

**Rhino Horn Stockpile
Management: Minimum
standards and best
practices from east and
southern Africa**

Simon Milledge

TRAFFIC East/Southern Africa



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RHINO HORN STOCKPILE MANAGEMENT: MINIMUM STANDARDS AND BEST PRACTICES FROM EAST AND SOUTHERN AFRICA

By Simon Milledge



Ranger holding huge rhinoceros horn displayed at the Centre for
Confiscated Wildlife Items, Nairobi, Kenya
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INTRODUCTION

This document presents recommended practices for rhino horn stockpile management and is based upon best examples of management currently employed throughout east and southern Africa.

A wide variety of rhino horn stockpile management policies and practices are found throughout Africa. In this regard, there is no single correct method, and for certain issues there is no need to reinvent the wheel when trying to recommend particular aspects of stockpile management. However, without exception, every rhino range State could benefit from the lessons learnt and best practices from neighbouring countries.

During 2001 to 2003, TRAFFIC reviewed the rhino horn stockpile management practices employed throughout east and southern Africa. Based upon this regional review, a stakeholder workshop was held in 2004, which was attended by government officers directly responsible for managing all of the largest horn stockpiles in Africa, including Botswana, Kenya, Namibia, South Africa (KwaZulu-Natal province, Limpopo province, Mpumalanga province, North West Parks and Tourism Board, and Kruger National Park), Swaziland and Zimbabwe. This document is the main outcome from the workshop, consolidating available knowledge and summarizing recommended best practices for all aspects of horn stockpile management. It covers the collection of horns from the field, measuring and marking, registration, storage and security, audits and reconciliation, and several other important components of stockpile management for both State and privately-owned horns.

This document contains recommended **minimum standards** that should be implemented in all countries, as well as **optimal practices** for those striving for the best possible benchmark. It is hoped that any nation wishing to improve any or all of the above ingredients for stockpile management may refer to this document.

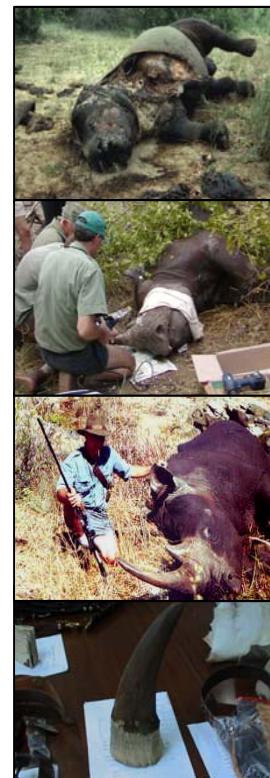
Readers should note that generic terms have been used in this document, and may not necessarily match terms used in all countries. For example, a '*reserve*' denotes any protected area containing rhinos; the '*field*' is equivalent to the terms '*bush*' or '*veld*'; '*wildlife department*' denotes a government wildlife conservation institution responsible for rhino (and stockpile) management, either national or provincial; and '*head office*' represents the headquarters of a wildlife department.



BACKGROUND

The majority of rhino horn stockpiles, both government and private, are derived from five major sources:

1. **Natural causes:** Horns may be recovered from rhino deaths from natural causes, such as fighting, predation or disease. However, horns may never be recovered when carcasses are not detected, for example in areas where there is limited patrol coverage of large rhino populations. On State land, rangers collect these horns, later to be centralized in government strong rooms. On non-government land, horns may be either handed over to government authorities or retained by private owners.
2. **Management actions:** Horns are also recovered from dehorning and ‘tipping’ operations, problem animal control, and horns broken off accidentally (e.g. during translocation).
3. **Trophy hunting:** In some areas, rhinos may be legally hunted, with the majority of the horns exported as trophies and held by individual private owners.
4. **Pre-CITES:** A significant proportion of private stockpiles may also consist of specimens acquired before 1973 (when rhinos were initially listed on CITES), mostly as personal or scientific specimens.
5. **Confiscations:** Seizures and confiscations may include horns from a variety of illegal sources, including poached rhinos and stockpile thefts.



CREDIT (top to bottom): S Snelling/SanParks, N van Strien/IRF, D Pienaar/MPB

In recent years, increased attention has been placed on ensuring adequate rhino horn stock management for two main reasons. From a *law enforcement perspective*, deficiencies in horn stock accumulation protocols, stock marking, registration and security increase the risk of horn leaking to illegal markets. Whilst the focus of preventing illegal trade in Africa has traditionally been on ensuring adequate field protection and infiltrating illegal trade syndicates, it is increasingly clear that the potential for illegal trade from horn stockpiles could seriously undermine ongoing conservation efforts. Not only do significant quantities of rhino horn already occur within east and southern Africa, but also they are likely to carry on increasing in volume so long as wild populations continue to increase. With some existing stockpiles approaching four tonnes, it is considerably easier for horns to go missing from larger stockpiles than from smaller stockpiles. This highlights the need to have stringent stockpile management measures in place throughout the world.

Secondly, from a *trade perspective*, some countries have expressed varying degrees of interest to legally trade rhino horn internationally. In light of declining budgets in many conservation authorities, the continued pressure to increase the economic returns from wildlife resources, the increasing size of horn stocks and associated management costs, and the declining financial value of horns held in strong rooms in perpetuity, there remains strong interest (particularly in South Africa) to pursue legal horn trade options. During a recent survey of live rhinos and rhino horns on private property in South Africa, the majority of owners expressed a desire to trade their horns if permitted. Since all rhinos are listed on CITES, any legal, international commercial trade in rhino horns (as with any other rhino product) would have to be subject to the agreement of CITES Parties. By the same token, virtually all consumer markets for rhino horns in Asia have imposed national trade bans or restrictions on rhino horn trade and use, so, in addition to CITES, national legal frameworks in any potential importing country will also need to be addressed. In any case, as with elephant ivory, one of the many pre-requisites for any consideration of trade options will almost certainly be adequate stockpile management.

KEY CONCEPTS

It is recognized that the final choice of stockpile management practices will continue to vary from country to country depending on existing practices, quantities of rhino horn being stockpiled, available resources and other factors. In addition to encouraging nations to adopt at least a set of minimum standards, a number of key concepts should apply to stockpile management everywhere:

Standardization: All generic stockpile management practices detailed in this document should be standardized throughout the different rhino reserves in each country. Thus, standardization at the national level is a prerequisite for effective and efficient stockpile management. Ideally, practices should be standardized throughout east and southern Africa.

Identification: Every horn needs to be adequately identified (e.g. species, source location, cause of recovery, etc.) at the time of acquisition, and thereafter it should be rapidly identifiable as a unique specimen from within the stockpile. This highlights the need for adequate registration, marking and measurement protocols.

Registration: Registration systems need to be fully auditable to help prevent leakage to illegal markets, whilst remaining efficient and administratively feasible under field conditions.

Compatibility: Procedures should be compatible with existing complimentary practices, at local, national and regional levels. For example, paperwork should be officially recognized at the national level, and mortality codes should match accepted SADC Rhino Management Group codes.

Efficiency: Appropriate computerized databases should be utilized to make the most efficient use of available resources and ensure key management questions are answered.

Security: Security of horn stockpiles and information should not be compromised at any level, and both proactive and reactive procedures should be in place to maximize horn recovery and overall stockpile management.

Conversion: Wildlife management agencies whose stockpile management practices do not meet the minimum standards defined in this document should aim to affect changes that result in a higher degree of compliance with the standards presented herewith.



CREDIT: R Hustler/NWPTB

COLLECTION FROM THE FIELD

On many occasions, horns are collected from rhino carcasses in the field before conducting an adequate investigation, often destroying important evidence where instances of poaching may be the cause of death. Conversely, adequate scene-of-the-incident investigative procedures increase the probability of successful investigations and prosecutions. Further, such procedures increase the likelihood of ascertaining the true cause of natural mortalities. This is an important consideration since the higher the proportion of undetermined cause of rhino mortalities, the less certainty one has regarding levels of poaching pressure and other mortality factors.

MINIMUM STANDARDS

Discovery of carcass/horn in the field: The following three procedures should always be undertaken by the field rangers who discover a rhino carcass or rhino horn in the field:

1. **Secure the scene** – an area around the carcass should be demarcated to prevent important evidence being contaminated or destroyed, such as spoor, blood, cartridge cases, etc. Securing the scene may involve cordoning off an area to prevent unauthorized access, guarding the carcass against marauding scavengers, and preserving important evidence from rain, wind, or other natural factors.
2. **Record in patrol notebook** – every patrol should maintain a patrol notebook, into which details concerning the discovery of the horn or carcass should be written. This notebook forms the first documentation of any incident, and may form part of any future investigation or audit. Descriptive information of the precise location should be recorded.
3. **Report the incident** – in addition to recording the incident in the (pocket) patrol notebook, the discovery of any rhino carcass or horn should be immediately reported to the reserve office.

Scene-of-the-incident investigation: Following the reporting of the incident, a thorough scene-of-the-incident investigation, including post-mortem, should be undertaken to try and determine the cause of death, and collect any necessary evidence in the case of a poaching incident. Every wildlife department should have *at least two* investigation officers who have received *formal scene-of-the-incident training* and every member of each wildlife department who works in the field should be familiar with the basic procedures regarding the correct actions to be taken by the first person to the crime scene.

Handing in horn: Following removal of horns from a carcass, they should be taken, at the first opportunity, to the reserve office where they are handed over to the officer-in-charge, marked and details filled in a Reserve Horn Register as part of a *formal handing over process* (see **Section 7**).



CREDIT (2): S Snelling/SANParks



OPTIMAL PRACTICES

Decentralized investigation responsibilities: In the case of wildlife departments responsible for large numbers of rhino reserves or large rhino populations, it is preferable that formal scene-of-the-incident training be undertaken in all rhino reserves. In this way, the Reserve Manager becomes responsible for any crime scene within his jurisdiction. Where resources are limited, or the number of rhino reserves fewer, a centralized, mobile unit may conduct scene-of-the-incident investigations.

Carcass detection rates: Monitoring of carcass detection rates provides a unique way to check on the performance of ranger patrols. Traditionally, ranger patrol monitoring has comprised of effort-based indicators such as the number of patrols, distance patrolled, number of patrol days, area coverage, and other factors. Whilst these remain important, performance or results-based indicators add a more useful dimension for a manager. A certain percentage of every rhino population will die from natural causes, depending on factors such as the size and age structure of the population, and levels of off-take before individuals reach natural mortality age. Further, a certain percentage of these mortalities should be detected by ranger patrols, the rate of which will depend on the area being patrolled, terrain, habitat, climate, manpower, presence of vultures, and so on. Three results-based indicators relevant to carcass detection can greatly enhance the ability to monitor patrol performance and reliability:

1. **Number of carcasses as a proportion of entire population** – where patrol coverage and patrol density is adequate, low levels of reported carcasses (or levels below expectations) may be either due to poor patrol performance (in which case rangers should be trained, motivated or moved) or due to misappropriation of horns from detected carcasses;
2. **Time since mortality** – the quicker the carcass is detected after death the higher the patrol performance, since it increases the likelihood of establishing cause of mortality and collecting evidence from poaching incidents; and,
3. **Cause of mortality** – establishing the cause of mortality reduces the number of undetermined rhino mortalities and therefore improves knowledge of poaching and other mortality factors.

Incentives: An *incentive-based bonus system* based on achieving minimum levels for the above three indicators is also advised as a means to increase motivation and ranger integrity. The same principle can be applied to the recovery of trophies from other large game such as elephants.

Dry horns: Before storage at reserve level, rhino horns should be dried (exposed to open air but away from direct sun) to remove fresh organic material. It is recommended that this drying process take place at the reserve station before transportation to head office.



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CREDIT: D Pienaar/MPB

HORN MEASURING

When recording horn measurements, both length and weight are necessary to avoid the possibility of swapping horns. Such measurements also allow calculation of the total stockpile weight, as well as the *Safari Club International* rhino horn trophy index (basal circumference + outside curve length). Length measurements are as important as the weight measurement since the latter may fluctuate with time.



CREDIT: S Hughes/Ezemvelo KZN

MINIMUM STANDARDS

Individual horns: Three measurements are considered essential for rhino horns:

1. **Weight** - measured to the nearest 0.1 kg (100 g). Weight measurements should be recorded at the reserve station, and then rechecked at head office using calibrated, *electronic* scales if possible;
2. **Basal circumference** - the circumference of the base of the horn measured to the nearest centimeter (cm); and,
3. **Outside curve length** – measured to the nearest centimeter (cm), extending from the base to the centre of the horn tip. This measurement helps to prevent/detect incidences where the base of a horn whose bottom few centimetres are the same circumference, is cut. Length measurements should be recorded using a flexible tailor's tape measure (i.e. not metal).

Mounted specimens: In the case of mounted specimens (horns attached to skull, plaque or other firm substance), the weight should not be taken, and instead only the two length measurements should be taken together with a photo.

OPTIMAL PRACTICES

Photos: Individual horn photographs, with a scale (see photograph above), can be very useful to aid identification, especially in cases where stockpiled horns are stolen. Placing the horn on a ruler which is on top of a plain coloured cloth background, and using a flash will greatly enhance the quality of the photo. Where possible, digital photos should be taken and linked to computerised horn register databases.

Additional measurements: In addition to the above three measurements, the *inside curve length* (to nearest cm) may also be taken. Wildlife departments may also choose to take measurements to a higher level of accuracy, for example weight measurements to the nearest gram (g) and length measurements to the nearest 0.1 cm (1 mm).

HORN MARKING

Marking horns is important to help identify them from within a stockpile or during an investigation of a horn seizure. Marking combines a unique numbering system with proven marking technique(s). A total of *eight different marking techniques* have been documented in east and southern Africa, including six *visible* techniques (tags/discs, permanent marker pens, engraving, paint, digit punches and labels) and two *hidden* marking techniques (transponders and ultraviolet markers). No single marking system is foolproof, and all have their own advantages and disadvantages (see table below).



CREDIT (2): S Hughes/Ezemvelo KZN

MARKING METHOD	ADVANTAGES	DISADVANTAGE
Visible marking techniques for rapid identification		
Engraver	Markings applied directly on horn, quick to apply.	Some horns difficult to mark using this method. Can become difficult to read. Difficult to use on small pieces.
Tags attached with rivets	Very durable and can be fitted to most horns. Aluminium preferred to Perspex as it is cheaper, relatively easy to make at reserve level, rust-resistant yet durable.	Rivets cannot be used on poor quality horn.
Tags attached with wire, cord or cable ties		Require drilling to become a permanent fixture – expensive and causes complications with storage of shavings. Wire may rust, or loosen (especially plastic-coated wire). String or cord can rot over time.
Tags attached with epoxy glue		Glued tags more likely to be dislodged than other fixture methods
Marker pen	Cheap, quick to apply. Markings applied directly on horn.	Can be easily rubbed off or become faint over time. Difficult to write on small pieces.
Digit punches	Markings applied directly on horn.	Does not work on rough horns, small pieces and can fade with time.
Labels	Cheap, quick to apply.	Weak, likely to become detached.
Hidden marking techniques for added security		
Transponders	Small, unobtrusive and easy to implant. May be implanted in both live rhinos (both horns and shoulder/neck) and the horns alone. The unique identification of each transponder facilitates compatibility with computerized databases.	Readers are relatively expensive. Some problems with readers of different makes of transponder being incompatible. Requires good national co-ordination of transponder numbers.
Ultraviolet fluid	Totally invisible to the naked eye. New technology not well known to smugglers.	Little practical experimentation to date. Cannot identify specific horns, only batches.

MINIMUM STANDARDS

Timing: Horns should be marked the moment that they are handed in to a reserve station, since the quicker the marking is done, the less likely horns may get mixed up or details forgotten. This should be part of the handing over process and therefore done in the presence of both individuals handing over and receiving the horn. At this point, a *unique serial number* should be allocated to the horn.

Numbering System: Every horn should be marked with the following numbering system, which allows rapid distinction between different reserves and years of recovery:

Area Code – Year of Recovery – Serial Number – Weight (kg)

For example, 'NPA2003/015/4.6' would represent the fifteenth horn collected from 'National Park A' in 2003, weighing 4.6 kg. This is similar to the current CITES marking system for elephant ivory.

Whilst large stockpiles already exist with more refined numbering systems (e.g. Area Code and Serial Number only), the above-recommended system is recommended for all horns collected in future.

Marking Techniques: All horns should be marked with *both a clearly visible marking technique for rapid identification* (preferably using either an engraver, or fixing aluminium tags/discs near the base with a rivet gun) *and a hidden marking technique for added security* (passive microchips/transponder). Transponders greatly enhance security operations, providing evidence of linkages to live rhinos and/or stockpiles in case of poaching incidents, seizures or thefts. Transponders are best implanted in existing holes or cracks, or alternatively inserted in a finely drilled hole in the base of the horn and bound with acrylic glue. The use of transponders should *not* preclude the use of visible marking such as tags. The latter remain important for rapid identification as well as a back up in case of failure of the transponder, although this has not yet been recorded as happening.

OPTIMAL PRACTICES

National Numbering System: At the national level, a National Horn Serial Number should be allocated in the same way prescribed by CITES for marking elephant ivory, using the following formula: country of origin two-letter ISO code / the last two digits of the year / the serial number for the year in question / and the weight in kilograms. For example, 'ZM03/002/4.6' would represent the second horn collected from Zambia in 2003, weighing 4.6 kg.

Visible Marking Technique: As mentioned above, to ensure rapid identification, the two best options for clearly marking horns are either to use an electric engraver, or attach an aluminium tag/disc near the base of each horn on a relatively flat section using a rivet gun. If for some reason tags or an engraver cannot be attached at the reserve level, then a permanent marker pen should be used to mark the same details at reserve level, and a tag or engraver subsequently used at head office. The use of marker pens alone as the sole visible, marking technique is not encouraged since it is difficult to write on weathered or small pieces, and pen may be easily rubbed off. Other marking methods are not encouraged due to the reasons given in the table above.

Hidden Marking Technique: Every country using transponders should have a focal person responsible for co-ordination and liaisons concerning transponder information. Ultimately, co-ordination and distribution of transponders used throughout the region by one trusted institution/individual would allow easy tracking of the overall usage of transponders within each country in the region, and help to co-ordinate law enforcement queries. Two types of transponder are currently being used in the region – *Trovan* and *Destron* – but unfortunately there is not 100% compatibility between the readers for these two systems. In the event that a universal reader is produced, these should be promoted in all wildlife departments. *Trovan* is recommended by The World Conservation Union/Species Survival Commission's African Rhino Specialist Group (IUCN/SSC AfRSG) in an attempt to reach some form of future uniformity in brand selection.

Marking Live Rhinos: Routine implanting of three transponders during every live rhino immobilization (one in each horn and one in shoulder/neck) is strongly encouraged.



CREDIT: R Hustler/NWPTB

OPTIONAL

Numbering System: Wildlife departments may also choose to record additional information on rhino horns, including a length measurement (since weight measurements frequently change over time), a source code (e.g. C = confiscation, M = mortality), and/or a provincial code (in South Africa).

Ultraviolet markers: Whilst not in routine use for marking rhino horns, ultraviolet markers could prove useful in marking specific *batches* of rhino horn. It is not suitable for individually marking horns. Application does not require any modification to the horn, unlike almost all other marking techniques, since the ultraviolet liquid is only visible under ultraviolet light. Examples of potential application include marking all horns from a specific location, or perhaps all horns from 'illegal' sources. Another useful application would be to apply the marker to private stocks as they are registered – even if other markers are removed, the chances of removing an ultraviolet marker (especially if its usage is kept secret) is very slim. Ultraviolet markers can also be useful during internal investigations and counter-intelligence, for example checking the efficiency of horn recovery and centralization by tracking the movement of planted, marked horns from field to stockpile.

REGISTRATION

Registration of all horns is perhaps the most important part of stockpile management, to ensure that all related information is accurately recorded and, more importantly, to help minimize the likelihood of horns not reaching the final strong room destination. In this way, the importance of two key aspects of registration cannot be understated: an *auditable paper trail* and the use of *comprehensive registers*.

AUDITABLE PAPER TRAIL

In practice, there are several different ways to ensure that an auditable paper trail is maintained. In many instances, a combination of issue vouchers and different registers are used. For example, the person handing in a horn to the reserve office is issued an Issue Voucher detailing the transaction, and more detailed information is completed in a Reserve Horn Register. At the time horns are moved to head office, another Issue Voucher is completed which accompanies the horns. Upon receipt at head office, the Issue Voucher may be signed and a copy returned to the reserve as confirmation of receipt, and again relevant details are entered into a Head Office Horn Register. This type of model involves considerable paperwork, although it reduces the likelihood of falsification. Further, it lends itself to loss of important information between the Reserve Horn Register and Head Office Horn Register since limited details are included on the Issue Voucher.

At the other extreme, perhaps the simplest model involves the use of a Reserve Horn Register in triplicate to act as the main document detailing not only descriptive horn information but also space for all those handling the horn to sign. The register therefore reduces the need for some separate Issue Vouchers for some transactions, and ensures that reserve-level information reaches head office. The Reserve Horn Register is completed upon receipt of a horn (with both the person handing in the horn and receiver signing), and two copies later accompany the horn at the time of transport to head office. There is space for the transporting officer to sign, as well as the receiver at head office. Upon final receipt of horns at head office, the two copies are again signed, one of which is retained with the horns at head office and the other is returned to the reserve. The hard copy retained at head office can be used to computerize a Head Office Horn Register.

Some wildlife departments use other documents to form part of the auditable paper trail, for example Rhino Mortality Reports and Incident Reports.



CREDIT: S Milledge/TRAFFIC East/Southern Africa

MINIMUM STANDARDS

As described above, there are several ways to ensure an auditable paper trail, and the following minimum standards should apply to all registration systems. For wildlife departments planning to implement a revised registration system, two examples of recommended formats for a Reserve Horn Register are given at the end of this document (see **Annexes**).

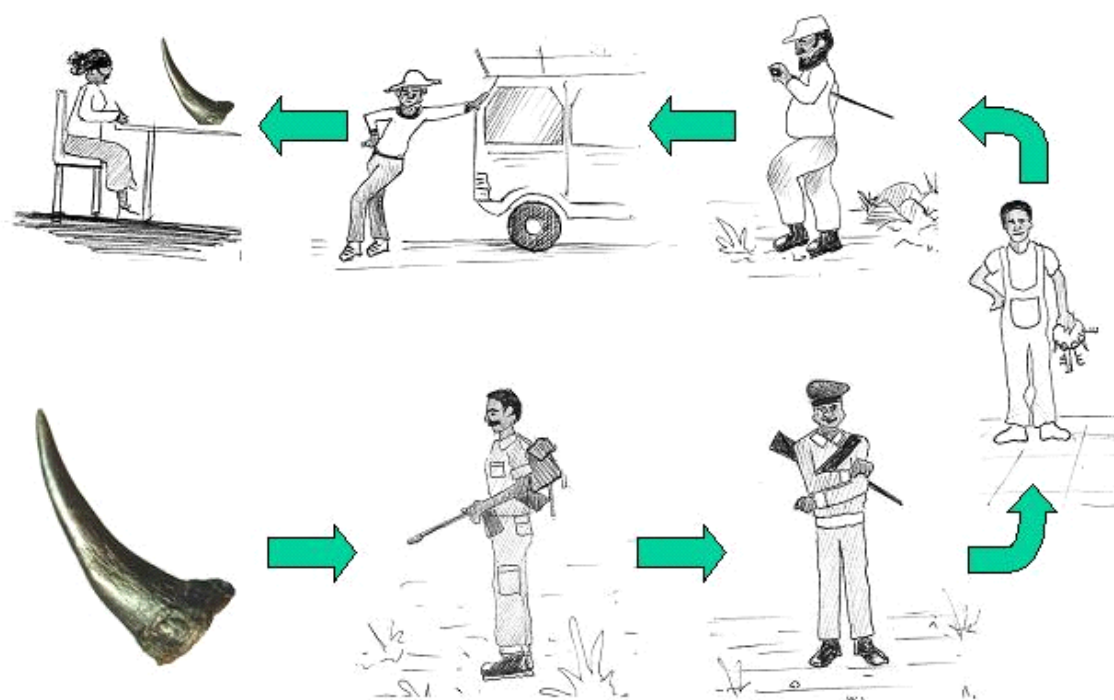
Documenting movements of horn: To ensure an auditable trail, documentation should be available for *every movement* of rhino horn, including:

- From the field to reserve strong rooms;
- From reserve strong rooms to a central strong room;
- From a strong room to a secret vault or bank storage;
- From a law enforcement agency to a strong room;
- From a strong room to a law enforcement agency/court case;
- From private individuals to a strong room; and,
- From a strong room to museums, scientists, etc. Documentation should also be available for *every visitation* to the stockpile.

Documenting signatures: Documentation should include the *date*, *names* and *signatures* of at least two people (normally persons handing in and receiving horn), and *details* of the transaction. There should be *clear reference to the unique horn serial numbers*.

Official documentation: Documentation should be *officially recognized* and acceptable to auditors.

Filing: A dedicated file should be kept at each reserve for copies of all relevant documentation.



Auditable paper trail: Arrows represent the need for a paper trail every time a rhino horn is handed between different individuals.

COMPREHENSIVE REGISTERS

Registers are used to store important information for each horn, and contribute towards audits. When computerized, register databases can form powerful tools to assist management (see **Section 11**).

MINIMUM STANDARDS

Horn registers – basic principles: For horns originating from government reserves, two ‘levels’ of register should be maintained, one at reserve level and another at head office / main strong room level. These registers should conform to the following guidelines:

1. They should be an *officially recognized format*, preferably A3 size, and *bound* instead of loose sheets;
2. Each page should be *numbered sequentially*;
3. *No photocopies* should be allowed;
4. Each entry should be *uniquely numbered* (entry number);
5. Registers should be *securely stored separately* from the actual horns;
6. They should be completed at the *same time* that the horn is handed in;
7. They should always be completed in the presence of *two people* – initially, the person handing in the horn and the person receiving the horn; and subsequently the receiving officer and the person transporting the horn;
8. All entries should be completed in *ink* and in *capitals*;
9. *Blank boxes* should be marked with a dash (-); and,
10. Any *corrections* should be dated and signed. Correctional fluid should not be used.

Reserve Horn Register: Each reserve should operate its own reserve horn register, which should contain *detailed information for each horn*, according to the following recommendations:

1. Each horn should be allocated a *unique serial number*;
2. The following details should be recorded (recommended format at the end of this document);

RECEIPT DETAILS	DESCRIPTIVE INFORMATION	TRANSPORT DETAILS
Register entry number Date horn recovered Location horn recovered (include GPS if used) Name of collector Issue Voucher / Case Docket number Name and signature of person handing over horn Date of receipt/registration at reserve office Name and signature of receiver	Horn description (whole horn/tip, etc.) Horn position (front/back/unknown) Species (black/white/unknown) Identity of rhino individual (if known) Cause of recovery / mortality Weight (to nearest 0.1 kg) Outside curve length (nearest 1 cm) Basal circumference (nearest 1 cm) Reserve Station Horn Serial Number (= Tag Number)	Date moved/transported Destination Issue Voucher number Name and signature of transporter Name and signature of officer-in-charge

3. The *name of the reserve* should be clearly marked on each page;
4. There should be *at least two duplicate copies* in addition to each original page;
5. Each entry should preferably refer to *individual rhino*, not horn, to help ensure details are entered for both horns collected (since this is the normal scenario);
6. It is very important to distinguish between horns collected from *different causes*, e.g. natural mortalities, management, or confiscations;
7. It may be necessary to include more entries for *signatures* and Issue Voucher numbers if more people handle the horn. For example, with larger reserves employing multiple ranger sections;
8. If *transponders* are inserted at reserve level, then an additional space to record the transponder number should be included; and,
9. At the time of transporting horns to head office, any remaining *blank entries* should be cancelled out

with two diagonal lines, running from the last entry to the bottom of the page. The details of the removal are entered accordingly in the presence of two people.

Head Office Horn Register: The Head Office Horn Register should contain summary information for each horn, clear reference to the associated reserve register entry, and additional information such as transponder number and storage details. The following details should be recorded:

RECEIPT DETAILS	DESCRIPTIVE INFORMATION	REMOVAL DETAILS
Date of receipt/ registration at head office Register page and entry numbers Issue Voucher / Case Docket number Name and signature of person handing over horn Name and signature of receiver	Reserve Station Serial Number (= Tag No.) Weight (to nearest 0.1 kg) Status of horn (legal/illegal) Transponder number Storage location details (shelf no., etc.) Other information	Date moved/transported Destination Issue Voucher number Name and signature of two officers

Computerization: For stockpiles exceeding a total of 50 horns, and/or stockpiles increasing by at least ten horns annually, information taken from these registers should be computerized (see **Section 11**).

Filing: A dedicated file should be kept at each reserve for hard copies of all incoming documentation pertaining to rhino horns.

Feedback: A record of what has been entered into the Head Office Horn Register should always be returned to the reserve level as confirmation that horns have been received in order.

Key control / visitations register: A register for recording *all* persons entering and viewing the stockpile should be maintained for additional security purposes at each reserve and head office. This should include the date, time, identity, signature and purpose of the visit and should apply to everyone including officers in charge of the stockpile security and records, auditors, scientists and law enforcement officers.



CREDIT: S Milledge/TRAFFIC East/Southern Africa

OPTIMAL PRACTICES

Reserve Horn Register: Ideally, the Reserve Horn Register should also include space for entering *GPS coordinates* and *skull details*.

Head Office Horn Register: Ideally, the Head Office Horn Register should also include the following information:

- National Horn Serial Number*; and,
- Treatment* information.

Additional, optional information for the Head Office Horn Register includes:

- Photograph* reference number;
- Inside curve length* (nearest 1 cm);
- Quality* of horn; and,
- If a horn-fingerprinting sample has been given to IUCN/SSC AfRSG. It is also preferable if *two* people at head office receive and check all horns.

Horn Confiscations Register: It is acceptable to record seizures in the Reserve Horn Register and/or Head Office Horn Register, as long as they are *clearly distinguishable* from horns from natural or management origins. Alternatively, a *dedicated register* can be maintained at each reserve and head office for recording information pertaining to horn seizures. The following details should be recorded:

RECEIPT DETAILS	DESCRIPTIVE INFORMATION	REMOVAL DETAILS
Case docket reference number Date of receipt/ registration at head office Issue Voucher number Name, signature and institution of person handing over horn Name and signature of receiver Name and signature of witness	Horn description (whole horn/tip, etc.) Horn position (front/back/unknown) Species (black/white/unknown) Identity of rhino individual (if known) Cause of recovery / mortality Weight (to nearest 0.1 kg) Outside curve length (nearest 1 cm) Basal circumference (nearest 1 cm) Horn Serial Number (= Tag No.) Transponder number Storage location details (shelf no., etc.) Court outcome Other information	Date moved/transported Destination Issue Voucher number Name and signature of two officers

Horn Movements Register: A register for all movements of horns from each stockpile should be recorded, for example, when universities or museums borrow horns for research or display purposes, or when horns are used as evidence in ongoing court cases. The following details should be recorded:

REMOVAL DETAILS	DESCRIPTIVE INFORMATION	RETURN DETAILS
Date removed Destination Purpose Reference to supporting request documentation Issue Voucher Number Name and signature of person handing over horn Name, signature and institution of person receiving horn	Tag Number Weight (0.1 kg) Outside curve length (1 cm) Basal circumference (1 cm) Storage location details (shelf no., etc.)	Date received/returned Issue Voucher number Name and signature of person handing over horn Name, signature and institution of person receiving horn

CENTRALISATION

Storing large quantities of rhino horns at reserve level increases the risk of theft, hence the need for a policy of centralization. Countries commonly have two or three different points of centralization: (i) reserve/station level, the first point of handing over from a field patrol; (ii) reserve/provincial level (in some countries only); and, (iii) a central vault, normally near head office. Ensuring an auditable paper trail helps to ensure centralization occurs in a timely manner, with the burden of responsibility borne by the last person to sign off.

MINIMUM STANDARDS

National stockpile centralization: Main stockpiles should be maintained at the *national level* wherever possible. If there is a need to maintain stockpiles within smaller administrative units (e.g. South African provinces), then this may be justified only if:

1. *Significant volumes* of horns have been accumulated to date, and/or are likely to be accumulated in the future; and,
2. Stockpile management *meets national standards*.

OPTIMAL PRACTICES

Risk analysis: Risk analysis should be undertaken on a reserve-by-reserve basis to determine:

1. Maximum time for keeping horns at reserve stations based on logistics and accumulation levels. For example, no longer than three months.
2. Maximum number of horns to be maintained at reserve stations, based on accumulation and security levels. For example, no more than 20 horns.

Secret storage: If space allows, it is also preferable to move horns from the central strong room to a secret vault / strong room, once they have built up to a certain amount.



CREDIT: D Pienaar/MPB

STORAGE AND SECURITY

Adequate storage facilities and security measures are required to prevent theft, decline in quality, and prevent access by unauthorized people.

MINIMUM STANDARDS

Elevated storage: Horns should be stored *off the floor or ground*, to prevent contact with rising dampness and infestation by termites and other insects.

Shelves: Horns should be stored on shelves in an organized, open display, for example in matrices of six by ten horns, to enable rapid detection of missing horns.

Reserve safe security: Horns should be stored, at minimum, within an immovable and approved safe.

Head office safe security: Horns should be stored in a reinforced and approved safe, equipped with an alarm system if possible.

Key control / visitations register: As mentioned earlier, a register/log book for recording all persons entering and viewing the stockpile should be maintained for each safe.



CREDIT: S Hughes/Ezemvelo KZN

OPTIMAL PRACTICES

Dry horns: As mentioned earlier, rhino horns should be fully dried to remove fresh organic material before transportation to head office and final storage.

Environmental control: The ideal storage conditions for rhino horns are *cool temperatures* and *low humidity*. Some form of ventilation is preferable, without compromising security.

Boxes: Rhino horns are best kept in *unlocked, strong plastic boxes* or trunks on the shelves, each individually labeled, as this increases resistance to termites; reduces the risk of transmitting insect horn-borers; facilitates transport and storage due to their ease of packing; and helps ensure that if a tag/disc becomes detached from a horn, it does not become lost amongst hundreds of horns. Locked metal boxes are not advised unless the trunks are being transported.

Head office security: The following table summarizes recommended security precautions to prevent unauthorized access:

SECURITY PRECAUTIONS	PREFERRED OPTIONS
Location	Underground. If above ground, no walls common with building exterior Within confines of secure government building or compound
Structure and locks	Reinforced walls, roof and reinforced (metal) door Two separate locks, each key with different person
Access	Single entry/exit point Access restricted to two people present together plus one armed guard
Secrecy	Main vault well hidden Location of any secret vaults kept classified to less than six personnel
Security presence	24-hour presence of armed security personnel Security cameras and movement-activated cameras/lights

Random checks: Random checks should ideally be conducted at least once every two months. These checks should include a check on the level of insect infestation.

Separation of horns: It is recommended that rhino horns be **separated** as follows:

1. Legal from illegal stock;
2. Government from privately-owned stock;
3. Retain Unknowns separately; and,
4. If significant quantities of horn exist, it is advantageous to separate horns from different species of rhino and perhaps also separate by source area.

Horn and ivory: If space allows, it is recommended that rhino horns be separated from elephant ivory since ideal storage conditions are different for the two products.

Pairing horns: In the same way that both horns from the same individual rhino are allocated consecutive serial numbers and grouped together in horn registers, it is also desirable to be able to rapidly locate both horns in the stockpile. It is recommended that horns from the same rhino are *stored adjacent* to one another on the shelves, perhaps attached together with a piece of galvanized wire passed through small drilled holes near the base of the horns.

Reducing insect damage: It is recommended that all severely infected horns are *physically separated* and destroyed on an annual basis since they serve no purpose, and pose a risk to better quality horns. If a wildlife department chooses to *treat* rhino horns, the use of mothballs or *carbodust* is recommended.

AUDITS AND RECONCILIATION

MINIMUM STANDARDS

Annual audits: It is recommended that rhino horns are included in annual audits. At a minimum, audits should cover the following three processes. Initially, a physical check should be conducted to compare randomly selected individual horns in the stockpile with corresponding entries in the accompanying register (random checks should also be conducted the other way, from register to stockpile). Secondly, the physical presence of horns in the stockpile, together with supporting documentation, should be verified for all horns received during a randomly selected period of time. Thirdly, the audit should verify all original documentation sent from a selection of reserves during a randomly selected period of time, together with confirming the physical presence of the horns in the stockpile.

Departmental reconciliation: In addition to regular audits, it is equally important that departmental checks are made to ensure that the *received physical stock actually matches independent records* of rhino mortalities, seizures, dehorning operations and other potential sources of horn. In this way, it is recommended that a *reconciliation exercise* be conducted at least once per annum to ensure that existing stock represents (1) all *potential stock*; and, (2) *expected levels*.

A sample template for a reconciliation process is shown below. Information presented in Tables A and B should balance.

A) Summary of Horns Received and Recorded in Stockpile Register

Information taken from main stockpile register.

CAUSE OF HORN RECOVERY	2000	2001	2002	2003
'Legal' origins (natural mortalities, etc.)				
'Illegal' origins (seizures and poached animals)				
Unknown origins				
Total				

B) Summary of Actual Incident Record of Horns Recovered from Different Sources

Information taken from annual summary records from different reserves or agencies.

CAUSE OF HORN RECOVERY	2000	2001	2002	2003
Reserve A – recovered horn from natural mortalities				
Reserve B – recovered horn from natural mortalities				
Reserve C – recovered horn from natural mortalities				
Game Capture Unit, e.g. accidental knock off during translocation				
Veterinary Unit, e.g. accidental mortality during immobilizations				
<i>Subtotal from 'legal' causes</i>				
Reserve A – recovered horn from poached rhinos				
Reserve B – recovered horn from poached rhinos				
Reserve C – recovered horn from natural mortalities / poached rhino's				
Investigations Unit - horn seizures				
<i>Subtotal from 'illegal' causes</i>				
Unknown origins				
Total				

COMPUTERISATION

Paper-based recording systems are unwieldy and less effective, especially for stockpiles accumulating on a regular basis. For example, they may be fine as a basic data storage function for information on received horns, but are not able to detect changes in the accumulation rates of different sources and types of horn.

MINIMUM STANDARDS

Databases: An electronic database should be implemented for all rhino horn stockpiles greater than 50 horns in size and/or growing at a rate of more than ten horns annually.

OPTIMAL PRACTICES

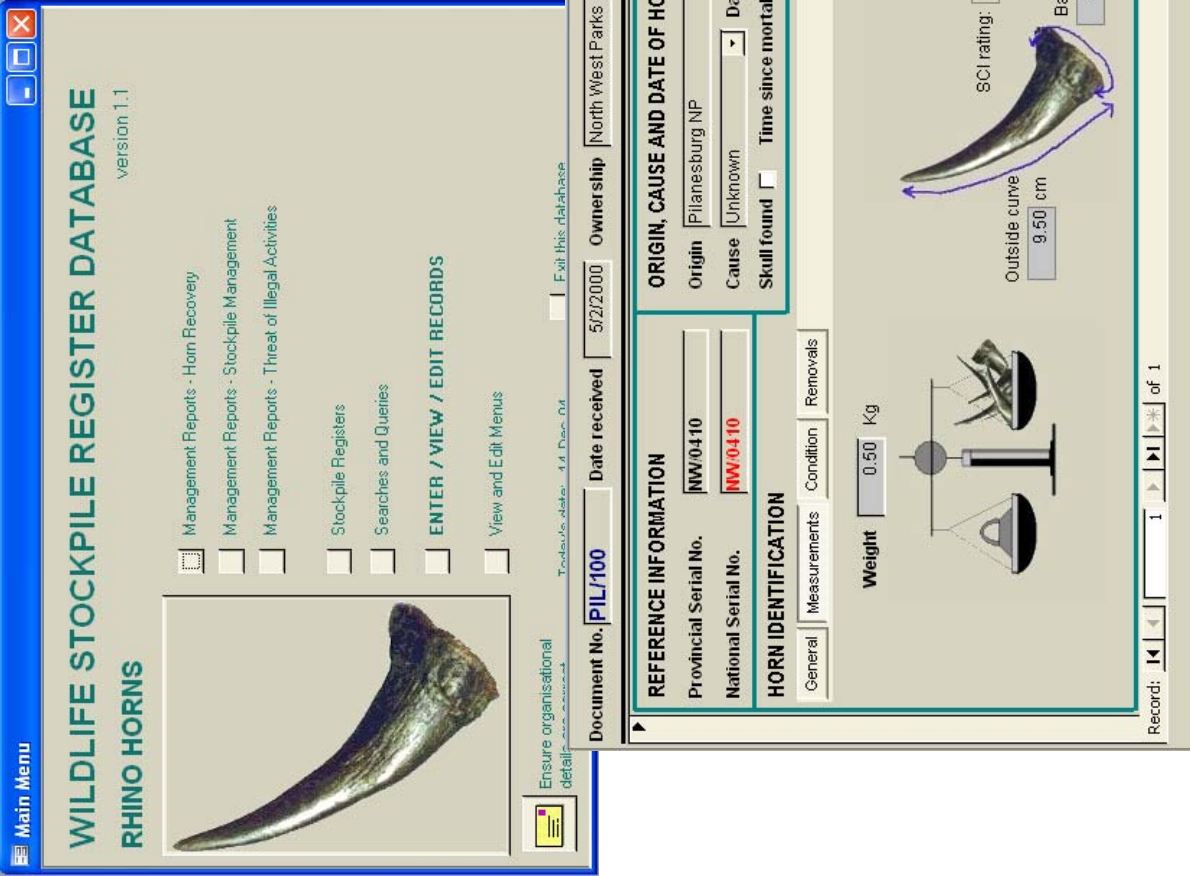
Wildlife Stockpile Register Database: In order to increase standardization throughout rhino range States, and ensure that use of the information entered is truly maximized, wildlife departments are encouraged to use the freely available version of the Wildlife Stockpile Register Database (WSRD), developed by TRAFFIC. A special version of WSRD (see **Figure 1**) has been adapted for rhino horn stockpiles, which is a fully functional, interactive management-level database. It is simple to use and does not require more staff, time or money. It has been developed following careful review of existing databases in use throughout east and southern Africa, and maximizes the use of information normally already collected by wildlife departments to perform the following functions:

1. Ensures basic minimum registration requirements are met;
2. Secure storage of data and production of lists and summaries;
3. Assists with audit processes;
4. Responds to specific queries;
5. Outputs compatible with GIS software; and,
6. Answers key management questions, providing useful indicators.

A copy of the database may be obtained from TRAFFIC East/Southern Africa by contacting one of the offices listed at the end of this document.



CREDIT: C Patterson/TRAFFIC East/Southern Africa



Report of entire existing rhino horn stockpile, sorted by cause of horn recovery

Cause of horn recovery	Date received	Document No.	Register Item No.	Station Serial No.	Recovery date	Source location	Species	Horn position	Weight (kg)	National Serial No.
Confederation										
Detal:										
2/2/2004	POTC-B01	NW0580C	84/194	84/194	Pach Room	Unknown	Whole horn	Unknown	1.00	NW0580C
2/2/1996	CS660804	84/194	84/194	84/194	REDEG	Unknown	Whole horn	Unknown	2.30	EO0024C
2/2/1996	CS660804	84/194	84/194	84/194	REDEG	Unknown	Whole horn	Unknown	0.30	EO0024C
11/2/1993	NIL	84/194	84/194	84/194	Taberna	Unknown	Whole horn	Unknown	0.25	EO0013C
8/6/1993	CS346063	84/194	84/194	84/194	Megwes	Unknown	Whole horn	Unknown	2.30	EO0008C
8/6/1993	SAP CASE	84/194	84/194	84/194	Megwes	Unknown	Whole horn	Unknown	2.00	EO0008C
7/2/1992	SAP	84/194	84/194	84/194	Unknown	Unknown	Whole horn	Unknown	1.30	EO0003C
6/2/1992	CS11662	84/194	84/194	84/194	Megwes	Unknown	Whole horn	Unknown	3.00	EO0000C
6/2/1992	CS11662	84/194	84/194	84/194	Megwes	Unknown	Whole horn	Unknown	1.44	EO0000C
3/2/1992	CS356662	84/194	84/194	84/194	Megwes	Unknown	Whole horn	Unknown	1.00	EO0001C
3/2/1992	CS356662	84/194	84/194	84/194	Megwes	Unknown	Whole horn	Unknown	6.30	EO0001C
2/2/1992	CS46262	84/194	84/194	84/194	Baselara GR	Black	Whole horn	Unknown	2.00	EO0005C
Summary: 12 with weighing 24.19 Kg										
Cut off										
Detal:										
2/2/2004	PILAS7	NW0516C	124/001	124/001	Pilanesburg NP	Unknown	Whole horn	Unknown	0.20	NW0516C

Status of received horns by year.

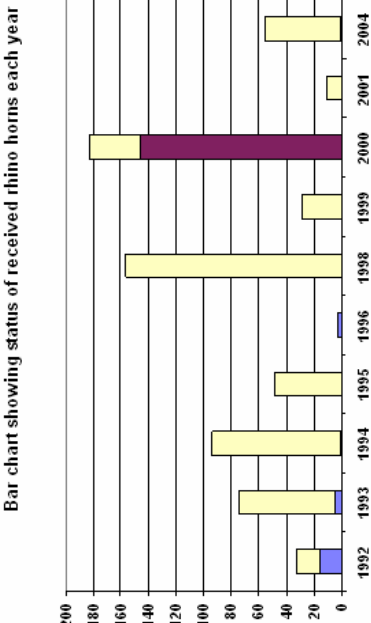


Figure 1 Examples of data entry pages and reports from the Wildlife Stockpile Register Database

PRIVATE SECTOR HORN OWNERSHIP

Full compliance within the private sector to rhino horn registration requirements is one of the greatest remaining challenges to effective horn stockpile management in east and southern Africa. Compliance problems are apparent from both government and private sectors, particularly in South Africa, where over three hundred private rhino owners resided in 2003, as discrepancies in registered horn data and independent study data have been found. Further, expected horn stockpile quantities do not always match officially registered volumes.



CREDIT: R Hustler/NWPTB

MINIMUM STANDARDS

Legislative provisions: In any country that permits private ownership of rhino horns, *national legislative provisions* should be enacted to allow legal ownership. Private horn ownership should *not* be voluntary. Legal ownership may be in the form of a *permit* system and/or a *registration* system. Minimum standards and optimal practices described in earlier sections (i.e. Collection from the Field, Measuring, Marking, Registration, Storage and Security) also refer to private sector horn stocks, helping to ensure accurate information is correctly recorded for every individual horn. The following conditions should apply to private horn ownership:

1. **Responsibility:** The burden to register horns and demonstrate legal acquisition should lie with the prospective owner;
2. **Location and identity:** Permits should be valid for a particular *person* and *place*, *not* per horn, to ensure that records for each person and place are kept up to date;
3. **Renewal:** Permits must be renewed when moving location, with the burden on the owner to re-register;
4. **Validity period:** Permits should have a validity period (e.g. two or three years) to ensure renewal and updating of records takes place;
5. **Visible marking:** All horns should be marked in a clearly visible way;
6. **Transponders:** All horns should be fitted with transponders; and,
7. **Registration fee:** Wildlife departments should impose an initial registration fee to help offset the considerable costs of horn stockpile management.

OPTIMAL PRACTICES

Private associations: The formation of formal associations with significant membership should be encouraged and facilitated by all stakeholders, to improve co-ordination amongst the private sector as well as enhance liaisons with the government.

Reconciling private horn stocks: The following table is recommended as a starting point to help keep track of *expected* quantities of rhino horn held in the private sector, by comparing information on formally registered horns with other records regarding the rhino populations.

Owner/location:				Year rhinos established:					
	2004			2005			2006		
	Black	White	Unk	Black	White	Unk	Black	White	Unk
Registered Horns									
Natural mortalities									
Dehorning exercises									
Knock-offs or found in veld									
Trophy sport hunting									
Pre-Convention items									
Donated or purchased									
Other									
Unknown									
Total Horn Additions									
Donated or sold									
Stolen									
Exported trophy									
Total Horn Removals									
Grand Total Registered Horns									
Live rhinos									
Reported total rhino population									
Reported natural mortalities									
Reported sport hunting									
Reported sales									
Reported movements									
Reported purchases									
Other									

LEGISLATION AND POLICIES

A critical element to the success of all management practices is *sustainability*. At the highest level, this includes comprehensive policies, procedures and legislative provisions that cover the main aspects of horn stockpile management mentioned throughout this document. Another key element to sustainability is the existence of clear, formal procedures that help to forge the co-ordination necessary between conservation departments, law enforcement bodies, private sector and others.

MINIMUM STANDARDS

Any country that permits private ownership of rhino horns should enact *national legislative provisions* to allow legal ownership.

Every rhino range State should have a *policy* and/or *internal directives* covering rhino horn management (perhaps in conjunction with elephant ivory stockpile management). These should include a background, definitions, legal implications, minimum standards for the different aspects of stockpile management, clear roles and responsibilities, and the procedure to follow from the time a horn is found to final storage in a central strong room. Clearly defined procedures should be given for horn originating from: (i) State-owned land; (ii) Confiscations; (iii) Privately-owned rhinos; and, (iv) Professional sport hunters.

For example, in the case of horn collected from State land, one recommended protocol is as follows:

In field:

1. Rhino carcass detected, details entered into patrol book, and incident reported to reserve office;
2. Scene-of-the-incident secured;
3. Scene-of-the-incident investigation undertaken, including post mortem; and,
4. Horns removed and taken to reserve office (or head office).

At reserve office:

5. Following debriefing, formal handing over of horns to store manager, including allocation of horn serial number, marking of horns, completion of register and signing of document by both field patrol officer and reserve station officer-in-charge;
6. Issue Voucher given to field patrol officer to confirm receipt, and copy kept on file at reserve station;
7. Horns kept in fresh air in secure location to dry; and,
8. When horn is taken to head office, relevant document issued to transporting officer detailing horns (e.g. Issue Voucher, duplicate Reserve Horn Register, mortality report).

At head office:

9. At head office, horns verified against accompanying documentation (e.g. Issue Voucher, duplicate Reserve Horn Register, mortality report), horns re-weighed, and head office register completed in presence of both people;
10. Feedback provided to reserve station by completing and returning relevant documentation (e.g. Issue Voucher, duplicate Reserve Horn Register, mortality report);
11. Transponder inserted at headquarters (if not already at reserve level);
12. National Horn Serial Number allocated if applicable;
13. Head Office Horn Register completed; and,
14. Horns taken to permanent storage location.

Entry No.	Horn(s) Recovery Details			Details on receipt at reserve level				Descriptive information								
	Date	Locality	Name of person/section	Handed in by	I/V no.	Date	Received by	Species	Rhino identity	Cause of recovery	Horn description	Weight (0.1kg)	Outside length (1cm)	Basal circum (1cm)	Station Serial No.	
1	21/03/03	River A, National Park A	Cpl Maro, Faru section	Sgt Maimu (+signature)	12652	28/3/03	Warden Kip (+signature)	Black	25 Susi (ad f)	Died from fighting	Front	Whole	4.6	38	50	NPA001/2003
											Back	Whole	2.4	18	35	NPA002/2003
											Unk.	-	-	-	-	
2	24/04/03	Bomas, National Park A	Paul Hone, Game Capture Unit	Dr. Dawa (+signature)	23872	24/04/03	Warden Kip (+signature)	White	13 Rolf (ad m)	Removed tip during immobilisation	Front	Tip	0.2	6	22	NPA003/2003
											Back	-	-	-	-	
											Unk.	-	-	-	-	
3											Front					
											Back					
											Unk.					
4											Front					
											Back					
											Unk.					
5											Front					
											Back					
											Unk.					
6											Front					
											Back					
											Unk.					
7											Front					
											Back					
											Unk.					
8											Front					
											Back					
											Unk.					
9											Front					
											Back					
											Unk.					

To be completed upon removal / transportation:

Total number of horns:	Date dispatched:	Date received at head office:
I/V No.:	Discharged by (officer-in-charge):	Received by (at destination):
Destination:	Transported by:	Witnessed by:

ANNEX B Example format #2 for an auditable paper trail

RECEIPT FOR THE HANDING OVER OF RHINO HORN		
COLLECTION AND INITIAL HAND OVER DETAILS		DEPT. CONTROL NO: PARK REF NO:
RESERVE:	SECTION:	LOCATION:
DATE FOUND:	BY WHOM:	ID NO:
RHINO: B / W	SEX: M / F / U	PICK UP: <i>(Details)</i>
FRONT HORN OUTSIDE LENGTH: cm CIRC. AT BASE: cm	REAR HORN OUTSIDE LENGTH: cm CIRC. AT BASE: cm	OFF CUT: <i>(Details)</i>
CAUSE OF DEATH: <i>(Details)</i> AGE OF CARCASS: DAYS/WEEKS/MONTHS		
DATE HANDED OVER:	HANDED TO:	SIGNATURE:
	WITNESS:	SIGNATURE:

completed by person finding horn (portion to be attached to patrol report)

REGISTER DETAILS		DEPT. CONTROL NO: PARK REF NO:
FRONT HORN OUTSIDE LENGTH: cm CIRC. AT BASE: cm WEIGHT: kg	REAR HORN OUTSIDE LENGTH: cm CIRC. AT BASE: cm WEIGHT: kg	
DATE ENTERED:	BY WHOM:	SIGNATURE:
DATE PLACED IN SAFE:	WITNESS:	SIGNATURE:

completed by initial receiver of horn (portion to be included in reserve register)

FINAL HAND OVER		DEPT. CONTROL NO: PARK REF NO:
FRONT HORN OUTSIDE LENGTH: cm CIRC. AT BASE: cm WEIGHT: kg	REAR HORN OUTSIDE LENGTH: cm CIRC. AT BASE: cm WEIGHT: kg	
DATE HANDED OVER:	BY WHOM:	SIGNATURE:
	WITNESS:	SIGNATURE:

completed by final recipient of horn at headquarters (portion to be filed separately)

HEADQUARTER REGISTER DETAILS		DEPT. CONTROL NO: PARK REF NO:
FRONT HORN OUTSIDE LENGTH: cm CIRC. AT BASE: cm WEIGHT: kg	REAR HORN OUTSIDE LENGTH: cm CIRC. AT BASE: cm WEIGHT: kg	
DATE ENTERED:	BY WHOM:	SIGNATURE:
HQ REF. NO:	MICROCHIP NO:	

TRAFFIC, the wildlife trade monitoring network, works to ensure that trade in wild plant and animals is not a threat to the conservation of nature. It has offices covering most parts of the world and works in close co-operation with the Secretariat of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

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