Distribution of NZ Falcon *(Falco novaeseelandiae)* in New Zealand 2006-09

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Dave Bell

Cover picture by Sandy Sandblom: Juvenile NZ falcon *(Falco novaeseelandiae)* at 2000m on McKerrow Range, Lake Wanaka, 15 January 2008.

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Chapter 1 – Introduction

1.1 Introduction

For three years from 1 June 2006 to 31 May 2009 a survey was undertaken of NZ falcon observation records. A total of 5,599 records were collected and collated during this period from throughout New Zealand, including eight from the Auckland Islands.

The earliest recorded sighting collected was from January 1942, whilst the last presence report received was for 31 May 2009, though the majority of records were from 2006-09 as a result of responses to the survey.

This report summarizes the information gained from the 1,761 records received for the period of the survey (1 June 2006 to 31 May 2009).

1.2 The New Zealand Falcon

The New Zealand falcon *(Falco novaeseelandiae)* also know as Karearea, Sparrow Hawk or Bush Hawk is considered as a medium-sized falcon that is endemic to New Zealand.

Regarded as one extremely variable species, there are three forms that vary in size, colour and habitats. The 'Bush Falcon' is found in the forests of the North Island and the northwestern South Island, the 'Eastern Falcon' habitat is the open country of the eastern South island whilst the 'Southern Falcon' is from coastal Fiordland, Stewart Island and the Auckland Islands (Heather and Robertson 1996).

All three forms of the NZ falcon are currently classified as threatened (Miskelly *et al.* 2008) by the Department of Conservation (DOC), under a system for species that is based on the likelihood of that species threat of extinction. Specific classifications are:

a. Bush Falcon - Nationally Vulnerable
b. Eastern Falcon - Nationally Vulnerable
c. Southern Falcon - Nationally Endangered

The classifications for the three forms of the NZ falcon have the qualifier of 'Data Poor' – confidence in the listing is low due to there being only poor data available for assessment.

1.3 NZ Falcon Distribution Survey (NZFDS)

The concept of undertaking a national NZ falcon survey was first considered during a wet day at the DOC house in Murupara on Friday 21 October 2005.

Two then members of the Raptor Association of New Zealand (RANZ) were unable to conduct any fieldwork that day due to rain and thoughts turned to the conservation of the NZ falcon. After much deliberation, discussion and a number of cups of coffee an initial concept for 'A proposal to assess the conservation status of the New Zealand falcon' was put together. A copy of the proposal is at Annex A.

This proposal was presented to and subsequently endorsed by the members of RANZ at the Annual General Meeting (AGM) held at Waihopai Valley, Marlborough on 3 December 2005.

1.3.1 Purpose of the NZ Falcon Distribution Survey

Stage One of the proposal was 'Data collection and database construction' in other words conducting a survey to ascertain NZ falcon distribution and to collate presence records. This then became the main purpose of the NZFDS.

Though initially aimed at the previous 10 years, to follow on from the RANZ/DOC New Zealand falcon Breeding Survey 1994-98 (Lawrence, 2002), the NZFDS very soon was extended to include all available/known NZ falcon presence records.

1.3.2 Launch of the NZ Falcon Distribution Survey

The NZFDS was officially launched at the Ornithological Society of New Zealand's AGM at Wellington on Friday 2 June 2006, by a brief presentation on the then known surveys of NZ falcon, followed by details on the NZFDS and the availability of information and a reporting form on the RANZ website.

1.3.3 RANZ Website

In conjunction with the NZFDS, RANZ constructed and launched their website (www.ranz.org.nz) that included information on the NZFDS and had the facility to submit observation records online or to download a copy of the Sighting Report Form, a copy of this form is at Annex B.

A total of 650 NZ falcon records were submitted directly using the online reporting facility on the website during the course of the NZFDS.

1.3.4 NZ Falcon Distribution Survey Database

A Microsoft™ Access database was then designed and constructed, with technical assistance from the SBS Group, New Plymouth.

The fields built-in the database were so designed to mirror the options available on the Sighting Report Form. Some supplementary fields were also included to provide for the addition of applicable information.

An illustration of the NZFDS Database fields together with explanatory notes on the data entry decision making process is at Annex C.

1.3.5 Publicity of NZ Falcon Distribution Survey

Additional publicity for the NZFDS was undertaken on 16 September 2006 by distributing a 'media release' under a covering letter to a variety of media, birding and conservation organisations.

A copy of this media release together with the list of those organisations sent to, and an indication as to those that it was known published the material is at Annex D.

As a result there have been nearly 600 individuals, groups and organisations that have submitted records to the NZFDS.

A proposal to assess the conservation status of the New Zealand falcon.

AIM.

To review the conservation status of the New Zealand falcon to enable an informed conservation strategy to be formed which ensures its long- term survival both regionally and nationally.

RATIONALE.

New Zealand falcon is a unique species endemic to New Zealand, yet very little is known about its current distribution and the threats that are affecting this.

The most important first step in ensuring the long- term survival of any species is to describe its abundance and distribution and ultimately its conservation status. If this is not done, the success of any conservation action can never be assessed and decisions critical to that species' survival cannot be made.

Population estimates and the resulting current conservation status is still based on Doctorate research completed 30 years ago. Attempts have been made to assess the population status of the falcon since this time. But due to the difficulty in finding nests sites and the large amount of time required to collect breeding data, accurate population estimates are not known and the overall conservation status of the falcon remains questionable.

However there are a great many records of falcons sightings kept by various organisations across the country. These records need to be centralised, data based and mapped in order to describe distribution more accurately. The overall population size can then be assessed and the resulting conservation status reviewed.

METHODOLOGY.

The research will be carried out in two phases:

"Stage before stage one: consult and research into whether this kind of data can produce the required population estimates given the known limitations of the data."

Stage One. "Data collection and database construction"

1. Collate all available sighting data for the last 10 years
2. Design database
3. Set up a database as a centralised ongoing resource for recording confirmed sightings nationwide
4. Input data

5. Map data
6. Produce report

Sources of data:

1. Wingspan Birds of Prey Trust
2. Raptor Association New Zealand
3. Falcons for Grapes?
4. Department of Conservation
5. Regional Councils
6. Ornithological Society New Zealand
7. Academic theses
8. Forestry Companies?

Stage Two. "Analysis and conservation status assessment"

1. Analyse data
2. Carry out conservation assessment
3. Produce report
4. Convene "falcon conservation status" workshop
5. Produce final report
6. Submit to the appropriate body?

ASSUMPTIONS AND KEY LIMITATIONS

Data collected in this way cannot produce precise population numbers. Ideally a National breeding survey would be carried out which would give the best data for describing population size. However this data will describe the distribution of falcon nationwide, and most importantly, more intensively than any other method previously used. Understanding the distribution of falcon will give a good basis for describing population estimates and is the only practicable option for New Zealand falcon considering the nature of the species and current resources available. Many species the world over suffer from such problems and statistical techniques have been developed to deal with such data? *Before funding is sought after and this is data collated these techniques will be thoroughly researched to ensure the validity of the research.*

Data collection in different regions will be biased both by differences in individual effort and by the individuals skill in identification. Sightings will be scored on a relative scale of reliability and where obvious gaps in the data occur the occurrence of falcon will be further investigated by widening the survey effort outside of the organisations listed above e.g. to local hunting groups and other outdoor users. Where there are no reports of falcon from areas which are not frequented often but there are confirmed sightings of falcon nearby it will be extrapolated, on a case by case basis, that falcon occur here, providing all factors are constant.

DATA OWNERSHIP.

Data will be made accessible to all the organisations involved and a system set up so that others can apply to use the data at the discretion of the data base holders or manager.

Raptor Association of New Zealand
NZ Falcon Sighting Report Form

1. **Date of sighting**:

Day	Month	Year

2. **Location**: GPS reading -

Elevation	Eastings	Northings
m		

or NZMS 260 Sheet GR -

Sheet No		Eastings	Northings

or Detailed description -
(See Note 1 below)

3. **How many falcon observed**:
(See Note 2 below)

4. **What activity was observed**:
(See Note 3 below)

5. **Any other comments**:

6. **Your contact details**:

   a. **Name**:

   b. **Address**:

   c. **Phone**: ( )

   d. **E-mail**:

Privacy Statement – The personal information supplied here will not be given to any third party and is for the use of the Raptor Association of New Zealand (RANZ) for clarifying falcon sighting information or to request additional detail. The information is held securely and may be requested to be viewed by individuals by making a request to survey@ranz.org.nz

Notes:

1. As much information that can be provided as to location would be beneficial, by means of a road name, track or hut name, river/stream/creek name etc.

2. The number, gender (if able to distinguish) and age (adult, juvenile, fledgling, or chick) of falcon observed would be of great benefit.

3. The activity observed (flying, chasing prey, perching, carrying prey etc.) is also very useful, particularly when combined with time of year observed.

Please post completed form to: RANZ, 9 Spencer Place, New Plymouth 4312

NZFDS Database

The fields of the NZFDS Database are:

a. **Record No –** consequential number allocated to each record
b. **Sighting Date –** date on which the sighting was made. Minimum excepted was month and year. If the day not provided the 15th was used
c. **Report Date –** the date on which the report was received by RANZ
d. **Source –** from where the sighting had originated, the options being;

1) NB Taranaki – from the Report on sightings in Taranaki
2) S & J Rowe – from OSNZ members Stella and John Rowe
3) Website – submitted online through the RANZ website
4) Others – all other including Sighting Report Forms and letters
5) Birding-NZ – those extracted from the Birding-NZ e-mails
6) S Lawrence – those from RANZ member Steve Lawrence
7) RANZ/DOC – from the breeding survey in 1994-98

e. **Map –** the NZMS 260 map number
f. **Eastings –** seven figure number donating the NZMG Eastings
g. **Northings –** seven figure number donating the NZMG Northings
h. **Region –** the regional authority in which the sighting occurred
i. **Location% -** percentage of accuracy of the location of the sighting, the option being;

1) 100% - GPS reading or Eastings/Northings were provided
2) 75% - accurate location description was provided
3) 50% - useable location description was provided
4) 25% - poor location description was provided (a guess)

j. **Description –** a brief description of the location of the record
k. **Bird Number –** number of birds observed
l. **Breeding –** whether or not it was a breeding record, the options being;

1) Yes – either the observers actually saw a nest or were 'dive-bombed'
2) Suspected – two or more falcons were seen or heard together
3) No – single falcon seen or heard

m. **Sensitive –** if the sighting record was sensitive, the options being;

1) Yes – all breeding records and if requested by respondent
2) No – all other sightings records

n. **Reporter Name –** the name (as given) by the respondent
o. **Organisation –** the organisation (if given/known) of the respondent
p. **Reporter Address –** mail address of respondent (if given)
q. **Reporter Phone –** phone number of respondent (if given)
r. **Reporter Email –** email address of respondent (if given/had)
s. **Memo –** any additional comments made by respondent

Media Release – NZ Falcon Distribution Survey

NATIONAL FALCON SURVEY

The Raptor Association of New Zealand (RANZ) is conducting a national survey of the New Zealand falcon. The aim of this project is to record and collate all past, present and future sightings of this charismatic raptor. The New Zealand falcon is a unique species, only found in New Zealand, yet very little is known about its current distribution and the threats that may be affecting this.

In the 1970's Dr Nick Fox undertook the first detailed study of the NZ falcon and described its distribution. Since then evidence suggests that the species may be in decline. In order to obtain an accurate measure of the distribution of NZ falcon RANZ requires the input of a great many people. We are asking for sightings from you of NZ falcon nationwide. From this, we hope to gain a more detailed idea of the distribution of NZ falcons, which then will place us in a better position to address this unique species' conservation.

In order to commence the capture of present and future sighting records RANZ has established a website (www.ranz.org.nz) to which sightings can be reported online or a Sighting Report Form downloaded. For those without Internet access forms may be requested from RANZ, C/- 9 Spencer Place, New Plymouth 4312, Phone (06) 757 2570.

Please ensure one sighting record per form. For those that may have multiple sightings a special form maybe obtained from the above address/phone number or from enquires@ranz.org.nz.

Since the launch of the national falcon survey and the RANZ website on 2 June 2006, 118 new sightings have been received (28 via the website). Currently there are a total of 694 sighting records of the NZ falcon held. This is a great start! But we need many more to get an accurate picture of distribution, AND YOU CAN HELP by simply filling out a form!!

It is hoped that readers and associates will be able to assist RANZ by reporting all past and present falcon sightings. Although RANZ is concentrating on the last 10 years (from 1995) any previous records would be most welcomed and can only add to our knowledge of these fantastic birds of prey.

Dave Bell
National Falcon Survey Coordinator
Raptor Association of New Zealand
www.ranz.org.nz or enquires@ranz.org.nz

The above Media Release was sent with a covering letter to the publications listed below, also sent was an electronic version on disk together with an image of a NZ falcon for possible use.

Magazines

New Zealand Kayak Magazine
New Zealand Pig Hunter
New Zealand Outdoor*
New Zealand Guns & Hunting
Fish & Game New Zealand
New Zealand Rod & Rifle*
New Zealand Hunting & Wildlife
New Zealand Lifestyle Block*
Wilderness Magazine*
Forest & Bird
Southern Bird*
FMC Bulletin*

Rural Post Newspapers

Rural News
Country-Wide
The New Zealand Farmers Weekly*
Straight Furrow

* Donates those that where known to have published information on the National Falcon Survey.

Chapter 2 – NZ Falcon Distribution Survey

2.1 Introduction

Though NZ Falcon Distribution Survey collated a total of 5,599 observation records only 1,761 of these records actually fell within survey period of 1 June 2006 to 31 May 2009.

This 1,761 total also included a period of grace for one month up to 30 June 2009 for reports received for which the record date was prior to 31 May 2009.

Brief analysis of the data collected is now undertaken with some distribution maps included as Annexes.

2.1.1 Regional Distribution

The observation records were designated on distribution by Regional Authority boundaries, to provide a simple indication of national coverage. It should be noted that because of many variables (population, area and topographic features etc.) not too much should be read into these figures, without consideration of the factors.

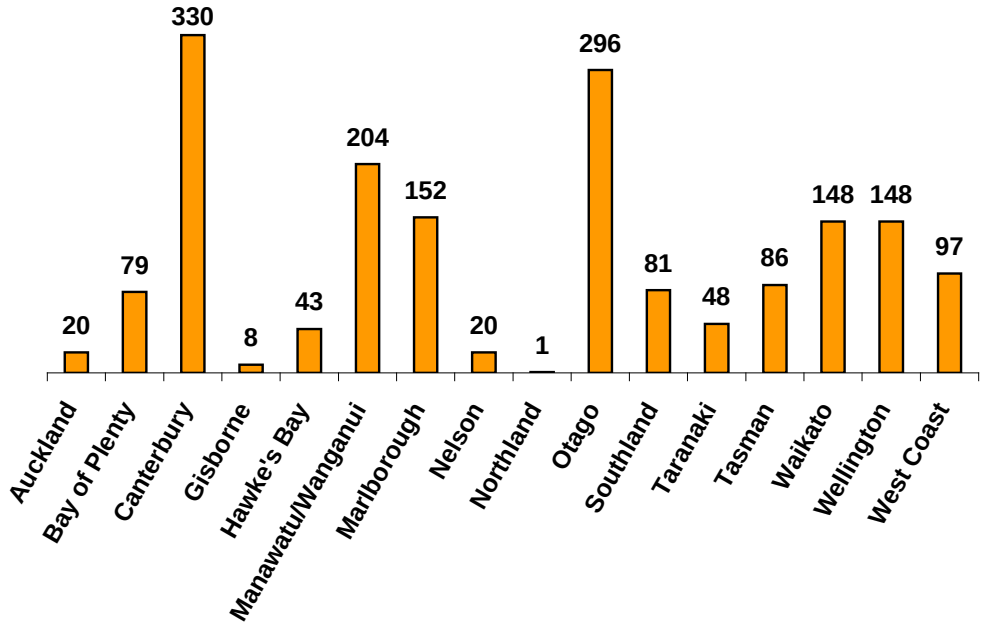


Table 1 Regional distribution of the NZFDS observation records

It can clearly be seen that it was the 'Eastern' form of the NZ falcon (in Otago and Canterbury) that provided more than one third of all observations records received, whilst there was only one confirmed record for Northland.

2.1.2 NZFDS – National Distribution Map

A map displaying all 1,761 observation records is at Annex A, though spread fairly widely throughout the whole country, except for a few notable areas.

In the North Island, Northland and the Coromandel, Southern Auckland and Northern Waikato, inland East Cape and Hawke's Bay and Wairarapa, plus coastal King Country and Whanganui National Park are the most obvious sparse areas for records.

In the South Island, northwest Tasman (Kahurangi National Park), the Canterbury Plains and Southland, Fiordland and Stewart Island have fewer records than other areas.

2.1.3 Seasonal Variation

The 1,761 records for the NZFDS were also collated in seasonal (monthly) categories, to best illustrate when during the year observations were made. Again obviously there are a number of factors that affect this data, not least of all the weather and human activity associated by it.

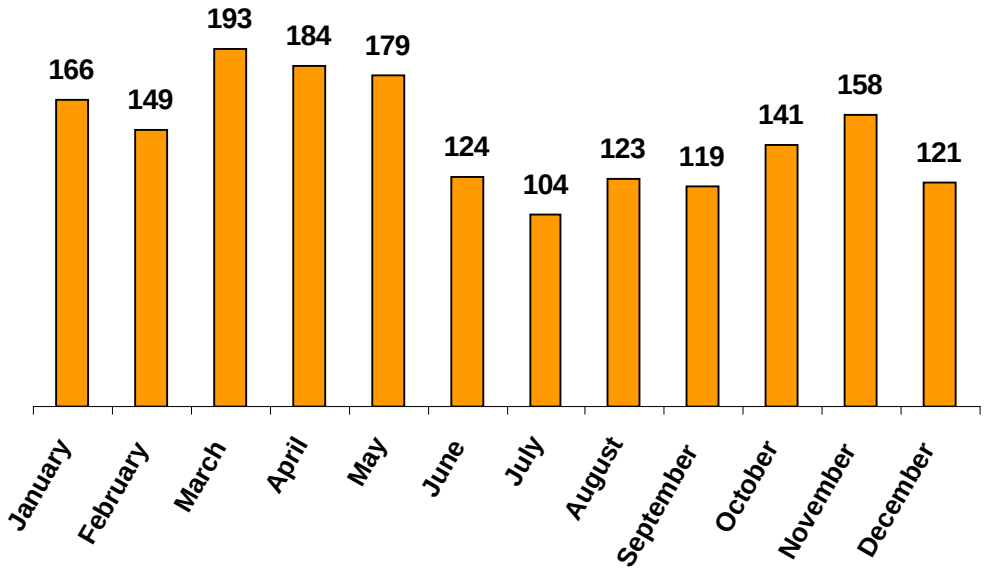


Table 2 Seasonal variations of the NZFDS observation records

The autumn months of March, April and May proved to be the most popular season for observation records with almost a third of all the records. This is considered to fit well with the seasonal events for the NZ falcon in that juvenile falcons are 'leaving' the breeding territory to find their own way in the world.

2.1.4 Breeding Records

To try and establish an idea of the breeding range of the NZ falcon in New Zealand, all the observation records received where classified as either a confirmed breeding record, suspected breeding record or as a no for breeding.

To be a confirmed breeding record there had to be either a nest observed or the observer was dive-bombed by one or more falcon. A suspected breeding record was for two or more falcon observed together, whilst a no record for breeding was for single falcon observations.

Of the 1,761 records received, 59 (3%) were for confirmed breeding, 316 (18%) were for suspected breeding and the remaining 1,386 (79%) of the records were for no to breeding.

2.1.5 NZFDS – Breeding Range Maps

Maps displaying the distribution of confirmed and suspected breeding for both the North Island and South and Stewart Islands are at Annex B.

With the exception of the Wellington area all the confirmed breeding records are in the central North Island region, though the suspected breeding records cover a wider geographical spread, which bodes well for the overall possible breeding range.

In the South and Stewart Islands there is a far wider distribution of confirmed breeding records, but again with the exception of the Marlborough Sounds and Otago, they are generally confined to the main divide. Together with the suspected breeding records there is generally a good overall spread throughout the South island. There were no confirmed or suspected breeding records received for Stewart Island.

2.2 Availability of Observation Records Data

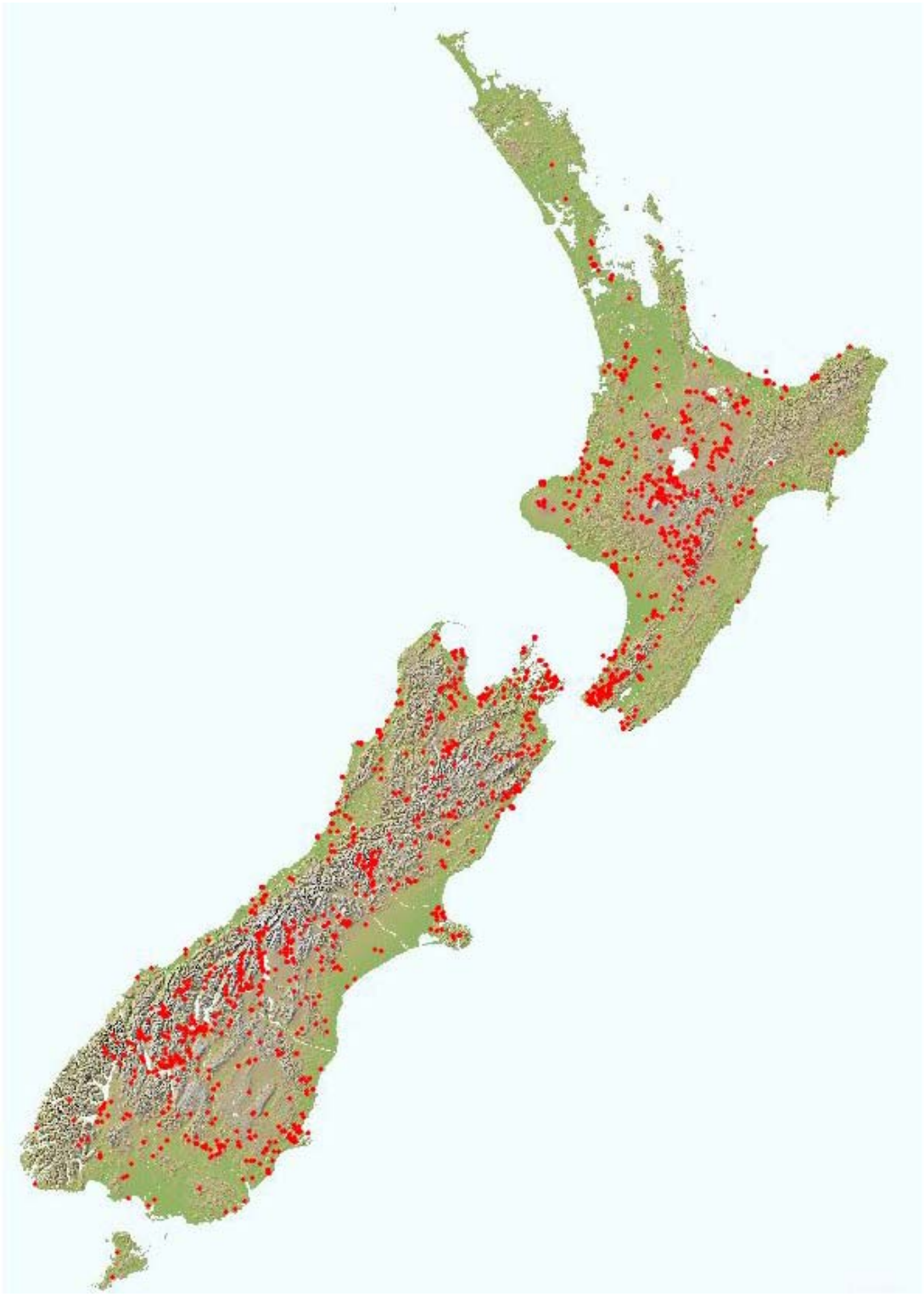
When all the observation records collated (over 5,990) during the survey are included there is some valuable and historic data that is available on request for those researching the NZ falcon or wanting to be aware of locations where NZ falcon have been observed in specific regions or areas.

Requests for information should be made stating specific areas/regional locations and/or dates. A full set of complete records data will not be made available.

Generally there will not be any charge for provision of such data, especially to those individuals, groups or organisations that provided observation records, though the author reserves the right to charge to recover any exceptional costs.

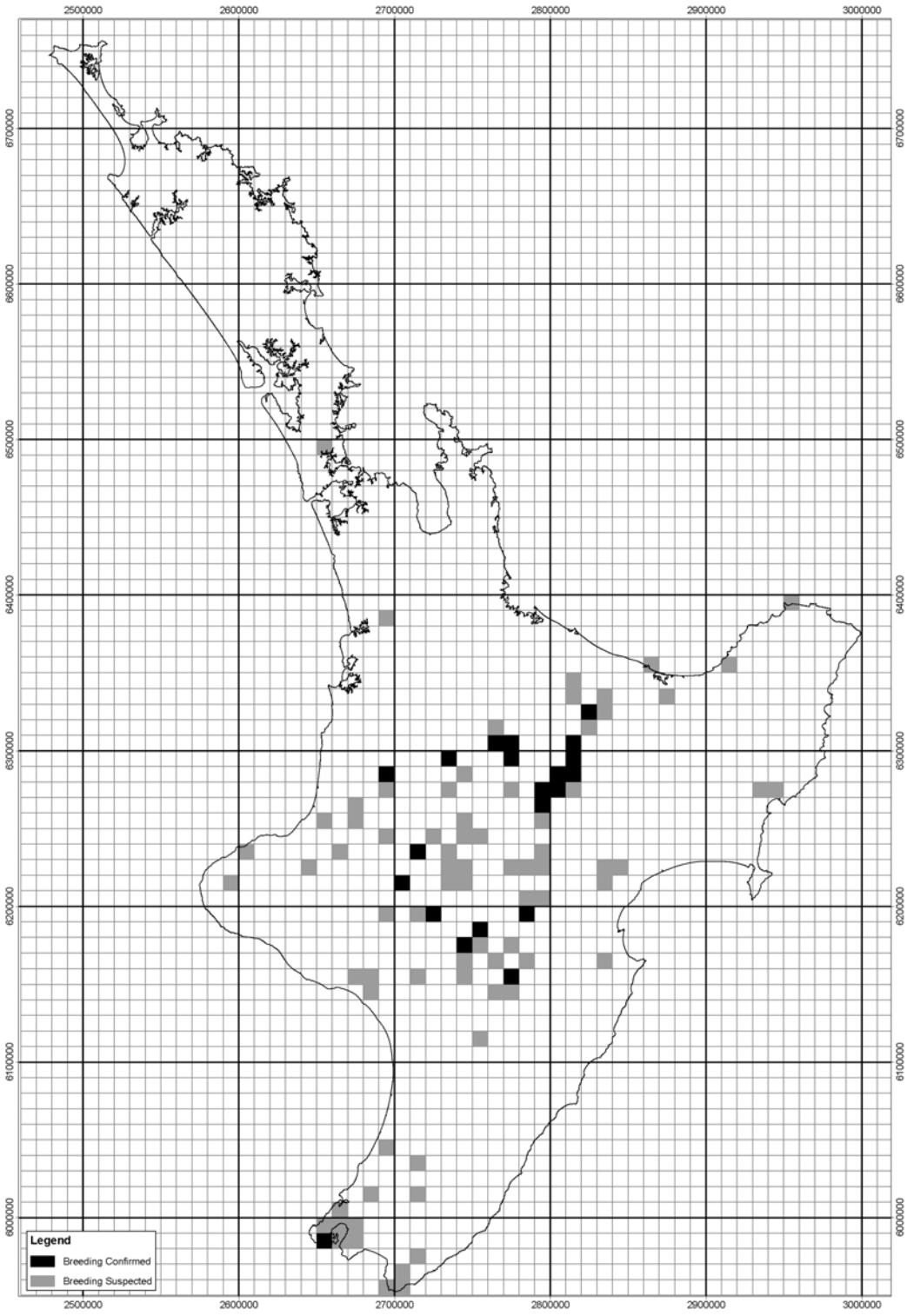
Annex A to Chapter 2
Distribution of NZ Falcon in New Zealand

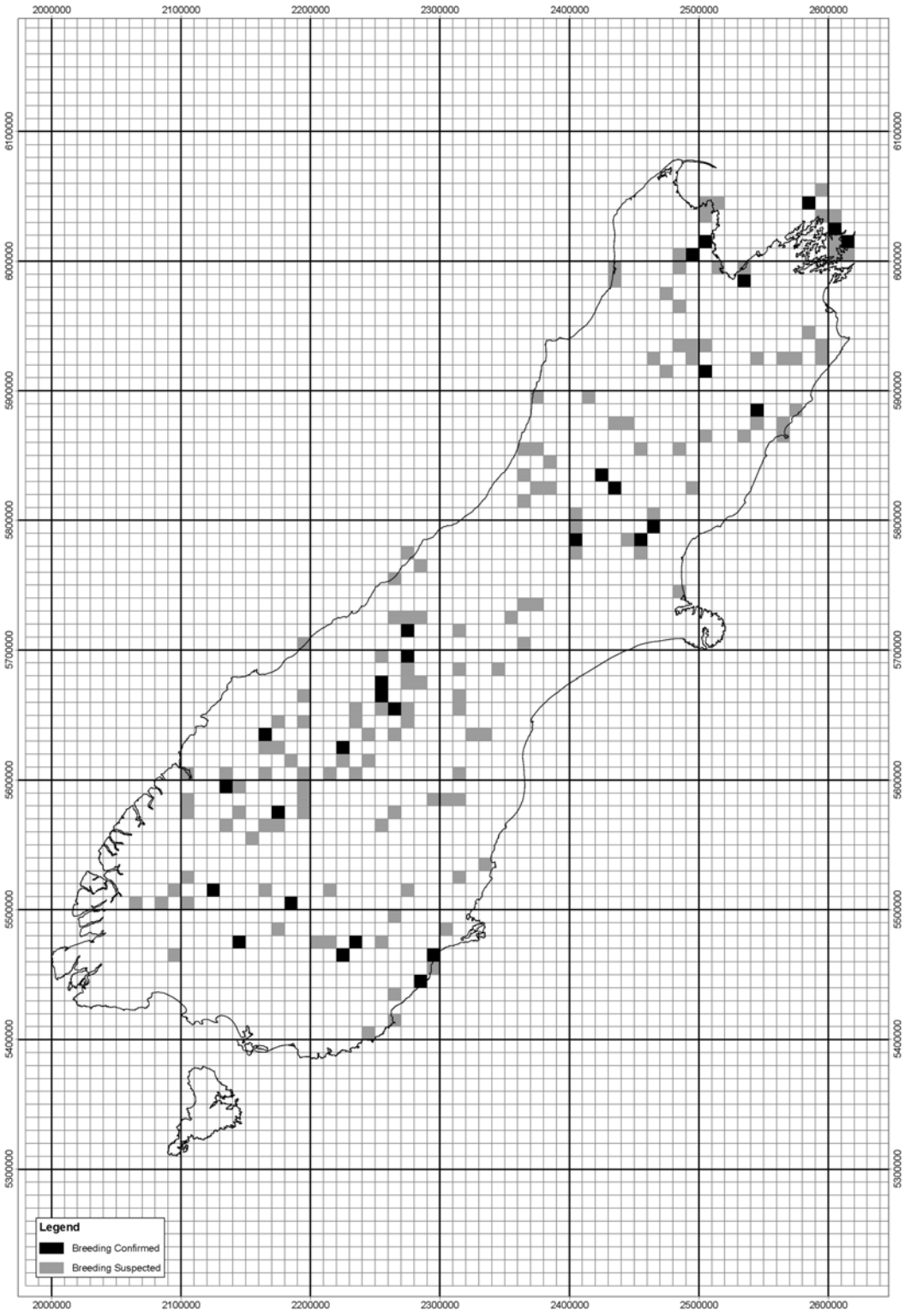
NZFDS – National Distribution Map



Annex B to Chapter 2
Distribution of NZ Falcon in New Zealand

NZFDS – Breeding Range Maps

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Legend
Breeding Confirmed
Breeding Suspected

Chapter 3 – Other NZ Falcon Matters

3.1 Introduction

During the course of the NZFDS a number of interesting details were either mentioned by respondents to the survey or were unearthed during research into additional sources of presence records.

3.2 NZ Falcon and Mustelids

A number of respondents to the NFS made mention of the possible threat to the NZ falcon, especially those nesting on the ground from the three predatory mustelids (ferret, stoat and weasel) introduced in to New Zealand.

Surprisingly there have been a number of record instances of encounters between falcon and mustelids, in particular the stoat. Most recently during research on a falcon nest in Kaingaroa Forest a pair of falcon were observed defending their nest of four eggs successfully for over an hour from the attentions of a stoat (Thomas, 2008).

Also seen in Kaingaroa Forest were two juvenile falcons attacking/playing with a stoat that reared on to its hind feet in defiance of the aerial assault that it was being subject to (Rich Seaton, pers com).

From the early 1970s came an observation of a NZ falcon with a freshly killed stoat at the Worsley River, Lake Te Anau, flying over the river with the stoat dangling in the water (Morrison, 1980). Also on 28 December 1979 a falcon was observed to catch a small stoat outside Dumpling Hut, Arthur Valley and fly back to its usual perch in a dead beech and begin to pluck its catch (Morrison, 1980).

A sighting has also been recorded (Calder, 1984) of a falcon seen with a still struggling ferret it its talons raise up from the roadside. Though relatively a small ferret the falcon was seen to lurch somewhat in flight with its prey.

These details though do not mean that the ‘battle’ between the NZ falcon and mustelids is one sided and it must still be presumed that mustelids could pose a significant threat to the NZ falcon.

3.3 NZ Falcon and 1080

Again a number of respondents to the NFS expressed concern with the possibility of 1080 poison effecting the population and survival of the NZ falcon.

The known facts on this sometimes controversial subject are far from conclusive, but two known details might suggest that the NZ falcon may not be that affected by the use (particularly the aerial application) of 1080.

More research will need to be undertaken before a definitive answer could be given on the effects/non-effects of the use of 1080 on the NZ falcon.

3.3.1 Prey of the NZ Falcon

Generally speaking the NZ falcon is known to mainly take liVe prey (but see also 3.4 below) and therefore would not be feeding on poisoned prey, though there is possibly still a danger that even live prey might be infected with the poison.

3.3.2 Research at Kaingaroa Forest

During a recent extensive study of the NZ falcon in the Kaingaroa Forest over three breeding seasons (Seaton, 2007) it was found that though widespread use of 1080, both ground and aerial application was undertaken this had no known adverse effects on the survival of the monitored NZ falcon population.

3.4 NZ Falcon Eating Carrion

The taking of carrion, in particular road-kill by NZ falcon would appear to possibly be a more common occurrence than initially appreciated, as falcon are usually regarded not to be carrion eaters.

One documented case (Taylor, 1977) reported a NZ falcon being observed at Jackson Bay, south of Haast on the West Coast eating a fish head on the boulder beach on 17 January 1977.

Subsequently Peter Gaze, from the Department of Conservation in response to an internal E-mail in 2002 collected 22 reports from DOC staff that had observed falcon eating carrion. A common theme with these records is that it mainly involved juvenile falcon during the winter months, suggesting their need to find ‘easy’ food.

It should also be noted that nine responses to the request for information also stated that though the opportunity existed falcon had never been seen to take carrion. This is a subject that would do with some more investigation and research.

3.5 Close Approach

Many of the respondents to the NZFDS remarked at how close they could approach the NZ falcon, and several of the photographs provided would bear this out.

As the top native predator in New Zealand the falcon does not have much to fear and is world renowned for its aggressive and persistent nest defence, yet when captured and ‘in-hand’ during approved research projects they are as calm as can be.

3.6 Abundance and Distribution

Many respondents to the NZFDS commented that they considered that the NZ falcons were now more common and being observed in areas not previously seen in.

Though the NZ Falcon Distribution Survey was not able to ascertain abundance of the NZ falcon but was an exercise in recording presence and distribution, there is undoubtedly a consensus that the NZ falcon is surviving well in modern day New Zealand.

With the recent confirmation that the NZ falcon is adapting well and breeding in exotic plantations in many parts of the country bodes well for the future of our only endemic bird of prey.

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First and foremost a great deal of appreciation must go to the many individuals that took the time and effort to report their observations whether singular or multiple and to the numerous groups and organisations that shared and provided copies of their observation records.

Though unwilling to highlight individuals, mention does need to be made of a few individuals and some couples that were particularly significant in their contribution to the NZFDS, in no special order they were:

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Ron Eddy	Mark Ayre
Dave and Gail Timmerman-Vaughan	Brent Rohloff
Bev Elliot	Blue Cumberworth
Shaun Barnett	Gary Davis
Nigel Milius and Wendy Hare	Bob Badland

A special word of thanks to all those that kindly provided copies of their photographs and video footage of their NZ falcon encounters.

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Sounds AO	-	Bill Cash
Taranaki AO	-	Dean Caskey and Emily King
Turangi/Taupo AO	-	Lucy Roberts and Fiona McGuire
Twizel AO	-	Dean Nelson
Wanaka AO	-	Florence Gaud

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