



# Five-star dining for Carnaby's

'Weloo weloo weloo' rings out in chorus—Carnaby's cockatoos have returned to the coast once more, seeking their preferred food. These distinctive birds were once abundant throughout the south-west but their population is now in decline, pressured by a loss of feeding and breeding habitat. It is hoped that an investigation into food resource availability will enable systematic conservation planning for this threatened species.

by Teagan Johnston





Well known for being spectacular and loud, Carnaby's cockatoo (*Calyptorhynchus latirostris*) is among the most recognised bird species in Western Australia. Ranging from the Murchison to Esperance, the endemic Carnaby's cockatoo occurs in areas receiving more than 300 millimetres of rainfall annually. During the 'holiday' (non-breeding) season these gregarious birds, like many Western Australians, head to the coast. The non-breeding season occurs from January to July, during which time Carnaby's cockatoos aggregate in large flocks in search of food. For many of the birds which breed in the northern wheatbelt, the higher rainfall Swan Coastal Plain is their preferred holiday destination.

Carnaby's cockatoos are visible in much of Perth's metropolitan landscape. However, WA's pattern of urban development and agricultural activity on the Swan Coastal Plain has historically contributed to a substantial loss of habitat and a decline in numbers (see 'Carnaby's black-cockatoo', *LANDSCOPE*, Winter 2009). As a consequence, Carnaby's cockatoo



has to work harder to find suitable 'restaurants' on the Swan Coastal Plain due to continued reduction in food resource availability.

### Threat to survival

During the past 60 years, a population decline in Carnaby's cockatoos associated with the loss of breeding and feeding habitat has been observed. As a result, this once-abundant species is now listed as threatened under both state and federal legislation.

Birds Australia carried out two surveys—between March and August 2010 and between March and August 2011—using specific night-time Carnaby's roosts. These were each referred to as 'The Great Cocky Count'. These surveys have estimated the non-breeding greater Perth region population to be 3,100 to 5,100 using the night roosts that were surveyed.

### Feeding locations

On the Swan Coastal Plain, Carnaby's cockatoos dine primarily in proteaceous woodland, kwongan heath and commercial pine plantations. Seeds from genera including *Banksia*, *Eucalyptus*, *Corymbia*, *Grevillea*, *Hakea* and *Pinus* constitute more than two-thirds of the birds' diet. In particular, proteaceous species (*Banksia*, *Grevillea* and *Hakea*) are highly sought after, making banksia woodlands a preferred feeding location.

Around 60 per cent of remnant vegetation on the Swan Coastal Plain has already been removed from the landscape for urban development and farming. Therefore, quality and abundance of food resources across the Swan Coastal Plain are likely to be major factors in the sustainability of the Carnaby's cockatoo population. With Perth's human population predicted to triple in the next 50 years, strategic and informed land-use planning is critical for the survival of the species.

### Action needed

Conservation and management of threatened plants and animals is rarely easy. Carnaby's cockatoos pose a dynamic and multifaceted challenge to land managers, due to their movement throughout the landscape and reliance on a variety of habitats for breeding, feeding and roosting. To conserve the Carnaby's cockatoo, informed



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Carnaby's cockatoo eyeing off acorn banksia.  
Photo - David Bettini

**Above** Carnaby's cockatoo feeding on slender banksia seed.  
Photo - Rick Dawson/DEC

**Left** Firewood banksia is one of the species which makes up the Carnaby's diet.  
Photo - Sallyanne Cousans





**Above** Banksia woodland.  
Photo – Jiri Lochman

decisions about where development should occur in the future need to be made in relation to the importance of known and potential habitat. Finding an acceptable balance between human needs and the birds' requirements will be needed to ensure Carnaby's cockatoos are around for generations to come. Understanding the availability of food resources and determining whether those resources can support the current and future cockatoo population is important to successfully manage the species.

With funding assistance from the environmental offsets package associated with the construction of the Fiona Stanley Hospital, the Department of Environment and Conservation (DEC) has begun a research project to investigate where Carnaby's cockatoos like to dine on the Swan Coastal Plain and what banksia delicacies they most enjoy feeding on.

### Filling the information gap

DEC plans to identify what food the Carnaby's cockatoo prefers to eat, in order to provide a food critique of Carnaby's eating patterns. But rather

than finding the birds and determining what they like through observation, DEC staff and volunteers have been venturing out into banksia woodlands to hunt for banksia cones and other food leftovers, referred to as 'feeding traces'. At 21 sites, 84 randomly stratified feeding locations (quadrats) have been established in banksia woodlands across the Swan Coastal Plain, from Yanchep to Waroona.

Carnaby's cockatoo feeding traces include eaten and manipulated fruits and cones, flower spikes, bark and green twigs. Feeding traces vary for each plant: some show distinctive signs of Carnaby's presence while the indicators on others are less obvious. As is the case in any good detective work, evidence or signs are the key to finding out where the birds have been and on what they have been feeding. Slender banksia (*Banksia attenuata*), firewood banksia (*B. menziesii*), acorn banksia (*B. prionotes*) and parrot bush (*B. sessilis*) are prime suspects and have been targeted in this research. Surveys aim to identify the proportion of the year each area is being used and the change in food type (for example cone or flower) and species used throughout the year.

### Health inspection

As part of the project, threats to the plant species will be examined to determine how they influence the availability of food resources. In particular, fire and dieback disease (caused by *Phytophthora cinnamomi*) have been singled out for further investigation as they are major threats to biodiversity on the Swan Coastal Plain, especially in banksia woodlands.

WA's vegetation has evolved to persist with fire. However, banksia species have developed different methods of coping with fire which affect flower and seed productivity and therefore dining potential for Carnaby's cockatoos. Some banksias resprout after fire—such as the slender banksia—whereas other species, such as parrot bush, reseed. Resprouters can produce flowers within as little

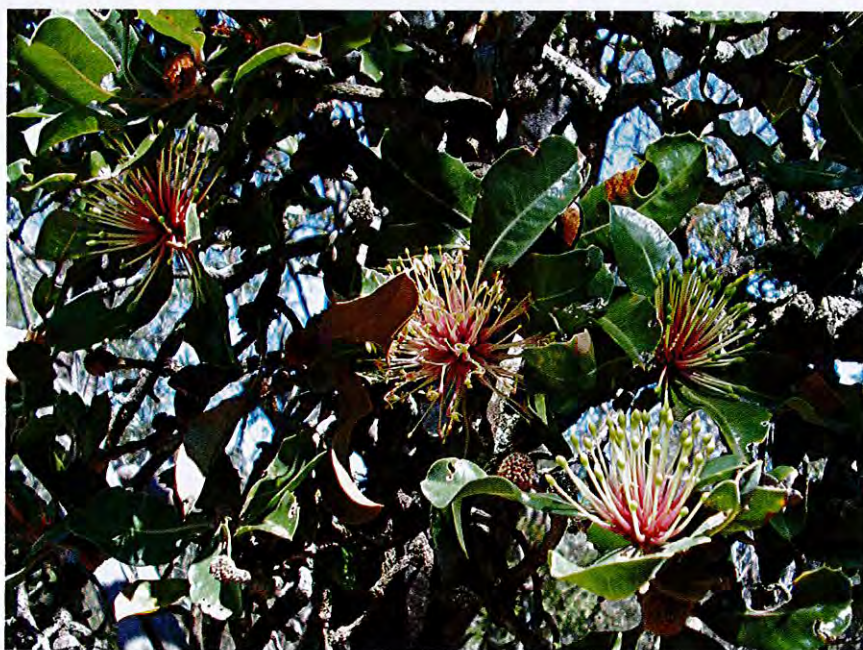




**Left** Carnaby's cockatoos feeding.

**Below left** Holly-leaved banksia (*Banksia illicifolia*).

Photos - Teagan Johnston/DEC



as 12 months but reseeders require more time before seed is available, taking up to seven years in some cases. Consequently, after fire, Carnaby's cockatoos are forced to feed in other areas while the vegetation recovers. Of concern, Carnaby's cockatoo habitat is constantly under pressure from the threat of arson and other causes of bushfire. Increased frequency of fire is a major problem in banksia woodlands as areas may not have enough time between fires to fully recover.

Dieback disease is a threat to native plants. However, unlike fire, this soil-borne pathogen causes irreversible

damage to native plant communities, altering their diversity, productivity and ecological processes. Unfortunately, proteaceous species, which include banksias, are highly susceptible. Defenceless against the disease, infested banksias eventually succumb. Despite the presence of dieback disease in many banksia woodlands, the disease is often patchy with islands of vegetation persisting. Although less desirable, as food availability is reduced, these areas still appear to be important in providing a dining opportunity for Carnaby's cockatoos, albeit at only half a star rating. The potential implications

of increased fire frequency and dieback disease on food resource availability for Carnaby's cockatoos are significant.

This research project aims to determine the abundance and density of food resources for Carnaby's cockatoo in a variety of banksia woodlands on the Swan Coastal Plain. Understanding the influence of fire, disease and soil type on food availability is needed for the future conservation management of Carnaby's cockatoo habitat. Hence, each dining location (quadrat) has been assessed to determine the time since the last fire, the presence or absence of dieback disease, soil type and biodiversity characteristics to examine how they effect the availability of banksia cones.

### **Mysteries unravelling**

The research is already revealing that Carnaby's cockatoos have preferences for different food resources at different times of the year and at different sites. Selection appears to be based on the availability and type of food and the size and location of remnant vegetation. Some sites are visited frequently, whereas others appear untouched. A site not being used doesn't necessarily mean it is not important—rather it may be too far from the nearest roost site, may lack vegetation linkages in the landscape or may be yet to be explored, as Carnaby's cockatoos appear to be habitual in nature. Unlocking these mysteries will help conserve and protect both known and potential habitat for the Carnaby's cockatoo.

### **Outcomes**

In an attempt to assess relative habitat importance, survey data collected on banksia productivity, distribution and disturbance factors will be used to develop a comprehensive but concise rapid-assessment protocol to guide surveys of bushland areas for determining those that





**Above** Carnaby's resting.  
 Photo – Rick Dawson/DEC

**Right** A volunteer taking plant measurements.

**Below right** Parrot bush.  
 Photos – Teagan Johnston/DEC

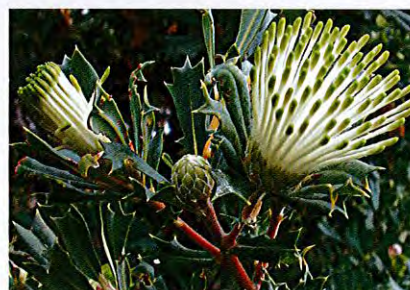
warrant priority management to benefit Carnaby's cockatoo. Outcomes will include evaluating proposed conservation areas, or identifying prospective areas for addition to the national reserve system and development offsets for Carnaby's cockatoo.

Bushland that is aesthetically pleasing to us is often different to what the birds prefer. For example, weed-infested sites which may appear unhealthy are in some cases proving to be prized feeding locations for Carnaby's cockatoos—but may require management intervention to maintain them into the future. By creating a rapid-assessment protocol based on research findings, assessments will become standardised and aligned to the tastes of Carnaby's cockatoo.

This research will provide a greater understanding of available food resources for the Carnaby's cockatoo, identify the limitations and influence of threatening processes, and develop a method to prioritise remnant vegetation on the Swan



Coastal Plain. Information generated from the research aims to guide and support land managers by providing a systematic approach to conservation planning for the Carnaby's cockatoo in this area. In addition, it will provide guidance for environmental consultants and environmental protection agencies when carrying out environmental impact assessments or assessing future development proposals. Systematic conservation planning will ensure the Carnaby's cockatoo can continue to enjoy its sojourns on the Swan Coastal Plain for years to come while dining at five-star banksia restaurants.



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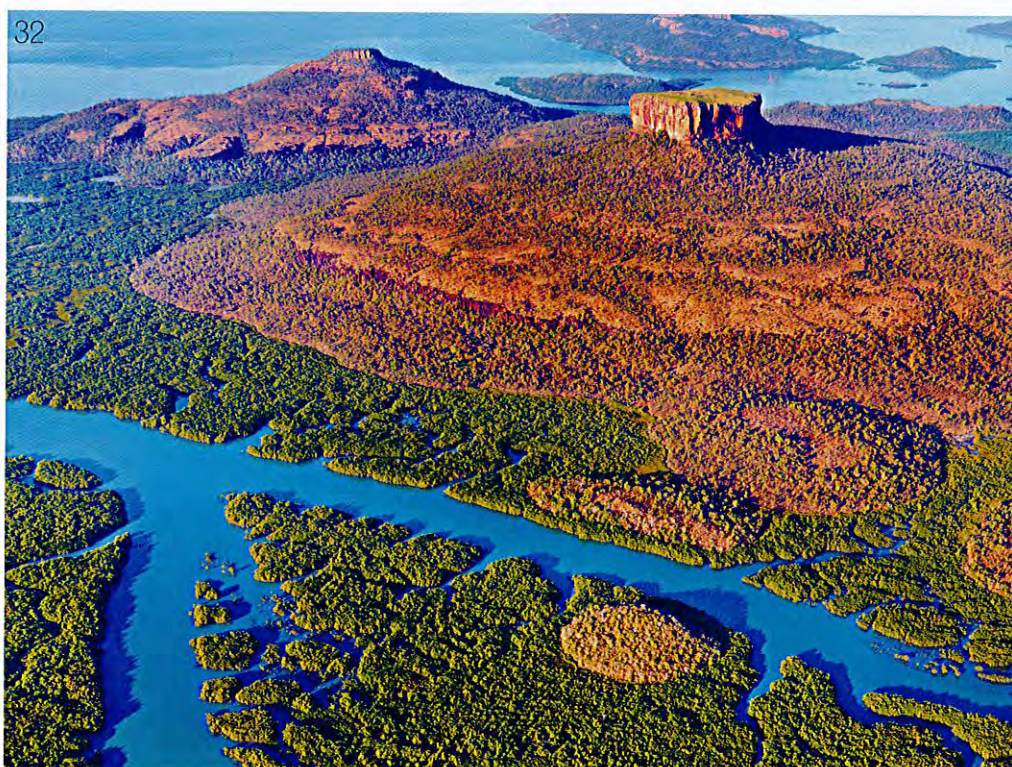
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