4

Metal and colour rings

4.1 METAL RINGS

The rings supplied by SAFRING are mostly metal rings; however, some plastic colour rings are also available. The metal rings have a serial number and a return address stamped on them. Older SAFRING rings state: INFORM ZOO PRETORIA; rings produced since about 1980 state: INFORM SAFRING UNIV. C.T.

Metal rings are the most common and the safest method used for marking or tagging birds. The rings are constructed of aluminium, aluminium alloy (aluminium and magnesium), incoloy and stainless steel, and these have a variety of purposes. SAFRING no longer imports monel rings; those monel rings still in stock were manufactured a long time ago. Metal rings are constructed in different sizes. The smallest SAFRING rings have an inside diameter of 1.8 mm and the largest 26.0 mm.

4.1.1 Aluminium and aluminium alloy rings

The advantages of pure aluminium rings are that they are light, malleable and cheap. Their main disadvantage is that they are soft, rather weak and corrode readily and are therefore not suitable for large, long-lived bird species. For the past decade, the strength of aluminium rings has been greatly improved by using an aluminium alloy. The best aluminium alloy contains 3% magnesium and 0.5% manganese. This has greatly improved the durability of the ring, without sacrificing lightness and malleability. The aluminium rings that are supplied by SAFRING use this alloy. These rings are mainly used on terrestrial (land) birds. Rings made of pure aluminium or of aluminium alloy should not be used on aquatic species. Pure aluminium rings (the soft ones) should also not be used on terrestrial birds with hard, strong beaks. These birds remove or deface the ring, and are alleged to damage their beaks attempting to do so, although very little evidence of this exists. The hard alloy rings do not appear to have this problem.

4.1.2 Incoloy and stainless steel rings

These rings are resistant to corrosion and abrasion. They are, however, more expensive than aluminium and aluminium alloy rings, mainly because their hardness increases production costs. These two alloys should be used to ring birds inhabiting water habitats. Stainless steel is also an extremely durable ring in terrestrial conditions, and ring numbers are still easily legible after more than a decade. Even in seawater, stainless steel

rings are in good condition after 10–20 years. In very saline conditions, however, stainless steel rings seem to corrode faster than incoloy, which consists of 36% nickel, 19% chromium and 45% iron. This appears to be the best ring material for long-term resistance to abrasion and corrosion in the harshest environments.

4.2 RECOMMENDED RING SIZES AND TYPES

The tarsal diameters of birds vary enormously, leading to the wide range of ring sizes. Even within a single species, there are considerable differences between individuals at a single locality. There may be further variation between the tarsi of nestlings and adults, between the sexes, and geographical populations. It is therefore not simple to specify the right ring size for any particular species. Based on the accumulated experience of ringers, SAFRING has produced recommended ring sizes for most species in southern Africa (Appendix 9). However, this is a guide; if in any doubt about the advice offered, measure the tarsus of the bird prior to ringing; this is most easily done with dial callipers. To do this, measure the maximum diameter of the tarsus at three positions, top, middle and bottom. Choose a ring just larger than the biggest of the three measurements. Report any discrepancies in the SAFRING recommendations to SAFRING immediately; if you ring a species not listed, this should also be reported.

4.2.1 SAFRING ring sizes

Note: The prefix usually changes when 100 000 rings of a certain type have been used.

Internal diameter (mm)	Prefixes (current and future)	Material
1.8	X,W	Aluminium
2.3	AE,AF,GA	Aluminium Alloy
2.3	AC,AH	Stainless Steel
2.5 (short shank)	Y	Aluminium
2.5–4.0 (soft overlap)	E,EE	Aluminium
2.8	F,FA	Aluminium Alloy
2.8	F,FH	Stainless Steel
3.0	BD,BE	Aluminium
3.0	BC,BH	Stainless Steel
3.3	CV,CU	Incoloy
3.5	CC,CH	Aluminium Alloy
4.2	4H	Stainless Steel
4.3	4,4A	Aluminium Alloy
5.25	D,DH	Incoloy
5.25	D,DA	Aluminium Alloy
6.0	5A,5B	Aluminium
6.0	5H,5J	Stainless Steel
7.0 (short shank)	PA,PB	Incoloy
8.0	6,6A	Aluminium
8.0	6,6H	Stainless Steel
10.0	K,KK	Incoloy
11.0	7,7A	Stainless Steel
12.5	8,8A	Incoloy

Internal diameter (mm)	Prefix	Material
12.5	8	Monel
16.0	9,9A	Stainless Steel
19.0	J,JA	Stainless Steel
26.0	G,GB	Stainless Steel
34	H	Stainless Steel
PENGUIN	P,T,V,S,A,L,M,R,X	Stainless Steel

4.3 COLOUR MARKERS

In order to recognise individuals or cohorts of a population without having to capture them again, many different marking techniques have been tried and developed. Colour marking is thought to affect the bird in the following ways: change their behaviour (the chosen colours might have behavioural significance), increase the rate of predation (by making the bird more conspicuous to predators; and increase the recovery rates (because humans are more likely to spot a colour ring than a metal ring). The overall effects of colour marking have not been proven. As a precaution, therefore, colour marking should only be undertaken when the person conducting the study has a well thought-out project. Large-scale colour-marking projects should only be undertaken if there are no behavioural implications for the species concerned.

4.3.1 Regulations regarding colour marking

To avoid the possibility of conflicts between colour-marking projects, SAFRING must be notified in advance of any plans to colour mark birds. Details must be given of the species involved, approximate number of individual birds that will be marked, duration of the project and the colours that will be used. There needs to be a contact person to whom any sighting reported to SAFRING will be sent. Colour markers must be used in combination with metal rings. No experimental marking technique should be used without informing SAFRING and obtaining permission from the relevant conservation authority.

4.3.2 Plastic colour rings

Colour-ringing projects are of two types: those in which it is desired that cohorts of birds should be recognisable, and those for which individual birds need to be identified with unique patterns of colour rings.

In the former case, the most common scenario is to use a single colour to indicate all birds ringed at a particular site or in a particular year or both. Individual birds are not distinguishable at a distance, although of course each bird also has a numbered metal ring.

Patterns of colour rings are usually applied when it is necessary to identify individual birds at a distance. Provided the chosen species is one whose tarsi are easily seen, colour rings usually provide the most efficient and cost-effective system for individual bird recognition, and are the easiest system to use. The set of rings on a bird usually last for at least several years before even the first ring is lost. The number of colour rings used

per leg should be as small as possible, consistent with providing enough unique colour permutations. SAFRING can give advice on these choices.

It is preferable not to place a soft colour ring and a hard metal ring together on the same leg – the harder metal will wear the softer plastic ring away. If it must be done, place the plastic ring above the metal ring. The golden rule of colour ringing is this: **the same number of colour rings should be placed on each bird in a specific study**; otherwise it will not usually be possible to detect birds that have lost a ring. It is for this reason that colour ringing projects need to be carefully planned in advance, so that growth of the number of birds ringed does not necessitate the later use of extra colour rings. If possible, the left and right leg should not be used as a means of obtaining twice as many colour combinations, because many observers find it difficult to make reliable observations as to whether the colour rings were on the left or the right leg. The concentration required to get the colours correct somehow seems to overrule the crucial additional piece of information: was the bird facing towards the observer or away from him? The designers of colour-ringing projects need to be realistic; it is a good idea to mark a few birds and to monitor these closely.

The best colours for colour rings are red, blue, yellow, black, white and green. However, black is not very visible on a bird with a black tarsus, green cannot easily be seen amongst green foliage, reds may fade to look like pink or pale purple after some time, and blues become pale white. So before commencing a colour-ringing project choose your colours with great care.

It is important to solicit the assistance of members of the public including members of the appropriate bird clubs, in searching for your colour-marked birds. The information given to the media and to anyone not in the inner circle of project assistants must be clear and simple. **Report all sightings of colour-marked birds to SAFRING, giving details of date, place and the colour markings observed.** It is not good practice to ask for sightings to be made directly to the project. As the number of colour-marking projects increases, we aim to avoid the situation where there is confusion about where to send a particular sighting. The message that goes out to the public must be clear and simple: report to SAFRING.

SAFRING is the main supplier of colour rings, which are made of various materials.

4.3.2.1 Celluloid rings

Split celluloid rings are mainly used for passerines; a wide range of colours is available but some colours fade badly with time. These rings are applied by using a special tool which comes with the rings, and which is used to open the ring so that it can be slipped over the leg. The split in the ring may be sealed by applying acetone with a small brush accurately on the sides of the split; immediately afterward, a little pressure should be applied on the ring until the split sides have bonded together. This helps to prevent ring loss. The acetone should be applied carefully; otherwise the whole ring gets soft and sticky.

4.3.2.2 Darvic and Vinylast rings

PVC rings (Darvic coil or Vinylast) are normally used on larger birds, although they are available in sizes down to 2.8 mm. They are generally colour-fast. These rings are spirals like the mainspring of a clock. The rings are applied by opening the spiral and slipping it on to the bird's leg.

Darvic and Vinylast rings are also manufactured from two-layer plastics which are laminated together, using two contrasting colours of plastics. These rings can be engraved through the outer layer of the ring to expose the inner layer of the second colour. Figures, letters and numbers can be engraved on the ring which make it possible to identify the bird uniquely. These rings usually have two bright and contrasting colours so that the inscription is legible in the field from a distance with a pair of binoculars or a telescope. Ring spotting of these rings is a new branch of birding with an increasing number of addicts; in Europe and the USA, birders can be seen hunched behind their spotting scopes at estuaries and open fields reading the engraved ring numbers of gulls, waders and storks. Rings like these are used in large-scale research projects. Currently in South Africa, these engraved plastic rings are being used on Hartlaub's Gulls, Swift Terns and African Black Oystercatchers. We hope that ring spotting will become as popular a branch of birding in southern Africa as it is elsewhere.

4.4 SPECIALIST TECHNIQUES

These are generally not used by SAFRING ringers, but are mentioned for the sake of completeness. Wing or patagial tags, nasal saddles, collars, harnesses and dyes are used when it is necessary for specific research projects to be able to identify individual birds from a distance. Any bird seen with any of these types of markers should be reported to SAFRING. SAFRING can also supply more information on these methods.

4.5 ORDERING RINGS

Use good judgement when ordering stocks of rings and anticipate your requirements well in advance, particularly with special orders, to prevent a last-minute rush. On the other hand, do not order more rings than you are likely to use over a reasonable period of time. From SAFRING's perspective, it is more efficient to process a smaller number of substantial-sized orders per year than a large number of small orders. The labour costs involved in preparing an order for dispatch are more or less independent of order size, and these costs need to be factored into the prices of rings.

4.6 RECORD KEEPING

SAFRING keeps a register of all rings issued to each ringer. This enables the system to determine to whom a ring was issued if the bird it was placed on is recovered before the ringing data arrives at SAFRING. All ringers need to be able to account for all rings issued to him/her at any point in time. If asked to do so by SAFRING, lists must be submitted of all the unused rings in a ringer's possession. Rings may be transferred from one qualified ringer to another; it is essential that the ringer handing over the rings supply SAFRING with a detailed list of ring numbers transferred. If a ringer ceases to ring, unused rings should either be transferred to another ringer, or returned to SAFRING.