

on similar basis to (ii) above, and is covered in a separate article by Russell Taylor in this newsletter.

Elsewhere in Zimbabwe, radio-tracking of elephant is being used in the following projects:

- (i) Hwange National Park: Some 30 odd collars are being used to examine the intensity of habitat occupation around artificial watering points, and movement to and from Botswana on the western boundary of the Park. (Conybeare, Monks)
- (ii) Gona Re Zhou National Park: A study of male elephant (10 collars) was initiated in 1982 to examine the role of elephant carrying large ivory versus large-bodied males and other males in breeding success. (Sharpe)
- (iii) Mana Pools National Park: 12 collars are being used to monitor movements of animals from the Zambesi Valley flood plain to the Escarpment. This is a management study arising from the need to identify the sub-populations causing woodland damage in the Escarpment area. So far the study has shown little

traffic between the Zambesi River and the high ground, leading us to believe that separate populations occupy the two habitats. (Dunham)

Other large mammals being studied are buffalo in the Zambesi Valley (12 collars-Swanepoel), and black rhino in the Gona Re Zhou (5 collars-Sharpe). In total about 140 animals are being tracked in Zimbabwe with the largest group being the Sebungwe elephant (70 collars). This is made possible by advanced technology frequency synthesised receivers with 128 channels. These receivers are specially adapted for radio tracking, possessing an input sensitivity ten times higher than most competing equipment, and front-end attenuation for range determination.

Recently we have supplied equipment outside Zimbabwe for elephant and rhino studies in the Luangwa Valley, Zambia (Dale Lewis and Nigel Leader Williams), elephant in the Kasungu National Park, Malawi (Hugo Jachmann, Richard Bell) and cattle in Botswana (Nick Abel, ILCA).

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## Seasonal Movement of Elephant in and around Matusadona National Park, Kariba

**National Park** (Taylor). This project was started in 1981

Matusadona National Park on the southern shores of Lake Kariba is one of a number of protected wildlife areas set amidst communal land in the northern Sebungwe region of Zimbabwe. In terms of the Park policy which seeks, *inter alia*, to conserve representative woodland habitats, it has been necessary to manage the elephant population in Matusadona. Management action thus far, achieved largely through culling, has been confined mainly to the valley area of the Park, where physical barriers, namely Lake Kariba and the Zambezi escarpment, limit elephant movement and dispersal. In the highlands of the Park, above the escarpment, there are no barriers to movement southward (Fig. 1). Nevertheless elephant destruction of woodland habitats in the highlands, compounded by the effects of uncontrolled wild fires, requires that some form of management action be taken.

It had been apparent for some time that the elephant population in the Matusadona highlands was not necessarily resident but that elephant moved in and out seasonally. This was evident from the seasonal distribution data of elephant in the northern Sebungwe, gathered during aerial surveys. The very large discrepancy in wet and dry season elephant numbers in the highlands confirmed that there was a wet season dispersal. However, little was known about the nature of this dispersal. Moreover, elephant are a valuable resource in the surrounding communal land where both financial and protein benefits accrue to the local community through commercial safari hunting and an annual offtake of crop-raiding elephant. Large scale culling operations within the

highlands of the Park could possibly damage the resource, limiting the availability of elephant in the communal land. Worse perhaps, management action could create a vacuum into which elephant would continue to move, without solving the habitat problems in the Park and simultaneously draining the communal land of a valuable resource.

The choice of management options clearly depended on understanding better the nature of seasonal movement in and out of Matusadona. With this objective in mind, twelve elephant cows were radio collared in June 1982. A Piper Super Club and an Airforce of Zimbabwe Alouette III helicopter were used to locate and immobilise elephant cows, preferably herd matriarchs in family units. Each cow was fitted with a collar supporting a radio transmitter encased in glass fibre, built by R.B. Martin at the Sengwa Wildlife Research Institute. Six elephants were collared in the Matusadona escarpment and highlands and six to the south and west of the Park's southern boundary. Since the collaring operation there have been regular tracking flights using a Super Cub, usually at two-weekly intervals. Each collared elephant, with its own transmitter frequency, is located using a receiver carried in the aircraft, the locality marked on a map and notes made on herd size and structure. Of the twelve elephant originally collared, eleven have been regularly located. One elephant was "lost" shortly after collaring, probably due to transmitter failure, so that only three fixes on its movement were obtained. A second elephant was accidentally shot by a safari operator, but the collar was replaced shortly afterwards on another elephant. Of a possible total 168 resightings (14 tracking flights x 12 elephants) 125 resightings have been made, a success rate of 74%.

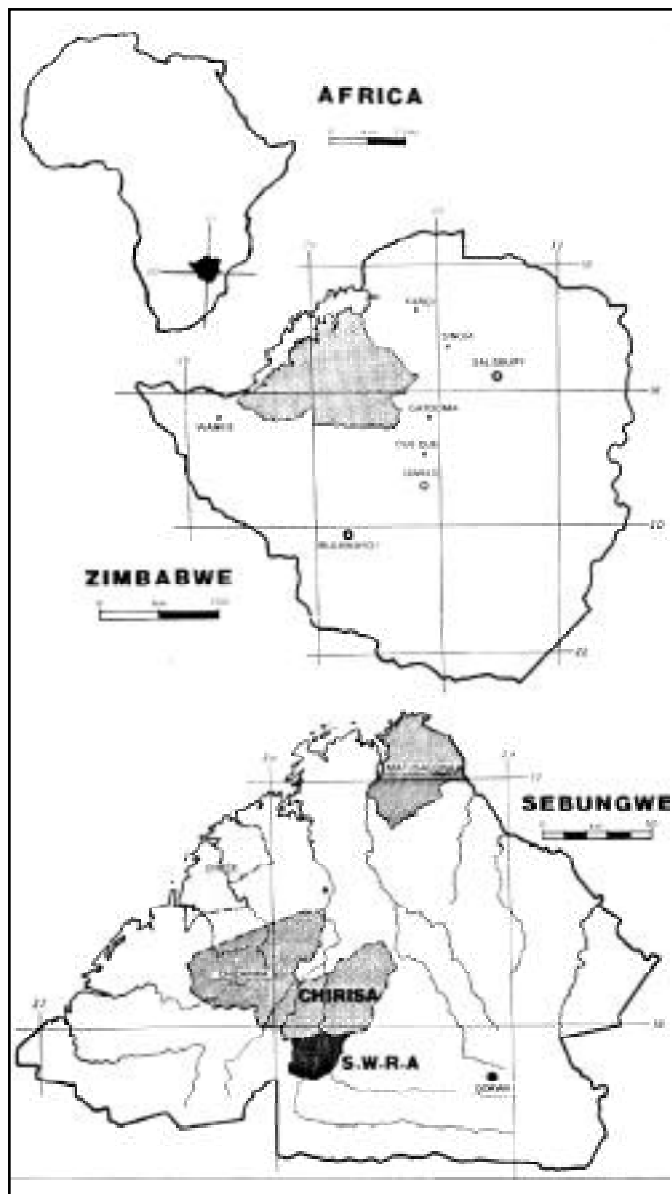


Figure 3

Figure 4 shows the wet and dry season sightings for four of the twelve elephants and illustrates the range of results that have been obtained to date. These can be briefly summarised as follows:

1. Three groupings are discernible:
  - (i) Northern (escarpment) elephant which do not move out of the Park at all, e.g. Odzi. There are a total of four such elephant with collars.
  - (ii) Southern (highlands) elephant which move both in and out of the Park e.g. Rita, of which there are again four animals with collars.
  - (iii) Communal land elephant which appear to live and move entirely outside the Park, namely Spider and Suzanne. If the elephant "lost" early in the project is included, the four remaining collared elephant constitute this group.
2. All elephants move greater distances during the wet season in comparison to their movement in the dry season. This would also suggest that wet season ranges are larger than the dry season range; however, the data are still inadequate for reliable home range measurements.
3. Elephant in the communal land, including some of those that spend a portion of their time in the Park, appear to

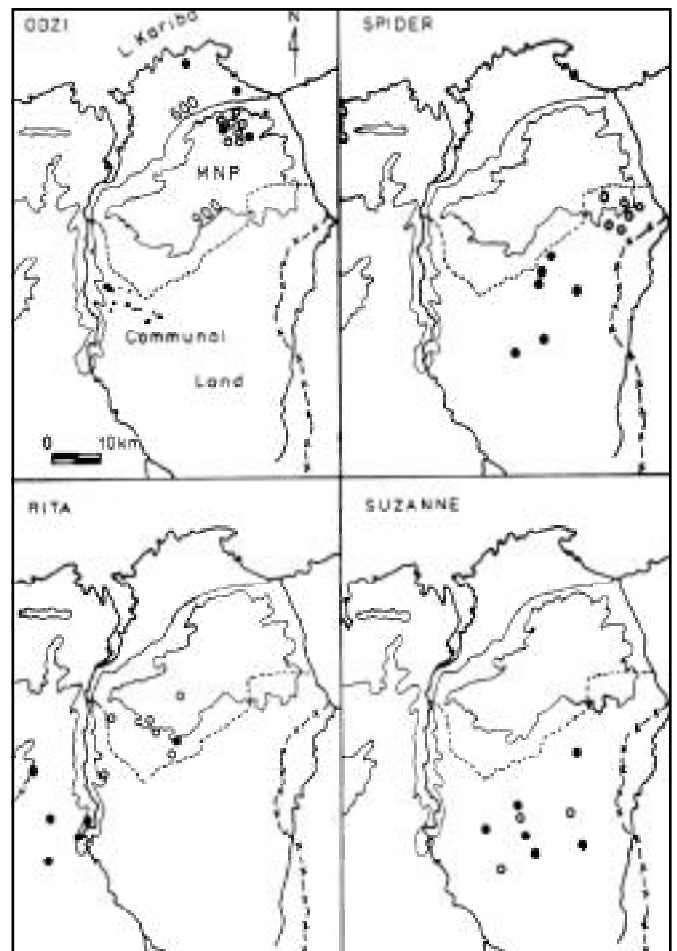


Fig. 4. Wet and dry season sightings of four radio-collared elephant in and around Matusadona National Park, June 1982 — May 1983. (•) Wet and (o) dry season sightings; (---) game fence; (—) Park boundary; (600) altitude, m asl; (~~~~) rivers and lakeshore.

have much larger ranges than do those who are always in the Park. Compare Odzi with Rita and Suzanne.

4. Some elephants have distinctly separate wet and dry season ranges, e.g. Rita and Spider. These elephants occupy the highlands in and adjacent to Matusadona during the dry season, moving to the lower lying areas during the rains.
5. Apart from a brief excursion to the Matusadona lakeshore by Odzi during the wet season, there has been no other movement northwards over the Zambezi escarpment into the valley. Most movement appears to take place in a south-west/north-east orientation which is also the geo-physical orientation of the land surface.
6. Elephant that live in both the Park and communal land, as well as just communal land elephant, are associated with crop raiding. Rita was in the vicinity of Negande in the west at a time when this village was being subjected to crop raiding. Magda (not illustrated), who was collared in the Park, had one of her colleagues shot dead next to her on control work following a crop-raiding foray at Sainpakaruma to the south of Matusadona. I found Magda and her group of 13 two days later no more than four kilometres away from the scene of the incident. Although she could easily have fled to the safety of the Park she had not done so. There were

also a further 60 elephants nearby which may have been indicative of some form of protective aggregation.

7. The overall group size of elephant in the communal land is larger than in the Park, while those elephants associated with both areas have an intermediate group size. However, there is considerable variation. For example Spider has been consistently associated with ten other elephants during the dry season in the highlands on the southern boundary of Matusadona, but her group size increased threefold during the wet season when she moved further south into the communal land.

The radio tracking results so far have helped to establish that some elephants are resident in the Park, certainly in the northern escarpment, but that others in the highlands move in and out seasonally. Nearly all movement takes place to the south and west and not northwards over the escarpment. Other elephants adjacent to the Park appear to be permanent residents in the communal land. However, there is considerable interaction between these elephants and those that move in and out of Matusadona. Obviously

more information is still required, particularly since the past two rainy seasons in and around Matusadona have been rather dry and this may have confounded the results somewhat. Nevertheless the management options are becoming clearer. If culling is to take place then it should be limited to the northern escarpment area. In seeking to protect the woodlands of the southern highlands it may be preferable to disrupt the seasonal movement of elephant into the Park. This can be achieved through selective hunting or aerial harassment of elephant along the southern and western Park boundaries. Elephant alive outside the Park are preferable to their being killed in the Park. Indeed the disruptive option has already been implemented with a certain measure of success. Finally it is perhaps important to state that appropriate fire management action is also being taken.

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*Figure 5. Southern White Rhino.*

## Rhino Rescue in Southern Zimbabwe

Between 30 and 40 Southern white rhino are being captured in southern Zimbabwe to rescue them from the worst drought to hit the region in living memory.

The last indigenous Zimbabwean white rhino was shot by hunters earlier in the century, and the country's current population of around 200 animals has been redeveloped from stock supplied by the Natal Parks Board.

Most of these animals are located in National Parks such as Hwange, and in smaller "Recreational Parks" including Lake Mcllwaine, close to Harare, and the Matopos outside Bulawayo. These areas have escaped the worst of the drought; but two separate populations on privately held ranches in the south of the country – the hardest-hit region would almost certainly have died by