

Resource Notes

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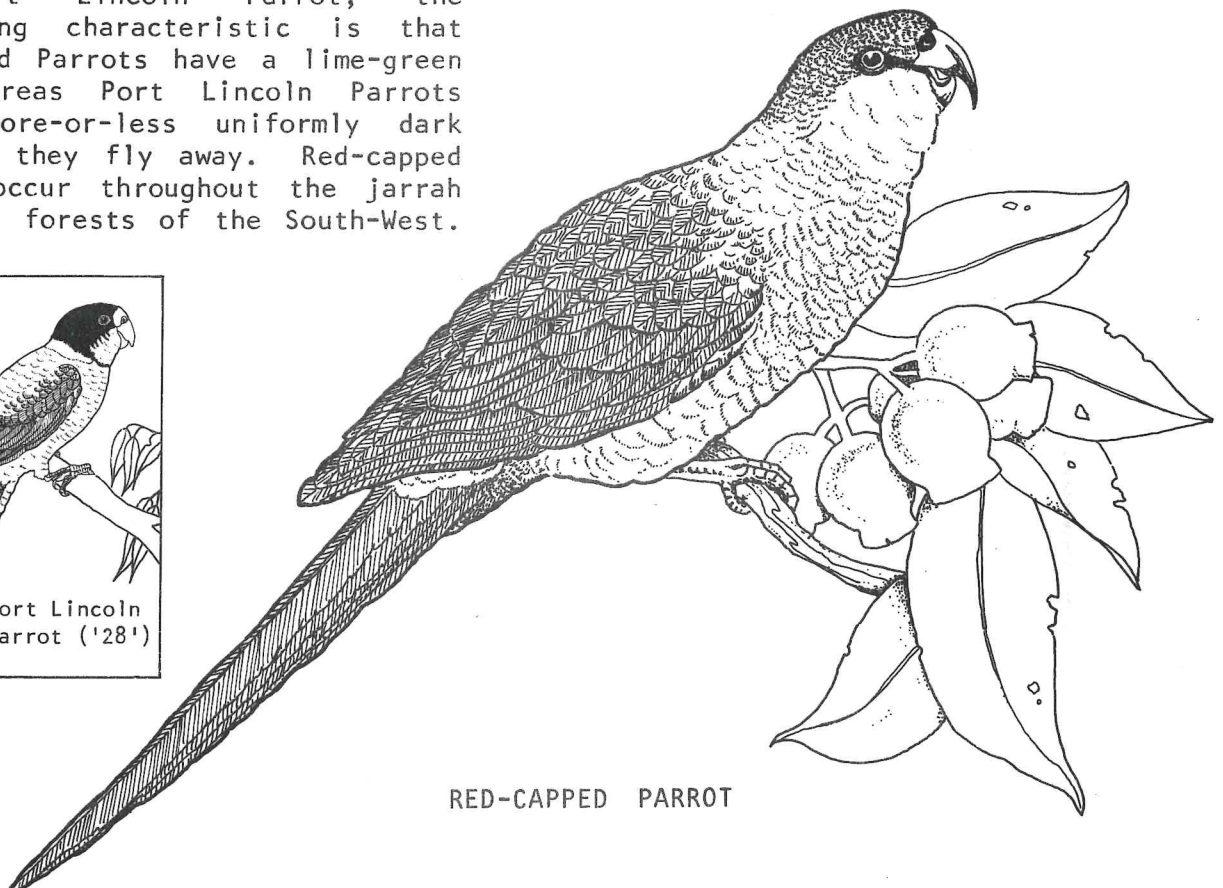
RED-CAPPED PARROTS, MARRI AND APPLE ORCHARDS - ADAPTATION AND PRE-ADAPTATION

Although it is nowhere as well known as the Port Lincoln Parrot ('28'), the garish and endemic Red-capped Parrot is in fact very common in south-western Australia. When perched in a tree adult birds are unmistakable because of their purple breast, lime-green cheeks and red cap, but when in flight they rather resemble the Port Lincoln Parrot; the identifying characteristic is that Red-capped Parrots have a lime-green rump whereas Port Lincoln Parrots appear more-or-less uniformly dark green as they fly away. Red-capped Parrots occur throughout the jarrah and karri forests of the South-West.

One of the most interesting features of the Red-capped Parrot is its long, pointed bill. Many naturalists contend that the shape of the bill is an adaptation to allow Red-capped Parrots to feed with maximum efficiency on the seeds of marri (*Eucalyptus calophylla*).



Port Lincoln Parrot ('28')



RED-CAPPED PARROT

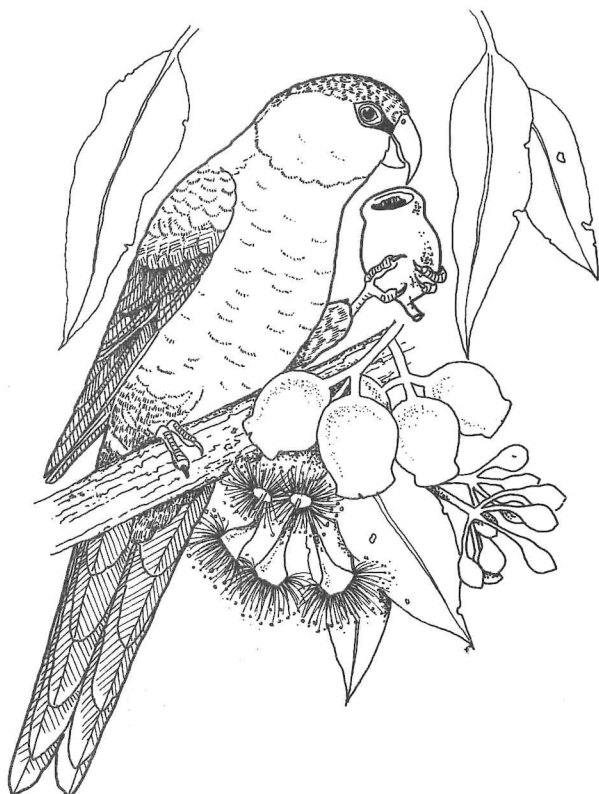
Marri, a large tree, also known as red gum, occurs throughout the jarrah and karri forests and its range almost exactly coincides with that of the Red-capped Parrot. Red-capped Parrots nest in hollows in marri and in other trees. Marri flowers copiously at the end of summer, and is one of the most important nectar and pollen sources for native animals (both vertebrate and invertebrate), and the commercial honey bee. After flowering the ovaries of marri flowers (containing the seeds) develop into the large seed capsules or "honky nuts". It takes about a year for the seed capsules to mature fully and release the seeds.

During that year Red-capped Parrots feed on the seeds extensively. Their long bill enables them to hook the seeds out of the seed capsules with a minimum of effort. In contrast, shorter-billed species like the Port Lincoln must spend a substantial amount of time chewing at the capsules before they are able to reach the seed. Thus, it can be seen that the Red-capped Parrot certainly is well adapted for feeding on marri seeds.

However, this does not necessarily mean that the bill evolved specifically for this purpose. It is quite possible that it evolved to

serve a quite different function (perhaps to extract insect larvae from stem galls) long before any Red-capped Parrot saw a marri tree. However, once the parrots and marri came together the parrots were pre-adapted for feeding on the seeds of the tree, i.e. they already possessed a bill structure that was adaptive for feeding on marri. At this point it should be noted that, although marri seeds are a very important component of the diet of Red-capped Parrots in forest areas, they also eat nectar from flowers, especially marri, seeds of various shrub and tree species, including jarrah (*Eucalyptus marginata*), and larvae of various insects.

Since the South-West has been developed for agriculture, Red-capped Parrots have widened their range of food items to include cultivated fruit, especially apples, and there have been many complaints from orchardists. The same is true of Port Lincoln Parrots and both cases are clear-cut examples of pre-adaptation. Both species already possessed all the necessary behavioural characteristics (because they feed on seed capsules of marri and other eucalypts) for handling apples. In fact, the different approach of the two species to marri seed capsules has affected the way they handle apples, i.e. they are pre-adapted in slightly different ways. Port Lincolns eat the apple flesh, which they remove to get at the seeds in the core, but Red-capped Parrots make a comparatively small hole in the apple and then extract the seeds with their long bill. They usually discard the apple flesh from the hole rather than eating it. Because the Red-capped Parrot's beak is perfectly adapted for feeding on marri seed, it relies heavily on that food source. However, that adaptation does not restrict it to marri and it is able to make use of other food sources if marri is unavailable.



Written by Stuart Halse who has recently completed research into the effect of parrots on apple orchards, for the Department of Conservation and Land Management.
