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SHORT NOTE

New Zealand falcon (*Falco novaeseelandiae*) distribution survey 2006-09

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The New Zealand falcon (*Falco novaeseelandiae)* is endemic to New Zealand. Although presently regarded as one extremely variable species, there are 3 forms recognised that vary in size, colour and habitats. The 'bush falcon' is found in forests of the North I and north-western South I, the 'eastern falcon' occurs in the open country of the eastern South I, whilst the 'southern falcon' is restricted to coastal Fiordland, Stewart I and the Auckland Is (Heather & Robertson 1996). All 3 forms of the New Zealand falcon are regarded as threatened, with the 'southern falcon' classified as nationally endangered and the 'bush' and 'eastern falcons' as nationally vulnerable. All 3 forms also have the qualifier of 'Data Poor' (Miskelly *et al.* 2008).

No specific national distribution survey of the New Zealand falcon has been undertaken since the 1970's (Fox 1978), though relevant data have been included in the Ornithological Society of New Zealand atlases (Bull *et al.* 1985; Robertson *et al.* 2007). Localised studies of falcons, not always specifically on distribution, have been completed for Taranaki (Bell 2004), Marlborough (Gaze & Hutzler 2004) and Otago (Mathieu *et al.* 2006), and a national breeding survey was undertaken in 1994-98 (Lawrence 2002). As the first stage in assessing the conservation status of the New Zealand falcon, the Raptor Association of New Zealand initiated a survey to collect and collate falcon observation records. Launched on 1 Jun 2006, the New Zealand Falcon Distribution Survey (NZFDS) was conducted for 3 years until 31 May 2009. A total of 5,591 usable records of falcon were collated dating back to 1942, with an additional 8 records for the Auckland Is. For the present survey, a total of 1,761 records were available from a variety of sources (Table 1), including 650 reported online through the Raptor Association of New Zealand website (www.ranz.org.nz). Note that a blank 10 km square on the survey maps does not necessarily indicate that falcons were not present, only that no reports were received for the period of the survey.

The results of our survey confirm that the New Zealand falcon continues to be widely distributed through both islands (Figs. 1), but there were some large areas with no or few records. Areas lacking falcons in the North I include Northland, Northern Waikato and Coromandel, East Cape, inland Hawke's Bay and Wairarapa. Falcons were absent from Northwest Nelson (Kahurangi National Park), mid-Canterbury, Southland, and large areas of Fiordland in the South I. Seasonal variation in records shows a marked increase in sightings during autumn, with 31% of records in the period from Mar to May (Table 2). This is the season when juveniles are leaving their natal territories and therefore are more likely to be seen by people.

The eastern falcon was the form most frequently reported (44%, Table 3), perhaps because it inhabits more open country and is more easily observed. The least reported form of falcon was the southern falcon. However, factors other than habitat type need to be considered when comparing the percentage of records for each form, as the number

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Table 1. Sources and number of observation records of New Zealand falcon. Abbreviations: DOC, Department of Conservation; OSNZ, Ornithological Society of New Zealand; NZ, New Zealand.

Source	Records
DOC – Sounds Area Office	81
DOC – Taranaki Area Office	24
DOC – Turangi/Taupo Area Office	47
DOC – Twizel Area Office	96
DOC – Wanaka Area Office	58
Hancock Forest Management (NZ) Ltd	73
OSNZ – eBird	84
OSNZ – Otago Region	37
BIRDING-NZ Group	65
NZ Biodiversity Recording Network	53
Wingspan Birds of Prey Trust	110
NZ Falcon Distribution Survey	1033
TOTAL	1761

Table 2. Seasonal variation in the number of observation records of New Zealand falcon.

Month	Records	% total
January	166	9
February	149	8
March	193	11
April	184	10
May	179	10
June	124	7
July	104	6
August	123	7
September	119	7
October	141	8
November	158	9
December	121	7
TOTAL	1761	100

of observers and the land area varies from region to region.

Breeding status was determined for each observation based on either the location of a nest or breeding behaviour such as the dive-bombing of observers. Only 59 (3%) of the 1,761 records indicated breeding. Suspected breeding (2 or more falcons observed) accounted for 316 records (18%). The remaining 1386 (79%) records were of single falcons, which were not indicative of breeding.

Table 3. Regional distribution in the observation records of New Zealand falcon.

Form	Region	Records	% total
Bush falcon	Northland	1	0.06
	Auckland	20	1.14
	Waikato	148	8.40
	Bay of Plenty	79	4.49
	Taranaki	48	2.73
	Gisborne	8	0.45
	Hawke's Bay	43	2.44
	Manawatu-Wanganui	204	11.58
	Wellington	148	8.40
	Nelson	20	1.14
	Tasman	86	4.88
	West Coast	97	5.51
Eastern falcon	Marlborough	152	8.63
	Canterbury	330	18.74
	Otago	296	16.81
Southern falcon	Southland	81	4.60
TOTAL		1761	100

When the present distribution of falcons is compared with the 1970's survey of Fox (1978), there are notable differences, with increased presence of falcons in the King Country, Wanganui and Wellington in the North I, and Christchurch, Dunedin and coastal Otago in the South I. Although the methods of data collection for the 2 surveys were similar (media promotion, personal contact, and sourcing from relevant groups and organisations), the present survey did have the benefit of modern day electronic communication (e-mail and internet), and some of the increase in range may be due to greater public knowledge and participation in the survey.

Breeding records, (both confirmed and suspected) likewise reveal interesting differences between this survey (Fig. 2) with the 1970's survey (Fox 1978: Fig. 3). For the North I, there are now new breeding records of falcons for Wellington, Wanganui, Waikato and south Auckland, but conversely no records were received for Coromandel, inland Tauranga and central East Cape that were present in the 1970's survey. In the South I, there are new breeding records for coastal areas of Dunedin and Nelson but also an absence of breeding records for coastal areas of South

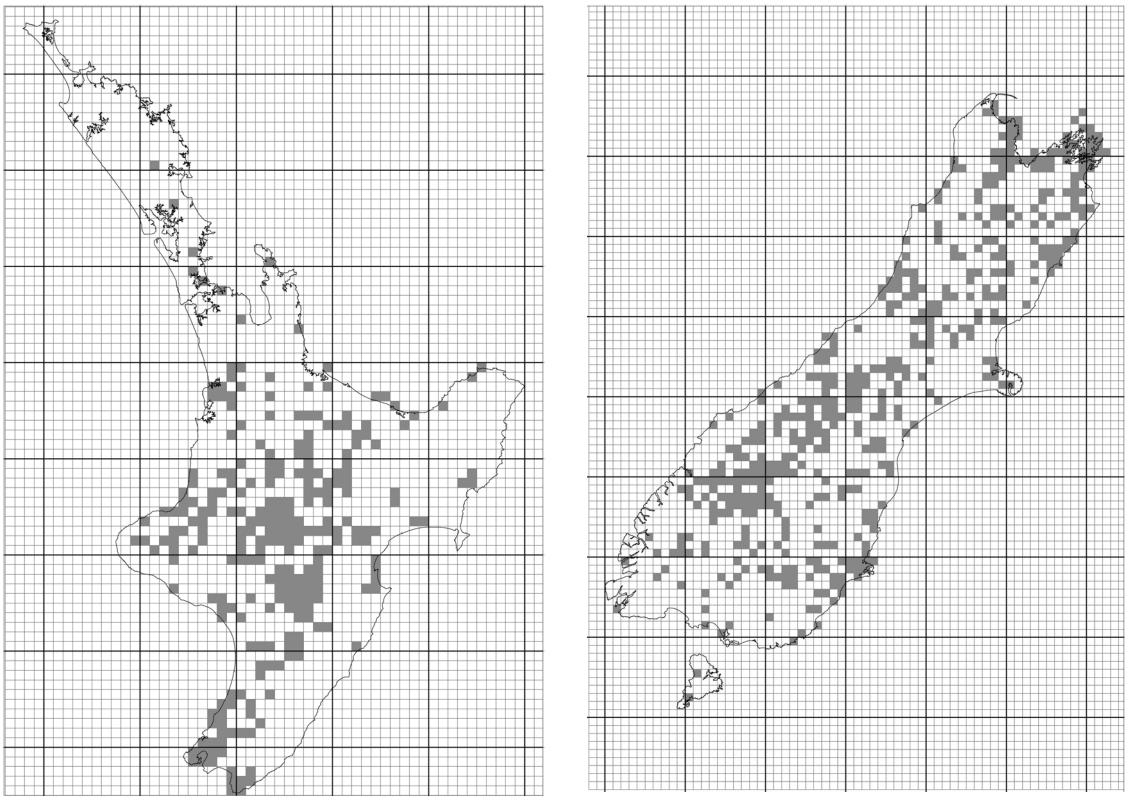

Fig. 1. Distribution of New Zealand falcon on the North I (left) and South and Stewart Is (right). Shaded squares indicate the confirmed presence of falcons. Each grid squares encloses an area of 10 km x 10 km.

Westland and Fiordland compared to the 1970's survey. There were no breeding records received for Stewart I in the latest survey but there were for the 1970's survey.

There are a number of possible reasons for the differences in both overall distribution and the breeding range between the 2 surveys. First, although similar methods were used in the 2 surveys, it is likely that some of the difference was due to variation in reporting and Fox (1978) also extrapolated reports to include adjacent areas of similar habitat. In contrast, the present survey used only known observations. Secondly, changes in land use, such as increased dairy conversions, grape growing (especially in Marlborough and Hawke's Bay), increased lifestyle blocks, and increased exotic tree plantations, may have affected changes in the abundance and distribution of falcons between the 2 periods. The importance of exotic forest as falcon habitat has only recently been fully appreciated (Seaton 2007), with 84 nests located over 3 breeding seasons in pine plantations in Kaingaroa Forest. Finally, some of the increases in breeding range have occured into areas with a high level of predator control, and this may have facilitated the spread of falcons.

The results of the NZFDS confirm that the New Zealand falcon can be observed in most areas of the country, with some minor exceptions. The survey also proved that with publicity and promotion a wide participation of respondents can be achieved, including urban, rural, and backcountry areas. For many participants in the survey, an encounter with a falcon was a memorable event, and most were keen to share the details. Although the survey did achieve wide coverage, future surveys could be further directed at hunters, who tend to get to some of the more remote locations, are keen observers and often record their observations.

The NZFDS officially concluded on 31 May 2009. However, observations continue to be submitted, as the enthusiasm and interest created by the survey is still prevalent as is the understanding by many of the need and value of such data. Given the rapid change in land use in many parts of the falcon's current range, a further falcon distribution and/or breeding surveys should be considered in

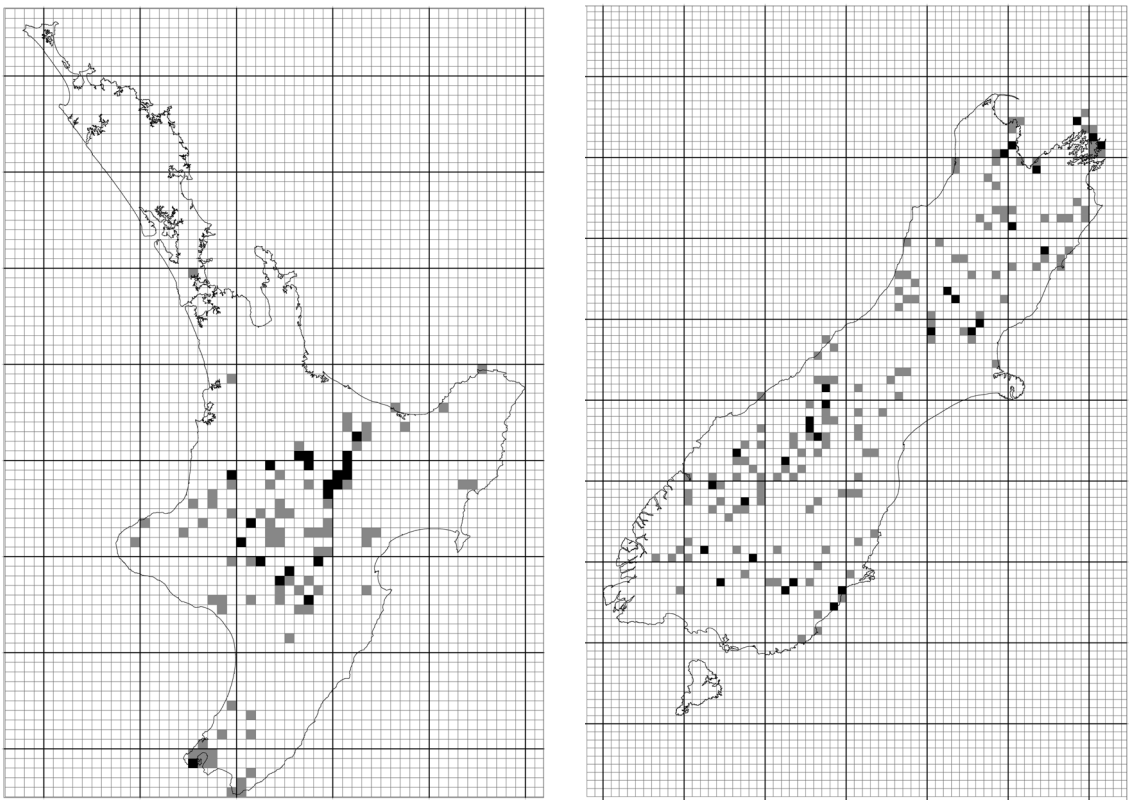

Fig. 2. Breeding distribution of New Zealand falcon on the North I (left) and South and Stewart Is (right). Lightly shaded squares indicate suspected breeding of falcon; dark shaded squares indicate confirmed breeding of falcon. Each grid squares encloses an area of 10 km x 10 km.

10 to 15 years. Areas in need of closer investigation of the possible presence and breeding of the falcon include Coromandel, Kaweka Range and central East Cape in the North I and coastal areas of the West Coast, south Westland and Fiordland in the South I, and Stewart I.

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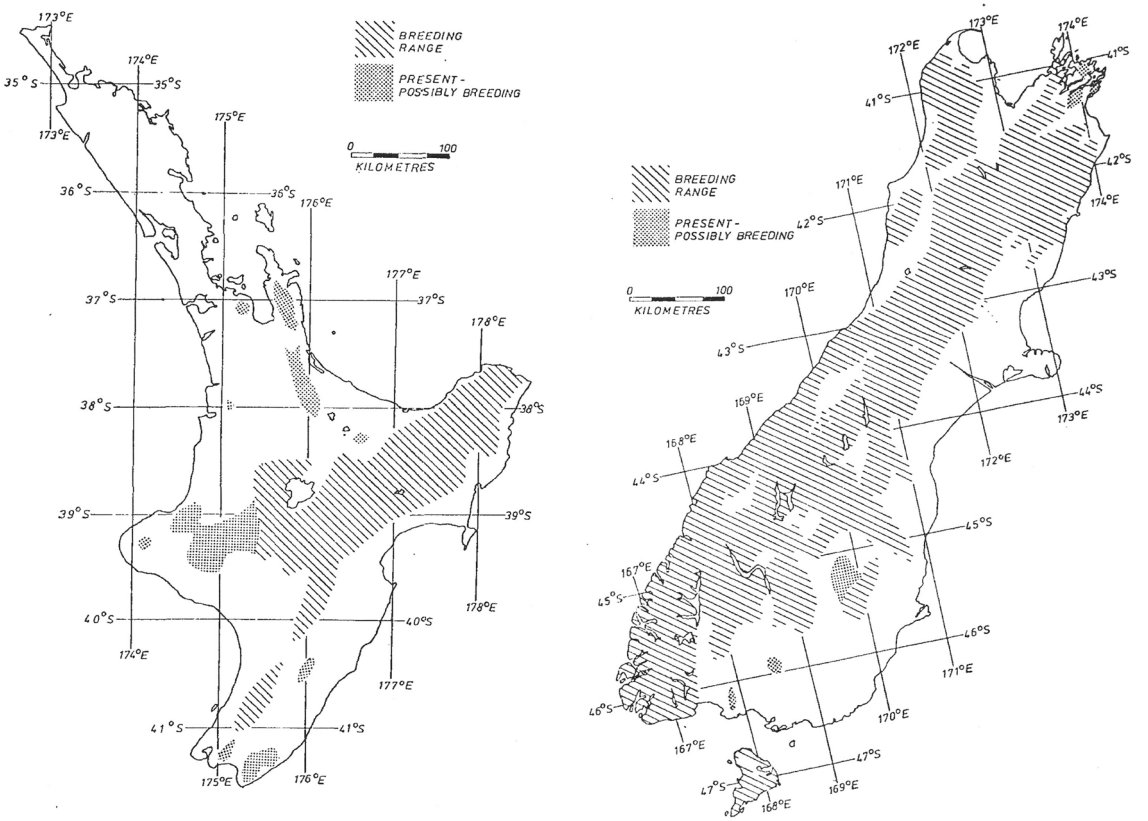

Fig. 3. The distribution and breeding range of the New Zealand falcon in North I (left) and South I and Stewart I (right) in the 1970's. Maps taken from Fox (1978).

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