A n article in the *Scottish Daily Record* (2019) brought to light the damage that parrots can do to their feathers if they are anxious, stressed or unhappy. In this news story, two zoo-housed macaws with severely damaged feathers and bare skin had been brought together in a new home to try to provide them with new opportunities for positive behaviours – in the hopes of the birds forming a pair bond and rearing a chick. Such “damaged” birds are unfortunately not that uncommon in public and private collections. Feather-plucking behaviour (Figure 1) has a complex aetiology but with compassion and care, expert veterinary advice and sound husbandry knowledge, birds can gradually recover and feathers can grow back.

There are many factors that can trigger the onset of feather-plucking, including the personality of the individual, contact time with owner, enclosure size and style, underlying pathological conditions, rearing experiences, social grouping or social isolation, environmental parameters and restriction to behavioural diversity. Many excellent reviews of the causative factors of feather damaging occur in the literature including Garner *et al.* (2003), Speer (2014), who discusses the importance of wild ecology to solving behavioural problems in companion birds, and Greenwell and Montrose (2017), who specifically focus on one of the commonest of companion parrots, the African grey parrot (*Psittacus erithacus*). In cases where a bird is feather plucking due to boredom or a lack of an outlet for normal behaviour patterns, enrichment can be used to encourage a wider behavioural diversity (Figure 2). Whilst enrichment for captive parrots is always to be encouraged and should be provided (Rodríguez-López, 2016), it can be a challenge to completely alter behaviour by providing enrichment alone.

Foraging tasks have been shown to provide an outlet for behaviours that reduce feather plucking in individual birds that are prone to this damaging activity (Figure 3). Research by Lumeij and Hommers (2008) has identified that prolonging foraging times for African grey parrots improves the plumage condition of birds that originally performed chronic feather plucking. These authors provided parrots with a complete pellet diet in a pipe feeder that a bird had to manipulate to get food. These birds were compared to a control group that had pellet given in an open bowl. The parrots that had to extract their diet from the pipe feeder had an increased time spent on foraging and showed a decline in feather-damaging behaviour. These authors note that the feather condition of feather-plucking parrots improved significantly with every extra hour that a bird can spend foraging.

Whilst increasing foraging time seems important to improving parrot welfare and the use of enrichment to do this might sound straightforward, it can be logistically quite tricky to have a big impact on foraging behaviour in this manner. Therefore, other forms of enrichment need to be considered too. Van Zeeland *et al.* (2013) show that a range of foraging enrichments tested on African grey parrots significantly increased foraging time, but none of them enabled parrots to demonstrate the same number of foraging activities.

Can enrichment keep birds physically and psychologically healthy?

**PAUL ROSE**

**ANIMAL BEHAVIOUR LECTURER, UNIVERSITY OF EXETER**

Paul Rose, PhD, completed his PhD on the use of social network analysis to assess behaviour and welfare in captive animal populations. Paul is Co-Chair of the IUCN Species Survival Commission Flamingo Specialist Group and Vice-Chair of the BIAZA Research Committee.