returned when collecting the Info Pack at the EAZA Annual Conference in Bath, but it is also possible to register throughout the year by sending the form to the EAZA Executive Office.

Participation
In principle, participation in **Save the Rhinos** is exclusive to EAZA members as part of their membership services. However, when a zoo / aquarium is a member of a national zoo association, which is an associate member of EAZA, participation is also allowed. In this case, the regional association will be responsible for the distribution of Campaign information (e.g. Info Pack and CD-ROM).

As rhinos are a very attractive species, many non-EAZA institutions and NGOs might be interested in participation. Therefore, every non-EAZA institution will be given the opportunity to participate. These organisations will have to submit a motivated application for an Info Pack to the EAZA Executive Office (E: corinne.bos@nvdzoos.nl).

Campaign Info Pack and CD-ROM
This Info Pack and the included CD-ROM contain information that participating institutions can use for Campaign activities throughout the year. The Info Pack contains information on the rules and guidelines of the Campaign, but also useful information on rhinos and the *in situ* conservation projects that will benefit from the Campaign. Images can be found on the CD-ROM.

Information updates
Throughout the year, all EAZA member institutions will be kept updated on the developments of **Save the Rhinos** on the EAZA website (www.eaza.net) and through the EAZA News magazine. The main focus will be successful fundraising and awareness activities in participating institutions. A website for the general public (www.rhinocampaign.net), including information on the progress of the selected projects, will also be available.

Please send your Campaign updates to Corinne Bos, the EAZA Conservation Campaign Coordinator (E: corinne.bos@nvdzoos.nl) at the EAZA Executive Office, for inclusion on the EAZA website and EAZA News.

Contact
For additional information and questions you can contact your regional coordinator, the Campaign Core Group and, in particular, Renaud Fulconis, the EAZA Rhino Campaign Manager (renaud@savetherhino.org) or the EAZA Executive Office. See later in this Section for the contact details for these people.

Registration form

EAZA members that would like to participate in **Save the Rhinos**, the EAZA Rhino Campaign 2005/6 should complete this form and return it to the EAZA Executive Office as soon as possible.

By signing this form your institution declares that:

• All photographs and other publicity material contained in the Info Pack and CD-ROM will only be used to support the EAZA Rhino Campaign 2005/6, following the relevant copyright details (see "Use of images" and "Use of Douglas, the Campaign mascot"). Full credits must be given when using the photographs
• When raising funds for the **Save the Rhinos** Campaign, these must be transferred to the Campaign's account (see "Fundraising money transfer details"). The Campaign Core Group will divide the funds between the selected **Save the Rhinos** beneficiary field projects (see Section IV)

Institution: _____

Date: _____

Name & Signature: _____

We also request the following information:

Contact person in your institution for **Save the Rhinos**:_____

Email address of this person:____ _____

Fundraising goal (in euros): _____

Estimated start date of the Campaign in your institution: _____

Estimated closing date of the Campaign in your institution: _____

If you wish, you may express a preference for one or more projects (see Section IV). Please circle the projects or categories below that are of particular interest to your institution:

• Project: A / B / C / D / E / F / G / H / I / J / K / L / M
Or:
• Species: black / white / greater one-horned / Javan / Sumatran
Or:
• Subject: Anti-poaching / monitoring / community-based conservation / environmental education / translocations / research / strategy

Please return the completed Registration Form to
Corinne Bos, EAZA Executive Office
C/o Amsterdam Zoo - PO Box 20164 - 1000 HD Amsterdam - The Netherlands - F: + 31 20 520 0754

I.III Use of images

EAZA has been incredibly fortunate to have been supplied with a generous number of images for the **Save the Rhinos** Campaign by a number of photographers across the world. Without exception, all of the images are available for use in the Campaign, free of charge, by all participating institutions as part of their Campaign activities within their institution.

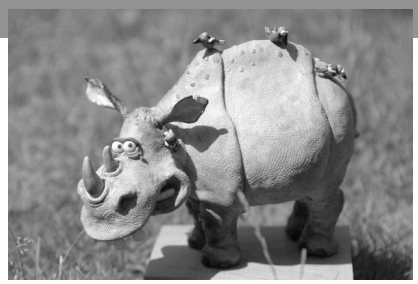
The images are available on the **Save the Rhinos** CD-ROM. Due to the limited space, they are not in the highest resolution possible. However, they should be large enough for most of your work. If you would like a higher resolution still, please contact Renaud Fulconis, who will then ask you to send him a blank CD-ROM. He may also be able to help if you need a particular type of image that has not been included in the selection provided.

(See later in this Section for information on the use of Douglas, the Campaign mascot.)

Please take note of the following restrictions regarding all images supplied in connection with the **Save the Rhinos** Campaign:

• The use of the images is restricted to registered EAZA Rhino Campaign 2005/6 participants
• Use of images and mascot is only allowed during the period of the Campaign (September 2005 – September 2006). Any signs, brochures etc. produced for your EAZA Rhino Campaign 2005/6, containing the images or mascot and produced before September 2006, may be used after the end of the Campaign
• Images and mascot are to be used only for educational and fundraising purposes and only in material relating directly to the EAZA Rhino Campaign 2005/6. They are not available to EAZA members for general use
• If you want to supply any image to an external agency such as a newspaper or magazine, to make any commercial use of a picture (e.g. to print on a T-shirt), to put a picture on a website (other than at low resolution), or to use any picture after the Campaign has ended (September 2006), you must contact Renaud Fulconis or the EAZA Executive Office to request permission
• Images are only allowed for use on websites of participating institutions in low-resolution format
• When using any of the images, it is essential that full credit is given to the photographer. The correct credit line is given as the name of each subfolder of images on the CD-ROM

If you have any questions, please contact Renaud Fulconis, EAZA Rhino Campaign Manager, renaud@savetherhino.org



Use of Douglas, the Campaign mascot

Terms and Conditions regarding the non-exclusive use of images of Douglas the Rhino (the "Stills") supplied by Aardman for Save the Rhinos, the EAZA Rhino Campaign 2005/6 (the "Campaign").

By using the Stills you shall be deemed to have agreed to the Terms and Conditions set out below:

• The Stills must only be used in printed publicity material to promote the Campaign and for no other purpose whatsoever. It is understood that the Campaign end in September 2006 and no use may be made of the Stills after this date
• The Stills must not be manipulated in any way without prior approval from Aardman, manipulation meaning, for example: the colours are not be changed; the image must be kept in scale proportion, i.e. not stretched or squashed. However, the Stills may be cropped without necessitating approval from Aardman as long as the crop remains sympathetic to the character, i.e., not cutting through key areas, for example, the eyes, mouth etc.
• Text can overlay the Stills but must not interfere with the visual impact of the Stills, for example, over the face. The text should be clear to read, taking into account the background colours
• The Stills must not be used alongside any distressing or harrowing images, which may feature within the Campaign
• The Stills may not be used within or alongside any material that contains any obscene, libellous, defamatory or blasphemous matter or infringes any right of any third party or in a manner that is derogatory or critical of Aardman
• Where possible the following copyright line should be included alongside the Stills:
© Aardman Animations 2004
• If requested by Aardman, you shall deliver to Aardman a copy of any material produced by you and incorporating the Stills free of charge
• If you breach any of these Terms and Conditions, Aardman may terminate this agreement and you shall immediately cease using the Stills

I hereby agree to the above Terms and Conditions:

Signed:

Name:

Address:

Telephone:

Fax:

Please fax the completed licence to the Aardman Imagebank Administrator on +44 117 908 6677

I.IV List of images and additional information on the CD-ROM

The contents of the entire Info Pack are included on the CD-ROM in Power Point, Word, and Pdf formats. You will also find the following:

Images
Over 100 photos relating to the five rhino species, the threats facing their survival, and conservation efforts, arranged in the following folders:
• Jambiyas in Yemen
• Illegal trade
• Rangers
• Snares and Skeletons
• Species
• Translocations

Publicity material
• Black rhino **Save the Rhinos** EAZA Rhino Campaign 2005/6 poster template
• White rhino **Save the Rhinos** EAZA Rhino Campaign 2005/6 poster template
• Greater one-horned rhino **Save the Rhinos** EAZA Rhino Campaign 2005/6 poster template
• Douglas, the Campaign mascot **Save the Rhinos** EAZA Rhino Campaign 2005/6 poster template
• Leaflet template
• EAZA logo
• Save the Rhino International logo
• Campaign logo
• Campaign font
• Press release

Additional information
• Rhino Cards and Teachers' Pages
• Be a rhino ranger: notes and template
• Make your own savannah
• Full list of African animal species sharing the white and black rhinoceroses' habitat
• EAZA yearbook 2003; EAZA Rhinoceros TAG Annual Report and white, black and greater one-horned rhinoceros EEP annual reports

I.V Use of logos and font

You are more than welcome to use the templates for the posters and leaflets provided with this Info Pack, or to create your own, when promoting the **Save the Rhinos** Campaign. Our regional representatives will be happy to help you with this. Please observe the following guidelines.

Logos
All printed material associated with the Campaign must include two logos: EAZA's logo and the Campaign logo.

The EAZA logo is available on the CD-ROM in colour and in black-and-white; the Save the Rhino International logo is only available in black-and-white. Examples of each are shown below:

The **Save the Rhinos** Campaign logo is available in five colour-ways on the CD-ROM: orange / blue, blue / orange, green / purple, yellow / purple and black-and white. Please use whichever best suits your own Campaign documents. The black-and-white version is illustrated below:

If possible, you should also include Save the Rhino International's logo, available only in black-and-white:

The correct wording for all print is as follows:

Save the Rhinos
EAZA Rhino Campaign 2005/6
Supported by Save the Rhino International
The fifth conservation campaign organised by the European Association of Zoos and Aquaria

Please note:
The official poster, Info Pack and leaflet for the Save the Rhinos Campaign do not include the Campaign logo, because the designs are so closely related. If you choose to use the templates provided, and merely change the language, then you also do not need to include the Campaign logo. However, if you create your own display materials, posters etc., then the EAZA and Campaign logos must be included as above, and the Save the Rhino International logo as optional.

Exception for non-EAZA participants:
Non-EAZA organisations participating in the **Save the Rhinos** Campaign should remove the EAZA and SRI logos from their Campaign materials. However, the Save the Rhinos Campaign logo must be included. This logo should be accompanied by the following text: “The European Association of Zoos and Aquaria (EAZA) has provided this organisation a special exception to participate in its **Save the Rhinos** Campaign”.

Font
The correct font is Interstate - Black Condensed. It is available on the CD-ROM and can be copied from it to your computer. Please use it when writing the name of the Campaign on any of your materials.

Colours
As far as possible, try to use the official Campaign colours (as used on the logos, Info Pack, posters and leaflet) on your display and print material.

Purple:	PANTONE 259C
Orange:	PANTONE 144C
Blue:	PANTONE PROCESS BLUE C
Green:	PANTONE 383C
Yellow:	PANTONE 7406C
Red:	PANTONE 200C

I.VI Fundraising money transfer details

Two new bank accounts have been set up specifically for the EAZA Rhino Campaign 2005/6 (one in euros and one in sterling). Please make sure you send your money to the correct account for the currency you are using. You have the option of wire transfer using IBAN (preferred) or sending a cheque.

Please also send an email to Renaud Fulconis (renaud@savetherhino.org) and Corinne Bos (corinne.bos@nvdzoos.nl) when (a part of) the fundraising money is transferred to the EAZA Rhino Campaign. Indicate in this email the amount of money that has been transferred and the name of your institution.

Euro account wire transfer details

Account name:	Save the Rhino - EAZA Rhino campaign
Account number:	57221929
Bank sort code:	40-52-26
IBAN code	GB90LJSO40522657221929
Bank name and address	Butterfield Private Bank Ltd 99 Gresham Street London EC2V 7NG United Kingdom

Sterling account wire transfer details

Account name:	Save the Rhino - EAZA Rhino campaign
Account number:	17700431
Bank sort code:	40-52-26
IBAN code	GB26LJSO40522617700431
Bank name and address	Butterfield Private Bank Ltd 99 Gresham Street London EC2V 7NG United Kingdom

Payment by cheque (euro and sterling)

Make cheques payable to: « EAZA Rhino Campaign »

Sent to:

FAO: Renaud Fulconis
EAZA Rhino campaign manager
C/o Save the Rhino International
16, Winchester Walk
London SE1 9AQ
United Kingdom

Please send any funds you raise at intervals throughout the year, rather than waiting until the end of the Campaign. Doing this will enable us to:

• Get the projects supported by the EAZA Rhino Campaign started
• Receive news and updates from these projects during the lifetime of the Campaign
• Send out the Fundraising Certificates for your zoo or aquarium as you reach the Bronze, Silver, Gold and Platinum levels (see later in this Section)

I.VII Sharing information and materials

From EAZA to you
During and after the **Save the Rhinos** Campaign, the Campaign Core Group will keep you informed of the progress of the Campaign. Not only will you be kept up-to-date with progress at the beneficiary field projects, but also about other rhino conservation stories and related issues. Furthermore, ideas for fundraising and awareness activities from your fellow members will be provided to stimulate the membership in successful campaigning and consequently making **Save the Rhinos** a huge success.

From you to EAZA
We need your help in order to provide the membership with successful ideas for raising awareness and fundraising for the selected projects. Please provide EAZA with your success stories, which we will then share with the membership. Your Campaign activities will be published in EAZA News and / or posted on the EAZA and Campaign websites. If you are willing to assist EAZA this way, please read the instructions below:

EAZA News
• Published quarterly (mid October, mid January, mid April and mid July) and sent to all EAZA members and subscribers
• Information and updates on EAZA Campaigns are published in the Campaign section of each issue
• If you want to submit your success story, please write a small article in English (100-200 words) and submit it by email (corinne.bos@nvdzoos.nl). Relevant photos (in jpeg format, at least 300dpi) or illustrations are very welcome
• Please refer to the EAZA website for more guidelines for contributions to EAZA News

EAZA website: www.eaza.net
• If your article is not placed in the magazine, it will be posted on the EAZA website.
• Information and updates on the EAZA Rhino Campaign will be posted on the EAZA Website throughout the year
• If you want to submit your success story, please write a small article in English and submit it by email (corinne.bos@nvdzoos.nl). Relevant photos or illustrations are very welcome

Save the Rhinos Campaign website: www.rhinocampaign.net
• We also have a Campaign website, which will carry even more news and information about rhinos, the Campaign projects, news, views etc.
• See Section VI, “Reference sources”, for more information about the difference between the Campaign website and the EAZA website

• We will also offer a free email newsletter which members of the public and participating EAZA institutions can register online from the Campaign website to receive

EAZA files

• EAZA keeps files on all conservation campaigns at the EAZA Executive Office, which keeps information such as newspaper clippings, photographs, articles and press releases)

• If you want to submit information on your activities to the Campaign Archives, please send it by email (corinne.bos@nvdzoos.nl) or mail (PO Box 20164, 1000 HD, Amsterdam, the Netherlands) to the EAZA Executive Office

EAZA membership emails

• Information on the EAZA Rhino Campaign which is relevant to the whole EAZA membership will be made available, by email, to the contact people at all EAZA member institutions

© Renaud Fulconis

I.VIII Certificates and awards

As in previous EAZA conservation campaigns, Save the Rhinos will be offering certificates and awards in recognition of fundraising and educational achievements.

Certificates
All participating institutions, whether members of EAZA or not, will receive a special **Save the Rhinos** certificate when they reach – and hopefully pass! – certain fundraising targets:

Certificate level	Amount (in euros)
Bronze	2,000
Silver	5,000
Gold	10,000
Platinium	20,000

So, if you raise 20,000 euros, you will be the proud owners of all four fundraising certificates!

As we explained in "Fundraising money transfer details," it would help the Campaign enormously if you send in money raised throughout the year, rather than waiting until September 2006. That also means you will get your certificate(s) quicker!

Awards
We do not just want Save the Rhinos to be about fundraising: raising awareness and developing interesting educational activities are just as important. And we fully recognise that not all zoos and aquaria have the same fundraising potential. We are therefore offering two special awards:

Education Award (rhino-holding facility)
This will be awarded to the most innovative and original school and / or public education programme or product produced by an EAZA zoo or aquarium holding rhinoceros in their animal collection.

Education Award (non rhino-holding facility)
This will be awarded to the most innovative and original school and / or public education programme or product produced by an EAZA zoo or aquarium without rhinoceros in their animal collection.

Please note that the Awards are open to EAZA members only.

These **Save the Rhinos** special Awards will consist of a unique colour certificate and prize to be presented at the closing of **Save the Rhinos** at the 2006 EAZA Annual Conference. The panel of judges will consist of members of the EAZA Executive Office and the Campaign Core Group. Written applications should be no more than 500 words long and should be supported with photographs wherever possible. They should be submitted, preferably by email or on CD-ROM, by 15 August 2006 to:

Renaud Fulconis
EAZA Rhino Campaign Manager
C/o Save the Rhino International
16 Winchester Walk
London SE1 9AQ
United Kingdom
E: renaud@savetherhino.org

I.IX Rhino campaigners

Campaign Core Group
The Campaign Core Group, chaired by Nick Lindsay, has developed and prepared the **Save the Rhinos** Campaign and will oversee its successful running throughout the Campaign period and, if necessary, afterwards.

Campaign Organisers

Corinne Bos (EAZA Executive Office)	corinne.bos@nvdzoos.nl
Renaud Fulconis (SRI)	renaud@savetherhino.org

Campaign Core Group:

Cathy Dean (SRI)	cathy@savetherhino.org
Susanne Toft Henriksen (Givskud Zoo)	s.toft@givskudzoo.dk
Friederike von Houwald (Basel Zoo)	vonhouwald@zoobasel.ch
Nick Lindsay (ZSL)	nick.lindsay@zsl.org
Kristina Tomasova (Zoological Garden Dvur Kralove)	Kristina.tomasova@zoodk.cz
Jake Veasey (Woburn Safari Park)	Animals@woburnsafari.co.uk

Regional representatives

The regional representatives for your area are available as contact points in order to help you promote and support the **Save the Rhinos** Campaign in your zoo or aquarium.

They will be able to help with translation of the Campaign materials into your language and provide you with additional sources of information. If they are unable to help you directly, they will be able to put you in contact with someone who can. Furthermore, they may assist in case of (national) media interest in the Campaign.

Please contact your representative if you or your institution can help by either suggesting a sponsor to support the Campaign in your region or by taking on some of the work or responsibility for the promotion of the **Save the Rhinos** Campaign. Please note that all potential sponsors of the Campaign must be approved by EAZA and by the Campaign Core Group before work can begin.

The overview on the next page shows the representatives for each region. If your country is not shown in this table, than please don't worry! Contact Corinne Bos or Renaud Fulconis directly for assistance.

Save the Rhinos regional representatives

Austria, Germany and Switzerland

Heiner Engel & Simone Hagenmeyer	Engel@zoo-hannover.de	Hannover, Germany
Andreas Ochs	a.ochs@zoo-berlin.de	Berlin, Germany
Friederike von Houwald	vonhouwald@zoobasel.ch	Basel, Switzerland
Beatrice Steck	steck@zoobasel.ch	Basel, Switzerland

Belgium (French-speaking) and France

Jean-Marie Carenton	conservation@cerza.com	Lisieux, France
François-Pierre Huyghe	fphuygue@yahoo.fr	Lisieux, France
Christelle Vitaud	zoologique@safari-peaugres.com	Peaugres, France
Alexis Maillot	alexis.zoo@wanadoo.fr	Amnéville, France

Czech Republic, Hungary, Slovakia and Poland

Martin Krug	krud@zoobratislava.sk	Bratislava, Slovakia
Andrzej Kruszewicz	akruszew@zoowarszawa.pol.pl	Warshaw, Poland
Radoslaw Ratajscak	radoslaw.zoo@interia.pl	Poznan, Poland
Janos Szantho	sostozoo@szabinet.hu	Sosto, Hungary
Kristina Tomasova	kristina.tomasova@zoodk.cz	Dvur Kralove, CzR

Denmark, Finland, Norway, Sweden

Susanne Toft Henriksen	s.toft@givskudzoo.dk	Givskud, Denmark
Bo Kjellson	Info@boraszoo.se	Boras, Sweden
Bengt Roken	Info@kolmarden.com	Kolmarden, Sweden

Spain

Daniel Sanchez	Dsanchez@terranatura.com	Benidorm, Spain

Italy

Cesare Avesani Zaborra	ricerca@parconaturaraviva.it	Bussolengo, Italy

Netherlands and Belgium (Dutch-speaking)

Tom de Jongh	t.dejongh@burgerszoo.nl	Arnhem, NL
Mario Hoedemaker	mhoedemaker@amersfoort-zoo.nl	Amersfoort, NL
Lars Versteege	l.versteege@beeksebergen.nl	Beeksebergen, NL

United Kingdom and Ireland

Mark Pilgrim	m.pilgrim@chesterzoo.co.uk	Chester, UK
Jake Veasey	animals@woburnsafari.co.uk	Woburn, UK
Tim Woodfine	timw@marwell.org.uk	Marwell, UK

© Thomas Collier

I.X Thanks and acknowledgements

Getting ready for the **Save the Rhinos** Campaign and producing this Info Pack has been a fantastic challenge. We would not have achieved so much without the remarkable help from the following people, to whom we owe our heartfelt thanks.

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Section II:
Awareness, education and fundraising

II.I Awareness

10 good reasons to get involved

1 Rhinos are critically endangered
At the turn of the 19th century, there were approximately one million rhinos. In 1970, there were around 70,000. Today, there are fewer than 18,000 rhinos surviving in the wild.

Four of the five species of rhino are “Critically Endangered” as defined by the IUCN (World Conservation Union). A taxon is classified as critically endangered when the best available evidence indicates that it meets any of a range of pre-determined criteria. It is therefore considered to be facing an extremely high risk of extinction in the wild.

Only the southern subspecies of the white rhino is classified by the IUCN in the lesser category of being “Vulnerable”; even this is considered to be facing a high risk of extinction in the wild.

In 2005, some of us are lucky enough to be able to travel to Africa and Asia to see them in the wild. In 2035, when our children and grandchildren have grown up, will they still be able to see wild rhinos?

2 Rhinos have been around for 50 million years
Rhinos have been an important part of a wide range of ecosystems for millions of years; we must not let them join the dodo in extinction.

3 Humans have caused the drastic decline in numbers
Poachers kill rhinos for the price they can get for the horns (used for traditional Chinese medicine and for ornamental dagger handles in Yemen); land encroachment, illegal logging and pollution are destroying their habitat; and political conflicts adversely affect conservation programmes.

4 Rhinos are an umbrella species
When protecting and managing a rhino population, rangers and scientists take in account all the other species interacting with rhinos and those sharing the same habitat. When rhinos are protected, many other species are too; not only mammals but also birds, reptiles, fish and insects as well as plants.

5 Rhinos are charismatic mega-herbivores!
By focusing on a well-known animal such as a rhino (or, to use the jargon, a charismatic mega-herbivore), we can raise more money and consequently support more conservation programmes benefiting animal and plant species sharing their habitat.

6 Rhinos attract visitors and tourists
Rhinos are the second-biggest living land mammals after the elephants. Together with lion, giraffe, chimpanzee and polar bear, the rhino is one of the most popular species with zoo visitors. In the wild, rhinos attract tourists who bring money to national parks and local communities. They are one of the “Big Five”, along with lion, leopard, elephant and buffalo.

7 In-situ conservation programmes need our help
Protecting and managing a rhino population is a real challenge that costs energy and money. Rhino-range countries need our financial support, and benefit from shared expertise and exchange of ideas.

8 Money funds effective conservation programmes that save rhinos
We know that conservation efforts save species. The Southern white rhino would not exist today if it were not for the work of a few determined people, who brought together the 200 or so individuals surviving, for a managed breeding and re-introduction programme. Today, there are some 11,100 Southern white rhinos.

With more money, we can support more programmes, and not just save rhino populations, but increase numbers and develop populations. The Northern white rhino subspecies may just have become extinct, but it is not too late to save the rest.

9 Many people don’t know that rhinos are critically endangered
Not just that, but how many visitors know that rhinos also live in Asia? Or that two species have just one horn? Or that the horn is not used as an aphrodisiac? We have even heard some people say that they are carnivores!

If people do not know about these amazing animals and the problems they are facing, how can we expect them to want to do something to help save rhinos?

10 We have a unique opportunity to join the EAZA Rhino Campaign!
For one year only, as many EAZA members as possible will work together to raise awareness about the need for rhino conservation, to develop formal education programmes based around rhinos, and to fundraise for a wide range of in-situ rhino conservation programmes.

This Information Pack contains lots of facts, figures and essays about rhinos, the problems facing them, and ideas for EAZA members to use throughout the Campaign.

Please join us, and take part! The more we do all together, the more visitors will learn about rhinos and the more field projects we will be able to support.

Renaud Fulconis

We do not have rhinos; how can we get involved?

All EAZA zoos and aquaria can link their collections to the story of the rhino and the campaign, not just those that actually house rhinos. Non-rhino-holding members can develop related displays and activities by focusing on the following aspects:

• Through their natural history and behaviour, rhinos maintain a diverse landscape that benefits the great number of both animals and plants that share it
• By protecting rhino habitats across Africa and Asia, we help conserve all the other species sharing those habitats (see Section III.VII “Threats to rhinos’ survival)
• The rhino conservation story – a story of poaching, international trade, habitat destruction and political conflict – is common for many other species

II.II Education

Suggested education activities

Please find below some activities that have been developed for the **Save the Rhinos** Campaign and some further ideas that can help you create education activities based on rhinos. This section will be updated regularly on the Campaign's website (www.rhinocampaign.net) and also on the EAZA website (www.eaza.net). As the Campaign progresses, please do tell us what educational activities you have developed, as we would very much like to hear about them.

Have fun!

Rhino Cards Zimbabwe (ready to use)
See next sub-section (and find on the CD-ROM).

Be a rhino ranger (ready to use)
This is a fully developed activity that can be adapted by your education department. The idea is to give kids or adults the opportunity to become a rhino ranger for an hour or so. On the CD-ROM you will find the education officer's notes and the documents to be printed for your visitors. At the end of the activity, you can give a certificate to all your visitors (find the template on the CD-ROM) or, even better, sell it for a euro or two.

Make your own savannah (ready to use)
Designed by Givskud Zoo, this activity (find it on the CD-ROM) will please young zoo visitors. They will have a bit of reading, colouring, cutting and a lot of fun by putting the rhinos and some of the animals sharing their habitat into the African savannah. You also can print the documents from the CD-ROM and choose to give them to the children or sell them for a small profit to benefit the Campaign.

Catch the poacher
See later in this section.

Pictures / drawings
Educators are always looking for footprints and silhouettes when making new signs and education material.
• Pictures of all five species
• Silhouettes of the species so the sizes can be compared
• Rhino footprints
Please find all of these on the CD-ROM.

Rhino senses
Be aware of the use of different senses, while learning about rhinos at the same time.

Make an arena with four chairs and a rope around the chairs. People spread out inside this arena and stand still. One person covers their eyes with a blindfold. The others start to make occasional small noises. The blindfolded person has to find the others, by listening to the sounds. When a person is “found”, he / she must leave the arena. When everyone has been found, the blindfolded person tells about his/her experience, and the group talk about the importance of good hearing (for example, in dense forest, or if you are prey for predators, or if you have bad eyesight like rhinos).

Next, one person must look for the others through two toilet rolls. The other people in the arena are allowed to walk quickly around, to avoid being caught. As they are caught, they must leave the arena. Again, the group talk about the experience. What is it like to have to move quickly, without being able to look right in front of you or without a wide field of vision? Alternatively, create a trail with different types of obstacles. Each participant must try to follow the trail, looking through the two toilet rolls.

Take five film canisters. Put into each one a different item with a strong smell (for example, lavender, pepper, mint, coffee, orange peel). Punch small holes in the lids. Label the canisters A-E. Pass them around, and ask your zoo visitors to smell them and identify what is inside. Explain that rhinos have a very good sense of smell, and use it to help them find suitable food, and also to smell middens (dung heaps) to work out which other rhinos have passed that way.

Differences
Prepare drawings of different rhino species, such as a black and a white rhino. Create a list of words, such as black, white, grey, square lip, pointed lip, very movable ears, one horn, two horns, fur, and ask the children to match the words with the drawings. In this way they can become aware of the differences between the species.

A bit of geography
Where on earth do rhinos live?

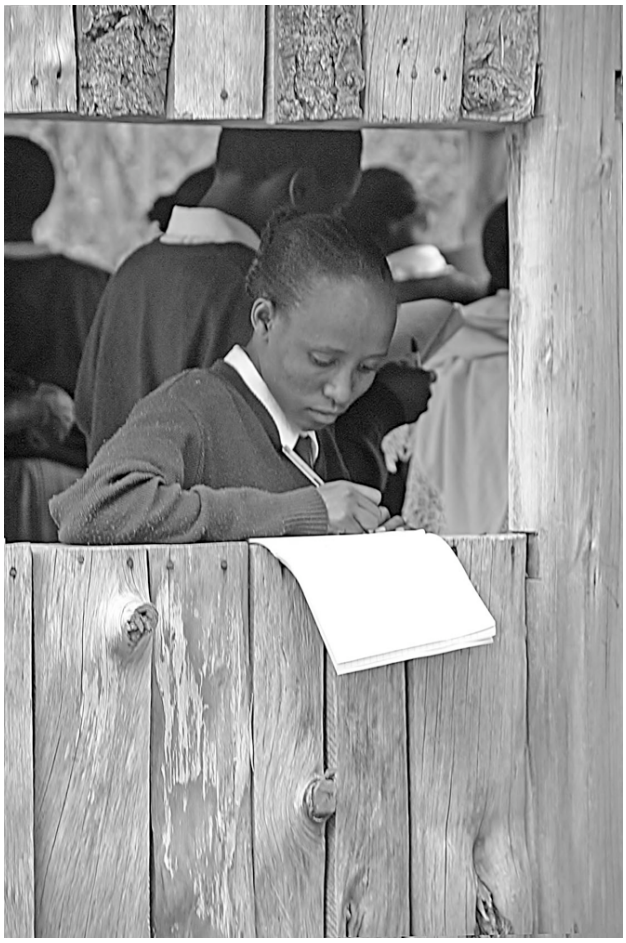
Write a short story about the different species and where they are living. Tell the story to a group of childrens and then ask them to draw the silhouettes of the five species, colour them in and cut them out.

Ask the children to stick the rhinos onto the right countries on a large map of the world. Ask them about the weather and the vegetation in those countries, while talking about the different species.

Debate
For older children and adult groups.

Read the “Debate” pieces in Section III, about rhino hunting and a legal trade in rhino horn. Introduce the subjects briefly, and then get a classroom discussion going about the pros and cons of each. You can add in other suggestions if the discussion needs new ideas. Alternatively, let everyone read the articles, and then ask two people to speak for five minutes on each side of the debate. Hold a vote before, and a vote afterwards, to see whether the debate actually changed anyone’s minds.

Renaud Fulconis and Susanne Toft Henriksen



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Rhino Cards Zimbabwe

Introduction

The Rhino Cards are an education pack for schoolchildren and teachers that were developed for use in Zimbabwe by the SADC Regional Programme for Rhino Conservation. Save the Rhino International helped to fund the production of 500 sets, which were printed and bound in the UK and shipped to Zimbabwe.

The EAZA Rhino Campaign is unable to afford to print copies of the Rhino Cards for members participating in the Rhino Campaign. However we are delighted to include a copy of the Rhino Cards and Teachers' Pages on the Campaign CD-ROM, so that education departments can adapt and use the material as they wish.

Here follows a brief description of the Rhino Cards and why they were produced.

The need for an awareness-raising educational programme in Zimbabwe

In recent months there has been a resurgence of professional rhino poaching (particularly in Hwange National Park and in private conservancies which have been taken over by so-called war veterans). It is a common tactic of rhino poachers to establish connections with local communities in an effort to gain information as to the rhinos' locations, drinking places and local security measures.

These communities are generally unaware of the critical population status of black rhinos. The need is therefore for a programme that aims to educate communities and encourage them to realise that they can play a vital and positive role in the protection and survival of this species. This needs to be done before professional rhino poaching occurs in other areas and the successful conservation efforts of the last 10 years eroded. By raising awareness it is hoped that the communities will be less likely to accommodate rhino poachers and more likely to pass on information about suspected rhino poachers to authorities.

The development of the Rhino Cards

The Rhino Cards programme aims to raise the general level of awareness of black rhino conservation in communities living near black rhino conservancies and Intensive Protection Zones (IPZs) in Zimbabwe. Trials run in schools in the informally occupied areas of the Bubiana Conservancy showed positive results. The Rhino Cards were well received and the communities are showing greater acceptance and support of the rhino monitoring efforts in these areas. Schools and community leaders that had not yet received the Rhino Cards indicated their desire to be included in any further expansion of the programme.

The Rhino Cards are presented as a School Set of eight different card types. Each card presents a different aspect of rhino conservation. The cards can be used to teach a range of subjects at different grade levels.

The cards are attractive and colourful, with an appealing mixture of cartoon illustrations and photographs, facts and questions.

The Teachers' Pages contain additional information on rhino conservation issues and a section containing guidelines for the use of the Rhino Cards and suggested class exercises.

Effectiveness
Natasha Anderson, the project's coordinator in Zimbabwe, reports the following results from the pilot project:

"When we did the initial trials of the Rhino Cards under the SADC Rhino Program we carried out pre and post trial surveys and the results have turned out to be very encouraging. The surveys posed a variety of questions to gauge the students' knowledge (factual) and attitudes (value judgments) towards rhinos and rhino conservation.

Category	**Pre-trial**	**Post-trial**
Factual (correct)	47%	71%
Attitude (positive)	64%	81%
Overall	52%	74%

866 students partook in the pre trial and 1,071 in the post. The results indicate that there has been a 20% improvement in the level of knowledge and attitude towards rhinos and rhino conservation after the material have been in use for six months.

We are currently running a trial of materials developed for secondary school level. The materials need to be in use for a few more months before we do the post-trials but the materials are being well utilized."

Catch the poacher

Create a trail or path that kids and their families follow, answering questions along the way. If they get the answers right, they will be able to spell a secret code word, and catch the poacher.

For this trail, six checkpoints are suggested. (Maybe you will have better ideas or want to add others.) For each checkpoint there is an introduction, some props, followed by a question and a range of answers to choose from. Add a letter to each answer so that the kids (or "rangers") can put together the code word out of the letters from the right answers. The trail can work as a competition where you give all kids a ranger certificate when they "catch the poacher".

Checkpoint One
You are ranger in a National Park and you find a dead rhino. The rhino has been shot by a poacher. It is the ranger's job to protect the rhinos. Now it is your task to clear up the crime and find the poacher.
Question: Why do the poachers catch rhinos? Write down the letter next to the right answer.
Possible answers:
• They want the horns!
• They are afraid of rhinos!
• The rhinos eat their crops!
Props / pictures:
• Rangers looking at a dead rhino
• A gun (not functioning or a copy) and some big bullets
• A snare and a description of how it is used

Checkpoint Two
The poachers shot rhinos because they want the horn. It is used in traditional Chinese medicine and for luxury products like ornamental handles for traditional daggers in Yemen. On illegal markets, the price is about 13,000 euros per kg.
Question: How much is this horn worth? Write down the letter next to the right answer.
• X euros
• X euros
• X euros
Props / pictures:
• A horn chained with a wire and a balance where the horn can be weighted
• A picture of a horn and the total weight given

Checkpoint Three
As a ranger, you have to know where to find the rhinos. One way is to find and identify footprints.

Question: Here you can see footprints from a lion, a rhino, a giraffe, an elephant and a human. Can you identify the rhino footprint? Write down the letter next to the right answer.
Props / pictures:
• Footprints made in sand or concrete
• Pictures or a poster showing the different footprints

Checkpoint Four
You can also look for fresh dung. Rhinos drop their dung in well-defined piles and often furrow the area around the piles with their horns or feet.
Question: Why does the rhino drop its dung in piles? Write down the letter next to the right answer.
• Rhinos are very clean animals that don't want to mess up the savannah
• To make it easier for the local people to collect manure for their vegetable gardens
• The dung piles act as "sign posts" or territory marks
Props / pictures:
• A pile of rhino dung

Checkpoint Five
There are five species of rhinos: the black and the white rhino are found in Africa, and the others in Asia.
Question: What kind of rhino / rhinos can you see in the zoo? Write down the letter next to the right answer(s).
• Black rhino
• White rhino
• Sumatran rhino
• Javan rhino
• Greater one-horned rhino
Props / pictures:
• Pictures of the five rhino species and distribution maps and numbers
• Binoculars so the visitors can get a close look at the rhinos in the enclosure

Checkpoint Six
One of the villagers tells you that he has spoken to a foreigner who seemed very interested in rhinos. The villager thinks he might be the poacher. By the description you identify the man in the local bar. Well done!
Question: What will happen to the poacher now?
• He is asked to give the horn back
• He is told that it is illegal to shoot rhinos
• The rhino horn is found in his tent and he has to go to jail
Props / pictures:
• Nice pictures of rhinos
• Pictures and information about a ranger's work
• Information about conservation projects

Suzanne Toft Henriksen

II.III Fundraising

Introduction
The EAZA **Save the Rhinos** Campaign aims to raise 350,000 euros, which will benefit the *in situ* conservation projects detailed in Section IV.

There are lots of things you can do to help. Some ideas will raise more than others, but the important point is the work we do all together during the Campaign, that will benefit the rhinos. Producing a single poster to inform your visitors about the rhinos' situation in the wild is a fantastic step. As for fundraising, please let us know about your successful activities, as they will be very useful to other zoos. A year is very short, but it also can make a significant difference to rhino conservation.

Suggested fundraising activities

Organise a rhino day
Ask some volunteers or keepers to talk to visitors about rhino issues in front of the rhino enclosure, or anywhere else in the zoo. Sell the posters and some items from the list of merchandise and ask them to:

• Guess the weight of one of your rhinos (to do so, they have to pay a euro and they can receive a certificate if they are as close as, say, 100 kg)
• Guess the weight of a rhino horn (if you have one!)
• If you had a rhino calf born recently, have three boxes (by the enclosure or in the zoo shop) with three different names and ask visitors to put money in the box with the name they prefer. After a month, the rhino calf is christened with the most popular name

Organise a "Save the rhinos" art competition
To be presented on your web site: ask for a small entry fee and ask kids aged between X & Y to draw a rhinoceros. Offer a prize of a free visit to the zoo for the winner and his family, with a special tour to the zoo enclosure with the keeper.

Involve the schools that are planning to come and visit the zoo
When sending the brochure from the zoo, also send a document on the Campaign explaining why we all should be involved in **Save the Rhinos**. They can also organise a Rhino day in their school, selling cakes etc. and discussing rhino issues.

Rhino jigsaw
With help from kids, draw a rhino on a large piece of wood with kids and then cut it into a jigsaw. Organise a puzzle competition in which people have to complete it as quickly as they can, after paying an entry fee. Then, they can try to beat the fastest time and set a new record.

Organise a rhino walk
Advertise your event in the local media and in the zoo. Organise a rhino walk (at least 10 kilometres) on a spring or summer Sunday morning. Just provide the walkers with a good map on which you can add some facts about rhinos. Charge an entry fee of 10 euros but let people know that you are looking for additional money for the Campaign; give them sponsorship forms so that they can raise money from family, friends and colleagues. Make sure that the walk finishes into the zoo, ideally in front of the rhinos' enclosure if you keep rhinos, where drinks should be available. Offer each participant a certificate on completion (see model on the CD-ROM).

Allow visitors to become a rhino keeper for a day
Donate some of the fee to the EAZA Rhino Campaign.

Have families become special guests for a day…
Offer VIP guided tours for families and donate some of the fee to the Campaign.

Sell the "Make your own rhino" origami for a few euros
Thanks to Edinburgh zoo for the model (available on the CD-ROM). Colour in, cut out and fold your own rhino.

Create some rhino badge-making kits for kids
Provide raw materials so that kids can make their own badges, in return for a small fee.

Renaud Fulconis, Susanne Toft Henriksen, Friederike von Houwald and Jake Veasey

How will my money be used?

As you will see from the table below, even a small donation will make a difference, and help to save rhinos. All these examples are taken from the budgets submitted for the beneficiary field projects.

Amount (in euros)	Pays for
1	The printing of an educational book
1.20	A box of pencils for educational purposes
8	A closed-cell (inflatable) camping mattress for rhino rangers
15	A mosquito net for a ranger
35	Food rations for a team of 12 rangers or game scouts (1 month)
110	A game scout's backpack
150	An hour of aerial surveillance
150	The salary of a game scout for a month
180	A pair of binoculars
220	A tent for three game scouts
300	The salary for an education officer for one month
340	A radio collar and set of immobilisation drugs
350	A GPS
550	A water tank
800	Night-vision equipment
1,000	A digital camera for monitoring rhinos
1,780	The construction of an observation post
5,300	The fuel for an educational bus for one year
15,700	A crane for translocations
35,000	A 4x4 for rhino patrols
506,000	The cost of funding all Rhino Protection Units in Indonesia (300 Sumatran and 60 Javan Rhinos

Renaud Fulconis

Section III:
Rhino information

III.I The evolution of the rhinoceros

Introduction
Rhinos can be traced back over some 50 million years, with a complex series of evolutionary paths throughout a sequence of geologic or evolutionary epochs (the term scientists use for these periods of time). These epochs are all part of the Cenozoic Era, known as the Age of Mammals, and include:

Epoch	**Began**
Paleocene	- 65 millions years ago
Eocene	- 58 millions years ago
Oligocene	- 37 millions years ago
Miocene	- 23 millions years ago
Pliocene	- 5 millions years ago
pleistocene	- 2 millions years ago
Holocene or recent	- 100 thousand years ago

All rhinoceroses belong to the mammalian order, Perissodactyla (from the Greek *perissos*, meaning numbers odd, and *daktulos*, meaning a finger or toe). In other words, they are all odd-toed ungulates (ungulates meaning hoofed-animals), with the axis of symmetry of the foot passing through the central toe, a characteristic also known as mesaxonic. Other Perissodactyla include horses and tapirs, and their evolution began during the early Paleocene,or possibly even earlier in the late Cretaceous.

In contrast, Artiodactyla (bovids, cervids, suids etc.) are even-toed, or paraxonic, with the axis of symmetry of the foot passing between the third and the fourth digit. Both Perissodactyle and Artiodactyle are Unguligrades: they walk on the terminal enlarged phalange, which forms a hoof.

Rhinoceroses were a very diverse and abundant family of mammals and were the largest terrestrial mammals on all the northern continents from about 35 to about 20 million years ago. During this time they ranged over all ecosystems and exhibited a wide range of behaviour, with many different size and morphological adaptations.

Paleontological history
The earliest known rhinoceros-like mammal is the *Hyrachyus eximus*, dating from Early Eocene, and which was found in North America. This small animal resembled early tapirs and horses, and had no horn.

Horns only became a defining characteristic later in rhinos' evolutionary history, with the appearance of Rhinocerotidae family in the late Eocene.

In fact three families evolved in the late Eocene: the Hyracodontidae or running rhinos; the Amynodontidae or aquatic rhinos; and the Rhinocerotidae, the forefathers of today's five species of rhino.

The Hyracodontidae, running rhinos, were adapted for speed and ranged in size from small (like todays' dogs) to horse and even mega-giraffe size (the Indricotheres, discussed below). The hyracodontids flourished from the mid-Eocene until the early Miocene. The second family, the Amynodontidae, was incredibly successful, with the maximum of diversification and dispersal – throughout America and Eurasia – in the late Eocene and early Oligocene. But during the Oligocene the Amynodontidae species declined, with just one hippo-like rhino species surviving until the middle Miocene.

The third family is the Rhinocerotidae, which first appeared in the late Eocene in Eurasia. The earliest species were small in size, with larger species only coming later, and Rhinocerotidae spread to North America. Some 26 different genera are known, but in the early Oligocene a large wave of extinction made all these early genera disappear. They displayed varying characteristics and were able to live in a wide range of habitats, one of the features that may account for their biological success.

For example, the *Menoceras* occurred in Europe until the early Miocene. It was a pig-sized rhinoceros, with males sporting two horns side-by-side, whereas females had no horns. They evolved locally in several lineages, e.g. *Teleoceras*, which had short legs, a barrel chest, and a single small nasal horn.

In Asia, Rhinocerotidae appeared during the Oligocene times. The most famous group is the Indricotheres, which included the *Paraceratherium*, believed to be the largest terrestrial mammal that ever existed. This hornless rhino is evaluated to be almost six metres high and nine metres long. Its weight would have been close to 20 tonnes. It ate leaves from trees with tusk-shaped upper teeth pointing down, while the lower teeth pointed forward.

Asia became the departure point for a big dispersal of all the large mammals from the Miocene to late Pleistocene periods. All the European rhinoceroses were connected to Asian forms. The woolly rhinoceros (*Coelodonta antiquitatis*), for example, appeared nearly one million years ago in China. It first arrived in Europe some 600,000 years ago (the oldest fossil record is found in Germany), and probably re-entered with a second migration wave around 200,000 years ago, together with the woolly mammoth, when it became common in Europe.

This rhino was a large genus, with morphological adaptations to live in steppic land (sub-hypsodont teeth) and a cold and dry climate, the most distinctive of which was the thick coat of long brown hair (like that of woolly mammoths), and a body septum separated the nasal bone in two parts, to warm the air easily). This two-horned rhino was hunted and drawn in caves by the early humans in the Ice Age. Like the woolly mammoth, the woolly rhino became extinct about 10,000 years ago, probably due to over-hunting by the early humans.

Another Asian species was the well-known *Elasmotherium*, the giant unicorn rhinoceros. It was two metres high and five metres long, and is estimated to have weighed nearly five tonnes. It had a single and enormous horn, hypsodont teeth with wrinkled enamel, and its long legs designed for running gave it a horse-like behaviour. Its habitat was similar to that of the woolly rhino. It seems this rhino became extinct around 10,000 years ago.

Rhinocerotidae only arrived in Africa from Asia in the early Miocene, with genera such as *Brachypotherium* and *Chilotheridium*. They evolved in Africa until the next exchange with Asia in the Late Miocene. The last species of *Brachypotherium* of Africa evolved at the beginning of Pliocene.

In Europe, the genus *Ronzontherium* is the first Rhinocerotidae known from the very end of Eocene and early Oligocene. Several species of it were found in western and eastern Europe, with *Protoceratherium* and *Menoceras* being the most important genera found in late Oligocene and early Miocene. In middle Pliocene, the genus *Stephanorhinus* ranged over all of Europe, coming in several migration waves from Asia. This genus, confused for a time with *Dicerorhinus*, experienced a large dispersal throughout Eurasia until it disappeared some 12,000 years ago. At the end of Middle Pleistocene and in Late Pleistocene some species of *Stephanorhinus* were found together with the woolly rhinoceros (*Coelodonta antiquitatis*).

The evolution of today's five species of rhino

Since the end of Miocene, Rhinocerotidae have been on the decline, probably triggered by changes in climatic conditions. Numerous species became extinct, and rhinos no longer survive in Europe (since about 12,000 years ago) or America (since about four million years ago).

The five species found today (white, black, greater one-horned, Sumatran and Javan) come from different lineages. The Sumatran rhino is thought to be the oldest and the most archaic form. As far as we can tell (fossil records with radioactive

dating disagree with molecular DNA clocks), the five modern species probably originated at these approximate times in the past

Sumatran	+ 15 millions years ago
Black	4-10 millions years ago
White	2-5 millions years ago
Greater one-horned	2-4 millions years ago
Javan	2-4 millions years ago

Morphological characters of the Rhinocerotidae
The rhinoceros has a massive body and a large head with one or two horns, depending upon the species, placed in the middle of the frontal or nasal bone of the skull. The horn has a dermal origin. It is composed of compressed fibrous keratin. Rhinoceroses have a very elongated skull, which is elevated in the occipital part. They have a small braincase, and the nasal bone is clearly projected forward, beyond the premaxillae bone. Its surface is rough where the insertion of the horn takes place.

All the Perissodactyla, especially rhinoceroses, have or had lophodont teeth, in other words the teeth are formed by two transverse lophs of enamel. The dental formula varies between species. I 0-3/0-3, C 0-1/0-1, P 3-4/3-4, M 3/3 x 2 = 24-44. They could be grazers (eg *Elasmotherium*), which means their premolars and molars are hypsodont (high crown), or sub-hypsodont (e.g. the woolly rhino, *Coelodonta antiquitatis*); but most of them are browsers with brachydont teeth (low crown). These characteristics are directly related to the species' environment. The hypsodont species could eat grass (a very rough food for the enamel), so lived in open habitat. On the contrary, the brachyodont species could only eat soft vegetable (such as leaves); consequently, they live in a more forested environment.

Frédéric Lacombat

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III.II The discovery of African rhinos

In the middle of the 18th century, it was known that there were rhinos in both Asia and in Africa, and that they had either one or two horns. However, the reports from Africa brought by sailors and traders were too vague for the naturalists in Europe to be convinced that the rhinos in Africa were all smooth-skinned and double-horned. The great French encyclopaedist, the Count of Buffon, could still treat all rhinos in one chapter without any divisions. The Swedish founder of systematics, Carl Linnaeus, listed two species, but the details in the description are confused enough to suggest that his material was inconclusive. He said that “Rhinoceros bicornis” was an obscure species, with two horns, from India, although now we believe that he meant the black rhinoceros then known from the Cape of Good Hope.

In 1750-1780, several travellers encountered rhinos in South Africa, and through their examination of dead specimens, their drawings and reports, it slowly became clearer that the African animals differed in many aspects from the heavy-armoured one-horned animals in India. Petrus Camper, a Dutch professor of anatomy, was the first to make the distinction unequivocally in a public dissection of a rhino head received from Africa in 1780.

The English naturalist William John Burchell was exploring the interior of South Africa when he came across some animals that were larger than others, and which had a prominent square upper lip. He shot one of them, took measurements, made drawings and brought the skull home. In 1817, he described the animal as a new species, which he called *Rhinoceros simus*. It has been established that, as least as early as 1838, this animal was called the white rhinoceros, while the smaller rhino with a prehensile lip known to Linnaeus and Camper was called black. Although these colours hardly describe the colour of the skins of these two species, the names stuck. The explanation that “white” is a corruption of an Afrikaans word, first suggested as late as 1931, is linguistically impossible and equally implausible as a host of other theories about the origin of the name.

When European hunters started to penetrate the African hinterland in search of ivory or sport in the course of the 19th century, African rhinos were still very common. It was not unknown to encounter 50 of these animals in the course of one day’s march. With the spread of firearms and increased settlement, it was inevitable that numbers of wildlife dropped in the areas that were opened up for trade and agriculture. Frederick Selous predicted in 1880 that the rhino would disappear within a few years. Such remarks helped to establish a new conservation movement, which successfully attempted to stem the tide in many areas.

The times of old, when rhinos were hiding behind every bush, have passed forever. But it is not too late to protect what is left. An African ecosystem without rhinos is both intolerable and inconceivable.

Kees Rookmaaker

III.III First sightings of Asian rhinos

In May 1515, a ship arrived in the harbour of Lisbon, carrying the first living rhino to be seen in Europe since Roman times, presented by an Indian ruler to the Portuguese king. Although it only lived for a couple of years before drowning on the way to Rome, the animal achieved eternal fame through a woodcut made by Albrecht Dürer – showing a rhino with an armour-like skin, one horn on the nose, and a small twisted hornlet on the shoulder. This image was copied so often in books and art works in the 16th, 17th and 18th centuries, that everybody knew this to be the appearance of the rhinoceros.

Four other rhinos came to Europe before 1750, the most famous of which was "Clara" who toured most countries in western Europe with her Dutch owner between 1741 and 1758. She looked very much like the animal figured by Dürer, except that she did not have the small horn on the shoulders. The species was first named by Linnaeus in 1758 as *Rhinoceros unicornis*, the greater one-horned rhinoceros with a single horn. All reports about rhinos in other parts of the world were compared with this animal, and although it is easy enough to tell the five species apart when you can compare them in a zoo, this is not so easy when you have to rely on eye-witnesses who only saw a short glimpse of a large animal in the forest.

Another one-horned rhinoceros in Asia looks very much like the Indian one, but it is somewhat smaller and differs in details of the skull. Jacobus Bontius went out riding in a forest in Java around 1630, when his party was chased by a rhinoceros. He only escaped because the rhino got stuck between two trees and was unable to move. The adventure was well-known at the time, but nobody suspected that the rhino involved would be different from the ones known in Europe. Two rhinos were shot in Java in 1787 and the skulls were sent to Holland, where they were studied by Professor Petrus Camper, who made a special study of rhinos. However, he died before he could publish his conclusion that the rhinos in Java differed from those in India. The species was only recognised to be separate when an animal shot in Sumatra by the Frenchman Alfred Duvaucel was studied by the famous French scientist, Georges Cuvier in 1822, who named it *Rhinoceros sondaicus*.

The rhinoceros of Sumatra is an elusive animal. One was shot 10 miles from Fort Marlborough on the west coast of the island in 1793. William Bell, a young surgeon stationed there, made some drawings of the animal and he wrote a description, which he sent to Joseph Banks, the president of the Royal Society of London. Although the paper was published, the Sumatran rhino was only named twenty years later, in 1814, by Gotthelf Fischer, Director of the Museum of Natural History in Moscow.

In 1822, finally, all five living species of rhinoceros had been described and named by European scientists.

Kees Rookmaaker

III.IV The five species of rhino and their subspecies

Rhino population numbers and distribution

Rhino population numbers in 2005 are as follows:

White rhinoceros

	Northern	**Southern**	**Total**
	Ceratotherium simum cottoni	*Ceratotherium simum simum*	
Botswana		67	**67**
D.R.C.	22		**22**
Kenya		218	**218**
Mozambique		2	**2**
Namibia		186	**186**
South Africa		10,306	**10,306**
Swaziland		61	**61**
Zambia		3	**3**
Zimbabwe		250	**250**
Total	**22**	**11,093**	**11,115**

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Black rhinoceros

	South West	Western	Eastern	South Central		Total
	Diceros b. bicornis	*Diceros b. longipes*	*Diceros b. michaeli*	*D.b. minor*	*D. b. bruceli?*	
Botswana				5		**5**
Cameroon		5				**5**
Ethiopia					4	**4**
Kenya			437			**437**
Malawi				8		**8**
Namibia	1,238					**1,238**
Rwanda			1			**1**
South-Africa	71		36	1,179		**1,286**
Swaziland				15		**15**
Tanzania			42	24		**66**
Zambia				5		**5**
Zimbabwe				536		**536**
Total	1,309	5	516	1,772	4	**3,606**

NB:
- Table excludes speculative guesstimates
- Numbers primarily compiled at (SADC RPRC and WWF-funded) IUCN SSC AfRSG Meeting held in Kenya 6-11 June 2004
- Numbers of *D. b. minor* in Tanzania, *D. b. bicornis* in Namibia, *D. b. longipes* in Cameroon and may be higher but this requires confirmation
- *C. s. cottoni* almost certainly now number less than 10, and are possibly extinct
- White rhino trend is up but numbers down due to sampling error associated with estimate for largest population of Southern white rhino (Kruger NP)
- The numbers of Southern white rhinos outside Kruger has increased by 606 (+10%) over the last two years and there is no evidence of an actual decline in Kruger
- Exact Swaziland numbers of *D. b. minor* given to AfRSG but are being kept confidential until authority is obtained to release them. In the meantime the table shows an approximation to the true number

	Greater one-horned	**Sumatran**	**Javan**	**Total**
	Rhinoceros unicornis	*Dicerorhinus sumatrensis*	*Rhinoceros sondaicus*	
India	2,000			**67**
Java			60	**22**
Nepal	400			**218**
Peninsular Malaysia		75		**2**
Sabah		25		**186**
Sumatra		200		**10,306**
Vietnam			2-7	**61**
Total	**2,400**	**300**	~70	**11,115**

NB:
• All numbers approximate
• Sumatran rhinos have two different subspecies, one in Sumatra and Peninsula Malaysia and one in Sabah; however these have not been distinguished in the above table

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White rhinoceros

Name and species
• Common name: white rhino
• Synonym: Square-lipped rhino
• Scientific name: *Ceratotherium simum:* "cerato" meaning "horn" "therium", meaning "wild beast" and "simus" meaning "flat nosed" in Greek
• White rhinos feed on grasses and their broad upper lip is adjusted to this type of food (hence the synonym square-lipped) – the "white" component of the name may have resulted from a mistranslation of the Afrikaans word "weit" meaning "wide" (although see also Kees Rookmaaker's article, "The discovery of African rhinos")
• Two subspecies:
• Southern *Ceratotherium simum simum*
• Northern *Ceratotherium simum cottoni*

Physical characteristics
• The white rhino is the bigger one of the two African species
• Adult males weigh between 1,800 and 2,500 kg and females 1,800-2,000 kg. Weight at birth: 40-60 kg
• Height at shoulder: 1.5 -1.8 m
• The colour of their skin is grey. There is no difference in the skin colour of both African species, nevertheless, after wallowing, the actual colour of the animal inevitably matches the colour of the local soil
• Their outline is characterised by a pronounced hump. The head hangs down; they look up only when alarmed
• White rhinos are surprisingly agile and can run very fast, up to 40 km/h for short periods
• Hair only on ears and tail tips, eyelashes
• They have poor eyesight, but acute senses of hearing and smell
• In zoological nomenclature, white rhinos belong to the Order Perissodactyla – the "odd-toed" or "odd-hoofed" mammals, family Rhinocerotidae (Rhinoceroses). Front and back feet each have three toes, surrounding a soft and elastic sole, which helps to balance the heavy weight of the body
• Horns are used as weapons against predators and for dominance and threat displays in contact with other rhinos. White rhinos have two horns: the larger front (anterior) horn measures up to around 100 cm (the record length being 158 cm); while the smaller rear (posterior) horn reaches up to around 50 cm.

• As with all rhino species, the horns grow from the skin and consist of compressed strands of keratin. They are not attached to the skull, but rest on bone pedicels at its dorsal part. The horns are continuously growing and if broken away, will subsequently grow back
• Longevity: up to 50 years
• Sexual maturity: males 10-12 years, females 6-7 years
• Habitat: African long- and short-grass savannah
• Food: grasses
• Adaptation to food intake: square mouth with wide prehensile lips, enabling efficient grazing as a “mowing machine”

Social behaviour and breeding
• White rhinos are sedentary, semi-social and territorial.
• Adult bulls are basically solitary and associate only with females in oestrus
• Bulls’ territories are relatively small, averaging between 1-3 $km^{2.}$ The size depends on many factors, including the quality and availability of food and water. Each territory is held by a mature male, often with between one and three resident satellite bulls. The territory owner ignores these satellite bulls, as long as they behave submissively. Territorial bulls treat foreign intruders far more aggressively than the resident satellite bulls
• Adult females and sub-adults are rarely solitary. They associate typically in pairs, usually a female with her latest calf. A juvenile stays with the mother for around three years. When the mother calves again, it seeks another companion, preferably of similar age and the same sex
• Stable herds of up to six animals can be commonly observed, while larger groups are the result of temporary aggregations, purpose-made because of availability of favourable food, watering, or resting conditions. Females' home ranges vary between 6-20 km^2, and usually overlap several males' territories
• As with the other rhino species, white rhino home ranges are scent-posted with dung heaps used by both sexes. The collective dung heaps, or middens, are usually located at territory boundaries and serve as communication and marking points. All animals add their deposits there, but only territorial males scatter the dung with ritualised kicks and spray urine
• Marking by urine spraying is mostly displayed along territorial boundaries
• White rhinos also communicate vocally, using a wide range of sounds from calf squeaking to snarling or wailing of adults
• When the urine test reveals a cow approaching oestrus, the territorial bull will join the female for several days. He at first accompanies the female at a distance, until she comes into full oestrus and allows him to approach. The foreplay lasts up to a day, characterised by the male resting his chin on the female’s rump and attempted mounting. Finally, the cow will stand still, with tail curled, and allow copulation. Mating is remarkably prolonged, lasting from 20 minutes to one hour.
• White rhino have a gestation period of approximately 16 months. Records of captive breeding in zoos vary between 480 and 548 days’ gestation.

• Females give birth for the first time at the age of 6.5-7 years. The interval between calving is 3-4 years
• Pregnant females leave their groups shortly before the parturition and stay apart for several days afterwards. Calves stand up within one hour, immediately attempting to suckle. Mother and calf become inseparable; the calf usually moves in front of its mother and immediately responds to the mother's behaviour.
• The calf begins grazing at two months, weaning occurs at around one year of age. The calf stays with mother for around three years.

Location and habitat
• White rhinos prefer short-grassed savannah with access to thick bush cover for shade and water holes for drinking as well as wallowing. The optimal habitat is a combination of grassland and open woodland
• White rhinoceroses feed and rest alternately during day and night. In hot, dry weather they routinely rest during the hottest part of the day. Much of their resting time is spent wallowing to keep cool and to get rid of skin parasites. They need water for drinking every 2-4 days. If there is no wallowing place available, they will roll in dust

Under threat: Southern white rhinos
Almost all Southern white rhinos *(Ceratotherium simum simum)* live in a single country: South Africa (10,300 individuals). The others (800) can be found in Botswana, Namibia, Swaziland, Zambia and Zimbabwe, and some were translocated to Kenya.

Today, the Southern white rhino is the most abundant rhino in the world, but it was different in the past. It was one of the first rhino species to be at the brink of extinction, and thought extinct at the end of the 19th century. Both farmers and hunters had decimated the animals. Nevertheless, a few individuals (50-100) survived in the iMfolozi River valley in Natal and became subject of intense conservation efforts at the beginning of the 20th century. Thanks to the co-operation of conservationists, researchers and general public (particularly in South African National Parks and sanctuaries) Southern white rhinos have recovered to over 11,000 individuals today. However, poaching pressure still exists.

Zoological gardens worldwide keep 760 Southern white rhinoceroses.

Under threat: Northern white rhinos
The Northern white rhino *(Ceratotherium simum cottoni)* used to be relatively widespread in central and East Africa (mainly in Uganda, Sudan, Zaire-Congo and the Central African Republic) with more than 2,000 individuals reported in the 1960s. Then came a dramatic decline in numbers due to over-hunting: in 1970 the population fell to 700; 10 years later, only 100 animals survived.

In 1984, the 13 last individuals were identified in Garamba National Park in Zaire – today's Democratic Republic of Congo. Thanks to the intensive international efforts, conducted primarily by the Zoological Society of Frankfurt and the International Rhino Foundation, these animals reproduced successfully and after 10 years; intensive work, they numbered over 30.

These animals survived relatively well even throughout the series of civil war outbreaks in the late 1990s and at the turn of the Millennium. Unfortunately, all the tremendous efforts for survival of this subspecies were defeated when, in April 2004, poachers invaded Garamba from Sudan and started exterminating rhinos. The situation deteriorated so dramatically that all conservative efforts had to be terminated in March 2005 and since then, Garamba National Park cannot be protected any more. (See also the section on "Political conflict" later in this Section.)

There are 10 Northern white rhinos in captivity (possibly the only survivors of their subspecies): seven at Dvur Kralove Zoo in the Czech Republic, and three at the San Diego Wild Animal Park in California, USA.

For more information on the work of the white rhino EEP, please refer to the CD-ROM, or visit the members' area of the EAZA website (www.eaza.net).

Kristina Tomasova

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Black rhinoceros

Species and subspecies

• Common name: black rhino
• Synonym: Hook-lipped rhino
• Scientific name: *Diceros bicornis*: “Di" meaning "two", "cerato" meaning "horn" in Greek and "bi" meaning "two", and "cornis" meaning "horn" in Latin
• Four or five subspecies:
• Western *Diceros bicornis longipes*
• Eastern *Diceros bicornis michaeli*
• SouthWest *Diceros bicornis bicornis*
• SouthCentral *Diceros bicornis minor*
• And possibly *Diceros bicornis bruceii*

Physical characteristics

• The black rhino is the smaller of the two African species. Adult males weigh up to 1,350 kg and females up to 900 kg. They stand up to 1.6 m tall at the shoulder
• The colour of their skin is basically grey but varies from yellow-brown to dark-brown according to local soil conditions. They only have hair on the ears, tail tips and eyelashes
• Their sense of hearing is excellent and they have a very good sense of smell as well, but have poor eyesight and cannot easily detect an observer standing more than 30 metres away. They can detect movement, however, at short distances
• Like all rhino species, they have three toes, and thus three stout nails, which leave impressions on the ground to the front and side of a softer wrinkled sole. The front feet are bigger than the back feet
• Black rhino have two horns, which grow continually from the skin at their base throughout their life (like human fingernails). The horn is continually worn away by rubbing. Each rhino develops its own rubbing habits and horn-wear patterns. Rhinos from different areas can have horns of different shapes. Horn shapes also differ between the sexes, with males tending to have chunkier horns and the females often longer and thinner ones. The horn is comprised of thousands of compressed hair-like strands of keratin, making it extremely hard and tough, but it can be broken or split during fighting. The front (anterior) horn is longer than the rear (posterior) horn, averaging 50 cm long
• They have a hooked upper lip which is used for grasping small branches
• Black rhino can move extremely fast. They can run at 55 km/h, change direction surprisingly quickly, and can run right through scrub and bushes.

It is impossible to outrun a black rhino (the speed of Olympic 100m sprinters is 40 km/h)
• The explosive puffing snort of an alarmed black rhino is the sound most clearly associated with this species by people who work with them. An appealing high-pitched whine or squeal is another sound made by this species. A calf uses it to attract its mother's attention, a male may use it to court a female, and all black rhino use it when in pain or distress
• In some areas, and especially in KwaZulu-Natal in South Africa and parts of Kenya, black rhinos have sores called lesions on their chests or flanks. These are caused by a wormlike parasite which infect the skin, transmitted by species of fly unique to rhino
• Black rhinos leave up to 30-35 years in the wild and 35-45+ years in captivity

Food and foraging
• Black rhino are browsers (i.e., they eat trees, bushes and shrubs). When they bite off woody plant parts they often leave a clean-angled (pruning-shear type) edge (elephant tend to shred the ends of branches like a toothbrush). This neatly bitten woody material can be clearly seen in their dung
• They eat a wide range of browse species in any given habitat, but while over 100 species may be ingested during a year's foraging, 90% of the diet is commonly made up from fewer than 20 species. Grass is generally only eaten incidentally while foraging for low-growing herbs, but new soft grass leaf growth is voluntarily taken on occasion
• Black rhino are most active during the night-time when most of their foraging and drinking is done. Foraging also occurs in the cooler hours of the morning and afternoon, but wallowing and / or sleeping in a cool, breezy or shady spot is the main activity during the heat of the day

Location and habitat
• Black rhino occur wherever herb and woody browse occurs in sufficient amounts to support a population. This spans a wide range of habitats covering deserts, semi-deserts, wooded savannas, woodlands, forests and even subalpine heathlands
• The densities at which black rhino can exist in the varied habitats vary 100-fold, from one rhino per 100 km2 in the desert plains of Western Kunene, Namibia to more than one rhino per square kilometre in thicket vegetation
• Currently, only around 3,600 individuals are found in National Parks, Wildlife Reserves and Sanctuaries
• There are four recognized subspecies of black rhino occupying different areas of Africa; a fifth subspecies may still survive in Ethiopia
• The Western black rhino is now only found in northern Cameroon, where just a few scattered animals remain. There may be a few animals in Chad, but these may be seasonal visitors from Cameroon. There are no animals in captivity
• The Eastern black rhino's current stronghold is Kenya with 458 rhinos. Tanzania has an estimated 42 rhinos. Rwanda has only one animal.

• South Africa, at end of 2003, had an estimated 36 animals of predominantly Kenyan origin out-of-range on private land. There are 173 in captivity worldwide as of end May 2004
• Namibia currently conserves 1,238 South-western black rhino as end 2003. South Africa is the only other South-western holding country with 71 rhinos. There are no South-western black rhinos in captivity
• The South-central black rhino is the most numerous of the black rhino subspecies with about 1,770 individuals (end 2003). Its stronghold is South Africa and, to a lesser extent, Zimbabwe, with smaller numbers remaining in Swaziland, and southern Tanzania. A few rhinos have been reintroduced to North Luangwa, Zambia, Botswana and Malawi from South Africa. There are 69 animals in captivity (end of May 2004)

Social behaviour, reproduction and population dynamics
• Adult male black rhino tend to live on their own, except when courting females. Among males, there are dominant and subordinate animals. Subordinate rhino are often subadults or young adults, who must defer to an established territorial bull or risk a fight. Young bulls are often killed or injured in these interactions. Old males which can no longer defend their territories also die in fights, or become confined to a small area until they die
• Adult female black rhino live with their calves until these are old enough to go off to find their own range (usually from 2-4 years). A cow is usually found with her latest calf, or sometimes her last two or three calves, or occasionally on her own if she has not calved for some time
• Male black rhino only become fully sexually mature after seven years old, and only become socially mature some years after this when they establish a set territory, in which they spend most of their time and do most of their feeding. Females settle into their own home range near the time of birth of their first calf. Female home ranges can overlap. The ranges of dominant bulls do not overlap much
• Black rhino advertise their presence in their range to other rhino by spray-urinating and scraping their dung on the ground next to a path; and also by defecation on well developed dung-piles (middens). Male rhino spray-urinate and scrape more than females, and territorial (dominant) males keep more middens in and around their range than other rhino
• Female black rhino will become fertile as they approach their sixth year of age, and most commonly have their first calf when 7-8 years old, but sometimes earlier (5-6 years), sometimes later (8-10+ years). This depends to some extent on body condition and weight
• Black rhino can produce calves at around two-year intervals, but can also take three or more years between calves, depending on the female's age and nutritional status
• Mating in black rhino follows a characteristic pattern with several mountings.

• During this period, the bulls can be extremely aggressive towards other bulls, and this is one of the causes of death of sub-adult male calves which remain with the mother
• Black rhino have a gestation period of about 15.4 months. As the time for parturition approaches, the female will chase her previous calf away, and will find a secluded bushy area in which to give birth
• Black rhino calf weighs 30-40 kg at birth and can walk and suckle within three hours of being born. While the calf is young, the cow tends to keep to thick bush to hide the calf. She may sometimes leave her calf hidden in a bush while she goes to drink at a waterhole or eat in an open area, returning to fetch it later. Black rhino calves stay with their mother for 2-4 years and are then rejected. The older, rejected calves are more vulnerable to predation, aggression by male rhino, and other mishaps. They feel insecure and usually attempt to join another female or occasionally young male, or even a white rhino female who will tolerate their presence. After 3-8 months, the mother may allow her former calves to return to her company. Male calves in particularly may not truly leave until 6-7 years' old
• Black rhino have few predators, although lions and hyenas may kill calves and sub-adults. Evidence of predator attacks are sometimes seen in the form of mutilated ears or missing tails. Ox-peckers are often seen with rhino and benefit them by removing ticks and also raising the alarm if there is any danger approaching
• Black rhino react swiftly when disturbed from rest, usually standing up and facing the source of disturbance. Because they have poor eyesight they may not locate the disturbance easily. Being curious animals, they will walk or trot forward to find out what is going on. Black rhino usually run away if they catch a human's scent – a rhino usually only deliberately charges if it sees the human but some aggressive males may actively follow the scent to track and scare the human away
• More male calves are born than female calves, but male mortality rate is higher, leading to adult sex ratios biased towards females. Fighting is the most common cause of adult male deaths. Most females die of old age
• Related rhino tend to maintain long-term bonds and often join up with each other for short periods over their lifetime

Under threat
• During the 19th century, as European influence over land use and trade strengthened, the black rhino, which was the most numerous rhino species with several hundred thousand animals, was hunted relentlessly across most of Africa. By 1970 there were an estimated 65,000 animals left
• Poachers remain the biggest threat to black rhino. However, with strict protection and effective biological management, black rhino numbers are slowly recovering and currently there are approximately 3,600 animals (end of 2003)

For more information on the work of the black rhino EEP, please refer to the CD-ROM, or visit the members' area of the EAZA website (www.eaza.net).

Keryn Adcock and Rajan Amin

Greater one-horned rhino

Name and species

• Common name: greater one-horned rhino
• Synonym: Indian rhino
• Scientific name: *Rhinoceros unicornis*: "uni" meaning one and "cornis" meaning horn in Latin

Physical characteristics

• Greater one-horned rhinos have a brownish-grey, hairless skin, which develops thick folds, resembling armour plating. Several prominent folds protect the neck. The skin has a maximum thickness of four cm; the subcutaneous fat is 2-5 cm thick and well supplied with blood, which helps thermo-regulation. Between the folds, around the stomach, the inner legs and the facial area, the skin is rather soft and thin. The tail lays well embedded between the hind-leg folds
• They are second in size only to the white rhino. They weigh between 4-6,000 pounds (1,800-2,700 kg), stand 1.75-2 metres tall at the shoulder, and are 3-3.8 metres long. Animals in the wild are in general '"lighter" than their captive colleagues. A bull weighs on average around 1,800 kg
• Greater one-horned rhinos have one horn, which is typically 20-61 cm long, and weighs up to three kg. It has the same horn structure as the hooves of horses and re-grows if broken off. It is not used for fighting but for the search of food / roots
• They feed on wide variety of plants (up to 183 different species) with a strong seasonal variation: grass (80%, mainly *Saccharum spontaneum*), fruits, leaves and branches of trees and shrubs, submerged and floating aquatic plants and agricultural crops
• Greater one-horned rhinos eat on average 1% of their body weight daily
• They have a prehensile upper lip, which assists in grasping their food
• Greater one-horned rhinos have long lower incisor teeth. In males they can become up to 8 cm long. They are used in fighting and can inflict deep wounds
• Greater one-horned rhinos are hind-gut fermenters and have a large caecum (90 cm) as well as a large colon (6-7.6 metres)
• Greater one-horned rhinos live an average of 30-45 years in the wild; while the longevity record for those in captivity is 40 years
• Hair is found at the tip of the tail, around the ears and as eyelashes
• They are very good swimmers and can dive and feed under water. They seem to enjoy the wet element

• Greater one-horned rhinos spend up to 60% per day (according to the season) wallowing (most frequently during the monsoon, less during the winter). The access to water / mud is essential for thermo-regulation and to get rid of ectoparasites
• They have a good sense of smelling and hear very well, but are rather short sighted. This is one of the reasons why they tend to attack “at the last moment” or “out of the blue”
• Greater one-horned rhinos can run fast (up to 40 km/h) and are very agile

Location and habitat
• Greater one-horned rhinos are closely adapted to the life along bodies of water. In former times, greater one-horned rhinos roamed freely the floodplains and forests alongside the Brahmaputra, Ganges and Indus River valley. Nowadays only around 2,400 individuals are found in National Parks and Sanctuaries in India and Nepal
• In India, its population is currently restricted to natural populations in:
• Assam: Kaziranga, Manas, Orang and Pabitora
• West Bengal: Jaldapara and Gorumara
• one re-introduced population in Dudhwa NP
• and one migratory population in Katerniaghat in Uttar Pradesh
• In Nepal, the three rhino populations are found in Royal Chitwan NP, Royal Bardia NP and Sulkhlaphanta WLS. The rhinos of the Royal Chitwan NP are a natural population while Royal Bardia NP and Sukhlaphanta WLS have a re-introduced population
• Kaziranga National Park in Assam (India) has the highest population of rhino (about 1,600), followed by Royal Chitwan NP Nepal (about 372 rhinos). Pabitora WLS has 85 rhinos in 16 km2 area

Social behaviour and breeding
• Greater one-horned rhinos are usually solitary, except for females with small calves. Males have loosely defined territories, which are well defended by the dominant male but can overlap with other territories. The territories change according to food availability, i.e. according to the season. The females can move in and out of these territories, as they like
• Male greater one-horned rhinos fight violently for these favourite places. It might happen that fights end with the death of one male (in general, the badly wounded animal dies days after the fight due to the inflicted wounds)
• If food is abundant, it is not unusual to see several animals all grazing close together
• Wallows can be places were several individuals meet. After wallowing they separate again. Wallowing helps thermo-regulation by preventing overheating. The mud, covering the animal body, serves as skin care
• In greater one-horned rhinos, 12 different communication sounds are known, which are frequently used
• The dung heaps serve as communication points. Several animals defecate at the same spot. Such a dung heap can become five metres wide and one metre high.

• After defecating, greater one-horned rhinos scratch their hind feet in the dung. By continuing to walk, they "transport" their own smell around the paths
• Greater one-horned rhinos tend to use the same path, which are marked by the secret from the gland of their feet, urine and dung
• Females are sexually mature at 5-7 years of age; males at 8-10 years. Their gestation period is approximately 16 months (465-490 days; interval taken from the experience of 30 births at Basel Zoo), and they give birth every three years. The birth weight ranges from 60-77 kg (Basel Zoo ranges). A calf drinks on average 20-30 litres of milk per day and grows by 1-2 kg daily. They start nibbling / feeding on roughage at the age of 3-5 months and continue to suckle up to the age of 20 months
• In the wild, youngsters are predated by tiger. Adults have no enemies other than humans

Under threat
• The biggest threat that greater one-horned rhinos face is human harassment / encroachment. Since centuries ago, rhinos were hunted for sport and for their horn. The horn is used in Asia as a medicine against fever and pain. In the early 19th century, the greater one-horned rhino was almost hunted to extinction. The remaining animals were only found in reserves
• With strict protection from Indian and Nepalese wildlife authorities, greater one-horned rhino numbers have recovered from under 200 in this century to around 2,400 today. However, poaching has remained high and the success is precarious without continued and increased support for conservation efforts in India and Nepal
• Poaching still remains the biggest threat to the rhino population. Recent counts in Nepal revealed that due to the political instability in Nepal, the rhino population in Chitwan NP decreased by 31% in the last five years (from 544 in 2000 to 372 in 2005). The lack of finance and control of anti-poaching measurements lead to a tremendous increase of poaching in recent years in Nepal. It is estimated that at least 94 animals were lost to poaching
• Apart from poaching, habitat destruction and loss are further threats to the rhinoceros population. As greater one-horned rhinos live in areas with very fertile soil, humans started to use the same land for their own existence. Conflicts between humans and animals are inevitable. The land used by greater one-horned rhinos is more and more used by humans and consequently fragmented, primarily for the extension of agriculture

For more information on the work of the greater one-horned rhino EEP, please refer to the CD-ROM, or visit the members' area of the EAZA website (www.eaza.net).

Friederike von Houwald

Sumatran rhinoceros

Name and species

• Common name: Sumatran rhino
• Synonyms: Asian two-horned rhino or the Hairy rhino
• Scientific name: *Dicerorhinus sumatrensis*, from the Greek “di”, meaning "two", “cero”, meaning "horn" and “rhinos”, meaning "nose"; “sumatrensis”, from Sumatra

Physical characteristics

• Sumatran rhinos have a reddish-brown skin, in the wild variably covered with short bristly hair. In captivity the hair can grow out to a shaggy fur, because of less abrasion from vegetation. The ears edges have a prominent fringe of longer hairs, and the tail is terminate with a tuft of thicker hairs. There are two prominent folds in the skin circling the body behind the front legs and before the hind legs, and lesser folds on the neck and at the basis of the legs. The skin is rather thin, about 10-16 mm, and soft and pliable. Subcutaneous fat is absent in wild animals, but may occur in zoo specimens
• The Sumatran rhino is considered the most “primitive” rhino species, because of its hairy skin and other ancient characteristics. It is the closest relative alive of the famous woolly rhinoceros that lived in the frigid lands of Europe and Asia during the past ice-ages
• Sumatran rhinos are by far the smallest of the five living species of rhino. They weigh between 500-800 kilos, often more in captivity), stand 1.20-1.45 metres tall at the shoulder, and are about 2.50 metres long
• The head is 70-80 cm in length and the tails vary in length from 35-60 cm
• Sumatran rhinos have two horns, dark grey to black in colour. In the wild they are usually very smooth and form a slender cone that is curved backwards. The larger front (anterior) horn is typically 15-25 cm long, the smaller second (posterior) horn is normally much smaller, seldom more than a few cm in length, and often not more than an irregular knob
• The longest horn ever found was 81 cm long and is now in the British Museum in London. Rhino horn has the same horn structure as the hooves of horses and re-grows if broken off. It is not used for fighting, but for scraping mud from the sides of wallows, pulling down food plants, and for protection of the head and nose when breaking through dense vegetation
• Sumatran rhinos eat on average 50-60 kg (almost 1% of their body weight) of plant matter per day

• Sumatran rhinos have a prehensile upper lip, which assists in grasping their food.
• Sumatran rhinos, like all Asian rhinos, have long dagger-shaped lower incisor teeth. They are very sharp and are used in fighting and can inflict deep wounds. These teeth are lacking in the African rhino species
• To masticate the large quantities of coarse food, rhinos have two rows of six strong broad and low-crowned molars on each side. The teeth are fitted with strong ridges of enamel, which cut the woody parts in characteristic 1-2 cm long bits. Over the years the teeth wear down by several centimetres to become shallow dish-like structures, and old animals will have problems masticating their food, will lose condition, and may eventually die of undernourishment
• Sumatran rhinos are hind-gut fermenters (they use micro-organisms in the last part of the intestine to break down indigestible parts of the food) and have a large cavernous caecum and colon
• Sumatran rhinos are estimated to live an average of 30-45 years in the wild; while the longevity record for those in captivity is almost 33 years
• Sumatran rhinos have a good sense of smelling and hear very well, but are rather short sighted. When encountered in the forest, they usually run away and attacks on humans are very rare and probably mainly accidental because of the animal's limited eyesight
• Sumatran rhinos can run fast and are very agile. They climb mountains easily and can negotiate very steep slopes and riverbanks. With the protection provided by the horns and rims of hard skin and cartilage on nose and head, they can easily break through the densest vegetation, leaving round tunnels

Location and habitat
• The Sumatran rhino lives in dense tropical forest, both lowland and highland. The Sumatran rhino is a browser with a very varied diet consisting of the great diversity of the plant species in tropical forest. The list of species that have been recorded as food for Sumatran Rhinos is several 100s long, but does not include wild bananas, or grasses and sedges. They eat the tips of plants growing on the forest floor, browse the leaves from sapling trees that they break to reach the crown and pull climbers from trees. They feed in primary forest, but mostly in small patches of more juicy secondary vegetation created by landslides, tree falls and along river banks. They are also fond of fruits fallen from the forest trees
• Sumatran rhinos are very well adapted to the life in the very dense tropical forests of Southeast Asia. In former times, Sumatran rhinos roamed freely from the foothills of the Himalayas in Bhutan and India through Myanmar, Thailand, Malaysia, Sumatra and Borneo. Its presence in the eastern states of Southeast Asia (Laos, Cambodia and Vietnam) has not been confirmed, though there are several unconfirmed reports from these states
• Currently only about 300 Sumatran rhinos survive in small populations in Sumatra, peninsular Malaysia and in Sabah (northern Borneo). Scattered remnants are reported in remote and inaccessible parts of Thailand and Myanmar

• In Sumatra about 200 Sumatran rhinos are found in three main populations, the largest being the Bukit Barisan Selatan and Gunung Leuser National Parks
• In Peninsula Malaysia currently about 75 Sumatran rhino survive, mainly in four areas, the larger of this being the Taman Negara National Park
• In Sabah about 25 remain in Tabin Wildlife Reserve and one or two other areas
• Sumatran rhinos spend a large part of the day wallowing in mud holes. They may use temporary pools and puddles which they deepen with the feet and horn. In mountain areas good places for wallows are scarce and some are used repeatedly for a very long term, and eventually become characteristic holes dug in several meters into a slope. The access to mud wallows is essential for thermo-regulation, skin condition and to get rid of ectoparasites and biting insects

Social behaviour and breeding
• Sumatran rhinos are usually solitary, except for females with small calves, and during a short period of courtship around the time a female is in oestrous. Males have large territories (up to 50 km2), which overlap with other males' territories. There is no indication that these territories are actually defended by territorial fights as happens in other rhino species, but they are marked along the main trails by urine, faeces, scrapes and twisted saplings. The females' much smaller ranges (10-15 km2) appear to be quite well spaced, but overlap with male territories
• Salt-licks are an important component in most Sumatran rhino areas, although they are absent (or have not yet been found!) in some areas. Salt-licks are usually small hot springs, seepages of mineral rich water or so-called "mud volcanoes". Each rhino has a favourite salt-lick that is visited once every one or two months, but much more often when a female is with a calf. Wildlife trails lead from all directions to these places, and other animals like elephants, tiger, orangutans, deer, etc. come there to get a supplement of scarce minerals. Salt-licks appear to be important social focal points where males can pick up scent marks from oestrous females. Unfortunately the big trail leading to the salt-licks also attract poachers who place their traps and snares around the licks
• The Sumatran rhino is surprisingly vocal and communicates with many different sounds, mostly whistling or whining noises
• Dung heaps also serve as a communication point, though the large latrines common in the greater one-horned rhino do not occur, probably because of the much lower natural density of these animals. But when a Sumatran rhino meets a heap of dung, it usually triggers a fresh deposit nearby. After defecating, Sumatran rhinos, in particular males, scratch their hind feet in the dung and kick it around in the bushes. This probably serves to mark the feet and the tracks with the scent of the faeces. Foot glands, as for the Javan rhino, are most likely absent in the Sumatran rhino
• Sumatran rhinos tend to use a network of game trails that occur on all major ridges and along all major rivers. The trails are well defined and are kept open by the regular passage of the larger animals, especially rhinos and elephants.

• They are also marked by the secret from the gland of their feet, urine, dung, scrapes and twisted saplings. The rhinos use the trails to travel between feeding areas, salt-licks or seasonal movements where they occur
• Gestation period is approximately 15-16 months and in the wild they have a single calf, every 4-5 years. Female sexually mature at an estimated 6-7 years of age, about 10 years for the male. The birth weight is 40-50 kg. A calf drinks and grows 1-2 kg daily. They start nibbling from the food hanging from the mother's mouth at an early age to learn what plants are good to eat, and continue to suckle up to the age of 13-15 months
• In the wild calves may occasionally be predated by tiger or wild dogs, but when young they stay very close to the mother at all times, and it is believed that natural predation is insignificant. Adults have no enemies other than humans

Under threat
• The biggest threats for Sumatran rhinos are poaching for their horn and loss of habitat for development. The horn is used in Asia as a medicine against fever and pain and trade in rhino horn between Borneo and other source areas in SE Asia and China has been reported more than 2,000 years ago. Over the centuries, the Sumatran rhino had been exterminated over most of its range, though in many places suitable habitat remains. This continued until, in 1995, there were only about 300 were left worldwide, largely in the places where they are still found today, all National Parks or Wildlife Reserves. Since then, the decline has stopped because of concentrated efforts of dedicated anti-poaching teams, called Rhino Protection Units (RPUs) in all major rhino areas
• With continued strict protection, of both the remaining rhinos and their habitat, over the next century the populations will eventually, hopefully, be able to recover to at least 2,000 to 2,500 individuals, as this number is determined by population biologists as a minimum requirement for long-term survival of the species
• Apart from poaching, habitat destruction and loss for agriculture and development are further threats to the rhinoceros populations. Though officially all rhino habitats are strictly protected by legislation, in practice many areas are subject to large-scale encroachment by poor and landless masses, while the National Park management usually does not have the means or the political support to counter this pillage. Habitat is still not a limiting factor overall, but some of the larger and better-protected rhino populations may face a shrinkage of available habitat in the near future
• Therefore re-establishment of Sumatran rhinos in areas where they have been exterminated is a vital component of the conservation strategy for this species

Nico van Strien

Javan rhinoceros

Name and species

• Common name: Javan rhino
• Synonym: Lesser one-horned rhino
• Scientific name: *Rhinoceros sondaicus*; from the Greek “rhino”, meaning "nose" and “ceros” meaning "horn". Sondaicus derives from "Sunda," the name for the western part of Java, but the word is also used to indicate the main chain of Indonesian islands, the “Sunda islands”

Physical characteristics

• Javan rhinos have a grey or grey-brown skin, almost black when wet, with pink colouring in the folds. As for the other Asian rhinos, there are two folds in the skin circling the body behind the front legs and before the hind legs, and horizontal folds at the base of the legs. The neck folds are less massive than in the greater one-horned rhino, but two folds continue over the back of the neck, forming a characteristic “saddle” on the neck-shoulder. The skin is covered with a mosaic pattern, giving a scale-like appearance
• The Javan rhino is a smaller and lighter relative of the greater one-horned rhino
• Javan rhinos are comparable in size to the African black rhino, though only a few animals have actually been weighed. They typically range between 900 and 2,300 kg, and are 1.4-1.7 metres tall at the shoulder. The few Javan rhinos surviving in Vietnam are very small, no more than 1.2 metres at the shoulder, and probably of the same weight as a Sumatran rhino (less than 800 kg)
• Javan rhinos have a single horn, grey or brownish in colour, never very long or massive, and usually less than 20 cm long. Males have the larger horns and many females, especially in Ujung Kulon, lack the horn or just have a small knob on the nose. The longest horn ever recorded is only about 27 cm long and is now in the British Museum in London. Rhino horn has the same horn structure as the hooves of horses and re-grows if broken off. It is not used for fighting, but for scraping mud from the sides of wallows, pulling down food plants, and for protection of the head and nose when breaking through dense vegetation
• There is not much difference in size between the males and females, and from information gathered in Ujung Kulon and from museum skeletons, there is a possibility that females are slightly bigger
• Javan rhinos have long pointed upper lip, which assists in grasping their food. Such prehensile lips are found in all browsing species, the African black rhino, and the Greater one-horned and Sumatran rhinos

• Javan rhinos, like all Asian rhinos, have long dagger-shaped lower incisor teeth. They are very sharp and are used in fighting and can inflict deep wounds. These teeth are lacking in African rhinos
• To masticate the large quantities of coarse food, rhinos have two rows of six strong, broad and low-crowned molars on each side. The teeth are fitted with strong ridges of enamel, which cut the woody parts in characteristic 1-2 cm-long bits. Over the years, the teeth wear down by several centimetres to become shallow dish-like structures, and old animals may have problems masticating their food, lose condition, and may eventually die of under-nourishment
• All rhinos are hind-gut fermenters (they use micro organisms in the last part of the intestine to break down indigestible parts of the food) and have a large cavernous caecum and colon
• Javan rhinos are estimated to live an average of 30-45 years in the wild; while the longevity record for the few animals in captivity is just over 20 years
• Javan rhinos have a good sense of smelling and hear very well, but are rather short sighted. Attacks on humans are not uncommon when the Javan rhino is met in the forest
• Very few Javan rhinos have ever been exhibited in zoos, and the last one died in Adelaide Zoo, Australia, in 1907. During its life it was exhibited as a greater one-horned rhino

Location and habitat
• Javan rhinos used to live in a variety of tropical landscapes, both lowland and highland, from the mangroves of the Sunderbans in India and Bangladesh, the mountains of southern China, to the sub-montane shrubs on the highest volcanoes of Java. The Javan rhino probably had a wider ecological range than both its larger relative, the greater one-horned rhino, or its compatriot, the Sumatran rhino
• But by the time the first naturalists ventured into the Southeast Asian forests, the Javan rhino was already very rare, and not much is known about its behaviour and ecology outside the single remaining viable population In Ujung Kulon, which may not be ideal or typical habitat
• Javan rhinos were once rather common over a large part of Southeast Asia, from near Calcutta in India, throughout Bangladesh, southern China, Laos, Vietnam Cambodia, Myanmar, Thailand, Peninsular Malaysia, the Large island of Sumatra, and the western half of Java. About 12,000 years ago they also occurred in Borneo and till about 2,000 years ago through large parts of China
• The Javan rhino showed the most dramatic decline of all three Asian rhino species, and by about 1930 the Javan rhinos was restricted to Ujung Kulon, a small peninsula on the westernmost tip of Java and a few small isolated populations in Vietnam and possible Laos and Cambodia
• Now only two populations remain. The largest one in Ujung Kulon, Java, recovered quite well from less than 30 in 1967 up to about 50-60 in 1980, but has been stagnant or even slowly declining ever since

• The only other population is in the Cat Loc part of the Cat Tien National Park in Vietnam, where a handful survives in about 4,000 hectares of reserved, but severely degraded habitat. No reproduction has been observed there since 1998
• The Javan rhino's diet is characterized by high species diversity. Hundreds of food plant species have been recorded, but about 40% of the quantity of food eaten comes from a few preferred and common plant species. The rhinos eat mostly leaves, young shoots and twigs. Most of the plants eaten by rhinos grow in unshaded locations, in vegetation types without tall trees, gaps created by fallen trees, and shrubland without trees. These unshaded places have a better average quality of foodplants. Rhinos rarely feed in vegetation types in which the quantity of available food was small
• In spite of their preference for feeding in vegetation types without tall trees, Javan rhinos are probably dependent upon the occurrence of forest in their environment. Forest provides protection against solar radiation, water supply is subject to smaller fluctuations inside forest than outside, and forest trees are the source of many saplings eaten by rhinos. The optimal habitat of the Javan rhino, with regard to vegetation types, therefore appears to be a mosaic of glades interspersed with patches of forest. This kind of habitat is widely distributed in Ujung Kulon
• Javan rhinos spend up a large part of the day wallowing in mud holes. They may use temporary pools and puddles, which they deepen with the feet and horn. The access to mud wallows is essential for thermo-regulation, skin condition and to get rid of ectoparasites and biting insects

Social behaviour and breeding
• Javan rhinos are usually solitary, except for females with small calves, or during a short period of courtship around the time a female is in oestrous. Occasionally young animals may form pairs or small groups for some time. Males in Ujung Kulon have larger territories (12-20 km2), only marginally overlapping with other males territories. There is no indication that these territories are actually defended by territorial fights as happens in other rhino species, but they are marked along the main trails by urine, faeces, scrapes and twisted saplings. The ranges of the females in Ujung Kulon are much smaller (3-14 km2) and overlap each other considerably
• Salt-licks, which are so dominant in the ecology of the Sumatran rhino, are unknown in Ujung Kulon, but occasionally Javan rhinos are known to drink seawater. It is likely that in other parts of the former range, salt-licks were also used by Javan rhinos
• Javan rhinos are not very vocal, much less than Sumatran rhinos, and only few vocalisations have been recorded. As with other rhino species, indirect communication through dung, urine and scrapes scented with the secretions of the foot glands play a more prominent role
• Dung heaps serve as a communication point, though the large latrines common in the greater one-horned rhino do not occur, probably because of the much lower natural density of these animals.

• Unlike Sumatran rhinos, Javan rhinos do not scratch their hind feet in the dung and kick it around in the bushes. They drag a hind foot, sometimes for several metres, to mark the scratch with the secretions of the foot glands. The visual marks made by the Sumatran rhinos in the form of twisted saplings are also unknown in Javan rhinos
• Gestation period is estimated to be between 16 and 19 months, but Javan rhinos have never been born in captivity

Under threat
• The biggest threat for the Javan rhino is poaching for their horn and the very small size of the remaining populations. This leads to inbreeding and loss of genetic variability and vitality. The two habitats where Javan rhinos occur are secure, but much too small for long-term survival of the species. The horn is used in Asia as a medicine against fever and pain
• With continued strict protection, both of the remaining rhinos and their habitat, and with active translocation and establishment of new populations in suitable and secure habitats, over the next 150 years the populations ought eventually to be able to recover to at least 2,000-2,500 individuals; the number determined by population biologists as a minimum requirement for long-term survival of the species
• Apart from poaching, habitat destruction and loss for agriculture and development are further threats to the rhino populations. Though officially all rhino habitats are strictly protected by legislation, in practice many areas are subject to large-scale encroachment by poor and landless masses, while the park management usually does not have the means and the political support to counter this pillage. Habitat is still not a limiting factor overall, but none of the two remaining habitats are large enough to allow significant growth of the rhino population, now or in the future. Therefore re-establishment of Javan rhinos in areas where they have been exterminated is a vital component of the conservation strategy for this species

Nico van Strien

III.V The web of life

The “Web of Life” is now a familiar concept. The delicate spider’s web is an excellent metaphor for the fragile strands that connect all living things, some directly, some more distantly, but all connected. The Web of Life, however, is infinitely more complicated than the even the most sophisticated spider’s web and the more we learn about life on earth and the global crisis it is facing, the more we see that these problems are also interrelated and interconnected. Third world poverty and debt, habitat destruction, global warming, over-population, and the extinction crisis are all woven together within the very structure of the web.

This year’s EAZA campaign focuses on just a few strands of this web: rhinoceroses. Of the five rhinoceros species surviving into modern times, four are facing extinction. The tragic story of the rhinoceros is a simple one; early in their evolution, during the late Miocene or early Pliocene they developed horns. This evolutionary development may have been what led to the peak of their diversity, but around 15 million years later it led to their wholesale slaughter.

Rhinoceroses are huge mega-herbivores and impact greatly on their environment by shaping the landscape. The browsers each feed on more than 200 species of plants. By forcing through thick scrub and forest like a tank, they open up access for other species and, by continuously browsing shrubs and small trees, rhinos shape the way they grow and keep them short and accessible to a whole range of smaller leaf eaters. The seeds rhinos eat take three days to pass through their gut and so when passed out – in their own, ready-made pile of fertiliser – they may be many kilometres from the parent plant. The dung also enriches the soil, returning vital nutrients and organic matter that improve the soil structure for the plant communities, as well as feeding whole communities of soil organisms that are the foundations of an ecosystem. The dung piles, known as middens, of rhinos also attract a great variety of animals: those that directly use or eat the dung such as dung flies and dung beetles; and those that feed on the invertebrates that are attracted there, including lizards, many birds such as flycatchers and hornbills, and many kinds of other insectivorous animals.

All rhinos are extremely fond of wallowing and will dig to create wallows for themselves. These then become used by many different species for bathing and drinking, and become breeding sites for animals that require small pools of open water to complete their lifecycles, such as frogs, many insects and a huge array of other invertebrates. Rhinos are great diggers and excavate minerals from the ground using their horns and feet. This provides an important service for those species requiring, but unable to open up, the earth for themselves.

It just takes a little imagination and research to link rhinos to any other part of the Web of Life, and this Information Pack should help you do this.

Mark Pilgrim

III.VI Sympatric species

Please find below some lists of species – mammals, reptiles and birds – that share habitat with the five rhino species.

African animal species sharing the white and black rhinoceroses' habitat

Mammals	
African elephant	*Loxodonta africana*
Reticulated giraffe	*Giraffa reticulata*
Rothschild's giraffe	*Giraffa rothschildi*
Grevy's zebra	*Equus grevvi*
Leopard	*Panthera pardus*
Lion	*Panthera leo*
Cheetah	*Acinonyx jabatus*
Black-footed cat	*Felis nigripes*
Chimpanzee	*Pan troglodytes*
Derby eland	*Tragelaphus (taurotragus)*
Bongo	*Tragelaphus boocercu euroceros*
Cape Buffalo	*Syncerus caffer*
Lechwe	*Kobus leche*
Nyala	*Tragelaphus angasili*
Puku	*Kobus vardonii*
Water chevrotain	*Huemoschus aquaticus*
Giant forest hog	*Hylochoerus meipertzhagen*
Brown hyena	*Hyaena brunnea*
African wild dog	*Lycaon pictus*
Reptiles	
African rock python	*Python sebae*
Black mamba	*Dedroaspis polylepis*
Eastern green mamba	*Dendroaspis angusticeps*

Black-necked spitting cobra	*Naja nigricollis*
Boomslang	*Dispholidus typus*
Long-snouted crocodile	*Crocodylus cataphractus*
Nile crocodile	*Crocodylus niloticus*
Egyptian cobra	*Naja haje*
Five-lined skink	*Mabuya guinguetaeniata*
Jackson's chameleon	*Chamaelo jacksonii*
Nile monitor lizard	*Varanus nilotieus*
Savannah monitor lizard	*Varanus exanthematicus*
Puff adder	*Bitis anetans*
Read-headed agama	*Agama agama*
African pancake tortoise	*Malacochersys tomien*
Bell's hinged tortoise	*Kinixys belliana*
Leopard tortoise	*Geochelone pardalis*
Tropical gecko	*Hemidactylus maboula*
Birds	
Ground hornbill	*Bucorys leadbeaten*
Greater flamingo	*Phoenicopterus rubber*
Lesser flamingo	*Phoenicopterus minor*
Marabou stork	*Leptotilos crumeniferus*
White pelican	*Pelecanus onocrotalus*
Secretary bird	*Sagittanus serpentarius*
Martial eagle	*Polemaetus bellicosus*
African fish-eagle	*Haliaeetus vocifer*
Bateleur	*Theratopius ecaudatus*
Black eagle	*Aguila verreauxi*
Spotted eagle owl	*Bibu africanus*
Pel's fishing owl	*Scotopelia peli*
Giant eagle owl	*Bubo lacteus*

Basra reed warbler	*Acrocephalus grineldis*
Saker falcon	*Falco cherrug*
Lesser kesterl	*Falco naumanni*
Lappet-faced vulture	*Torgos tracheliotus*
Bearded vulture	*Gypaetus barbatus*
Cape griffon	*Gyps coprotheres*
Cape parrot	*Poicephalus robustus*
Crowed crane	*Balearica regulorum*
Blue crane	*Anthropoides paradisea*
Wattled crane	*Bugeranus carunculatus*

(NB: Only critically endangered or vulnerable mammal species have been included in the above list; a more comprehensive list can be found on the CD-ROM).

Kim Bingham and Friederike von Houwald

Nepalese / Indian animal species sharing the greater one-horned rhino's habitat

Order Primata	
Rhesus macaque	*Macaca mulatta*
Common langur	*Presbytis entellus*
Assam macaque	*Macaca assamensis*
Capped langur	*Presbytis pileata*
Hoolock gibbon	*Hylobates hoolock*
Order carnivora	
Smooth Indian otter	*Lutra perspicallata*
Asiatic jackal	*Canis aureus*
Indian wild dog (Dhole)	*Cuon alpinus*
Indian fox	*Vulpes bengalensis*
Striped hyena	*Hyaena hyaena*
Jungle cat	*Felis chaus*

Black-necked spitting cobra	*Naja nigricollis*
Fishing cat	*Felis viverrina*
Tiger	*Panthera tigris*
Leopard	*Panthera pardus*
Clouded leopard	*Neofelis nebulosa*
Red panda	*Ailurus fulgens*
Sloth bear	*Melursus ursinus*
Order Pholidota	
Indian pangolin	*Manis pentadactyla*
Order Catacea	
Gangetic dolphin	*Platanista gangetica*
Order Proboscidea	
Asian elephant	*Elaphas maximus*
Order Artiodactyla	
Sambar	*Ceryus unicolor*
Chital	*Axis axis*
Hog deer	*Axis porcinus*
Swamp deer	*Cervus duvauceli*
Indian muntjac	*Muntiacus muntjak*
Gaur	*Bos gaurus*
Wild pig	*Sus scorfa*
Water buffalo	*Bubalus amee*
Birds	
Bengal florican	*Houbaropsis bengalensis*
Lesser florican	*Sypheotides indica*
White-rumped vulture	Gyps bengalensis
Slender-billed vulture	*Gyps tenuirostris*
Palla's fish eagle	*Haliaeetus leucoryphtus*
Grey-headed fish eagle	*Ichtyophaga icthyaetus*

Imperial eagle	*Aquila heliaca*
Saker falcon	*Folco cherrug*
Sarus crane	*Grus anitigone*
Spot-billed pelican	*Pelecanus philippensis*
White-bellied heron	*Ardea insignis*
Black-necked stork	*Ephippiorhynchus asiaticus*
Lesser adjutant stork	*Leptoptilos javanicus*
Greater adjutant stork	*Leptoptilos dubius*
Greater pied hornbill	*Buceros bicornis*
Great imperial pigeon	*Ducula aenea*
Pink-headed duck	*Rhodonessa caryophyllacea*
Wood snipe	*Gallinago nemoricola*
Reptiles	
Gharial	*Gavialis gangeticus*
Mugger or Marsh crocodile	*Crocodilus palustris*
Indian starred tortoise	*Testudo leongata*
Monitor lizard	*Varanus monitor*
Indian python	*Python molurus*
Common cobra	*Naja naja*
King cobra	*Naja hannah*

Friederike von Houwald

Indonesian / Malaysian animal species sharing the Javan and Sumatran rhinoceroses' habitat

Order Primata	
Orangutan	*Pongo pygmaeus*
Javan langur	*Trachypithecus auratus*
White-handed gibbon	*Hylobates lar*
Javan or Grey gibbon	*Hylobates moloch*
Muller's or Bornean gibbon	*Hylobates muelleri*
Siamang	*Symphalangus syndactylus*
Greater slow loris	*Nycticebus coucang*
Order Carnivora	
Dhole	*Cuon alpinus*
Marbled cat	*Pardofelis marmorata*
Asiatic golden cat	*Catopuma temmincki*
Fishing cat	*Prionailurus viverrinus*
Clouded leopard	*Neofelis nebulosa*
Leopard	*Panthera pardus*
Tiger	*Panthera tigris*
Oriental small-clawed otter	*Aonyx cinerea*
Smooth-coated otter	*Lutrogale perspicillata*
Hairy-nosed otter	*Lutra sumatrana*
Otter civet	*Cynogale bennettii*
Sun bear	*Helarctos malayanus*
Order Proboscidea	
Asian elephant	*Elephas maximus*
Order Perissodactyla	
Malayan tapir	*Tapirus indicus*

Order Artiodactyla	
Gaur	*Bos gaurus*
Banteng	*Bos javanicus*
Kouprey	*Bos sauveli*
Indian muntjac	*Muntiacus muntjak*
Lesser mouse deer	*Tragulus javanicus*
Order Pholidota	
Malayan or Sunda pangolin	*Manis javanica*
Birds	
Great hornbill	*Buceros bicornis*
Helmeted hornbill	*Rhinoplax vigil*
Rhinoceros hornbill	*Buceros rhinoceros*
Black hornbill	*Anthrococeros malayanus*
Wrinkled hornbill	*Rhyticeros corrugatus (leucocephalus)*
Milky stork	*Mycteria cinerea*
Storm's stork	*Ciconia stormi*
Sarus crane	*Grus antigone*
White-winged duck	*Cairina scutulata*
White-rumped vulture	*Gyps bengalensis*
Slender-billed vulture	*Gyps tenuirostris*
Bornean peacock-pheasant	*Polyplectron schleiermacheri*
Chinese crested-tern	*Sterna bersteini*
Silvery wood-pigeon	*Columba argentina*
White-eared night-heron	*Gorsachius magnificus*
Spot-billed pelican	*Pelecanus philippensis*
Greater adjutant stork	*Leptoptilos dubius*
White-shouldered ibis	*Pseudibis davisoni*
Giant ibis	*Thaumatibis gigantean*
Edward's pheasant	*Lophura edwardsi*

Reptiles

River terrapin	*Batagur baska*
Painted terrapin	*Callagur borneoensis*
Malaysian giant turtle	*Orlitia borneensis*
Spiny turtle	*Heosemys spinosa*
Sulawesi forest turtle	*Leucocephalon yuwonoi*
Malayan flat-shelled turtle	*Notochelys platynota*

Most of the mentioned mammal, bird and reptile species are classified by the IUCN as Critically endangered, Endangered or Vulnerable. Finally, these lists are far from being complete!

Friederike von Houwald

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III.VII The threat to rhinos' survival

Poaching for luxury products

Generally speaking, the horn from rhinos killed in East Africa tends to end up in the Yemen, where it is made into ornamental handles for daggers (jambiyas) while horn from rhinos poached in southern Africa (as well as from those poached in Asia) makes its way to the Far East where it is used in traditional medicine.

Although jambiyas can have handles made of a range of substances, such as precious metals, buffalo or plastic, and can be decorated with gemstones, those made of rhino horn are regarded as the "Rolex" or 'Porsche" versions.

Poaching of rhinos for use for jambiyas first became a major problem in the 1970s, when OPEC pushed up oil prices in Saudi Arabia, increasing demand for Yemeni workers, who remitted huge amounts of money back to Yemen, some of which was spent on buying expensive jambiyas. Demand for rhino horn surged, resulting in a major crash in rhino populations. After a few years of some remission in the late 1990s, rhino poaching has again intensified in both Africa and Asia. In Eastern and Central Africa, poaching of both black and southern white (the latter an introduced subspecies) saw a resurgence in Kenya from 2001 and has virtually or actually exterminated the Northern white rhino in the Democratic Republic of Congo.

Since 1978 Esmond Martin has studied the illegal trade in rhino horn between East Africa and the Yemen; since 1983 with his colleague Lucy Vigne. Making trips every two years or so, they have monitored the black market in rhino horn, the supply chains, the illegal workshops and the buyers of the finished jambiyas.

Their most recent trip was in 2002 and their findings are summarised below:

Almost all rhino horn that entered the Yemen from 1998-2002 originated from rhinos killed in Kenya, Tanzania and the Democratic Republic of Congo. In the late 1990s there was little recorded poaching in eastern Africa, but in 2002 Kenya experienced the worst poaching for over 12 years. An estimated minimum of 46 rhinos was killed between 1998 and 2002 in these three countries. From this figure, Esmond estimates that the potential weight of rhino horn that may have reached the Yemen to be an average of 29 kilograms per annum.

Poaching methods are mainly snaring and shooting by rifles. Most horns are smuggled to Djibouti and then by dhow to the Yemeni coast amongst consignments of consumer goods, which are illicitly moved to Sanaa. The price of horn has increased from US $519-650 per kilo when exported from Kenya, to US $750 when it arrives in Djibouti, and US $1,200 per kilo when it reaches Sanaa (2002 figures). The Sanaa US dollar price for horn has remained the same since around 1985.

In 2002 the number of workshops, where rhino horns are made into traditional dagger (jambiya) handles, was 70 and the number of craftsmen 102. This has increased since 1985 as the population grows. Nearly all handles however are made of water buffalo horn, while the number of new rhino horn handles being made has fallen significantly. This is mainly due to the shortage of rhino horn on the market.

In 2002 the Yemeni government brought in proper legislation to implement CITES' ban on the rhino horn trade, and has expanded its staff involved in wildlife conservation at the upgraded Environment Protection Agency.

Rhinos are not the only animals poached for products that are regarded as luxury items. Elephants are killed for their ivory; gorillas for their hands which are used to make grotesque ashtrays; snow leopards for their skins; birds of paradise for their plumes. These are just some of the many, many examples.

(With thanks to Esmond Martin and Lucy Vigne for their supporting information.)

Cathy Dean

Poaching for traditional Chinese medicine

Try this: Ask the person next to you what he or she thinks rhino horn might be used for in traditional Chinese medicine (TCM). Chances are, they'll tell you it is used as an aphrodisiac. It is not. In certain Asian countries, ground rhino horn is used to cure almost everything *but* impotence and sexual inadequacy. In Bernard Read's translation of the 1597 Chinese materia medica "Pen Ts'ao Kang Mu", the complete section on rhinoceros horn ("the best is from a freshly killed male animal") reads as follows, with no mention of any aphrodisiac qualities:

"It should not be taken by pregnant women; it will kill the foetus. As an antidote to poisons (in Europe it was said to fall to pieces if poison were poured into it). To cure devil possession and keep away all evil spirits and miasmas. For gelsemium [jasmine] and snake poisoning. To remove hallucinations and bewitching nightmares. Continuous administration lightens the body and makes one very robust. For typhoid, headache, and feverish colds. For carbuncles and boils full of pus. For intermittent fevers with delirium. To expel fear and anxiety, to calm the liver and clear the vision. It is a sedative to the viscera, a tonic, antipyretic. It dissolves phlegm. It is an antidote to the evil miasma of hill streams. For infantile convulsions and dysentery. Ashed and taken with water to treat violent vomiting, food poisoning, and overdosage of poisonous drugs. For arthritis, melancholia, loss of the voice. Ground up into a paste with water it is given for hematemesis [throat hemorrhage], epistaxis [nosebleeds], rectal bleeding, heavy smallpox, etc.

Because it was believed to provide such a pharmacological bounty, it is perhaps superfluous for rhino horn also to serve as a love potion. How then did rhino horn acquire its aphrodisiacal reputation? Probably from Western writers who had only a passing acquaintance with Chinese traditional medicine. One such was J.A. Hunter, (who was reputed to have shot more than a thousand rhinos, see the article on Habitat Loss in this Information Pack) who, in 1952, wrote:

"The horns are worth thirty shillings a pound or more – ten shillings more than the finest grade of ivory. These horns are used for a curious purpose. Orientals consider them a powerful aphrodisiac and there is an unlimited demand for them in India and Arabia. No doubt any man who has a harem of thirty or more beautiful women occasionally feels the need for a little artificial stimulant."

Hunter tried it himself, but perhaps because he was alone, it did not work. "I closely followed the recipe given me by an Indian trader," he wrote. "Take about one square inch of rhino horn, file it into a powder form, put it in a muslin bag like a tea bag, and boil it in a cup of water until the water turns dark brown. I took several doses of the concoction but regret to report that I felt no effects. Possibly I lacked faith. It is also possible that a man in the bush, surrounded by nothing by rhinos and native scouts, does not receive the proper inspiration to make the dose effective."

In his 1962 study of the animals of East Africa, C.A. Spinage seemed to share the belief that Asians were interested in the horn as an aphrodisiac and were willing to pay handsomely for it: “On account of mysterious aphrodisiac properties attributed to the horn by certain Asiatic peoples, the Rhino has been sorely persecuted… With its horn fetching the present high price the prospects of its continued survival in the face of the poachers’ onslaught are not very bright.” The anthropologist Louis Leakey also shared this misunderstanding. In his 1969 book on African wildlife, he commented that rhinos were “in grave danger from poachers because rhino horn commands a high price in the Far East, where it is rated as an aphrodisiac.” And in *S.O.S. Rhino*, C.A.W. Guggisberg asserted that: “The superstition that has done more harm to the rhinoceros family than all others is undoubtedly the Chinese belief in the powerful aphrodisiac properties of the horns. Through the centuries untold generations of aged gentlemen have been imbibing powdered rhino horn in some appropriate drink, hoping to feel like a twenty-year-old when next entering the harem!”

Even without aphrodisiacal properties, however, rhino horn is one of the mainstays of TCM, and its collection has been responsible for the death of tens of thousands of rhinos around the world. Make no mistake: those people who use rhino horn to cure medical ailments really believe it works. That’s what drives up the demand on which the poachers thrive. As Ann and Steve Toon commented in 2002, “For practitioners of traditional Asian medicine, rhino horn is not perceived as a frivolous love potion, but as an irreplaceable pharmaceutical necessity.” And Eric Dinerstein (2003), concurs: “In fact, traditional Chinese medicine never has used rhinoceros horn as an aphrodisiac: this is a myth of the Western media and in some parts of Asia is viewed as a kind of anti-Chinese hysteria.”

Rhino horn has been an integral component of TCM for thousands of years. It matters little where the rhinos come from; the horn of a rhinoceros from any continent may be used for medical purposes. In East Africa – primarily Kenya, Uganda and Tanzania – statistics on rhino horn harvesting have been kept since 1926. Over this period, most of the rhinos killed were black rhinos, although the “harvesters” would not pass up a white rhino if it appeared in their gunsights. During the 1930s, according to Nigel Leader-Williams (1992), declared exports from East Africa (then under British rule) averaged about 1,600 kilograms (3,520 pounds) per year, which meant the death of some 555 black rhinos annually. During World War II, the numbers soared to 2,500 kilograms (5,500 pounds), for which approximately 860 rhinos died each year. During the 1950s and 1960s, the auction houses reported about 1,800 kilograms (3,960 pounds) per year; which would have entailed the death of about 600 rhinos every year in that period. In the 1970s, the numbers skyrocketed again, to 3,400 kilograms (7,480 pounds), and every year in that decade, 1,180 rhinos died. Leader-Williams (now Professor of Biodiversity Management of the Durrell Institute for Conservation and Ecology at the University of Kent) identifies the Far East’s primary consuming nations as Hong Kong (which was separate from the People’s Republic of China until 1997), mainland China,

Taiwan, Singapore, Japan, South Korea, Peninsular Malaysia, Sabah Malaysia, Brunei, Macau, and Thailand, while the major Asian importers of African rhino horn were, not surprisingly, the first three on this list – mainland China, Hong Kong and Taiwan.

In the 1960s and 1970s, Hong Kong was the world's largest importer of rhino horn. Although the government officially banned all imports in 1979, rhino horn was smuggled in from Macao, Burma, Indonesia, Malaysia, India, Taiwan, and South Africa. At the 1987 CITES meeting in Ottawa, participating parties agreed to abate the rhino crisis by closing down the trade in rhino products completely. British Prime Minister Margaret Thatcher promised the ban would take effect later that year. This never happened in an effective way, of course, but there were suggestions that substitutes for actual rhino parts might suffice for TCM. Scientists at the China Pharmacological Institute proposed using buffalo horn (made of keratin, as are rhino horns), and the manager of China's National Health Medicines Products said that all their new medicines now used buffalo horn instead of rhino horn. In the section on "Heat-clearing, blood-cooling medicinals" in Wiseman and Ellis's 1996 "Fundamentals of Traditional Chinese Medicine", we find the admission that all those rhinos didn't have to be killed at all. After a list of all the symptoms that rhinoceros horn can alleviate, there is this note: "The rhinoceros is an endangered species. Please use water buffalo horn as a substitute."

Taiwanese self-made millionaires are notorious for their conspicuous consumption of rare and exotic wildlife, and the Chinese traditional adage that animals exist primarily for exploitation is nowhere more pronounced than on Taiwan. Most of the rhino horn for sale there comes from South Africa. The demand for Asian horn in particular is increasing and wealthy Taiwanese, aware that prices will rise even higher as rhinoceros numbers decline, are buying it as an investment. In those regions where rhino horn products are dispensed – legally or illegally – the most popular medicines are used for tranquilisers, for relieving dizziness, building energy, nourishing the blood, curing laryngitis, or simply, as the old snake-oil salesmen would have it, "Curing whatever ails you."

Keratin – the major protein components of hair, wool, nails, horn, hoofs and the quills of feathers – in rhinoceros horn is chemically complex and contains large quantities of sulphur-containing amino acids, particularly cysteine, but also tyrosine, histidine, lysine, and arginine, and the salts calcium carbonate and calcium phosphate. Rhino horns are composed primarily of keratin, but so too are rhino nails. Three to a foot, for a grand total of twelve per rhino, the nails can also be shaved or powdered for pharmaceuticals. You cannot carve a *jambiya* handle from a toenail, but shaved or powdered rhinoceros keratin, with all its believed powers, might be beneficial regardless of which part of the rhino it comes from.

The scarcity of rhinos today, and the corresponding intermittent availability of rhino

horn only drives the price higher, and intensifies the pressure on the declining rhino populations. For people whose annual income is often far below the subsistence level, the opportunity to change one's life by killing a large, ungainly, and otherwise seemingly "useless" animal must be overwhelming. How much is rhino horn worth? In Nowak's revision of "Walker's Mammals of the World", we read:

"*R. unicornis* is jeopardized by loss of habitat to the expanding human population and illegal killing, especially in response to the astonishing rise in the value of the horn. The wholesale value of Asian rhino horn increased from US $35 per kg [2.2 pounds] in 1972 to $9,000 per kilogram in the mid-1980s. The retail price, after the horn has been shaved or powdered for sale, has at times in certain East Asian markets reached $20,000-$30,000 per kilo. In contrast, in May 1990, pure gold was worth about $13,000 per kilo."

(NB: Please also refer to the article on Poaching for luxury products in this Section for further details of the value of rhino horn.)

Throughout those markets, the trade in rhino horn for medicinal purposes is a very big business, but because much of it is conducted through various black markets, its true magnitude may never be known.

The Taiwanese make up much of the market for horn imported to Asia from South Africa, Mozambique, Tanzania, and Zimbabwe – wherever black rhinos can still be found. Like the Taiwanese, many Koreans are devoted practitioners of traditional medical arts, and are prepared to import substantial amounts of substances not naturally found in their country. Korean traditional medicine is based on the Chinese version, which is said to have come to Korea during the sixth century. "Rhinoceros horn," wrote Judy Mills in 1993, "is an ingredient in five… medicines still popular among doctors of Oriental medicine in Korea today. These rhinoceros horn derivatives are used to treat maladies including stroke, nosebleeds, dermatitis, headache, facial paralysis, high blood pressure, and coma. The most popular of these medicines is Woo Hwang Chang Shim Won, a medicine ball made from rhinoceros horn, musk, cow gallstones, and a number of herbs." In 1992, after the US government threatened to impose sanctions via the Pelly Amendment on South Korea for failure to police the trade in rhino horn, the price of rhino horn in South Korea doubled. Among the some 7,000 doctors licensed to practice Korean medicine in South Korea (no figures are available for North Korea), there was little diminution of prescriptions written for Woo Hwang Chang Shim Won after 1992. In fact, it is not clear that the use of rhino horn for medicinal purposes has decreased at all.

Indeed, it is not clear that rhino horn serves any medicinal purpose whatsoever, but it is a testimony to the power of tradition that millions of people believe that it does.

Of course, if people want to believe in prayer, acupuncture or voodoo as a cure for what ails them, there is no reason why they shouldn't, but if animals are being killed to provide nostrums that have been shown to be useless, then there is a very good reason to curtail the use of rhino horn. There are five species of rhinoceros, and with the exception of one subspecies of the African white rhino, all are in danger of being hunted to extinction for their horns. Rhinos as we know them have been around for millions of years, but Dr H. Sapiens has created a predicament from which they might never recover. It is heartbreaking to realise that the world's rhinos are being eliminated from the face of the earth in the name of medications that probably don't work.

Richard Ellis

Habitat loss

When one compares a map of the current distribution of the five rhino species with one showing the distribution c. 1800, the difference is striking. Many countries have lost their rhino populations altogether: Burkina Faso, Ivory Coast, Ghana, Togo, Benin, Nigeria, Chad, Central African Republic, Sudan and Mozambique in Africa; and Pakistan, Bhutan, Bangladesh, Myanmar, Thailand, Cambodia, Laos and Sarawak in Asia.

The most obvious reason for the decline from around a million rhinos in the year 1800 to approximately 18,000 today is poaching, but habitat loss has also been a key factor. There are several ways in which this is manifested:

- Clearance of land for human settlement and agricultural production
- Logging, authorised and illegal

Black rhinos – Kenya
In Kenya, for example, between 1948 and 1957, a government-sponsored settlement scheme was implemented in the Makueni District, near to the Chyulu Hills. The District straddles the road and railway that run between Nairobi, the capital, and Mombasa, an important port on the Kenyan coast. The local people, the Akamba, had taken advantage of the building of the railway at the beginning of the 20th century, and began trading goods. Further settlement was constrained by harsh climatic conditions, tsetse fly, human-wildlife conflict and government prohibition. As the population grew, the Akamba intensified their struggle to increase access to land outside the Akamba Reserve.

Initially the Government resisted these moves, but continued protests, livestock predation and the severe degradation of the land eventually persuaded it of the need to implement a land clearance scheme. Bush was cleared for tsetse fly control, and Game Warden J.A. Hunter was brought in to shoot some 1,000 black rhino that were causing problems (see also the previous section of traditional Chinese medicine). Today, just a dozen or so black rhinos survive in the Chyulu Hills, now critically endangered and, in a neat turn of history, protected by Richard Bonham, whose wife's grandfather was the very same J.A. Hunter.

Kenya's rhinos are confined to National Parks and private fenced sanctuaries. There are currently some 33 million Kenyans. It is estimated that by 2020 there will be 45 million. Pressure on protected areas and on all forms of wildlife within them, will increase unless we look at ways in which to knit conservation with development.

Sumatran rhinos – Indonesia and Malaysia
The Sumatran rhino numbers probably less than 300, with only four or five populations where more than a handful survives (Bukit Barisan Selatan National

Park, Gunung Leuser NP, and Way Kambas NP on Sumatra; Taman Negara NP in Peninsula Malaysia; and Tabin Wildlife Reserve in Sabah, Malaysia). Exact figures are difficult to give, but the largest populations occur in Bukit Barisan Selatan (60+) and Gunung Leuser (50+).

Habitat encroachment has become a much more serious problem recently in most Sumatran rhino areas. For example, in Sumatra, perhaps 30% of Bukit Barisan Selatan has been converted over the last 15 years and Way Kambas lost 15% over the last five years. The land is used for cash crops, and particularly for palm oil plantations.

Since the nineteenth century, primary rainforest throughout Indonesia and Malaysia has been targeted for its desirable hardwoods. Species such as the semaram, merbau, kruing and meranti are favourites of loggers, fetching a very high price on the international market, around (US$1,800) per m3.

The negative effects of logging – legal and illegal – have been much described. Species endemic to Malaysia and Indonesia, such as the Sumatran tiger, elephant, rhinoceros, orangutans, hornbills, cloud leopards and the world's largest flower, the rafflesia have all declined steeply in number, as their range has been reduced. In Borneo, in Tabin Wildlife Reserve in Sabah, for example, the 30 or so Sumatran rhinos have effectively retreated to the Core Area, untouched primary rainforest, while the surrounding secondary rainforest now functions mainly as a buffer zone. Ethnic groups such as the Gayo, Alas, Acehnese, Batak, Pakpak, Karo, Singkil, Penan and Dayak, who formerly practised a shifting cultivation pattern that was matched by forest regeneration, have lost their traditional homes, livelihoods and knowledge about the use of plant species. The denudation of mountain slopes has led to flash flooding, to water-supply problems for large catchment areas, and to unprecedented erosion.

Although laws exist to try to prevent illegal logging, enforcing them can be difficult. In many areas, while logging within protected areas is illegal, retrieving logs washed downstream by rivers is not. So unscrupulous loggers harvest trees and wait for a flood to wash them downriver where they claim them.

The tsunami has also been used as an excuse for new logging activity. There is undoubtedly a need for building materials. It is estimated that the minimum wood requirement needed for the reconstruction and rehabilitation of Aceh, in the northern tip of Sumatra, which is foreseen to last for five years, is 1.1 million cubic metres (m3) of logs, equivalent to 446,000 m3 of sawn timber. Such a huge timber requirement will worsen the already sorry state of the forests of Aceh and nearby provinces. Logging activities in Aceh are currently concentrated in the districts of Aceh Besar, Aceh Tenggara, Aceh Singkil and Aceh Timur, which, coincidentally, are areas where there are conservation sites or places covered by the Leuser

Ecosystem, one of the richest bastions of tropical rainforest in Southeast Asia. Local people's homes tend to be built from cheap and renewable softwoods and bamboo, rather than the tropical hardwoods so desired by international markets, yet logging permits for hardwoods have increased dramatically. The inference is that corrupt politicians have used the tsunami's effects as an opportunity to make money, and indeed former governor Abdullah Puteh is now in jail for corruption.

Habitat fragmentation

The impact of habitat fragmentation has been well documented by writers such as Jared Diamond. In very general terms, smaller areas support lower biodiversity and smaller populations. Although black, Sumatran and Javan rhinos are largely solitary animals, they still need to be part of a larger population for genetic diversity and breeding to take place. Many conservation biologists consider 15-20 individuals to be the minimum number of rhinos needed for a successful breeding nucleus capable of recovering to viable population levels, which is 50-100 rhinos for an individual population and perhaps 2,500 to 5,000 of all populations combined, i.e., a metapopulation. A metapopulation is a collection of separate subpopulations among which animals can move because there are corridors or can be moved by managers. With any fewer than 15 or so, reproduction chances and long-term genetic viability are compromised. (Of course, there are examples of wild populations that are fewer in number and which are breeding nonetheless.)

So if the habitat becomes fragmented, then rhino populations are smaller. With so few animals surviving, the loss of even a few individuals may easily become fatal for the species. Even if a few animals survive, the reproductive process can be disrupted by an uneven sex, unbalanced age structure, or reduced rates of inter-sexual encounters. There are indications that this has happened in many areas, most recently in the Kerinci-Seblat National Park in central Sumatra. Therefore it's vital that all rhino surviving receive the strictest protection achievable in the wild and that through evacuations from unviable situations, translocations and captive breeding, the existing populations can be reinforced and new one established.

Cathy Dean and Tom Foose

Political conflict

Poaching is the main threat to rhinos' survival, whether motivated by the Yemeni dagger handle trade or by the demand for rhino horn in traditional Chinese medicine. Conservationists obviously try to prevent poaching from occurring, whether by mounting intensive anti-poaching patrols and maintaining high visibility, by fencing sanctuaries, or by incentivising locals to pass on intelligence.

In some locations, where normal law and order has broken down – particularly in war zones or where there is political instability – it has become much easier for the poachers to kill rhinos and other endangered species. Particular examples of places where political conflict has been matched by a rise in poaching include the Democratic Republic of Congo, Zimbabwe and Nepal.

The Democratic Republic of Congo
The Northern white rhino (*Ceratotherium simum cottoni*) is Critically Endangered in ironic contrast to the status of its relative, the Southern white rhino, which is the most abundant of all rhino taxa known today. Once ranging in large numbers throughout north-central Africa south of the Sahara, today wild Northern white rhinos are, or were, only found in Garamba National Park in the Democratic Republic of the Congo (DRC).

Situated on the northern border of DRC with south Sudan, the biggest threat to the park's ecosystem has been illegal hunting linked to the proliferation of arms and ammunition and displaced persons from the 40-odd years of civil war in Sudan and exacerbated during the last six or seven years by the civil wars within DRC. In the 1970s and 80s, poachers reduced the number of northern white rhinos, from 500 in the mid 1970s to 15 in 1983. Strict protection then permitted the rhino population to recover so that numbers had doubled to more than 32 rhinos by the early 1990s. However, since then, poaching pressure intensified and has recently become intolerable, probably fatal, to this rhino population.

Monitoring systems of the Park and hard evidence recovered from poachers show that commercial bushmeat and ivory poaching, which has been on the increase since 1991. Involved were trans-border movements of southern Sudanese, often from Sudanese People's Liberation Army (SPLA) camps near the border; Sudanese refugees, of which over 80,000 entered the area in 1991; local Congolese and a group of SPLA regulars that had been based in DRC in the Reserve east of the Park since 1999, despite orders to return to Sudan. In this first phase of the war, guards were disarmed, anti-poaching patrols stopped, people in the surrounding areas suffered harassment and coercion by armed military, and over half the elephants, hippos and buffaloes were slaughtered.

Nevertheless, with the major support from the UN Foundation through UNESCO and

the Garamba National Park Project (supported by NGOs like International Rhino Foundation, Save the Rhino International, ZSL, Frankfurt Zoological Society) for the guards in the field, anti-poaching patrols were re-established and large mammal numbers were maintained stable or increasing until 2003.

However, from June 2003 poaching shifted from bush meat plus ivory to strictly ivory and rhino horn, and gangs swept through the southern sector of the Park, which held the main concentration of rhinos and elephants. In early April 2004, for the first time, there was an incursion in the west of much more organized heavily armed gangs, northern Sudanese horsemen from Bar el Gazal near the Darfur region. These horsemen, the janjaweed militia, were much better armed and equipped with donkey trains. The involvement of these pack animals to transport the rhino horn and ivory back to Sudan and of these tough northern horsemen, marked the start of the systematic elimination of the elephant and rhino populations, as well as other species. They are almost certainly major contributors to the large quantities of ivory passing through Khartoum.

By September 2004 the situation had worsened to such an extent that rhino numbers were thought to have been reduced down to around 20; the number falling each month. Rhino numbers were so low (by January 2005, only around 10) that translocation of some animals for safekeeping was deemed an urgent necessity to ensure their survival.
An agreement was to be drawn up with the DRC government to govern the capture, translocation and future repatriation of five rhinos (two males, three females), and to commit the parties concerned to increased support for conservation activities at Garamba itself. This two-fold approach was felt critical to ensure that the rhinos could be returned to Garamba when security was properly in place, so that the DRC's natural asset could be restored to its rightful home. Logistical planning and recruitment of a team of experts for the operation was underway in DRC and internationally. Ol Pejeta, a wildlife conservancy in Kenya, was selected as the temporary safe haven on the basis of security, habitat, and management support and proximity. Discussions were initiated through the Kenya Wildlife Service to expedite the necessary approval and support from the Kenyan authorities.

But political infighting intervened, and factions within the DRC government began to campaign against the temporary removal of the five Northern white rhinos to another country. Discussions broke down; the agreement was never signed; and the Northern white rhinos remained where they were in Garamba: unprotected and under threat.

It seems highly probable that the Northern white rhinos will become extinct in the next few months, if they have not done so already. The further tragedy is that Garamba may lose its World Heritage Site status, and thus lose funding that helps ensure the survival of other species that share the Northern white rhinos' habitat,

such as elephant and okapi.

(With thanks to Kes Hillman-Smith for her supporting information.)

Zimbabwe
When Zimbabwe gained independence in 1980, its black rhino population numbered around 2,000 animals, of which around 1,300 were concentrated in the Zambezi Valley.
Serious cross-border poaching then flared up. In response to the ongoing poaching pressures, which steadily spread to the other Zimbabwean rhino strongholds of the Sebungwe and Hwange regions and Gonarezhou National Park, a national rhino conservation strategy was launched with the following main components.

Creation of four IPZs (Intensive Protection Zones) within National Parks. These received significant donor support and the more effective patrolling that was achieved within them, combined with an extensive de-horning campaign, stemmed the poaching by 1995
Export of more than 30 black rhinos to overseas captive breeding facilities
Development of a rhino custodianship scheme, whereby 190 rhinos were moved to a number of areas of private land where the landowners undertook to look after them on behalf of the state. Although there were some poaching problems, by 2000, black rhino populations in several of these conservancies (in Zimbabwe's Lowveld region) had doubled, after achieving some of the fastest growth rates ever recorded for rhino populations

The successful rebuilding of Zimbabwe's black rhino population (from a low point, after the heavy poaching, of about 370 in 1993 to a current level of over 500), along with the establishment of innovative conservancy projects, earned Zimbabwe considerable acclaim within the international conservation community. Almost 70% of Zimbabwe's black rhinos are on commercial farms and conservancies, with over 200 in the Lowveld conservancies of Save Valley, Bubiana, Chiredzi River and Malilangwe.

However, since early 2000, the situation has become much more serious again. The rhino custodianship scheme has been greatly undermined by the large-scale land invasions throughout Zimbabwe and the deteriorating economic and political situation. The reported failure of the harvest, the break-up of formerly successful food-producing farms, and the breakdown of law and order, are having a detrimental effect on Zimbabwe's wildlife.

In most wildlife areas on private land (such as the Lowveld conservancies) the occupation of land for growing crops has been accompanied by a dramatic increase in snaring activity. In the affected areas, the perimeter fences to the conservancies have been dismantled by the occupying farmers.

Much of the wire from these fences has been used to make wire snares – loops of wire secured to trees in the bush to trap and kill antelope species. When a rhinos encounters such snares the wire tightens around either the leg or neck but is then broken free from the tree and is carried away in the flesh of the rhino. If such snares are not detected early the snare embeds deeply (sometimes into the bone) causing severe injury and requires surgery to remove the wire. Of course, snaring on such a massive scale is also depleting populations of antelope, which in turn impacts on predators such as lion, leopard, cheetah, hyena and wild dog.

Prior to the land invasions, anti-poaching units patrolled these wildlife areas. In many areas, these anti-poaching units are no longer conducted due to the land invasions. Those anti-poaching units that are still operating are having to contend with much increased poaching. For both reasons, more rhinos are being lost.

This situation is further aggravated by the increased movement of rhinos caused by home-range disruption. The clearing of fields for cropping and the dramatically increased human and livestock activity inside the conservancies has disrupted the home ranges of many rhinos causing them to change their patterns of behaviour and shift home ranges. Sometimes this leads to the animals moving outside the conservancy or into the home ranges of other rhinos. This movement into other home ranges can lead to fighting. On at least three known occasions this had lead to the death of rhinos through injuries sustained in fights.

(With thanks to Lovemore Mungwashu for his supporting information.)

Nepal

Nepal's Rhino population has suffered a catastrophic decline of more than 30 per cent in the last five years. The number of greater one-horned rhinoceros in the country's Royal Chitwan National Park has fallen from 544 in 2000 to just 360 in 2005. At least 104 have been killed by poachers.

As the country's political situation has deteriorated since the last survey in 2000, the National Parks have seen less protection from the military. Unarmed National Park guards have had little chance to protect the animals against heavily-armed poachers.

The upsurge in poaching is almost certainly due to Nepal's military reducing the number of soldiers assigned to protect the park - which is home to the vast majority of Nepal's rhinos - from 32 to 8. Nepal's army is currently struggling to deal with the Maoist insurgency that has led to increased violence throughout the country. A security post has to be manned by ample number of personnel or else it cannot function effectively, and the poachers have been clever enough to exploit the weak security situation.

Income from wildlife tourism has been important to help Nepalese conservation organisations do their own work and encourage local communities to pass on intelligence about poaching gangs. More tourism is needed but less is occurring as European and other governments advise against all non-essential travel to Nepal.

Cathy Dean and Tom Foose

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III.VIII The work of *in situ* rhino conservation projects

Managing a rhino programme

The continental strategic framework and direction for African (black and white) rhino conservation is provided by the IUCN Species Survival Commission (SSC) African Rhino Specialist Group (AfRSG). Its Action Plan, and the various regional, national and organisational rhino conservation plans, strategies and policies, promote a range of strategies needed successfully to conserve African rhinos. These strategies and plans all recommend managing rhinos in any individual Park as part of a bigger regional or national metapopulation; and all set minimum target goals of achieving an overall population increase of at least 5% per annum. To some extent, rhino metapopulation conservation can be seen as a form of portfolio investment management.

Successful rhino conservation involves a combination of seeking to limit mortalities on the one hand (good protection and law enforcement, efforts to reduce illegal demand for horn, good biological management) and promoting rapid population growth on the other (through good biological management). The latter in particular seeks to use translocations to ensure that the reproductive performance of as many populations as possible remains high, as well as helping to maintain genetic diversity to maximise long-term metapopulation viability.

Protection
Effective field protection has been critical to success over the last decade. Experience indicates that to achieve success, it is necessary to concentrate law enforcement at or above minimum threshold levels. Apart from having a sufficient manpower density on the ground, field rangers need to be well trained, equipped and effectively deployed. In some reserves, additional specialist anti-poaching units operate in addition to standard field ranger patrols.

While pro-active and reactive anti-poaching patrols can reduce the level of poaching and chances of catching rhino poachers, experience has shown that the setting up and running of informer networks can prove particularly useful and cost-effective. Effort and training is also required to ensure the effective investigation, successful prosecution and sentencing of those guilty of rhino crimes. Ultimately, rhino crimes are perpetrated because of the illegal demand for rhino horn, and so efforts are being made to reduce the illegal demand where possible. Another important aspect of law enforcement is the management, monitoring and protection of legal rhino horn stockpiles.

Biological management
To benefit from compounding growth, it is important to maintain rhino populations at

productive densities, and prevent the density-dependent declines in reproductive performance (lengthening inter-calving intervals, older ages at first calving, reduced calf survival, increased mortality rates etc.) that can occur if rhino populations are left to approach or exceed ecological carrying capacity (ECC). It is recommended that populations be kept productive by annually translocating at least 5% and not more than 8% of populations that have exceeded 50% of estimated ECC annually. In smaller populations, it is recommended that densities should not be allowed to exceed 75% of ECC. Techniques exist to estimate ECC for black rhino and these are continually being refined. The impact of potential competing browsing species such as elephants, giraffe and nyala, as well as the impact of any vegetation changes for rhino, also need to be considered.

Surplus rhinos that are removed from more heavily stocked populations are used to create new or enhance existing populations with a good potential for high growth. Apart from the strategic benefit of having more eggs in more baskets, translocations aim to improve or maintain performance in established populations, whilst at the same time to create new rhino investments with rapid growth potential. Due to the effects of compounding, small differences in rhino metapopulation performance translate to large differences in numbers of rhinos in only a few years, which is why so much effort is expended in trying to keep rhino populations productive.

Regular monitoring and reporting on the reproductive and demographic performance of populations using standardised systems, provides managers with the necessary information to make more informed and better biological management decisions, as providing measures of whether or not metapopulation management goals are being met. Monitoring the reproductive performance of females and accurately estimating rhino numbers are two key aims of monitoring. Regional synthesis of the results of this monitoring also enables managers of a park to put the performance of their rhino population in context, as well as learn and share lessons from past experience, which in turn can be used to further refine best-recommended management practices. Continental rhino monitoring training courses have been developed by the AfRSG and these focus on training local trainers so they can train local staff on site.

Coordination
This is achieved through IUCN's AfRSG, regional groups such as SADC's Regional Programme for Rhino Conservation and Rhino Management, Rhino Recovery and Rhino and Elephant Security Groups as well as national and organisational rhino committees. National plans seek to develop and implement an effective coordination framework for conservation action, status reporting, and decision-making among all stakeholders.

Capacity-building
Another key aspect of any successful strategy is to ensure that sufficient human

resources and skills are available and deployed efficiently. Appropriate training is required to develop and maintain the necessary capacity for all aspects of rhino management (monitoring, field law enforcement, translocations, habitat assessments, crime investigations etc.). The lack of a training culture in some conservation organisations and staff turnover are problems that limit capacity.

Economic and social sustainability
Finally, for rhino conservation to have a long-term future, it is essential that support (political and public) for rhino conservation is in place and fostered. As a result an increasing effort is being made to integrate local communities into rhino conservation efforts in an attempt to ensure the sustained flow of benefits from conservation and / or management of rhino parks contributes to the social and economic development of neighbouring communities.

Successful rhino conservation is not cheap. It can cost as much as $1,000 per km2 per year. It is therefore essential to ensure that the necessary financial budgets and manpower to undertake vital rhino conservation activities are secured from government, donor agencies and in some parts of the world (notably the SADC region of southern Africa) also from the sustainable use of rhinos (tourism, live sales and limited controlled sport hunting). Declining national budgets for conservation is one of the major problems facing rhino conservation agencies today, and donor funding and support is playing an increasingly important role today as a result. However, despite this trend, the majority of funding for successful rhino programs in the majority of successful range states continues to come from government agencies, and private sector owners and custodians within those range states. As such, donor funding tends to be most effective where it builds on and enhances existing efforts.

Richard Emslie

Translocations

Background

Having suffered catastrophic declines in their range and numbers, rhinos tend to live in relatively small, isolated populations that need to be actively monitored and managed to ensure their persistence. In nature, animals may at times migrate between centres of population or expand their range. This helps to avoid inbreeding, allows a population to grow, or allows individuals to find sufficient food and water resources if these are scarce. However, as habitats are limited in extent and there are now great distances between rhino populations and barriers to their movements such as human habitation, the process needs to be helped artificially.

The “translocation” or assisted movement of rhinos between different areas has become a necessary and ongoing component of conservation which helps address the problems associated with these discrete populations. This process is known as meta-population management and it takes into consideration the overall status of all the combined, isolated groups of rhinos.

Genetic management

Small populations may suffer from inbreeding, which can have negative consequences for individual animals and the population. The solution is to swap rhinos between centres of population and thus ensure gene flow amongst the meta-population. This also helps to increase genetic diversity in a population, which means that it is more likely to be able to adapt and cope with natural catastrophes such as disease.

Safe havens

Sometimes, despite the best efforts of conservationists and land managers, the illegal poaching of rhinos occurs and this continues to be the greatest threat to these species. In extreme cases, where anti-poaching measures have either not been effective or are difficult to implement, the only option is to translocate remaining rhinos to safer havens elsewhere in the country. This safeguards the individuals and means that they can continue to contribute to broader conservation goals.

De-stocking and reintroduction

If rhinos are well protected and their numbers increase, it is possible that the population reaches carrying capacity in a given area. If this happens, there may be insufficient food and water resources to sustain the population and bulls may compete to breed, which can result in fighting, injuries and even death. Ideally, before these problems occur, it is best to de-stock the area to reduce the rhino population to below the ecological and social carrying capacity.

Rhino populations also tend to grow quicker if they are maintained below carrying

capacity. This means that individuals are available to re-establish populations in areas where they have become locally extinct, or be moved to augment numbers in an existing small population. This all helps to achieve the goal of increasing numbers of rhinos and returning them to their former ranges.

The translocation process

Translocations are carefully planned operations that involve capturing and moving rhinos with minimal stress. This requires an expert team of vets and other support staff. Depending on the size of the area, vegetation and terrain, the team may be able to get close enough to the rhino on foot or with four-wheel-drive vehicles to capture it. Alternatively, where conditions are more challenging, a fixed-wing aircraft may be used to spot the rhino and a helicopter used to get the vet close enough to dart the rhino. The drugs used to sedate rhinos and the veterinary care given during capture operations have been specially developed and researched over many years to ensure the animals are in safe hands.

As rhinos are such large and strong animals, but also need to be treated with great care, they are transported in specially designed crates on very robust trucks. A lifting crane is often needed to help the process of loading and unloading the rhino in its crate.

At the recipient site, translocated rhino are often kept in an acclimatisation enclosure known as a boma before release. This allows the vet to make sure that the rhino has suffered no ill effects from the journey and is strong and healthy enough to fend for itself before being set free into its new home.

Tim Woodfine

Environmental education programmes

Environmental education is seen by most State and private conservation areas as a vital factor in their long term protection. However, it is generally true that with the wide range of core conservation duties that need daily attention, relatively few resources can usually be spared on a sustained basis for education functions. To be effective, consistent commitments of trained personnel, transport, equipment and educational materials are needed, along with clear, measurable goals of what the education should achieve.

Around rhino conservation areas, environmental programmes have taken many forms. Pilanesberg National Park during the 1980s and early 1990s probably went further than most, by employing a full-time team of school teachers, and setting up a large educational facility that could house and feed scores of rural school children on routine basis. A full 2-3 day programme of environmental teaching and field activities awaited visiting children, and the aim was to expose every single school child in the entire region to this programme at least once in their school careers. Realising that a few days of exposure would not usually be sufficient, a travelling road show was devised, and all schools were assisted in setting up Wildlife Clubs. The success of this programme could be gauged by the fact that parents and village elders began to complain to Park staff that the children now knew more than them, and they too needed to be educated. State budget and staff cuts however eventually crippled this education programme, reducing it to a shadow of its former glory. Lapalala Wilderness was the first private conservation area to purchase black rhino, and they set up a similar rustic environmental school camp system. They used the added component of showing the children Bwana, a lovable hand-raised black rhino, who is a great success at stimulating everyone's interest.

Most environmental education programmes today take the form of general conservation and ecological teaching aimed at school children. Many areas have rustic overnight facilities for children, but many others can only afford one or two usually under-resourced staff members to undertake general community liaison and education, with school classes coming for only a few hours to a conservation area. Efforts to teach school teachers are underway, but usually the deep rural schools have absolutely no resources or capacity to routinely impart environmental awareness (with or without a rhino component) to their charges.

Several private conservation areas have scholarship programmes which fund the higher education of a number of children from local communities or staff members. In addition, such areas often provide direct support to one or more local schools.

A vital general background theme in much of the environmental education is to show how protected areas are valuable job-creating and income-generating resources that can bring economic upliftment to neighbouring areas. In countries where rhinos

can be bought and sold or trophy hunted, the direct link between their conservation and income to the area is more easily demonstrated, and some new initiatives to involve communities themselves in hands-on rhino conservation breeding have begun.

Save the Rhino Trust (SRT) in Namibia were among the first fully to include communities in rhino conservation and day-to-day monitoring, and to develop rhino-specific educational and awareness material for children. The desert black rhino became all-the-rage among school children who sold the appealingly designed "rhino friend" badges to raise funds to sponsor a rhino for their school. The first fun educational / games booklets were developed by SRT for young children, based on rhino conservation and biology themes.

Since then, the idea of developing educational / awareness material with a rhino theme has progressed greatly by developing products that can be used as a teaching aid in any school subject (e.g. mathematics, geography, reading, biology). This allows the environmental (and rhino) education to be incorporated almost seamlessly into a wide variety of routine school classes. The first example was the "Rhino Resource Book" developed by Wildlands Trust, KwaZulu-Natal. This contained a range of 2-4 page "lessons" featuring rhino issues. In Zimbabwe under the SADC Regional Programme for Rhino Conservation, the idea was made more practical for younger children by adapting several key lessons into laminated cards which could be used outdoors if necessary; the "Rhino Cards" supplied on CD-ROM with this EAZA Rhino Campaign Information Pack. File kits were produced, comprising teacher guide notes plus several copies of the laminated card lessons to share among the kids during a session. For older children, un-laminated "Rhino" booklets (similar to the Rhino Resource Book) were produced.

Along with any education programme comes the need to gauge its effectiveness. The Zimbabwe team undertook before and after questionnaires among several targeted schools and found around 20% improvement in knowledge about rhinos and attitudes towards the need for rhino conservation. The programme was also taken to Swaziland with good preliminary results.

Although all schools using the "Rhino Cards" and "Rhino Resource Book" were very enthusiastic about the idea, limitations included the rate at which teachers could be trained to use the material, their individual willingness to implement the lessons, and the provision of sufficient copies of the books (at around $2 per copy) for all the children passing though each trained teacher's classes. Teachers themselves are often not broadly educated and have very limited environmental awareness, and schools have very few or no resources of their own.

A final approach developed by some private areas involves using field rangers as role models and educators. They undertake tours of local communities and schools,

discussing their own jobs and role in conservation, relating exiting tales of encounters with dangerous animals and poachers. They are provided with educational material to show (films etc.) or hand out. This approach can be very successful. The ranger is seen by children as someone to look up to and indeed relate to much more personally, rather than as the same boring teacher they encounter every day. Obviously the rangers need to be supported by a budget for travel and equipment, and extra staff would need to be employed to maintain normal levels of field surveillance.

Keryn Adcock

Community-based conservation programmes

Be it the tropical rainforest or the African savannah, every country and ocean comprises an incredible wealth of natural resources. Over thousands of years, ecosystems have changed and developed their magnificent beauty and diversity. Animals lived in harmony with human beings for centuries. But rapid population growth, burgeoning resource consumption and changing land use have destroyed habitats and exterminated biodiversity worldwide, and are continuing to do so.

Conservation efforts started a long time ago. National Parks and Reserves were created and still they only cover a small piece of the cake that is slowly being eaten up by human beings. Outside protected areas, the land is used by a constantly increasing population of human beings and in many countries this has led to monocultures and the extinction of many animal species. At the same time, human-wildlife conflict is becoming more and more frequent due to the overlapping animals' habitat with new or growing human settlements.

In the past, most policies and regulations focused on the protection of fauna and flora and ignored the needs of local people who were often moved out of these protected areas and excluded from their own land and activities. But it soon became obvious that the involvement of local communities, who used to live in and depend on these resources, and who were given no alternatives when forcibly removed, was critical for the success of conservation activities.

The involvement of the local communities brought a change of approach to conservation efforts. A variety of initiatives have been developed in the attempt to organise communities for natural resource extraction and management, with the aim of bringing about sustainable management of these resources in ways that benefit local communities. These initiatives are called community-based conservation (CBC): the natural resources' protection by, for and with the local communities.

CBC projects include ecotourism, creation of tree nurseries, production and selling of local craft work, hunting and collecting traditional medicine products, direct involvement in conservation work by becoming a scout, guide, manager of the region, and environmental educational programmes. The aim is that the local people protect and sustainably use their own land by becoming directly involved and responsible. In some cases, this can be a slow process, as local communities have been excluded for a long time from any decision-making process. Some have never learned how to, or been given the chance to, live from their own land in a sustainable manner.

In many countries where the most fascinating animals on earth live, local people have not always had chance to see them. Most of the inhabitants of Kenya, for

for example, have never seen a rhino! They may not be able to afford National Park entry fees, or won't have access to a four-wheel-drive vehicle. Reaching children and adults through environmental education programmes is one way of addressing this. As Baba Dioum, from the Ministry of Agriculture and Ecology from Senegal, once said: "In the end we will conserve only what we love. We will love only what we understand. We will understand only what we are taught".

The key to successful conservation work is systematically to integrate the communities into the projects for profitable cohabitation for all.

Friederike von Houwald and Renaud Fulconis

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III.IX Debate

Rhino hunting

As can be expected, the use of hunting as a conservation tool generates much debate. This is primarily due to philosophical differences of opinion on:

• whether it is right to kill individual animals to further overall conservation objectives for the greater good of a population or species
• whether one supports the principle of sustainably using wildlife and resources to generate revenue to help fund conservation management programmes and to create positive economic incentives to encourage the private sector and communities to conserve wildlife and habitats

Those whose primary focus is on the welfare of individual animals targeted for hunting, as opposed to the broader issues of how best to conserve viable populations of species and their related habitats, tend to be against hunting, irrespective of whether it can be demonstrated to be sustainable and / or create positive incentives to encourage people in developing countries to conserve wildlife.

For many it seems incongruous that, on the one hand huge efforts are being made to conserve remaining rhino populations, yet at the same time a small number of rhino are being sport hunted. It is therefore worth looking at the rationale behind hunting.

Southern white rhino hunting
Limited hunting of Southern white rhino has been undertaken since 1968. This has clearly been sustainable because, since hunting began, numbers of Southern white rhino have increased from 1,800 to 11,100 in the wild, with a further 740 in captivity worldwide. This has helped give white rhinos an economic value and increased the incentives for the private sector and communities to conserve white rhino. By 2003, 3,250 of Africa's southern white rhino were privately owned and the limited hunting in part contributed to this large expansion of rhino range. However, it is interesting that on the whole, live sale prices have been higher for breeding females than for old, potentially trophy males indicating the desire of the private sector primarily to breed up rhino.

Most Southern white rhino occur in fenced reserves and parks and, even though in some cases these are large areas (a few hundred km2 to a couple of thousand km2), the fence acts to prevent sub-adult dispersal, which is a natural white rhino population regulation mechanism. If left untouched, eventually densities of white rhino can build up to such a level that density-dependent population regulation can kick in and rhino performance declines. In addition, such large long-lived mega-herbivores also have the potential to overshoot carrying capacity. As a result, the

prevention of dispersal by fences may result in grazing levels becoming unnaturally high, and helping cause negative habitat changes for the rhinos (bush encroachment). If this occurs, the long-term potential of an area to carry white rhino will be reduced, and the rhinos will be more susceptible to die during droughts. As a result of these problems, management agencies capture and remove surplus white rhino to prevent densities getting to these unnaturally high levels.

The vast majority of white rhinos that are translocated are used to set up new breeding populations. However, since 1968 a limited number of surplus older animals (usually males) have been hunted annually in the major range state, South Africa and, to a much lesser extent, in Namibia. The total number of white rhinos hunted annually currently represents less than 0.5% of the total number of white rhinos in the wild, and hunting is controlled through permits issued by the formal conservation agencies.

While many white rhinos have been donated to restock other state conservation areas, the majority of rhinos that have gone to the private sector have been sold at market-related prices. The major supplier of surplus rhinos has been the state conservation areas and these live sales have significantly contributed to the overall cost of conservation in some rhino areas, especially in KwaZulu-Natal, South Africa. This additional income has been especially important as government grants for conservation have been declining in real terms and these rhino sales have helped make up some of the shortfall. Successful rhino conservation and management is not cheap. A further spin-off is that putting a value on the wildlife (live sales, limited hunting together with the promotion of eco-tourism) has made it easier for conservationists to argue to local politicians that conservation is a valid economic form of land use and not just a “waste of land.”

Black rhino hunting

The 13th Conference of the Parties (CoP13) of the Convention in Trade in Endangered Species of Fauna and Flora (CITES) from 2-14 October 2004 in Bangkok, Thailand also recently approved quota applications by Namibia and South Africa each to sport hunt five surplus male black rhinos per year.

At first glance, it seems inconceivable that anyone would want to hunt *Vulnerable* (Namibia) and *Critically Endangered* (South Africa) subspecies of black rhino when so much effort is going into protecting these animals and breeding them up as rapidly as possible.

The surplus male problem

The problem of surplus black rhino males is not new and has been discussed as far back as 1992. It is primarily the result of some black rhino populations ending up with markedly skewed sex ratios in favour of males. These skewed sex ratios can

occur either by chance in some populations (with many more males than females being born in a population), or if removals from donor populations are biased in favour of females (as was the case in setting up the highly productive Namibian custodianship populations). The problem is compounded by an apparent slightly skewed sex ratio at birth in favour of males, although this is often later reversed because of the higher adult male mortality rates due to fighting.

The social carrying capacity of adult male black rhinos is also limited. If no action is taken in markedly male-biased populations, fight-related mortalities are likely to increase once these surplus males grow up. If surplus males killed only other males then perhaps they could just be left to fight it out and let natural selection take its course. However, conservationists have expressed concern that in such populations, valuable breeding females and calves may be injured or even killed as well as other males, as appeared to have been the case in Pilanesberg National Park in the past.

Surplus males also use valuable food resources that may affect female breeding performance. Although not yet conclusive, preliminary evidence from annual SADC Rhino Management Group status reporting suggests that female reproductive success may also be slightly higher in populations with a higher proportion of adult females to males. Thus many field managers in southern Africa have for some time now sought to find a way to reduce the number of surplus males in such populations. Somewhat counter-intuitively, the hunting of a limited number of surplus males may end up stimulating metapopulation growth rates and hence overall rhino numbers.

Only some populations have a surplus male problem. Owners or management agencies conserving populations that end up with skewed sex ratios in favour of females over males are invariably happy for this to remain the case as long as possible, as percentage growth rates and calving production will be higher. This is similar to productive cattle farming, where the number of bulls in a herd is limited to maintain rapid population breeding rates. Managers of such female-skewed black rhino populations are simply not keen to accept males.

The corollary is that while populations that end up with markedly skewed sex ratios in favour of males usually want to obtain more females, sourcing additional females is very difficult. Many donor populations, not unexpectedly, are loath to provide females only, as this would negatively affect the donor population's sex structure and potential future performance. In practice, it is hard for the populations that have by chance ended up with more males to source and obtain additional females.

It is also known that specific rhino males can dominate the breeding and sire a large proportion of the calves in smaller populations. The removal of such animals after a period of say 10–15 years may therefore reduce the risk of father–daughter

matings and contribute positively to the genetic management of such populations, in the same way that a cattle farmer is unlikely to keep the same breeding bull for an extended period. In addition, the hunting of an old post-reproductive male that has been pushed out of his territory will not affect his contribution to the gene pool of that population.

Attempted solutions to the surplus male problem
A number of alternatives to hunting surplus males have been tried over the years including sending them to zoos, attempting to sell surplus males, and creating male-only populations in reserves that are too small to hold breeding populations. This last approach has not been particularly successful or popular. For example, in Makasa, KwaZulu-Natal, South Africa, a bull in a small male-only population killed the other two males. For the approach to have a better chance of success, it is recommended that males that "know" each other be introduced together.

Attempts to exchange or introduce adult males to bring in new blood to populations have also not had much success, with the result that it is recommended that adult females be introduced instead.

The argument that surplus males can be used to "test" potential new areas for reintroduction also has limited applicability. This is because breeding females need to be on a higher nutritional plane than males successfully to conceive and raise calves at a rapid rate. A "survival" diet for a small number of male rhinos is not the same as a diet for optimal breeding. Therefore, the mere fact that a few surplus males survive in a new area is no guarantee that females will breed well if introduced (which in the process will raise stocking rates higher).

In addition, mortality risks when setting up new populations appear to be reduced if founder animals are introduced at the same time. Concerns have been expressed by some that if males-only populations were to be established, and females introduced at a much later date, mortality rates of females following introduction may increase. If an area is big enough to set up a breeding population of black rhinos, ideally one should proceed straight to setting up the breeding population and not start with males only. If one starts with males, the problem remains of sourcing more females than males in future.

Demand for surplus males has been limited, and as a result these males have not generated much revenue to help fund conservation. Live males auctioned in KwaZulu-Natal in 2004 fetched an average price of US $21,130.

Declining budgets for conservation
The reality facing many conservation management agencies in Africa is that their budgets have been declining in real terms. Successful rhino management is also expensive, requiring concentrated field protection and law enforcement, running of

intelligence networks, monitoring, maintenance of fences and waterholes, and biological management (including translocating groups of surplus rhino to set up new breeding populations). These activities are required to increase rapidly the numbers of black rhinos in national metapopulations and meet national metapopulation goals. Intensively managing and successfully protecting rhino populations can cost as much as US $1,000 per km2.

Given the high cost of successful rhino conservation, the demonstrated sustainability of southern white rhino hunting, and the fact that other attempts to deal with the surplus male problem have met with limited success and generated little revenue to help fund conservation, it was to be expected that proposals to hunt surplus male black rhino would eventually emerge. Indeed, the possibility of starting hunting has been discussed for a number of years in the SADC Rhino Management Group. A number of conservation agencies in southern Africa had suggested that such a move could be a win-win strategy; solving the surplus male problem while at the same time generating additional much-needed income to help fund necessary field conservation efforts. It has been estimated that a black rhino trophy hunt might fetch about US $200,000, almost 10 times the current live price. It is expected that this would create a positive economic incentive for the private sector and communities to conserve black rhinos. The live value of black rhinos is also likely to increase, which will most benefit the state conservation agencies with surplus breeding animals.

Proponents of limited hunting argued at CITES that hunting such a small number of such surplus males will not lead to a reduction in overall rhino numbers, but for the reasons outlined above rather could contribute to improving population growth rates. They also have noted that the combined number of black rhinos now in Namibia and South Africa (2,530) is now greater than the number of Southern white rhinos when hunting started in South Africa in 1968 (1,800).

In Namibia all black rhinos belong to the state. Thus Namibia's Ministry of the Environment and Tourism would decide which specific surplus males would be hunted. It was explained that many individual rhinos in Namibia are individually known, enabling the Ministry to target specific surplus male animals. Namibia also indicated it would hunt only adult male black rhinos. The Namibian representative committed that 100% of all proceeds from any black rhino hunted on communal conservancy land would be made available for use in conservation programmes by respective community conservancies through the Namibian Game Products Trust Fund, thereby proposing a mechanism whereby communities that did not own the rhinos, but had successfully conserved them, would benefit directly from the hunting. The largest community-managed black rhino population in Africa occurs in Namibia, and it was explained that communal land representatives have shown high interest in this scheme. At CoP 13, Namibia stated that it was keen to increase benefits to communities.

Speculation about the impact of these decisions on poaching
There has been some speculation in the press that the decisions at the recent CITES CoP to allow the annual hunting of 10 black rhino will send a message to poachers and perhaps lead to an upsurge in rhino poaching and widespread slaughter of rhino. It is perhaps worth pointing out that in general trade experts do not feel that this argument is credible. In part, this is because as far as the illegal end-user markets are concerned, there is no major distinction between black and white rhino horn when making dagger handles, or when horn is used as an ingredient in traditional Chinese medicine (TCM). The main difference is between how Asian rhino horn is viewed, valued and used compared with African horn. The annual export of 10 black rhino trophies will in effect simply add to the existing export of around 40 to 70 odd Southern white rhino trophies per year. If the controlled export of a few black rhino hunting trophies were going to stimulate rhino poaching, one would have expected this to happen long before in response to the ongoing export of white rhino trophies.

Trade experts also point out that the dynamics of the controlled export of a limited number of marked and CITES-permitted hunting trophies are not the same as the illegal killing of rhinos in an attempt to supply an illegal demand for rhino horn to make dagger handles and to use in TCM. Had CITES CoP 13 approved the reopening of a legal rhino horn trade (which it did not) this would have been a very different matter.

Richard Emslie

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A legal trade in rhino horn?

The Rhinocerotidae were possibly the most diverse group of mammalian megaherbivores to have existed. Their collective population decline in more recent years has been caused by the poaching of rhino for their horn. In an attempt to stem the decline in wild rhino populations, an international ban prohibiting its trade was initiated in 1976. The ban contributed to massive prices increases in horn during the 1970s and 1980s, which subsequently increased the incentive to poach rhino, in turn leading to accelerated declines in rhino numbers. The black rhino suffered its most significant declines in the years after the trade ban. Most rhino states have inadequate funds to protect their rhino in the light of such strong poaching pressure, and as a result, rhino populations in many areas continue to decline.

The arguments in favour of legalising the trade in rhino horn
The illegality of the horn trade has denied rhino states the right to manage their rhino such that funds can be made available for protecting wild populations and thus stemming the dramatic population decline. The depletion of the world's rhino can, it is argued, only be realistically halted by international and national political measures that result in a decline in the price of rhino horn and an increase in the funds available for the protecting of wild rhino. These joint goals could be achieved most effectively by the instigation of a strictly regulated trade in rhino horn (in practice, only that derived from the African species), with the profits being reinvested in rhino protection: in short, giving African nations ownership of their rhino resources.

It is further suggested that by instigating a regulated trade in rhino horn, the incidence of poaching would decline. This would occur as a result of:

• a reduction in the global price of rhino horn, leading to a reduction in the incentive to poach for both African and Asian species
• regular dehorning would result in fewer large specimens of horn being available, which when combined with an increase in resources for anti-poaching patrols, would dramatically reduce the incentive to poach and this the illegal killing of rhino
• the increased incentive to protect rhino, due to the profits they would be capable of generating

Other outcomes might include surplus black and white male rhinos in South Africa and Namibia no longer being culled or sold for sport hunting, as the funds for translocations would be provided by business people willing to invest in farming rhinos for their horn. Furthermore, a rhino could generate a regular income throughout its life, whereas if sold for sport, can only provide a one-off return.

Until now, the means by which such a trade could be regulated have been elusive, but with the advent of chemical forensic fingerprinting, such that the origin and date

of purchase of the horn can be encoded onto the horn. This can also be detected in derivative products, making the identification of illegal horn now possible. A central selling organisation would be required to be established in order to regulate prices.

The flux of horn on the market maintained at considerably lower prices than illegal horn would encourage stockpilers to sell their horn before prices drop further, thus flooding the market and subsequently further reducing the poaching pressure on wild rhino. It has been suggested that stockpilers are banking on the extinction of rhino to boost their investments. However, stockpilers could be given the option to sell their horn to the newly established central selling organisation, such that this horn can be added to the legal stockpile and released on the market in a more controlled manner.

Legalisation of the horn trade would take control of the trade away from the criminal syndicates that presently run it, allowing the trade to be monitored more effectively, and run for the benefit of rhinos rather than horn traders.

The arguments against legalising the trade in rhino horn
On the converse, if is often argued that allowing a legal trade in rhino horn would create as many problems as it would solve.

Chief among these are the risks to the rhinos themselves in the collection of the horn. Although removing the horn is, in itself, as simple as cutting fingernails, rhinos must be tranquillised for the procedure to be carried out. Despite the advances in chemical immobilisation, tranquillisation of rhino always carries a risk, not just from the use of the drugs, but also because there is a danger that rhinos may become killed or injured as they succumb to the tranquillising agent, for example by falling into a waterhole or stumbling into a ravine. Additional concerns have been raised over the inhibitory effects of tranquilisation on rhino reproduction.

A common question is whether rhinos actually need, or use their horns. As explained in the descriptions of the five species, Asian rhinos use their incisor teeth rather than their horns to fight each other, but the African rhinos do use their horns and can inflict serious injuries. There is evidence to suggest that, with up to 33% of female black rhinos actually being killed by intra-specific fighting, dehorning might seem worthwhile just to reduce fighting-related mortality! However, limited studies have also shown that dehorned black rhino may be less able to defend calves from predators such as hyena or lion (and tigers in Asia), while rhinos of all species are known to use their horns to push obstacles out of their way, and to protect their faces and eyes from thick undergrowth.

It could also be argued that, given the low starting point of rhino populations, even a legal trade in rhino horn could not satisfy the demand for horn, and that poachers would continue to kill rhinos from National Parks or places not practising rhino horn

“farming”, and find it easier to export than they are currently able.

Conservationists may also find it difficult adequately to explain why some people are allowed to dehorn rhinos (albeit without involving the death of the animal) and profit from that, while others may not. Those able to participate in the scheme would tend to be larger, commercial landowners, or those involved in communal area conservancies, such as in Namibia and Zimbabwe. The gap between the “haves” and the “have-nots” might apply not just to the rhinos (with or without their horns) but also to local communities.

Possibly the biggest argument against this trade would be concerns over the management of it, and the practicalities of ensuring the trade is managed effectively for the benefit of rhinos, rather than corrupt officials in both range states and areas where horn is traded.

Cathy Dean and Jake Veasey

Section IV:
Beneficiary projects

IV.I Selecting the beneficiary projects

The Core Group received 53 applications requesting a total of 2.6 million euros. The EAZA Rhino Campaign is targeted to raise 350,000 euros. Even though we are confident that zoos in other parts of the world, particularly in the USA, will run parallel fundraising, education and awareness campaigns, we were never going to be able to support all the projects who applied.

Deciding which projects would benefit from the Campaign was difficult. The most important factor, we considered, was whether the project would deliver an increase in rhino numbers. In general terms, we were looking for projects which demonstrated strong leadership and close links with other local NGOs or government agencies as part of a national rhino strategy, and which have been endorsed by organisations such as the African and Asian Rhino Specialist Groups. We also favoured projects that would build local capacity, act as a blueprint or model that could be rolled out to other locations, and be sustainable. Finally, we wanted to identify projects where we felt an EAZA Rhino Campaign grant would make a significant impact (not just in financial terms, but also in terms of a widening of the donor base or exchange of expertise) and deliver value for money.

All those involved in the decision-making process agree that we have learned a great deal about rhino conservation efforts in the field. The selected projects add up to 338,200 euros. We have allowed just under 5% contingency for inflation or otherwise increased costs, and for fluctuations in exchange rates.

If you need more information about any of the beneficiary projects, in order to create your displays or linked education activities, please either visit the Campaign website (www.rhinocampaign.net) or email Renaud Fulconis (renaud@savetherhino.org).

IV.II Expressing a preference

Participating EAZA members can, when registering for **Save the Rhinos**, choose simply to support the Campaign as a whole, or state preferences for one or more particular species or types of project (such as anti-poaching work or environmental education programmes). Please see the Campaign Registration Form in Section I.

Preferences shown for individual projects will influence funding allocation, particularly at the start of the Campaign when funds first become available. The Campaign's Core Group does, however, reserve the right to allocate funds as circumstances dictate. This is to avoid finding ourselves with too much support for one project and not enough for another. At the end of this section you will find short descriptions of a few projects already identified as being especially deserving of support, if we succeed in reaching and passing our target of 350,000 euros.

Project A:	**Rhino monitoring equipment for Kenyan National Parks**
Location:	Aberdares, Chyulu Hills, Lake Nakuru, Meru, Nairobi and Tsavo West National Parks, Kenya
Species:	Black (*Diceros bicornis michaeli*)
Coordinator:	Martin Mulama and Benson Okita, Kenya Wildlife Service
Type:	Monitoring
Amount awarded:	22,400 euros

Abstract
Kenya is the stronghold of the Critically Endangered Eastern black rhino (*Diceros bicornis michaeli*) and currently conserves the majority (84%) of the remaining 540 animals of this subspecies. The five-year Kenyan Black Rhino Conservation Strategy has given highest priority to their biological management to help achieve and maintain rapid meta-population growth to increase rhino numbers. The Kenyan Rhino Programme is addressing these needs by:

• Training personnel in the Rhino Programme to deliver a more quality-controlled and scientific approach to the monitoring of black rhino and the processing of monitoring data to assist decision-making
• Developing capacity for habitat assessment. This includes a) detailed habitat assessment of the rhino areas; b) development of a Kenyan black rhino carrying-capacity model to assist rhino sanctuary management and planning; c) development of procedures for periodic re-assessments of black rhino habitats to inform conservation policy; d) training staff in habitat assessment

Good-quality monitoring data is essential for managing the Kenyan rhino populations. Analysis of this data will provide the required population estimates (eg using RHINO Mark-Recapture Software), and a number of indicators of population performance. This information is used to decide on management actions (especially translocation decisions) to maintain healthy and productive populations. The information also allows field managers to assess progress, as part of the national conservation strategy.

Support
The main aim of this project is to improve rhino monitoring activities in six KWS National Parks by providing essential monitoring equipment and training of field staff in their use, thereby enhancing the quality and accuracy of the data input to the management decision-making process

Funds raised through the EAZA Rhino Campaign will be used to buy 30 pairs of 10x50 binoculars, seven digital cameras and accessories, 20 GPSs and accessories, practical, hands-on tutorials covering all aspects of operations and maintenance of the equipment, and reference manuals.

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Project B:	**Environmental education programme at the Laikipia Wildlife Forum**
Location:	Laikipia District, Kenya
Species:	Black (*Diceros bicornis michaeli),* White (*Ceratotherium simum simum*)
Coordinator:	Dr Anthony King, Laikipia Wildlife Forum
Type:	Environmental education
Amount awarded:	27,400 euros

Abstract
Laikipia is home to over half of Kenya's black rhinos, in addition to other threatened species such as the reticulated giraffe, Jackson's hartebeest and Grevy's zebra.

There are currently some 33 million Kenyans. It is estimated that by 2020 there will be 45 million. Pressure on protected areas and the wildlife within them, even those with such enlightened policies as Laikipia, will increase unless we look at ways in which to knit conservation with development.

The Laikipia Wildlife Forum (LWF)'s objectives are being realised through its five operational programme areas: Community Conservation, Wildlife Management, Tourism, Education and Security. As a result Laikipia is the one district in Kenya that continues to record increasing or stable wildlife populations, in contrast to the declining trend throughout the country. Wildlife population densities in the Laikipia region now rank second only to the internationally renowned Masai Mara ecosystem in Kenya.

The Environmental Education (EE) programme, which has been running since January 2004, recognises that the long-term sustainability of conservation efforts in Laikipia is inextricably linked to the environmental awareness of local school children. The LWF hopes that by encouraging involvement through environmental education, the next generation of responsible, committed Kenyans will work for the sustained conservation of the Laikipia ecosystem. The great majority of Kenyan children have never seen wildlife in their natural environment, despite living in a country with rich wildlife resources and an economy dependent on wildlife tourism. Through the efforts of the LWF, Laikipia school children have begun a process that sees the gradual reversal of this situation. There are 231 primary schools in Laikipia District, with an enrolment of 70,730 pupils, and a further 10,866 pupils in 43 secondary schools. The LWF education programme aims to link these schools with existing environmental education initiatives across the District.

The environmental education programme has been running since January 2004, and over the past 18 months the LWF has closely monitored and evaluated the delivery of the programme. Certain targets have been adjusted for 2006 and 2007 in the light of experience.

Support
The EAZA Rhino Campaign will fund the LWF's Environmental Education programme during the calendar year 2007.

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Project C:	**Re-establishment of black rhino**
Location:	North Luangwa National Park, Zambia
Species:	Black (*Diceros bicornis minor*)
Coordinator:	Hugo van der Westhuizen
Type:	Anti-poaching, monitoring, environmental education
Amount awarded:	16,800 euros

Abstract
Historically Zambia was one of the major range states for black rhinos. The stronghold of black rhinos in Zambia, with population estimates ranging from a minimum of 4,000 to possibly as many as 12,000 animals, used to be the Luangwa Valley, located in the eastern part of Zambia. Due to heavy poaching in the late 1970s and 80s, black rhinos were declared “presumed nationally extinct” in 1998.

As the remote and wild North Luangwa National Park never received any official protection and was a stronghold for poachers, the North Luangwa Conservation Project (NLCP) was initiated in 1989 with the goal to support and strengthen the local wildlife authority (ZAWA) to enable it to manage and conserve effectively the Park and the Game Management Areas surrounding the Park.

Eighteen years of support led to the situation where wildlife numbers showed a steady and ongoing increase and poaching had been brought under control. The point had been reached where it was felt that a reintroduction of black rhinos was a feasible and natural next step in the ongoing conservations efforts of NLCP and ZAWA in North Luangwa NP. In 2003, five black rhinos were reintroduced to a 55 km2 fenced sanctuary. This reintroduction was just the first step towards the goal of establishing a population of at least 20 founders in the Park within three years.

Security and monitoring of the reintroduced rhino is obviously a very high priority and the expansion of the current sanctuary to enclose an additional 150 km2 requires additional personnel and equipment. A very cost- and personnel-effective way of adding to the security offered by traditional foot patrols in the sanctuary and wider Intensive Protection Zone is the use of observation posts on high ground. One such observation post already exists, adjacent to the first rhino sanctuary, and ZAWA personnel equipped with binoculars and night-vision equipment are able to scan the sanctuary and surrounding areas on a 24-hour basis.

Support
The EAZA Rhino Campaign will pay for two more observation posts, together with the equipment needed to monitor the new section of the sanctuary. In addition, it will pay for NLCP and ZAWA to re-issue conservation education materials, which were originally developed for the education of the local communities, especially children. It is important to make them aware of the conservation value of the rhinos and the project and to show them that the project has established a sense of partnership between communities and the Wildlife Authority. These materials (colouring books) will have new information and an update on the history of the rhino project to date.

© NLCP Rhino project - FZS

Project D:	**Lifting crane for rhino capture truck**
Location:	Zimbabwe
Species:	Black (*Diceros bicornis minor*), White (*Ceratotherium simum simum*)
Coordinator:	Lovemore Mungwashu, SADC Regional Program for Rhino Conservation
Type:	Translocations
Amount awarded:	19,500 euros

Abstract
Zimbabwe experienced severe poaching problems in the 1980s, which almost resulted in the complete annihilation of both black and white rhino particularly in those parts of the Parks Estate along the border with Zambia. Numerous engagements took place between members of Parks and Wildlife Management Authority. It was decided to move the animals to private Conservancies and into state Intensive Protection Zones (IPZs) in order to reduce the losses of rhinos. In addition, anti-poaching manpower densities in the IPZs were increased and this helped to reduce poaching to levels where annual losses to poachers were less than the net population increase.

Over the years, the capacity and resources for sound management of the rhinos in the Lowveld Conservancies have been built to universally accepted levels. They have one rhino capture vehicle, but the geographical scope of this vehicle is limited to the Lowveld. This truck is now 13 years old and, because of its age, spares are difficult to source. In addition, the increased size of the black rhino population in the Lowveld Conservancies, combined with the disruptions of the Fast Track Land Resettlement programme, has created a situation where each year more rhinos require translocation than is actually possible to achieve given the available resources.

Owing to the prevailing unfavourable macro-economic environment, the Parks and Wildlife Management Authority has not been able sufficiently to equip its wildlife capture unit, to the extent that the unit no longer has the capacity to react to emergency rhino operations, let alone normal rhino capture and translocations. In cases when capture has been carried out, some unacceptably high levels of mortalities have been recorded due to the use of antiquated capture equipment.

Support
The equipping of a suitable vehicle to undertake capture and translocation operations will improve the national capacity to attend to all animals that require translocation. The project organisers are confident that funding will come from another source to pay for the purchase of a capture truck; the EAZA Rhino Campaign will then pay for it to be fitted out with a Fassi lifting crane.

Once operational, the truck will be used to fulfil the currently unachievable needs for rhino translocations within Zimbabwe, in National Parks such as Matobo and Hwange, and in private conservancies and ranches, such as the Midlands and Goourlays. In addition, the truck may also be deployed for rhino capture operations in adjacent countries (such as North Luangwa National Park in Zambia, which lacks capture capacity).

Project E:	**Rhino translocation equipment**
Location:	Etosha National Park, Namibia
Species:	Black (*Diceros bicornis bicornis*), White (*Ceratotherium simum simum*)
Coordinator:	Pierre du Preez, Ministry of Environment and Tourism
Type:	Translocations
Amount awarded:	34,800 euros

Abstract
Namibia holds more than a third of all the black rhinos remaining in Africa, and is the stronghold of the south-western subspecies (*Diceros bicornis bicornis*). With more than 95% of the total population of this taxon found in Namibia, and rhino numbers increasing steadily under a well-established and innovative conservation and management programme, the future of the south-western black rhino will depend on Namibia's ability to maintain adequate standards of protection, management, monitoring and sustainable utilisation of rhinos, and to expand available areas of range to accommodate further population increase.

Apart from increasing the risk of losing animals through reduced fecundity and increased mortality as the population approaches ecological carrying capacity, there is a real risk that the carrying capacity of Etosha National Park could be depressed (in the short (5 years) to medium term (15-20 years), as a result of heavy browsing pressure. The risk of this would be higher if high population densities coincided with a period of low resource availability during drought. In other countries, translocations of surplus rhinos from one National Park to another have helped to improve the overall growth rate.

With the biggest single population of black rhino (± 650) in any protected area, Etosha National Park is in need of equipment to load and translocate rhinos in emergencies but also during planned capture and translocation programmes, as approved by the Hon. Minister as part of the rhino work plan of the Ministry of Environment & Tourism of Namibia (MET).

Support
Etosha National Park has currently no rhino translocation equipment. Funds provided by the Campaign will pay for the purchase of: a specialised capture vehicle fitted with a mobile fire fighter (water to cool down immobilised animals), a generator for power tools etc. for transmitter implants, and general equipment; for the modification of an existing truck so that it can carry rhino crates and be fitted with a lifting crane; for the modification of two existing rhino retrieval trucks; and the

construction of six light wooden rhino crates (four for black rhinos, two for whites).

The EAZA Rhino Campaign's contribution will help in the active management of the rhino population in Namibia and will contribute to the conservation of this rare species in Namibia in the future.

© Raman Marais

Project F:	**Hluhluwe EAZA rhino security equipment funding**
Location:	Hluhluwe Game Reserve, KwaZulu-Natal, South Africa
Species:	White (*Ceratotherium simum simum*), Black (*Diceros bicornis minor*)
Coordinator:	Dave Robertson, Ezemvelo KZN Wildlife
Type:	Anti-poaching, monitoring
Amount awarded:	17,000 euros

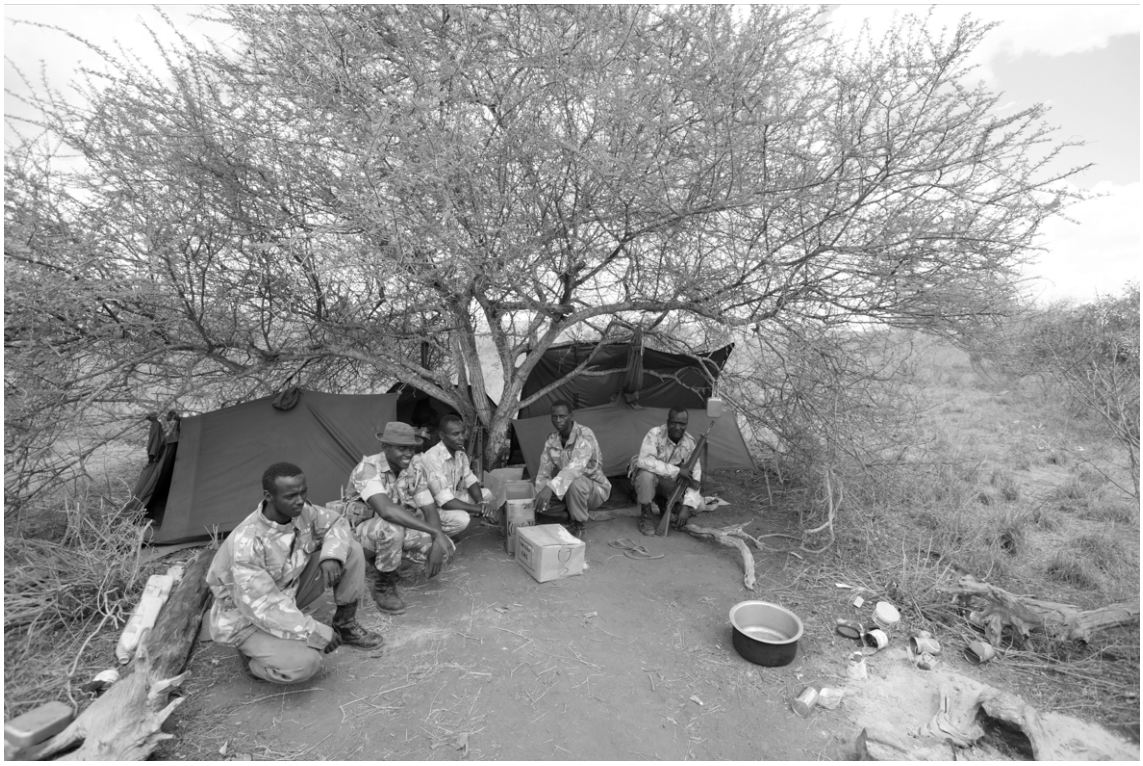
Abstract
Hluhluwe-iMfolozi Game Reserve is synonymous with rhino conservation. The Southern white rhinoceros (*Ceratotherium simum simum*) had been reduced to a single population of 20 animals in the late 1800s, when the Reserve was proclaimed to protect them. By the early 1960s, rhino conservation had been so successful, that the Natal Parks Board were able to start catching and translocating these animals to other conservation areas throughout Africa, as well as to zoos overseas. The African population now stands at over 11,100 animals, all of which had their origins in the Reserve.

More recently, conservation focus has shifted to the black rhinoceros (*Diceros bicornis minor*), which are intensively monitored and managed in the Reserve. This has allowed surplus black rhinos to be translocated to other conservation areas in Africa. Ezemvelo KZN Wildlife is currently working hand in hand with WWF's Black Rhino Range Expansion Project.

The success of rhino conservation in Hluhluwe-iMfolozi Game Reserve is largely due to two factors: community outreach programmes and effective law enforcement. Neither of these can be successful on its own. Law enforcement is largely carried out by field rangers based at picket camps throughout the Reserve, supported by a more specialised anti-poaching unit. In order for staff to perform successfully and efficiently, it is imperative that they are well equipped to perform any task that may be required.

Although equipment for law enforcement is seen as a priority and a significant part of the budget is allocated towards purchasing this, there are still some important shortfalls.

Support
Funding from **Save the Rhinos**, the EAZA Rhino Campaign 2005/6 will pay for rifle safes for the safeguarding of field rangers' rifles. This is a requirement of the Reserve's management, as well as now being mandatory due to new legislation in South Africa. Funding will also provide camping equipment, such as tents, backpacks, hiking mattresses and torch batteries. These will enable field ranger patrols to camp out in high-risk areas and to be active during high-risk times of the day – mainly late afternoon and at night-time during the full moon.



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Project G:	**Rhino horn-fingerprinting project**
Location:	N/a
Species	White (*Ceratotherium simum simum*), Black (*Diceros bicornis minor, Diceros bicornis michaeli, Diceros bicornis bicornis*)
Coordinator:	Richard Emslie and Rajan Amin
Type:	Research
Amount awarded:	5,550 euros

Abstract
Wildlife Investigators and Specialist Police Units dealing with wildlife crimes have indicated it would be very useful to have a forensic technique, which could both identify the species and source location of rhino horn recovered in busts. For this reason, IUCN SSC African Rhino Specialist Group initiated a rhino horn-fingerprinting project.

The initial horn-fingerprinting project could reliably identify the species of horn. The first results were very encouraging. But samples sizes were too small per park in order to be able reliably to determine the source of horn by analysing its chemistry.

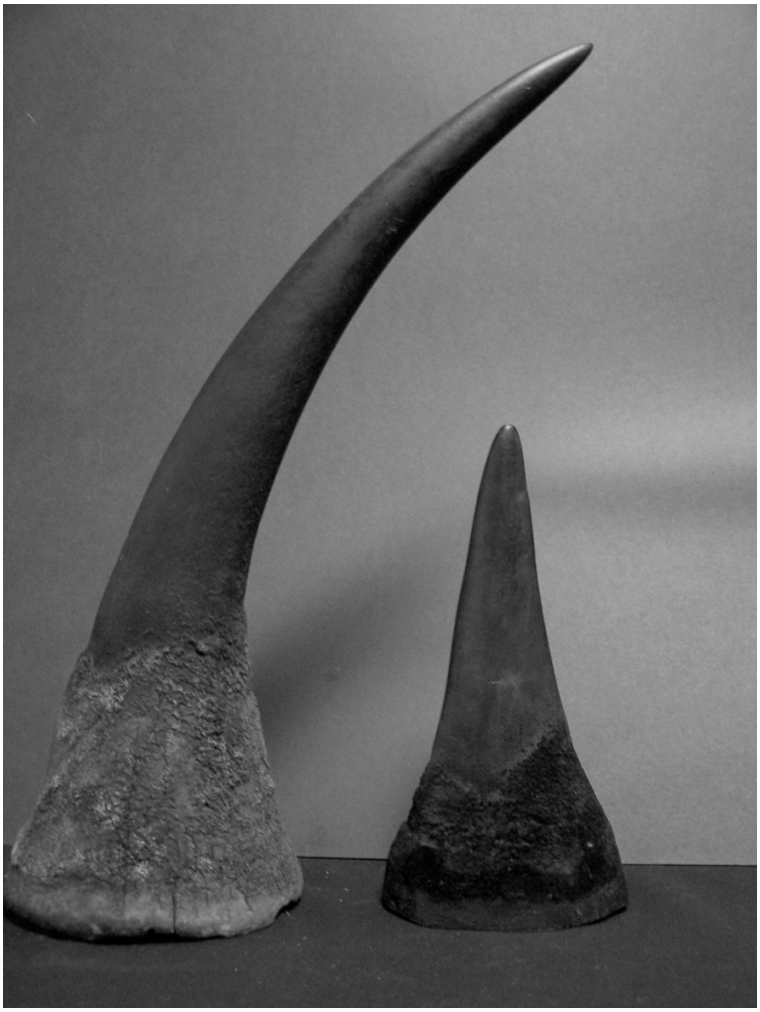
The aim of the AfRSG's horn fingerprinting project is now to complete the final experimental phase of the project and in particular to determine the degree to which one can successfully identify the source of rhino horn as well as to determine the number of horn samples per park needed and the successful discrimination between regions and parks.

These results are to be used to inform a decision (in consultation with representatives on the SADC Rhino and Elephant Security Group) as to whether or not to proceed to full implementation of the method in the field and if so, how many samples should ideally be sourced for each area in the horn database. Clear directions will be given in the final report on exactly how the technique would work in practice. Custom-made software would than be provided in order undertake the species and source determinations in the future.

In addition, being able to source horn recovered in consumer states or illegally in transit would assist with identifying illegal trade routes for rhino horn. If the approach works for rhino horn, then similar approaches could be used for other threatened species such as elephants.

This work is momentarily partially completed. In order to be able to complete the rest of the work additional funding is being requested from **Save the Rhinos**, the EAZA Rhino Campaign.

Support
Specifically, the funds will pay for: coordinating the collecting, labelling, pre-processing and transport of the samples; coordination with the laboratories; management of the horn-fingerprinting database; carbon and nitrogen analyses; analysis of other elements using a Finegan-Mat-Element-Magnetic-Sector-High-Resolution-Inductively-Coupled-Plasma-Mass-Spectrometer; processing of samples using a pressurised microwave oven to produce sample solutions; and write-up of all the findings.



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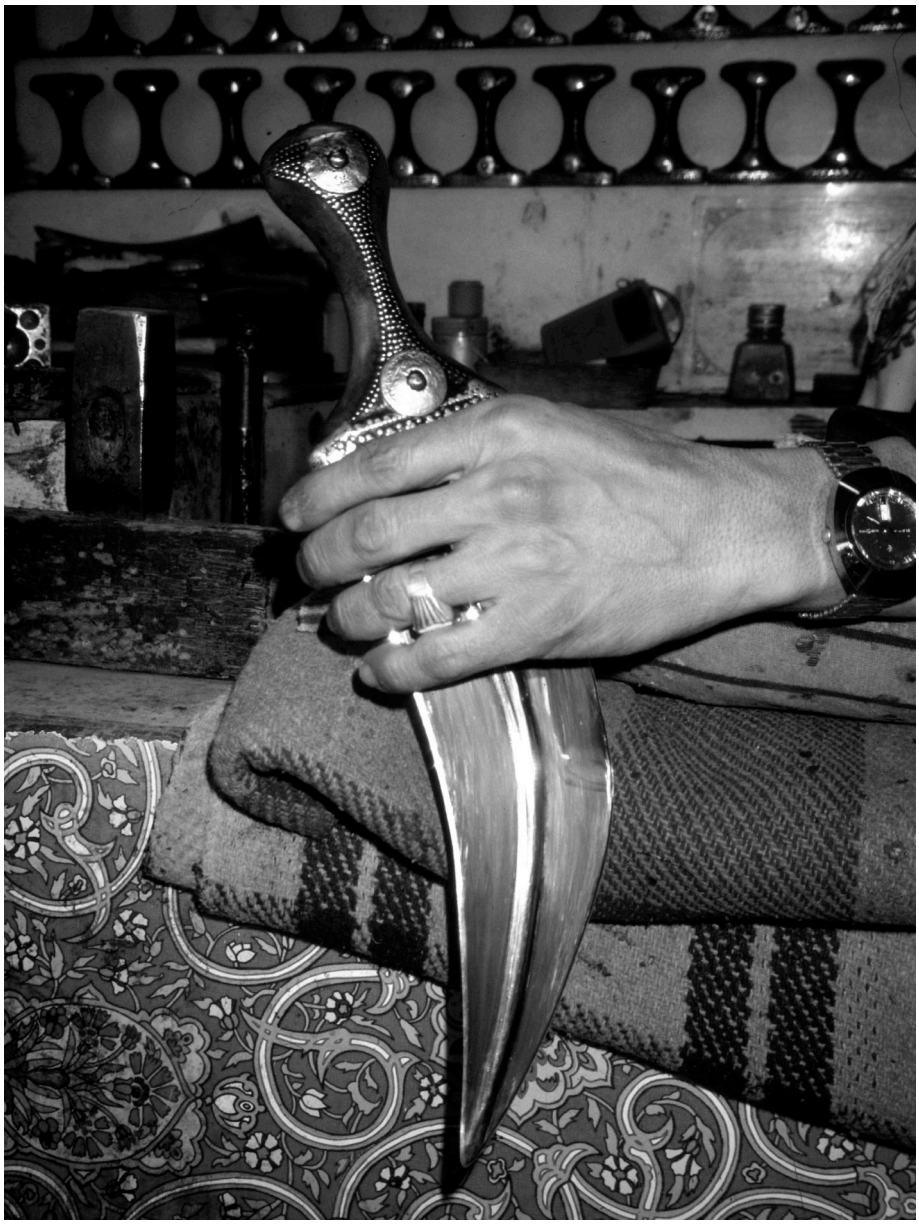
Project H:	**Combating the illegal trade in and demand for rhino horn in Yemen**
Location:	Yemen
Species:	N/a
Coordinator:	Esmond Bradley Martin and Lucy Vigne
Type:	Research
Amount awarded:	10,100 euros

Abstract
Since the early 1970s, Yemen has been the most significant country in the world for importing rhino horn. Traders smuggle more rhino horn into this one country than into any other. In Yemen, mainly in Sanaa, the horns are made into dagger (jambiya) handles. It is because of this trade that rhino poaching continues in the East African region. Esmond Martin and Lucy Vigne have been studying and reducing trade in rhino horn to and within Yemen since 1978 and 1986 respectively, with regular visits to Sanaa and other parts of the country around every two years. In the late 1980s and 1990s, they succeeded, with the support of the Prime Minister of Yemen, in banning imports of rhino horn and exports of horn shavings to the East. They also prohibited the internal trade in rhino horn, as well as banning the making of new rhino horn jambiya handles. This crackdown on trade, supported by efforts to lower the demand by encouraging substitutes for the horn, reduced the quantity of rhino horn entering Yemen considerably. After many meetings, Yemen also finally agreed to join CITES.

Support
The grant from the EAZA Rhino Campaign will pay for a further visit by Martin and Vigne to Yemen. The objectives of the trip are to monitor Yemen's rhino horn trade, and to promote the use of substitutes for rhino horn jambiya handles being made in Yemen, thereby reducing the demand for rhino horn. These will be achieved by:
• Investigating trade routes for rhino horn coming to Yemen
• Collecting new information concerning rhino horn prices and recent purchase
• Counting the craftsmen and workshops in Sanaa's souk and Taiz's souk for comparison purposes and trends
• Checking prices and sales of jambiyas with various handle types
• Photographing craftsmen and jambiyas
• Talking with Yemenis about their ideas on other materials for dagger handles, looking into the sources and availability of alternative materials and researching ways to make alternative materials more popular

• Encouraging the government to implement their laws against rhino horn, and asking high-level highest officials for their support in reducing demand for new rhino horn in Yemen in the form of a public statement
• Producing posters and other public awareness materials such as stickers, cards etc., for distribution in Sanaa and Taiz especially, providing teachers with information, giving a slide projector or similar device to the Sanaa zoo for its new education centre
• Meeting high-level Sanaanis to learn and instigate ways to improve education and awareness on the plight of the rhino



Project I:	**Indian rhino vision 2020**
Location:	Assam, India
Species:	Greater one-horned (*Rhinoceros unicornis*)
Coordinator:	Christy Williams and Tariq Aziz, WWF India, and Tom Foose, International Rhino Foundation
Type:	Strategy, translocations
Amount awarded:	92,000 euros

Abstract
Recently, Kaziranga National Park in Assam, India, celebrated 100 years of successful greater one-horned rhino (*Rhinoceros unicornis*) conservation. Numbers in the Park have increased from approximately 10-12 in 1905 to an estimated 1,700 today, thanks to the superlative efforts of the Forest Department in Assam.

Kaziranga currently contains 93% of Assam's rhinos and an estimated 67% of the species total. There are currently only nine breeding populations in two countries. Moreover, only two of these (Kaziranga and Royal Chitwan National Park in Nepal) have more than 100 individuals. This restricted distribution, with most of the eggs in only two baskets, renders the species very susceptible to stochastic and catastrophic events.

The Assam Forest Department and the various NGOs interested and involved in conservation of the greater one-horned rhino have therefore agreed that range expansion through translocations from Kaziranga and Pabitora (another Park with a healthy population of rhino) to other appropriate Protected Areas in Assam is a prudent direction for future efforts. Such translocations have produced initial positive results in Nepal and have had long-term success for the Southern white rhino.

WWF-India and the International Rhino Foundation have been and will continue to be the NGO leaders in assisting the Assam Forest Department in the development of this Rhino Range Expansion Programme, which has now been designated Indian Rhino Vision 2020.

The goal over the next 15 years is to increase the total rhino population in Assam from about 2,000 to 3,000 individuals and, as significantly, to expand the distribution of the rhino so that there are at least six Protected Areas with populations of 50-100 individuals. This goal will be achieved by a combination of rhino translocations and

improved protection. First steps towards the 15-year goal will be to improve rhino protection at all source and target Protected Areas and to translocate 20-30 rhinos from Pabitora and Kaziranga to Manas NP, where they will be protected and monitored.

Support

Funds from the EAZA Rhino Campaign will be used to pay for Year 2 (July 2006-June 2007) of the project, will will include the following activities: the publication of studies on habitat assessments and the ecology of rhinos; gaining permission for tranquilising and collaring the rhinos being translocated; a translocation training workshop; 4th and 5th meetings of the Task Force; translocations of the rhino in February 2007; and monitoring of them thereafter. The groundwork done will help ensure the short- and long-term protection of greater one-horned rhinos in Assam.

Project J:	**Conservation of rhino in India and strategy framework to reduce rhino poaching in range countries**
Location:	Assam, India
Species:	Greater one-horned (*Rhinoceros unicornis*)
Coordinator:	Melanie Shepherd, David Shepherd Wildlife Foundation, and Bibhab Talukdar, Aaranyak
Type:	Anti-poaching, research, environmental education
Amount awarded:	27,600 euros

Abstract
Assam is home to an estimated 70% of the world's remaining wild greater one-horned rhino population, which numbers approximately 2,400 animals. In 1998 a new project was launched by Aaranyak and DSWF in Pabitora, Orang and Kaziranga NPs on wildlife crime monitoring and infrastructure enhancement, which focused on the provision of wireless communications, anti-poaching kits and a speedboat to assist anti-poaching operations, especially during the seasonal monsoon flooding when the National Parks are closed to visitors, and the animals more exposed to threats from poachers. The number of rhinos poached per year in Assam has been dramatically reduced to between 7-10.

Yet the illegal trade in wildlife parts – especially that of rhino, elephant, tiger and bear – is still flourishing, putting immense pressure on the remaining greater one-horned rhino populations. Monitoring the poaching trends and international trade is important in order to assess the threats and the requirements for a suitable and effective anti-poaching strategy. The specific objectives to be met by this project are to:

• Monitor each case of rhino poaching to find out the modus operandi and investigate the culprits involved with such crimes
• Prepare revised sets of guidelines for rhino-bearing areas in Assam regarding requirements to prevent the illegal entry and exit of poachers from the rhino-bearing areas
• Maintain updated database of rhino poachers and traders operating in Assam, and other parts of Eastern Himalaya. This will involve the continued undercover monitoring of the two known trade routes for rhino horn smuggled out of Assam – one via Nepal to Hong Kong and one via Myanmar and Thailand
• Offer non-financial assistance to rhino-bearing areas in Assam in terms of equipment and transport to enhance rhino protection

• Offer annual awards to the five notable rhino protectors in Assam, to be selected from the field forest staff of rhino bearing areas. This will increase the morale of the field staff who dedicate their life to rhino protection
• Provide training to forest staff with regards to wildlife crime and legal assistance for them in their fight to combat it
• Provide education initiatives to local people on the importance of the rhino
• Bring out a publication at the end of this project on the “Rhino Conservation beyond 2000”

Support
Funds raised by the EAZA Rhino Campaign will be used to pay: salaries; for the purchase of a patrol vehicle and rental of other vehicles and elephtants as needed; incentives for intelligence; cash awards; for the purchase of 10 wireless handsets and two base stations; four digital cameras; and for general communications needs.

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Project K:	**Rhino Protection Units for Javan and Sumatran rhinos in Indonesia**
Location:	Sumatra and Java, Indonesia
Species:	Sumatran (*Dicerorhinus sumatrensis*), Javan (*Rhinoceros sondaicus*)
Coordinator:	Tom Foose and Nico van Strien, International Rhino Foundation
Type:	Anti-poaching, monitoring
Amount awarded:	50,000 euros

Abstract
Both SE Asian rhinoceros species, the Sumatran rhinoceros (*Dicerorhinus sumatrensis*) and the Javan rhinoceros (*Rhinoceros sondaicus*), are facing extinction. Currently they survive in numbers that are very small and their long-term survival is critical without help. The Javan rhino numbers only about 50 animals in two locations, with 95% in Ujung Kulon National Park on Java. Less than 300 Sumatra rhinos live in remote populations on Sumatra and Malaysia. Exact figures are difficult to give, but the largest populations occur in Bukit Barisan Selatan (60+) and Gunung Leuser (50+) on Sumatra.

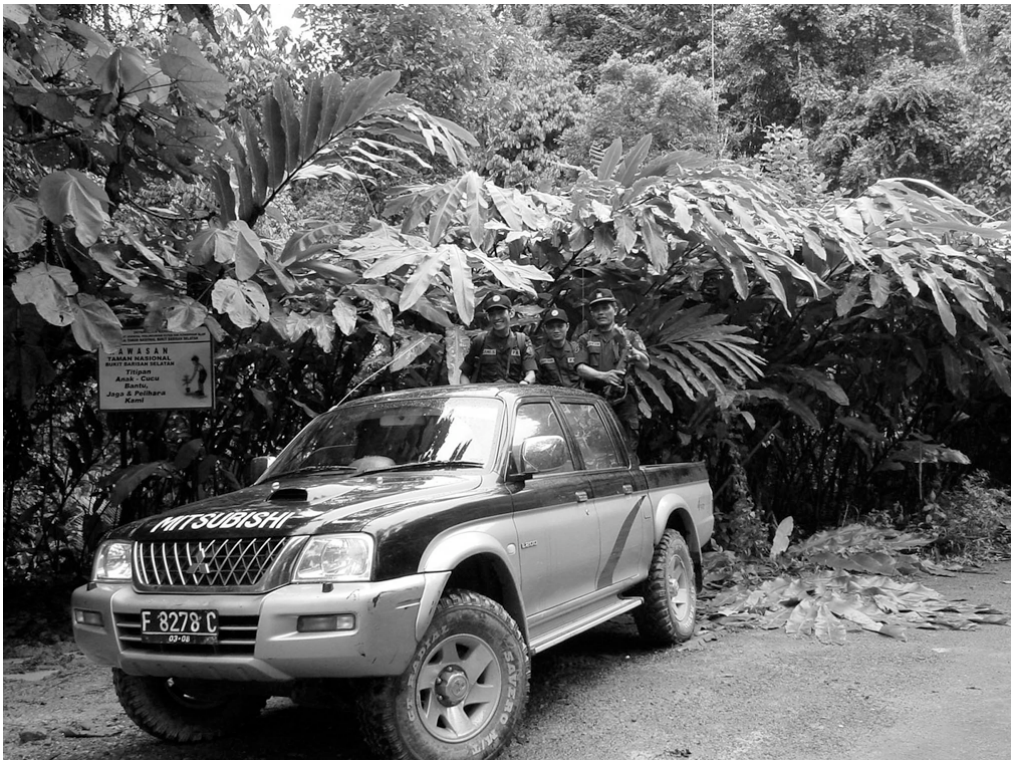
The continuous strong demand for rhino horns for traditional Chinese medicine encourages poaching; while pressure from expanding human settlements reduces the size and quality of the remaining habitat. With so few animals surviving, the loss of even a few individuals may easily become fatal for the species. Therefore, it is vital that all surviving rhinos receive the strictest protection achievable in the wild and that, through evacuations from unviable situations, translocations and captive breeding, the existing populations can be reinforced and new ones established.

This project is part of a coalition effort between conservation organisations and the Indonesian government to continue the programme of Rhino Protection Units (RPUs) in Bukit Barisan Selatan (BBS) National Park (NP), Way Kambas (WKA) NP, Gunung Leuser (GL) NP in Sumatra and Ujung Kulon (UK) NP in Java, Indonesia. The RPUs are highly motivated anti-poaching teams, which intensively patrol rhino areas, destroy traps / snares and identify / apprehend poachers. This basic work is augmented by a law enforcement and advocacy program that facilitates prosecution of poachers.

This programme has been very successful, both in Sumatra and Java. Indeed, both the Government of Indonesia and the global conservation community have

recognised the RPU programme as one of the most effective and successful conservation programmes for megafaunal species in SE Asia and indeed the world. With good protection and active management, both species can and will recover to viable levels, if funding for this project is continued for future years.

Support
With the money raised during the EAZA Rhino Campaign, the International Rhino Foundation will continue its efforts and support for the protection of the Sumatran and Javan rhinoceroses. The funds will help pay for ranger salaries, uniforms and equipment, ongoing training, vehicle fuel and maintenance costs, rations, intelligence gathering exercises and law enforcement.



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Project L:	**Establishment of two additional rhino protection units**
Location:	Tabin Wildlife Reserve, Sabah, Malaysia
Species:	Sumatran (*Dicerorhinus sumatrensis harissoni*)
Coordinator:	Nan Schaffer and Edwin Bosi, SOS Rhino
Type:	Anti-poaching, monitoring
Amount awarded:	6,400 euros

Abstract
In recognition of the drastic and continuous population decline of the Sumatran rhinoceros, the conservation community has identified this rhinoceros species as critically endangered. Currently there are less than 300 animals living on Sumatra, Peninsula Malaysia and on the island of Borneo, where they are mainly found in Tabin Wildlife Reserve, Kulamba, Ulu Segama, Danum Valley and the Lower Kinabatangan Wildlife Sanctuary. Sabah, in the north and east of Borneo, is home to the last known population of the subspecies *Dicerorhinus sumatrensis harissoni*. Surveys have indicated a population of greater than 20 animals in this area, but the diminished habitats place the rhinos at increased risk of exposure to poaching threats.

To ensure survival of this species, conservation efforts must combine community outreach programmes with intense research and vigorous protection efforts. Accordingly, in Tabin Wildlife Reserve, SOS Rhino's Rhino Protection Units (RPUs) directly engage villagers and oil palm plantation owners and employees in the effort to protect the rhinos through the SOS Rhino's Community Outreach Programme. By securing the assistance of these stakeholders, the RPUs can more effectively monitor and patrol the Reserve and cut off all potential entry or exit points utilised by encroachers.

In addition to assisting the Sabah Wildlife Department with these anti-poaching measures, SOS Rhino's RPUs have helped gather important demographic information on local rhino ecology. The RPUs continually assess the Sumatran rhinos' distribution and population density and this information is incorporated into the region's wildlife management and protection plans. SOS Rhino has established a multi-dimensional, multiple-stakeholder collaborative programme that requires units to be highly mobile and responsive.

To date, SOS Rhino field teams have 15 people divided into three RPUs, which have been assigned to cover the northern, western and eastern parts of the Reserve.

Support
With the funds from the EAZA Rhino Campaign, SOS Rhino will be able to purchase supplies and equipment to support two additional RPUs: a new unit based in the south of the Reserve, which is urgently needed to cover the many plantations and villages along the southern border and thus complete the protection coverage of Tabin; and a new roving RPU to supplement and support SOS Rhino's existing patrol teams.

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Project M:	**Enhanced community outreach programme**
Location:	Tabin Wildlife Reserve, Sabah, Malaysia
Species:	Sumatran (*Dicerorhinus sumatrensis harissoni*)
Coordinator:	Nan Schaffer and Edwin Bosi, SOS Rhino
Type:	Community-based conservation
Amount awarded:	8,600 euros

Abstract
To ensure survival of the Sumatran rhino in Malaysia, vigorous protection by traditional Rhino Protection Units (RPUs) is necessary, but insufficient. Although the RPUs contribute to a great extent to the conservation and protection of the rhinos, the units cannot be everywhere at once. Engaging surrounding villages and plantations to the conservation effort is vital, as they represent the first line of defence against poachers and encroachment into a Reserve. Engaging these stakeholders improves both the efficiency and effectiveness of protection efforts.

Accordingly, since 2000, Tabin Wildlife Reserve's RPUs have directly engaged villagers and oil palm plantation owners and employees in the effort to protect the rhinos through SOS Rhino's Community Outreach Programme (COP). This programme helps to secure Tabin Reserve boundaries by developing incentives for local communities to become involved by raising awareness and establishment of alternate income sources. Rangers are recruited from the villages and SOS Rhino is building the foundations for eco-tourism in the Reserve. The RPUs are responsible for various aspects of the Volunteer Programme, which generates funds for both the COP and the villages around the Reserve. Without advertising, the Volunteer Programme has captured the support and participation of individuals and organisations around the world. These individuals come from diverse backgrounds. Zoo staff, for example, are able to gain valuable conservation experience and return home with a greater appreciation for the global conservation perspective. They can become more effective in promoting the sustainable conservation message to both visitors and donors to their zoos.

Support
The COP has reached maximum capacity, and RPU rangers and programme staff are challenged to accommodate and manage additional volunteers. SOS Rhino intends to begin widespread promotion of the program, but needs to maintain the quality of the experience by upgrading the facilities and improving volunteer coordination. With a Grant from the EAZA Rhino Campaign, SOS Rhino plans to

to create additional facilities to accommodate more volunteers and visitors to Tabin.

Specifically, the funds will pay for the construction of two more chalets for volunteer accommodation, bedding, mosquito nets, cooking and eating utensils and equipment, five water tanks, two generators, two boats and four 15HP boat engines.

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IV.IV Waiting-list projects

Out of the original 53 proposals received, 13 have been chosen to benefit from the **Save the Rhinos** Campaign. In the lucky event that the zoo community raises more than the target 350,000 euros, the additional funds may be used to support a further eight projects that are currently on the "waiting list". A description of these follows:

• A Kenyan project is focusing on the protection of a remnant black rhino population in the **Chyulu Hills**. This project is led by Richard Bonham from the Maasailand Preservation Trust. Currently around 12/13 black rhinos live in this area. The aim is to protect and monitor this indigenous and important breeding group

• The **Association of Private Land Rhino Sanctuaries** (APLRS) in Kenya works in close cooperation with the Kenyan Wildlife Service (KWS) for the protection of around 200 black and 160 white rhinos. This project's aim is to enhance the security of the rhinos by increasing the motivation and morale of security personnel through cash incentives

• The **Mkomazi Game Reserve**, coordinated by Tony Fitzjohn from the George Adamson Wildlife Preservation Trust, is the first black rhino sanctuary in Tanzania. Currently eight black rhinos (a calf was born in June 2005) live in this 45 km2 area (Tony hopes to get a further four rhinos via translocations). The proposal focuses on assistance for maintenance and upkeep of the sanctuary and the rhinos it holds

• A Zimbabwean project, the **Midlands Black Rhino Conservancy**, is seeking support for its conservation work for the 68 black rhinos currently living on the 90,000 hectare Intensive Protection Zone. Money is needed to perform darting operations (implantation of transponders in the horn, translocation), for new equipment and for an upgrade of the security system (more guards to be employed)

• Another Zimbabwean project, led by Raoul du Toit and by Lovemore Mungwashu, (SADC Regional Program for Rhino Conservation / WWF Rhino Conservancies Project) is asking for support to train and employ further rhino monitors for the **SADC Rhino Monitoring Unit**, to collect field level information needed to properly manage a number of important southern African rhino populations

• **Save the Rhino Trust** in Namibia is working for the conservation of the black rhino population of the western Kunene region. This black rhino population is one of the key populations. The money requested will be used to enhance the quality and quantity of monitoring and protection

• We received three proposals (from Keryn Adcock, Kenneth Buk, and Jo Shaw and Stephane Hilary) all focusing on aspects of the **nutrional ecology of black rhinos and its effect on carrying capacity and breeding performance**.

In some areas black rhinos have suffered high mortalities and poor calving performances, which make these investigations necessary for future management of this population. Equally, a better understanding of black rhino diet may help in the selection of the most appropriate areas for the establishment of new populations

•The **African Rhino Specialist Group** (AfRSG), whose Chair and Scientific Officer are situated in South Africa, has the reputation of being the most active and effective of the IUCN's SSC's Specialist Groups. The AfRSG has requested funding to part-support the two posts, and / or the 2006 meeting

NB: The Campaign Core Group reserves the right to add new projects at any time. It may also be that, by the time we have raised 350,000 euros, the above projects may already have raised the necessary funds, or have new or different priorities. The Core Group will reconsider the waiting list projects if and when the 350,000 euros has been raised.

Section V:
Merchandise

V.I. Save the Rhinos Merchandise

Selling **Save the Rhinos** merchandise in your souvenir shop is a good way to raise funds for the Campaign. That is, if you allow part of the profit from the sales to go to the Campaign. Of course, this can be done in addition to putting up a collection box and / or organising all kinds of activities to collect money for the **Save the Rhinos** conservation projects of your choice.

To assist you in setting up a special **Save the Rhinos** corner in your gift or souvenir shop, the Campaign Core Group has made arrangements with a number of companies to prepare special **Save the Rhinos** merchandise. Of course, you can also produce your own **Save the Rhinos** souvenir products, for which we sincerely hope that you will contribute a part of the profit made to the Campaign.

Merchandise already prepared for Save the Rhinos
Information and order details of five companies and a local community (see the article on Bushman art that follows), which have prepared **Save the Rhinos** merchandise, are provided on the next pages.

We are delighted that all the companies – Dowman, HJM, Ravensden, Something Different and Thuthuka – supplying merchandise to EAZA members have agreed to donate 10% of the sale price to the **Save the Rhinos** Campaign. These companies have prepared a wide variety of products (see later in this Section), and we are particularly impressed by the quality and innovation.

We sincerely hope that you will consider making several of them available in the **Save the Rhinos** corner of your zoo or aquarium shop. We suggest that you donate a percentage of the profit from selling these items to the Campaign.

Finally, we'd like to bring to your attention the products created by the Ombili Foundation in Namibia (see later in this Section). Basel Zoo, which is kindly coordinating the sales, is selling these to EAZA members at cost.

Save the Rhinos shop
For further information on available **Save the Rhinos**-related products, please also refer to the Campaign section on the EAZA website (www.eaza.net). Merchandise information will be regularly updated throughout the duration of the Campaign.

Source your own Save the Rhinos merchandise
Participants in the Campaign may also produce their own products to support **Save the Rhinos** financially. The logos of EAZA, the Campaign and Save the Rhino International (if using just one, please use the Campaign logo) and the images on the CD-ROM may be used on these products. The images of Douglas, the Campaign mascot, however, must NOT be used on any of your products in any way.

V.II Bushman art

The Bushmen, one of the first human beings in southern Africa, have lived there for thousand of years. Being nomadic, they lived closely with nature, never depleting the resources of this world. Nowadays, Bushmen are facing tremendous difficulties. They have been suppressed by many races and have lost – due to changes in the last century – the knowledge of how, and opportunity, to live from nature.

In Namibia, Bushmen have lost the land they used to hunt on and are no longer allowed to hunt elsewhere. They are not even allowed to search for berries, roots, etc. As most of them are analphabetic, there is no option for them other than to work on farms where they often are suppressed and exploited by having no rights.

The Ombili Foundation was set up in 1989 in Namibia. Its aim is to assist the Bushmen in the process of settling down and to prevent the good nature and innocence of the Bushmen being exploited by others. Bushmen, who used to hunt and collect their own food on a daily basis, are now taught how to cultivate crops, attend schools and are helped in supporting their talents (such as craftwork).

The Foundation operates on a huge farm of 10,000 hectares. 30 hectares are used for planting crops, woods, etc; the rest remains for the Bushmen to collect material and plants they need for crafts, medicine and spices.

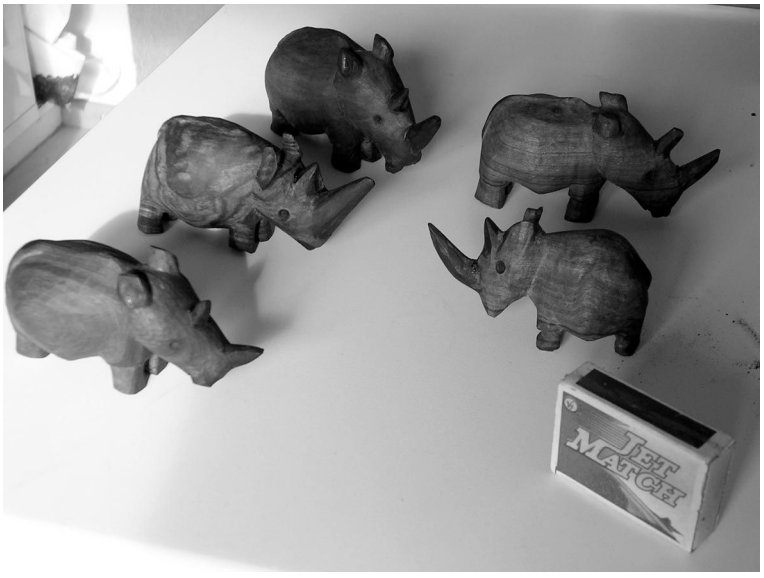
The wood used by the artists to create the little rhinos sold for the EAZA Rhino Campaign has been planted and grown at the farm. It is an indigenous plant called Tambuti. The plants are harvested at an early age in order not to waste too much wood, something that happens when crafting large animals. Sustainable use of nature products is very important at Ombili. The money paid to the Foundation for the rhinos goes directly to the artist him/her-self. They can use this money for additional food, for school, clothes, bicycles etc.

Besides having the money to purchase certain items, we should not forget how proud these people are of what they do. First of all, they have been informed that many zoos want to buy rhinos from them! But secondly, it makes them even more proud, as they all are now carving rhinos for rhino conservation, for species they have lived with in the past, species they still highly respect. It gives those people at Ombili also the opportunity to “do something” for their own animals.

Friederike von Houwald

To enquire about prices and to place your order for Ombili Foundation products, Please contact:

Basel Zoo
Postfach
CH-4011
Basel
Switzerland
F: +41 61 281 0005
E: vonhouwald@zoobasel.ch



V.III List of products

Supplier	Items
Dowman	25cm cuddly sitting rhino (black and white rhinos)
	18cm cuddly sitting rhino (black and white rhinos)
	16cm cuddly sitting rhino (black and white rhinos)
	35cm standing rhino greater one-horned rhino
HMJ	Rhino pencils (handmade and painted)
	Rhino puzzle (palm and pine wood)
	Rhino textile figure filled with sand
	Palm wood chunky rhino
	Recycled metal rhino
	Silver rhino
	Hanging rhino candle stick
	Rhino candle lantern
	Rhino coat hook
Ravensden	Rhino inflatable
	Rhino key-ring
	Rhino mask
	Rhino cape (children's)
	Rhino umbrella
	Rhino ceramic bank
	Rhino ceramic mug
	Rhino family pack (plastic rhinos)
	Rhino backpack (children's)
	Rhino stationery set (eraser, notebook, two pencils, eraser)
	Rhino ballpoint pen
	Rhino pen and pencil set

Supplier	Items
Ravensden	Rhino ruler
	Rhino eraser
	Rhino pencil-top
	Rhino pencil case
	Rhino crayon
Something diferent	Selection of Tshirts with rhinos, logo, Douglas the mascot
Thuthuka	Rhino poo planter
Ombili Foundation	Little wooden rhinos. Orders through Basel Zoo (CH)

Section VI:
Reference sources

VI.I The Campaign website: www.rhinocampaign.net

The EAZA website will, as usual, carry information about the Campaign, designed for use by participating institutions (see also Section I: Sharing information and materials).

But we are also keen to provide the general public with information to enthuse, inform and inspire them! We very much hope that people who have just spent an enjoyable afternoon in their local zoo, watching the rhinos, will want to find out more when they get home. We also hope to provide schoolteachers with the makings of practical and intellectual exercises to carry out in the classroom.

To that end, **Save the Rhinos** is accompanied by its own official website. www.rhinocampaign.net has been developed specifically with the needs of zoo visitors and the general public in mind. Each of the two Campaign websites (EAZA and Campaign) is specifically tailored to the different audiences: the EAZA website for the EAZA membership and the Campaign website for the general public.

The Campaign website will be in English but, via regional representatives (or other volunteers), we hope to be able to provide translations into other languages. As the Campaign develops, we aim to create a special interface that will enable convenient updating of all language versions. Please contact Renaud Fulconis, the EAZA Campaign Manager, for more information.

The website was launched simultaneously with that of the Campaign (on 7 September 2005) and contains the following sections, all illustrated wherever possible:

Home page
• Basic information about the Save the Rhinos Campaign, an explanation of the goals and background of the Campaign
• Forewords by scientific authorities (regional representatives are welcome to add the forewords of their own national scientific authority and / or national V.I.P.)
Rhino information
• Basic zoological information about all five rhino species, their current and historical distribution and status
Threats to rhinos' survival
• Information on the factors threatening the survival of rhinoceroses
How you can help
• Link to online credit card donation facility
Supported projects
• List of *in situ* rhino conservation projects supported within the framework of the Campaign

News and events
• Invitation to subscribe to the Campaign news mailing list
Links and Contacts
• Links to the field projects supported by the Campaign

Please note:

• As previously, the EAZA website www.eaza.net will also contain information about the **Save the Rhinos** Campaign. Both websites will be linked where relevant
• Zoos are strongly encouraged to put information about the EAZA Rhino Campaign on their own websites, together with hyperlinks back to the Campaign and EAZA websites
• You will also find links to and from the International Rhino Foundation, which is helping to organise a parallel campaign in the USA, and to and from Save the Rhino International, which is supporting the EAZA Rhino Campaign

Tomasz Rusek and Kristina Tomasova

Brief bibliography

Books

Here follows a very short list of some recent English-language books, that either focus on rhinos or include a significant amount on them, and which are still in print and readily available. As the Campaign progresses, we hope to expand this section on the Campaign website.

• Adams, Douglas and Carwardine, Mark: *Last chance to see*. Paperback. Pan, 1991. (Includes a chapter on the Northern white rhinos in Garamba National Park.)
• Chapman, Jan: *The art of rhinoceros horn carving in China*. Hardback. Christie's Books, 1999.
• Dinerstein, Eric: *The return of the unicorns. The natural history and conservation of the greater one-horned rhinoceros*. Hardback. Columbia University Press, 2003.
• Ellis, Richard: *Tiger bone and rhino horn. The destruction of wildlife for traditional Chinese medicine*. Hardback. Island Press, 2005
• Ridley, Glynis: *Clara's Grand Tour. Travels with a rhinoceros in eighteenth-century Europe*. Hardback. Atlantic Books, 2004.
• Toon, Steve and Ann: *Rhinos*. Paperback. Colin Baxter Photography, 2002.

Journals

The quarterly magazine *EAZA News*, the official newsletter of EAZA, contains information on all EAZA Conservation Campaigns. News about the **Save the Rhinos** Campaign will also be published. Visit the following link for *EAZA News* online: www.eaza.net/magazine/EAZANews.html

The *EAZA Yearbook* with the black, white and greater one-horned rhinoceros EEP Annual Reports provides invaluable reference information on the *ex situ* breeding programmes. A digital version of the *EAZA Yearbook* is available in the Members' area of the EAZA website. The Member-area also contains other relevant rhino related such as husbandry guidelines.

Pachyderm, the Journal of the African Elephant, African Rhino and Asian Rhino Specialist Groups, is an invaluable reference tool. *Pachyderm* is a bi-annual international peer-reviewed journal that deals primarily with matters related to African elephant and African and Asian rhino conservation and management in the wild. It is also a platform for dissemination of information concerning the activities of the African Elephant, the African Rhino, and the Asian Rhino Specialist Groups of the IUCN Species Survival Commission (SSC). Visit the following website to read issues going back to 1983 online:
www.iucn.org/themes/ssc/sgs/afesg/pachy/

Save the Rhino International publishes a twice yearly magazine called *The Horn*, which carries reports from projects the charity supports, as well as write-ups of

events and trailers for forthcoming ones. You can read the articles online at www.savetherhino.org in the “News and Views” section under “What we do” or you can become a member of Save the Rhino (sign up online with your credit card) and receive your own copy.

The *International Zoo Yearbook* is an internationally renowned conservation-based publication launched in 1960 as an international forum for the exchange of information amongst zoos. Although primarily concerned with wild animals in captivity, the International Zoo Yearbook also publishes papers on conservation and management in the wild and reintroductions. Volume 40, which will have “Elephants and Rhinoceros” as the theme of Section 1, is due to be published in early 2006.

The *EEP Annual Reports* provide invaluable reference information on *ex situ* breeding programmes, and you can find these in the Members’ area of the EAZA website.

Websites
You will further information about rhinos and useful links on the websites of Save the Rhino International, the UK-based charity that is supporting the organisation of the EAZA Rhino Campaign in Europe, and the International Rhino Foundation, which is helping to run a parallel campaign in the USA:

www.savetherhino.org
www.rhinos-irf.org

Do send us your recommendations regarding other useful reference material!

Rhino Resource Center

The rhinoceros is threatened with extinction. Sound conservation is based on a good understanding of the biology of the animals. For that reason scientists have studied rhinos both in the field and in zoological gardens, accumulating and interpreting data about their behaviour, ecology, social structure, food requirements, reproduction, diseases, distribution and status – and many other aspects of biological knowledge. These studies are a guide to field managers and zookeepers, as well as an essential basis for policy makers.

As rhinos are large and conspicuous animals, over the years many surveys and studies have been undertaken in the range states in Asia and Africa, in zoos and research facilities all over the world. Many results have been written down and published in a wide variety of media and languages. Every study has contributed some important fact about the rhinoceros and often led to further questions and more focused enquiries.

The Rhino Resource Center (RRC) has been set up to collect, to preserve and to disseminate all these written studies about the five living species of rhinoceros. All sources are considered, irrespective of the date, language or subject matter, both popular and scientific. Currently, the RRC contains copies of about 10,000 documents referring to the rhinoceros. As a resource of knowledge about one group of animals, it is practically unique. The collection contains dissertations and articles published in countries around the globe, and several metres of books dealing with the rhinoceros. Every subject is represented, be it cultural, historical or biological.

www.rhinoresourcecenter.com
The Rhino Resource Center aims to disseminate available knowledge through its website. This contains a complete catalogue of all available titles, which can be searched by author, title or date – thus allowing visitors to find the contributions of a certain author, about a certain subject, or written in a specific period, including those which have appeared in the last few months. However, it is recognised that titles of publications are only a start to most enquiries. Therefore, the aim of the RRC is to provide full access to all published data in a searchable format through the website, which is available worldwide without charge.

The Rhino Resource Center is registered as a charity in The Netherlands. The board is chaired by Dr Nico van Strien. The RRC is sponsored by both the International Rhino Foundation and SOS Rhino. Further sponsorship is required to expand the contents of the website for the use of the global rhino community.

The Chief Editor of the Rhino Resource Center is Dr Kees Rookmaaker, who can be contacted by email: rhino@rookmaaker.freeserve.co.uk

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