

Observations of the eastern rosella (*Platycercus eximius*) in the Wellington region

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Abstract Observations of eastern rosellas (*Platycercus eximius*) in the Wellington region were recorded during February 1994 to January 1997 by members of the Ornithological Society of New Zealand. Sixty-one percent of the 1227 sightings were made in 3 localities, Paraparaumu-Waikanae, Upper Hutt, and central Wellington. Most rosella sightings were in pastoral farmland (47%) and urban habitats, including parks, and golf courses (41%). Of the 400 sightings for which flock size was given, the mean was 3.6 rosellas, and flock size did not change significantly with season. Rosellas were seen feeding ($n = 54$) on buds and shoots (19%), flowers (5%), fruit (15%), and seeds (61%), with feeding on introduced plants making up 80% of the feeding observations.

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INTRODUCTION

Native of southeastern Australia, the eastern rosella (*Platycercus eximius*) was first introduced to New Zealand as a cage bird in the early 20th century (Oliver 1955; Thomson 1922). It is likely that some escaped and others were intentionally released (Wright & Clout 2001), resulting in the establishment of the species in the wild. For example, about 12 rosellas escaped after their cage was destroyed in a gale (Hamel 1970), and rosellas were released from a ship off Otago Heads after entry had been refused by the Customs Department (Higgins 1999). Sites of early establishment were Dunedin in c. 1910, Auckland during the 1920s, and Hutt Valley during the 1960s (Hamel 1970; Higgins 1999). By the late 1970s, the eastern rosella's range in the North Island had expanded to include much of Northland, Auckland, Coromandel, and northwestern Waikato. In the South Island it was found only around Dunedin (Bull *et al.* 1985). The eastern rosella's range has continued to expand in the North Island, and by the late 1990s, they were common in Northland, Auckland, Waikato, Coromandel, western Wairarapa, Hutt Valley and Wellington, and

sparsely distributed in the Bay of Plenty, Hawkes Bay, Volcanic Plateau, Taranaki, Manawatu, and Horowhenua (Higgins 1999; Wright & Clout 2001). In contrast, in the South Island its range has remained fairly static, the eastern rosella still being confined mainly to Dunedin (Higgins 1999).

In New Zealand, the eastern rosella inhabits open woodland areas, such as along the edges or in remnant patches of native forest in otherwise open farmland, around shelterbelts and exotic plantations, in orchards, and in well-treed urban areas, especially parks and golf courses (Higgins 1999). It feeds on the ground, as well as in shrubs and trees, eating mainly seeds of native and introduced species, but also takes fruit, buds, flowers, nectar, and insects and their larvae (Higgins 1999).

From 1994 to 1997, members of the Ornithological Society of New Zealand (OSNZ) in the Wellington region carried out a study of 6 species, including the eastern rosella. The primary objective of the study was to provide members with training on determining grid locations for bird sightings before an anticipated OSNZ bird species mapping scheme that would require such experience. The eastern rosella was included among the 6 species because its distribution was thought to be expanding in the region, and little detailed information was

available on its ecology in New Zealand. In this paper we report the results of a study of the eastern rosella's distribution, flock size, and diet in the Wellington region.

STUDY AREA AND METHODS

The Wellington region of OSNZ extends north from the southern and western coastlines to the Otaki River, and east to the peaks of the Tararua and Rimutaka Ranges (Plate 4, p. 132). Record sheets supplied to members requested the following information for each eastern rosella sighting: date, time, location (map number and grid reference), activity (feed, fly, call, roost, breeding), and notes (e.g., type of food, flock size, breeding information). Nil records were not requested. The computer software package ArcView® version 3.1 was used to plot the grid reference of each rosella sighting on to a map of the Wellington OSNZ region. This package was also used to plot the Land Cover Database (a habitat map derived from satellite images) on to the regional map, and to determine the number of rosella sightings in each habitat type.

The computer package SigmaStat® was used to carry out statistical analyses. Because the flock size data were not normally distributed, the Kruskal-Wallis 1-way analysis of variance test was used to test for differences in flock size between seasons. All means are ± 1 standard deviation.

RESULTS

Distribution

Plate 4 (p. 132) shows the distribution of the 1227 eastern rosella (henceforth called rosella) sightings in the Wellington region. Most (61.2%) of the sightings were made in 3 localities. From north to south, these were Paraparaumu-Waikanae (16.8%), Upper Hutt (Te Marua to Silverstream) (38.3%), and central Wellington (Ngaio to Karori to Brooklyn) (6.1%). Areas where sightings were rare or absent were Porirua-Khandallah, Makara Beach, Lower Hutt-Petone, and Wainuiomata.

Nearly half of the sightings were in pastoral farmland (47.6%), followed by urban areas (27.1%), urban open space, such as parks and golf courses (14.3%), native forest (5.5%), scrub (4.7%), and exotic forestry plantations (0.8%) (Plate 4). Rosellas seen in native forest tended to be in small forest patches or near the edges of large forests; only in native forest to the east of Eastbourne were rosellas seen further than 100 m from the forest edge (Plate 4).

Flock size

Of the 400 sightings for which the number of birds present was indicated, mean flock size was 3.6 rosellas per sighting (SD = 4.0). Single birds made up 25.0% of sightings, 2 birds 33.0%, 3 birds 8.3%, 4

birds 10.5%, 5 birds 6.2%, and flocks of more than 5 birds 17.0%. The largest flock seen was of 52 rosellas feeding on the ground. Mean flock size did not change significantly with season: summer, 3.1 ($n = 101$, SD = 2.4); autumn, 3.9 ($n = 77$, SD = 3.5); winter, 3.9 ($n = 95$, SD = 6.0); spring, 3.4 ($n = 127$, SD = 3.4) (Kuskal-Wallis 1-way analysis of variance = 1.95, $df = 3$, $P = 0.583$).

Diet

Over 3 years (Feb 1994-Jan 1997), rosellas were observed feeding on 91 occasions on at least 21 plant species (Table 1). Of the 54 occasions when the food type was identified, 61.1% involved rosellas feeding on seeds. Other food types were buds and shoots (18.5%), fruit (14.8%) and flowers (5.6%). Assuming that rosellas seen feeding on the ground, grass or lawns ($n = 37$, Table 1) were eating seeds, then seed eating would increase to 76.9% of feeding observations. Rosellas fed on seeds during most months. Introduced plants were eaten on 80% of occasions ($n = 54$).

DISCUSSION

Before this study, the most recent information about eastern rosella distribution in the Wellington region was that from the OSNZ's bird distribution mapping scheme of 1969-1979 (Bull *et al.* 1985). That survey showed that the species occurred in Wellington city, Eastbourne, Upper Hutt, and Paraparaumu-Waikanae, and were present in 11 of the 36 10,000 yard map grid squares of the region. During the 1994-1997 study, rosellas were present in 18 squares, a 64% increase in distribution over 15 years. However, because we do not know where searches were made but no rosellas found, and where no searches were made, Plate 4 must be regarded as the species' minimum distribution in the Wellington region at the time.

The main habitats in which rosellas were seen in the Wellington region (pastoral farmland, urban areas, and urban open spaces) were those that the eastern rosella has been reported to favour, both in New Zealand and Australia (Higgins 1999). An exception was that there were few sightings of rosellas in exotic pine (*Pinus radiata*) plantations. This probably reflects the scarcity of this habitat type in the region, particularly near urban areas where most Wellington OSNZ members live. Just 5.5% of sightings were of rosellas in native forest (Plate 4). This result may reflect a difficulty of hearing or seeing rosellas in native forest, or a lack of survey effort in extensive tracts of such forest. A detailed study of habitat use by radio-tagged rosellas would be required to determine accurately the species' use of native forest in the region.

A survey in 1998-1999 of native forest patches in the Rodney district, north of Auckland, found that rosellas were common in small (< 100 ha), open

Table 1 Number of observations of foods eaten by eastern rosellas (*Platycercus eximius*) during February 1994 to January 1997 in the Wellington region

	Jan	Feb	Mar	Apr	Ma	Jun	Jul	Aug	Sep	Oct	Nov	Dec
European beech*	1									3		
Poplar								1				
Flowering cherry								1	1			
Willow						1						
Totara			1			1						
Total buds & shoots	1		1			2		2	1	3		
Himalaya honeysuckle		2										
Dandelion	1											
Total flowers	1	2										
Dock	2	1										
Thyme		1										
Anise		1										
Fennel		1										
Silver birch												1
European beech				1								
Plantain	1											
Totara	1	1	1		1	1	1	1	3			
Kahikatea						1			1			
Flax					1							
Grass	1	2							1	3		4
Total seeds	5	7	1	1	2	2	1	1	5	3		5
Apple		1		1		1						
Pear		1										
Cotoneaster				1								
Puriri				1								
Titoki	2											
Total fruit & berries	2	2		3		1						
On ground, grass and/or lawn	8	1	3			1	1	1	9	4	5	4
Total unknown foods	8	1	3			1	1	1	9	4	5	4
TOTAL	17	12	5	4	2	6	2	4	15	10	5	9

*Scientific names of plants: silver birch (*Betula pendula*); European beech (*Fagus sylvatica*); poplar (*Populus* sp.); flowering cherry (*Prunus serrulata*); willow (*Salix* sp.); totara (*Podocarpus totara*); Himalaya honeysuckle (*Leycesteria formosa*); dandelion (*Taraxacum officinale*); dock (*Rumex* sp.); thyme (*Thymus vulgaris*); anise (*Pimpinella anisum*); fennel (*Foeniculum vulgare*); plantain (*Plantago* sp.); kahikatea (*Dacrycarpus dacrydioides*); flax (*Phormium tenax*); apple (*Malus domestica*); pear (*Pyrus communis*); cotoneaster (*Cotoneaster* sp.); puriri (*Vitex lucens*); titoki (*Alectryon excelsus*).

patches consisting mainly of kauri (*Agathis australis*) and kanuka (*Leptospermum ericoides*), but were generally confined to within 100 m of the edges of large, dense, podocarp-broadleaf forests (M. Bellingham pers. comm.). However, a study in 1979 found rosellas in all 7 Northland native forests (Raetia, Mataraua, Warawara, Omahuta, Waipoua, Puketi, and Russell Forests) surveyed (Moynihan 1980), and that they were present in the interior of these forests (Ogle 1983; Fitzgibbon & Wairau 1999). A re-survey of these forests in 1993 indicated that rosella numbers had not changed substantially, and that counts were lowest in Raetia and Waipoua Forests, the 2 of highest altitude (Pierce *et al.* 1993).

Although mean flock size was 3.6, 58% of sightings were of single birds or pairs. This concurs with observations in Australia where the species usually occurs as single birds, pairs, or in small flocks (Higgins 1999). Mean flock size was only marginally greater in autumn and winter than in spring and summer. The single observation of breeding during this study was of an adult feeding a juvenile in January, suggesting rosellas may nest in spring-summer. Females alone incubate eggs and brood young chicks, so flocks should be slightly smaller in summer than at other times. Similarly, observations in Australia indicate that flock size decreases before and during the nesting season,

mainly as a result of flocks of subadult birds subdividing into smaller flocks, because adults tend to be found as solitary mated pairs throughout the year (Higgins 1999).

Our results suggest that the diet of rosellas in Wellington was much the same as has been determined for the species elsewhere (Robertson 1990; Higgins 1999). However, given the small number of feeding observations obtained during this study, our results should be interpreted with caution. A variety of food species and types was eaten, but seeds were the dominant food type, and included fallen seed, as found in Australia (Higgins 1999). Although most foods were from introduced plants, it is possible that the seeds of native trees were more important than indicated in Table 1. This is because 41% of the feeding observations were of rosellas feeding while on the ground, in grass or on lawn when the foods were not identified. The observation that the largest flock seen (52 birds) was grubbing for totara (*Podocarpus totara*) seeds in lawn sward during August 1996 supports this contention. Totara fruit ripens in February to May (RGP pers. obs.), and rosellas may feed on them for several months as they develop and ripen on the trees, and then on the ground as fallen seed. Likewise, Fitzgibbon & Wairau (1999) found that rosellas in the Whangarei area ate a variety of food types and species, both arboreally and on the ground, and that podocarp seeds and foliage, particularly totara seed, were important foods from autumn to spring.

The results of this and other studies (Higgins 1999), suggest that the distribution of the eastern rosella will continue to expand in the Wellington region. Some aspects of the rosella's ecology make it particularly suited to inhabiting much of the urban and pastoral landscape of the region. For example, rosellas eat several food types from a wide range of plant species in a variety of habitats. Furthermore, the eastern rosella does not have specific nest-cavity requirements, using hollows in limbs and trunks of a wide variety of tree species, both living and dead, and occasionally it will nest in fallen logs, stumps, burrows in the ground, buildings, and purpose-built nest-boxes (Higgins 1999).

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