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# A SIMPLE METHOD FOR THE ANALYSIS OF STRATIFIED AERIAL SAMPLE COUNTS

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Aerial Sample Count methods, perfected in the 1960s, have been comprehensively described by Norton-Griffiths (1978) and more recently by Mbugua (1996). These methods are widely applied for the census of wild and domestic mammals throughout Africa. Jolly's II method for unequal sized sampling units (Jolly, 1969) has been consistently used to provide both the population estimate and give a measure of the error of the estimate. Norton-Griffiths (1978) also explains how stratification of the census zone serves to reduce the margin of error in the population estimate. However, although both the practical aspects of the methods undertaking the sample count and the mathematics required to calculate the population estimate have been adequately described, there is little information on the methods that can be used to undertake a series of calculations to produce population estimates and confidence limits and figures to represent the distribution of wildlife in the count zone.

Several researchers have developed computer programmes to calculate the Jolly's II population estimate and map distributions (Burl and Douglas-Hamilton 1984; Campbell, 1993; and Western, 1976). However, these programmes have often been tailored for individual areas, or are not widely available and cannot be easily adjusted to other count zones.

We have developed a method which utilises available spreadsheet programmes to provide:

- a simple method of data entry
- an instant total of each species in each stratification block
- a simple calculation of both the population estimate and the 95 per cent confidence limit
- figures depicting the distribution of species within the count zone - of both the numbers of each species per subunit or the density of each species per subunit.

This method of data analysis is of value to researchers undertaking the analysis of sample count data who would like to improve on the accuracy of the population estimate and produce basic figures representative of the distribution of wildlife surveyed without the need for Geographic Information Systems. Other programmes do exist for both

of these aspects, but this method makes use of commonly available software (Fox, 1998) and does not require the most up-to-date computer hardware to undertake more elaborate analysis.

The method is based on the use of QuattroPro 4.1 (Borland, 1992), but the approach can be used in all other similar spread sheet programmes eg. Microsoft Excel and Lotus 1-2-3. In other spreadsheet programmes most of the commands will be identical or require only limited changes.

This method was developed in 1993 as part of the Garamba National Park Monitoring Programme (Hillman-Smith *et al.*, 1993) and has been thoroughly tested since (Hillman-Smith *et al.*, 1995a, b).

Anyone wishing for more information regarding this method can contact the Editor of *Pachyderm* for a copy of the manual which describes this method in detail.

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## NEPAL DESTROYS LARGE STOCKS OF WILDLIFE PRODUCTS

For many years the Nepalese authorities have been collecting wildlife trophies from animals which have died in and around royal Chitwan National Park. Those products found outside the Park are stored in the Forest Department's rooms at Tikauli (Chitwan District) which

come under the jurisdiction of the District Forest Officer at Bharatpur; those products found inside the Park are deposited at the headquarters of the Park at Kasara.

Until the early 1990s some of the rhino products such

Table. Wildlife trophies recorded in government storerooms in Tikauli and Kasara, Nepal, as of 9 November 1998.

Product	Tikauli	Kasara	Total
Rhino skin pieces	994 (3,475kg)	207 (869.5kg)	1,201 (4,344.5kg)
Rhino horns	32(23.11kg)	51(35.33kg)	83(58.44kg)
Rhino nails	498	865	1,363
Rhino teeth	0	2	2
Rhino skulls	3	6	9
Fake rhino skin pieces	2	7	9
Tiger and leopard bones	144kg	99.4kg	243.4kg
Tiger skin pieces	9	4	13
Fake tiger skin pieces	10	0	10
Elephant tusks	1 (5.7kg)	63 (66.38kg)	64 (72.08kg)

\* Most of these ivory tusks are derived from domesticated elephants owned by the Department of National Parks and Wildlife Conservation; they are cut to reduce the chances of people being injured.

Source: Gopal Prasad Upadhyay, Chief Warden, Royal Chitwan National Park, unpublished statistics.

as the horns and nails were sent regularly to the Royal Palace in Kathmandu. With the advent of multi-party democracy and the subsequent decline in the power of the King, the horns and nails have remained in the stores at Tikauli and Kasara.

By late 1997 the stockpile of wild animal products had reached significant amounts (see Table) with the world's largest collection of skins and nails from the greater one-horned rhino. A debate raged in Nepal amongst conservationists on what to do with these items.