Rhino Tracking with the CyberTracker Field Computer

Louis Liebenberg[1], Lindsay Steventon[2], Karel Benadie3 and James Minye[3]

[1]PO Box 1211 Noordhoek, 785, Cape Town, South Africa, [2]8500, 148 Avenue NE#N3045, Redmond, Washington WA, 98052, USA, [3]Karoo National Park, PO Box 316, Beaufort-West, 6970, South Africa

INTRODUCTION

To interpret animal tracks the tracker must have a sophisticated understanding of animal behaviour. There is in principle no limit to the level of sophistication to which a tracker can develop his or her expertise (Liebenberg, 1990a,b).

Apart from knowledge based on direct observations of animals, trackers gain a detailed understanding of animal behaviour through the interpretation of tracks and signs. In this way much information can be obtained that would otherwise remain unknown, especially on the behaviour of rare or nocturnal animals that are not often seen.

Expert trackers can give valuable assistance to researchers studying animal behaviour. Combining traditional tracking with modern technology, such as radio tracking, may enable the researcher to accomplish much more than by applying either method on its own.

Trackers can also extend the capacity of researchers to gather data by orders of magnitude. As long as the scientist is satisfied that the data collected by trackers are reliable, a team of trackers who go out on daily patrols can gather large quantities of very detailed data on an ongoing basis.

In the past, trackers have been used in research on animal behaviour, but received little or no recognition for their contributions. Recently some researchers have recognised the contributions of trackers by including them as co-authors of papers.

While trackers have worked in collaboration with researchers, it has still not been possible for trackers to document data and conduct their own research independently. The main obstacle is the fact that the best traditional trackers often cannot read or write. To overcome this we developed a user interface for a pen-based hand-held computer for trackers who cannot read or write.

THE CYBERTRACKER FIELD COMPUTER

The field computer is designed to be quick and easy to use in the field, enabling trackers to record all significant observations they make in the field. The field computer therefore makes it possible to generate a large quantity of very detailed data. Computer visualisation makes it possible for scientists to have instant access to all the information gathered over a period of time.

Icons allow the tracker to select options by simply touching the screen of a pen-based computer. The menu includes icons that enable the tracker to record sightings of animals, animal track observations, species, individual animals (such as individual rhinos) and numbers of males, females and juveniles. Species covered may include a full range of mammals, birds, reptiles and other animals. Activities such as drinking, feeding, territorial marking, running, fighting, mating, sleeping, etc. can be recorded. A plant list enables the tracker to record plant species eaten by the animal. The tracker goes through a sequence of screens until all the necessary information is recorded. When the tracker saves the information an integrated Global Positioning System (GPS) automatically records the location of observations.

With each recording the tracker (if s/he can write) also has the option to make a field note if s/he observes something unusual that is not covered by the standard menu. (An illiterate tracker can ask a literate apprentice tracker to write the field notes).

When the tracker gets back to the base camp he follows a very simple procedure to transfer the data onto the base station PC.

The CyberTracker field computer system has been tested by two of the authors, Benadie and Minye, for almost three years in the Karoo National Park in South Africa. Although they cannot read or write, they have been using the field computer to record their observations in the field and download the data onto the PC by themselves. They have therefore demonstrated that they can use the computer independently.

RHINO TRACKING

Individual rhinos can be identified by the distinctive random pattern of cracks that show up in their spoor. This allows trackers to track individual rhinos and collect data on their behaviour and feeding habits.

The movements of individual rhinos are shown on a map. This shows areas frequented exclusively by each individual rhino, as well as areas where their territories overlap.

From an anti-poaching point of view, knowing where the rhinos drink and sleep may help to protect them in the areas where they are most vulnerable, since these would be the locations where a poacher will most likely find them during the day. To optimise available manpower (there are at present not many women trackers in anti-poaching units), anti-poaching patrols can therefore cover those areas where poaching will most likely occur.

The data collected on feeding is very detailed. For example, shifts in rhino feeding behaviour can be seen every two months, shifting from the rainy season through to the dry season. Figure 1 shows the relative frequency of plant species fed on. Towards the end of the first year, the trackers were collecting a lot more data than at the beginning of the project. The period July/August 1997 is probably more respresentative than the corresponding period September/October 1996, which shows some gaps due to the fact that the trakcers gathered less data. A shift towards plants that the rhino do not usually feed on may indicate over grazing, which may happen in drought years or due to too many antelope (such as kudu) feeding on the same plants, or a combination of the two.

This may make it possible to anticipate poor feeding conditions before the rhino starts to lose condition. Once the rhino has lost condition it is already under stress, increasing the risk of death if it is translocated in an effort to save it from starvation.

In addition they record animal tracks of rare or nocturnal species that are not normally monitored.

They record virtually everything that they find interesting in the field. This may make it possible to monitor long-term trends that would not otherwise be noticed at all.

For example, a porcupine may destroy a whole *Acacia karroo* plant by eating the root in one meal. At present it is not known what impact porcupines have on plants utilised by the rhino. But to manage highly endangered species like rhino it may become increasingly important to monitor the whole system in order to get a better understanding of how they interact and compete with other species.

Initial field tests indicate that a tracker can generate more than 100 observations in one day. One field computer could therefore generate more than 20,000 observations in a year. If, for example, a large park like the Kruger National Park could have about 100 field computers, it may be possible to generate more than two million observations per year.

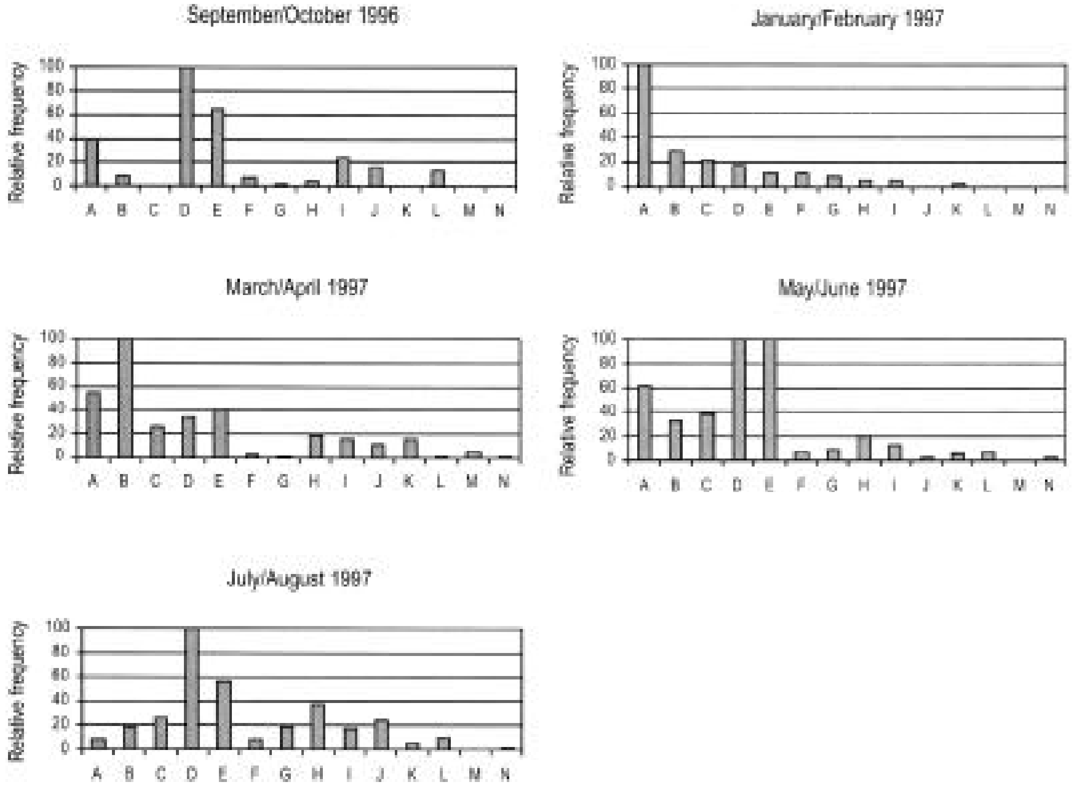
SOCIAL AND ENVIRONMENTAL IMPLICATIONS

Perhaps the most significant benefit is the prestige that the field computer gives to trackers who previously were held in low esteem. Co-authors Benadie and Minye report that using the field computer has given them an incentive to refine their skills and has made their work in the field more meaningful. For the first time they are being recognised for the work they do.

Creating employment opportunities for trackers in national parks provides economic benefits to local communities. In addition, illiterate trackers who have in the past been employed as unskilled labourers can gain recognition for their specialised expertise. The employment of trackers will also help to retain traditional skills, which may otherwise be lost in the near future.

The CyberTracker field computer system may have far-reaching implications for environmental

Figure 1. Trackers Karel Benadie and James Minye tracked the black rhino, *Diceros bicornis,* to record its feeding behaviour. September/October is the end of the dry season and January/February the beginning of the rainy season. From January through to August the feeding patterns shift as plants dry out and mainly succulent species are available. (A) Acacia karroo (B) *Sasola smithii* (C) *Rhigozum* obovatum (D) *Zygophyllum lichtensteinianum* (E) *Lycium cinereum* (F) *Gre wia robusta (G) Garuleum bipinnatum* (H) *Hermannia desertorum* (I) *Delosperma* sp. (J) *Eberlanzia ferox* (K) *Pteronia adenocarpa* (L) *Lycium oxycarpum* (M) *Salsola calluna* (N) *Rhus lancea.*



monitoring. It not only enables trackers to communicate all their observations to scientists and conservation managers on a day-to-day basis, but will also store the information over time long after the trackers may have forgotten the specific details. It will therefore be possible to monitor long-term ecological trends in much more detail than before. Moreover, computer visualisation will make it possible to analyse vast quantities of data in a meaningful way.

REFERENCES

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Web Site: www.cybertracker.co.za