THE VAN TIENHOVEN FOUNDATION

FOR

INTERNATIONAL NATURE PROTECTION

REPORT ON A VISIT TO LATE AND FONUALEI ISLANDS,

VAVA'U GROUP, KINGDOM OF TONGA

DICK WATLING

5TH AUGUST 2003

1 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

The Van Tienhoven Foundation provided Dick Watling with a grant of US$2000 to enable him to visit the islands of Late and Fonualei to determine the success of translocation efforts of the Polynesian Megapode *Megapodius pritchardii* to those islands in the early 1990s. This report is the formal account of the visits for the Van Tienhoven Foundation and is submitted in accordance with the conditions of the grant

1.2 POLYNESIAN MEGAPODE

The Polynesian megapode is the rarest of all 22 megapode species (Megapodiidae, Galliformes, Aves). Previously there were an estimated 188-235 pairs in 1991-1993 restricted to the tiny volcanic island of Niuafo'ou, Kingdom of Tonga, it is listed as *critically endangered* (B1 + 2e: IUCN-criteria) in the Megapode Action Plan 2000-2004 and in various publications by BirdLife International (2000 Threatened Birds of the World). From 1991 to 1993 60 eggs were buried at volcanically heated sites on Late, and an additional 35 eggs and chicks were transferred to Fonualei, both uninhabited and rarely visited by humans. Surveys of Late in 1995, 1996, and 1997 *claimed* that the re-introduction to this island (where according to the fossil record the species occurred in pre-human times) was successful, but no written evidence has ever been published. Discussions by R. Dekker, Chairman of the Megapode Specialist Group and Dick Watling, with C. Matevalea in Tonga in 2001 who claimed the surveys in 1995 – 1997, did not give any hard evidence of the success of this re-introduction, other than she said that 'there were many'.

1.3 METHODS & TIMING

I had made three trips to Vava'u during the preceding 18 months to his visit in March 2003. On each occasion the possibility of travelling to Late and Fonualei had been pondered but on each occasion the seas were too rough to consider landing on either island. It was realised that the most likely time of finding good weather and calm seas was ironically during the cyclone season when large high pressure systems come down south. In March 2003 following some survey work in southern Vava'u, a high pressure system with good weather and calm seas appeared. The chance was taken immediately. A high speed boat was chartered from Mr Alan Bowe of Muonu Resort, Late was visited 18-19th March and Fonualei 20-21st March 2003. Neither island has a harbour or anchorage close to shore and so landings are always `wet landings'. These are possible when the seas are calm, but when there is a swell, these can be dangerous. Boats cannot anchor safely except in the calmest weather and so have to be manned continuously during any visit.

It was believed that short visits would be sufficient to determine the presence of the megapode through the use of tape recordings of their call. The use of play-back territorial calls worked extremely well when Dekker visited Niuafo'ou in 2001, with birds strongly reacting and coming close towards the broadcaster.

2 RESULTS

2.1 LATE ISLAND, VAVA'U

Late is an uninhabited[1] 15 sq km island which rises to 565m. It is volcanically active but has been dormant since 1854.

We arrived at Late before midday on 18th March 2003 and after circum-navigating the island chose a boulder beach on the north east side to swim too. Four of us landed, myself and a Tongan Eva Taumalolo formed one party and Kirsty and Jason Bowe formed another making coastal observations.

Eva and I struck inland across what appeared to be relatively flat terrain leading up to a steep climb to the summit. It proved to be very thick vegetation and hard going with very sharply reliefed terrain on a small scale. The vegetation comprised broadleaf trees and shrubs of small stature - mostly below 6 m with emergents, especially *Casuarina equisetifolia* and *Ficus* spp. Every 10-15 minutes we stopped to use the `play back recorder'. Visibility inside this forest was only a matter of meters and it was unlikely that the recorder could be heard very far. At about 1600 we climbed a small ridge which gave us a good views just above the forest vegetation and enabled the playbacks to carry much further. We used this site to make observations and use the play back recorder until the evening before returning to the boulder beach.

We saw no megapodes during the day and heard nothing responding to the play-back. The weather was good throughout, sunny and not too windy but very hot and the mosquitoes voracious. Our other team, Kirsty and Jason also made no observations of megapodes.

Eva and I slept in the open on the beach, the mosquitoes kept us awake most of the night. Next morning at O645 headed straight back to the observation ridge and remained there until 0930 without any success. We then took a different route, making observations and play backs through similar thick vegetation, returning to the boulder beach at 1330. We swam out to the boat and returned to Muonu, Vava'u, reaching there in the evening.

2.2 CONCLUSIONS FOR LATE

No megapodes were seen or heard during our visit on Late and there was not the slightest indication that they may be present. However, we covered only a small proportion of the island perhaps 10-15% of the island was within hearing distance of the play-back calls. We did not reach the summit or anywhere close to it and we did not find the 'lake' or find any thermal sites.

On the basis of our visit, we cannot conclude that megapodes are not present on the island. They could be present and uncommon.

Another visit would be required to confirm their presence or absence. A longer stay - 5 days would be required and one of the regular Tongan visitors to Late from Neiafu should be taken as they know where the few paths or easy climbing routes are.

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[1] Late was formerly inhabited but its inhabitants were moved to the mainland of Vava'u in the 1830s (?) to forestall the slave raiders who were raiding isolated islands at the time.

We can confirm that at least one Red Shining Parrot *Prosopeia tabuensis* survives from the release by the Tonga Wildlife Park in the mid 1990s. One bird was heard and seen very briefly, there may well be more but only one bird was definitely seen.

2.3 FONUALEI ISLAND

Fonualei is a round volcanic cone, approximately 1.5km across, which rises to about 195m. There are steep cliffs on all but the eastern side, and trees only in a few steep small valleys and certain slopes. Eruptions in 1846/7 and in 1864 covered Vava'u (about 70 km away) with ash which also blew onto ships 800 km away. There were new lava flows in 1939 and explosions in 1943. Big eruptions took place in 1946/7 which formed a new cone inside the crater. Thermal vents and areas of warmed soil from which steam rises early on cool mornings can be seen at several places around the island.

We arrived at Fonualei before midday on 20th March 2003 and after circum-navigating the island chose a landing place on the south western side (probably the only landing place on the island - the remaining coastline being jagged larval cliffs.

Figure 1: Aerial Photo of Fonualei from the north (courtesy R.Dekker).

We headed inland on what appeared to be the easiest route up and into the central cone and towards the one slope with relatively tall and thick vegetation. It turned out to be a relatively recent larva flow and just a myriad of small cliffs and ravines of jagged black larva covered in vines, ferns and 1-3m shrubs. It took us about two hours to get circa 500m close to a position overlooking a ravine with the well-vegetated slope on the other side. From this vantage point, I started with the play-back while Eva and the other team of Kirsty and Jason continued up the larva flow.

For ten minutes I alternated play-back with periods of silence for listening - about a minute of each - with no sign or sound of megapodes. At that point, I decided to stand up and stretch my legs and look behind my vantage point. At the moment I

stood up, a bird exploded out of the short ferns 5 m to my right and flew across the ravine into the thick vegetation. Its dull brown plumage, 'absence' of a tail and heavy orange trailing legs clearly indicated it to be the Polynesian megapode.

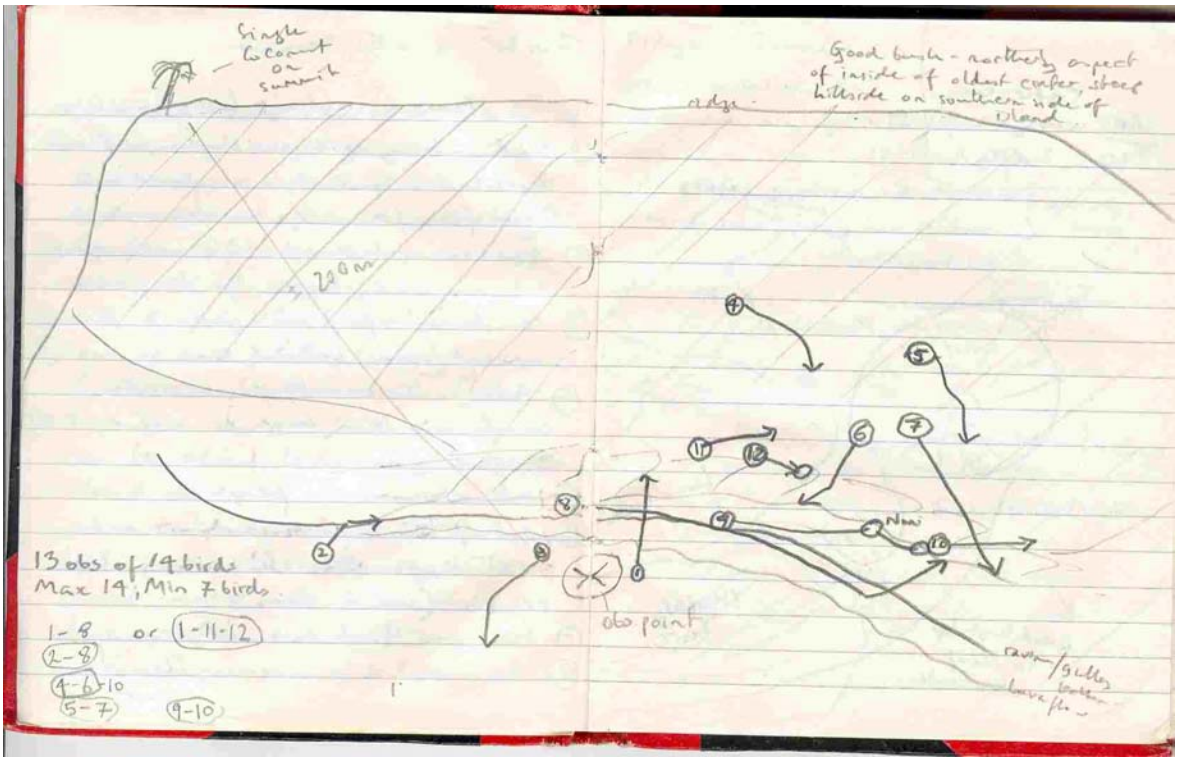
Over the 45 minutes I had 13 observations of 14 megapodes. Most of these were birds flying up briefly above the vegetation and then diving back down into it, as shown on Figure 1. Two of the sightings were of birds sitting on exposed branches of short trees, about 1.5-2m above the ground. Given the sequence of appearances and their location, it is possible that the 14 sighting megapode sightings above represented a minimum of seven birds.

Thereafter Eva, Kirsty and Jason returned having seen 15 megapodes on a walk to the summit. We then returned to the landing beach by two close but different routes and saw one more megapode, right down on the bare lava close to the cliff edge, a few metres away from any vegetation.

While passing through a small Sooty Tern colony on the lava flow, one predated egg was found still in the nest cavity. Clearly predated in situ by something with a strong beak - but not strong enough to remove the whole egg. Banded rail seems likely but in their absence on the island (not seen but could be present), the possibility that the megapode feeds on eggs should not be discounted.

That night Kirsty and Jason returned to the boat offshore, Eva and I slept on the beach without any shelter. Fortunately, no mosquitoes on Fonualei but unfortunately it started to rain at about 2000 and continued drizzling until dawn. We both slept in dustbin bags !!

Figure 1: Notebook sketch of initial playback location and megapode sigthings, Lines represent flight lines from emergence to dropping back into the bush.



Soon after dawn we started climbing directly up from the beach - the direct route which looked steep with thick vegetation. It was decided not to take the play-back apparatus, so that I was more manoeuvrable and so that we could cover more ground. In fact it was infinitely easier than yesterday's hike and where the vegetation was thick it was quite easy to walk underneath it on our hands and knees. It was in these circumstances that we suddenly found ourselves in a megapode nesting area, with open burrows lightly scattered through what looked like quite a large site. We had well over an hour watching several megapodes walking around us most unconcernedly and we also saw three megapode chicks. Continuing up and out of the thick vegetation we then climbed through fern country up to the top ridge, having only one ravine to cross near the ridge. From there we walked through short grassland right to the summit of the new volcanic cone where we found an enormous nesting colony of Sooty Tern *Sterna fuscata.*

During the ascent we had several sightings of Friendly Ground-doves *Gallicolumba stairii,* all of remarkably tame individuals and this globally 'Vulnerable' species if clearly quite common on the island.

By about 1000 the wind was beginning to get up and we could see storms approaching Fonualei from the south east and so we decided that we had better return to the beach and the boat. We left the island at midday and experienced a very wet and rough ride back to Neiafu, Vava'u.

On the second day we had 25 observations of 26 birds. It is possible that 11 of these birds were in fact double counted and so a minimum number of birds seen is believed to be 15.

2.4 CONCLUSIONS ON FONUALEI

Multiple, good observations and photographs confirmed the presence of the Polynesian Megapode on Fonualei. Observation of three chicks and numerous burrows in an area of warm soil confirmed breeding. In summary a grand total of 54 observations of 56 megapodes were recorded which could represent a maximum of 56 or a minimum of 38 megapodes.

Based on the area of the island covered to a slight degree - about 20% and the potential habitat, a population of 300-500 Megapodes is considered reasonable - but this is little more than a guess.

2.5 PRESS RELEASES

Following our return from the successful visit to Fonualei, a Press Release was drafted (Annex 1), this was specifically drafted to be released by the Government of Tonga and worded for that purpose. It was felt important that this was done so that the achievement could reflect on Government participation and policy. It is known that the Press Release was sent to Tongatapu and it was heard over the news there, but it did not reach the regional or international press from Tonga. The news was released to other agencies, 10 days after my return to Fiji and then a few days later another press release was drafted and given to PacNews Agency. This went regional and international (Annex 2)

Recently, following a press release by BirdLife International (Annex 3), the story was taken up again and reached a very wide audience including Nature, the BBC and I gave an interview to Radio Australia.

2.6 OTHER BIRDS SEEN

A list of birds seen or heard on or near Late and Fonualei is given in Table 1.

Species		Late	Fonualei
Tongan Megapode	*Megapodius pritchardii*		✓ - estimated 3-500
Banded Rail	*Gallirallus philippensis*	✓ - one seen and heard irregularly	
Friendly Ground-dove	*Gallicolumba stairii*	✓ - at least four heard calling	✓ - common
Pacific Pigeon	*Ducula pacifica*		✓ - common
Many-coloured Fruit-dove	*Ptilinopus perousii*	✓ - heard irregularly	
Crimson-crowned Fruit-dove	*Ptilinopus porphyraceus*	✓ - abundant	
Red Shining Parrot	*Prosopeia tabuensis*	✓ - at least one heard and seen	
White-rumped Swiftlet	*Aerodramus spodiopygius*	✓ - abundant	
White-collared Kingfisher	*Todirhamphus chloris*	✓ - common	
Polynesian Triller	*Lalage maculosa*	✓ - two seen	
Tongan Whistler	*Pachycephala jacquinoti*	✓ - common	
Wattled Honeyeater	*Foulehaio carunculata*	✓ - abundant	✓ - abundant
Polynesian Starling	*Aplonis tabuensis*	✓ - abundant	✓ - common
SEABIRDS			
Herald Petrel	*Pterodroma heraldica*		✓ - 2 or 3 prs flying over the island in early evening
Black-winged Petrel	*Perodroma nigripennis*		✓ - seen on passage from Vava'u close to the island
Wedge-tailed Shearwater	*Puffinus pacificus*	✓ - seen on passage from Vava'u	✓ - seen on passage from Vava'u and heard calling on land at night
Audubon's Shearwater	*Puffinus lherminieri*	✓ - heard calling at night	
Red-tailed Tropicbird	*Phaethon rubricauda*		✓ - one pair seen near island
White-tailed Tropicbird	*Phaethon lepturus*	✓ - common, one nesting in a tree hollow	✓ - nesting but not that common
Brown Booby	*Sula leucogaster*	✓ - nesting on cliff tops	✓ - very common - nesting
Red-footed Booby	*Sula sula*	✓ - common - nesting	✓ - common - nesting
Great Frigatebird	*Fregata minor*	Abundant and nesting on the island, both species seen but which species nesting not ascertained	Seen over the island, nesting not confirmed
Lesser Frigatebird	*Fregata ariel*		Nesting on the island confirmed
Black-naped Tern	*Sterna sumatrana*	✓ - seen	
SootyTern	*Sterna fuscata*		✓ - abundant - at least three separable colonies

Black Noddy	*Anous minutus*	✓ - common	
Brown Noddy	*Anous stolidus*	✓ - common, nesting on the island	✓ - abundant, nesting on the island
White Tern	*Gygis alba*	✓ - common	✓ - not that common
SHORE BIRDS			
Pacific Golden Plover	*Pluvialis fulva*		✓ - 5 seen up near crater
Ruddy Turnstone	*Arenaria interpres*		✓ - 8 seen up near crater

Table 1: Birds recorded on or near Late and Fonualei

ACKNOWLEDGEMENTS

I would like to express my gratitude to the Van Tienhoven Foundation for International Nature Protection for enabling me to go to Late and Fonualei.

Rene Dekker introduced me to the Foundation and provided advice, assistance and materials including a copy of the tape of the call of the Malau by Ann Göth, and I am very grateful to him.

Alan Bowe was as keen as I was to get to both islands and confirm the presence of the Malau, he was a very able and willing Captain. Jason and Kirsty helped on land. Eva Taumalolo was a great companion and assistant ashore - sharing either mosquitoes or rainfall all night with a great smile and then bushwacking during the day.

Dieter Rinke deserves our greatest admiration and he helped, as always, whenever I had questions for him.

Press Release

The Government of the Kingdom of Tonga is proud to announce the successful translocation of a population of the critically endangered Malau or Niuafo'ou Megapode *Megapodius pritchardii* to Fonualei Island in the Vava'u Group.

Historically the Malau has only ever been found on Niuafo'ou island in Tonga's far north, where it is declining in the face of predation by cats, dogs and overharvesting by humans. In 1993, a detailed study provided a population estimate of only 188-235 pairs. Since that time it has been categorised as Critically Endangered by the World Conservation Union in their Red List of Threatened Species.

Megapodes are an unique group of birds which do not incubate their eggs. Some, like the Malau on Niuafo'ou lay them in warm soil associated with thermal ducts, others lay their eggs in rotting vegetable matter and leave them to be incubated by natural heat.

In June 1989, the Government of the Kingdom of Tonga initiated a bird conservation programme with the Brehm Fund for International Bird Conservation based in Germany. The Tongan project was directed by Dr Dieter Rinke and in 1993 Dr Rinke supervised the translocation of 30 Malau eggs from Niuafo'ou to the island of Fonualei.

Fonualei is an active volcanic island comprising a round lava cone 2 km across and 195 m high lying 64 km north of the main island of Vava'u. The island last erupted in 1946/47 when a new cone was formed inside the crater. Fonualei is little-visited because it has no anchorage and is surrounded, for the most part, by jagged lava cliffs.

Pacific ornithologist, Dick Watling, visited Fonualei 20-21st March 2003 with the assistance of the Van Tienhoven Foundation for International Nature Protection. During a short visit to a small part of the island he observed 56 Malau including 3 recently hatched chicks. He estimated a population of 300-500 adult Malau for the island, possibly surpassing the number on Niuafo'ou.

The establishment of a new population of the Malau on Fonualei is a remarkable conservation success and demonstrates the Tongan government's determination to conserve its unique wildlife heritage.

For further information contact:

Tongan contact - Governor of Vava'u ?? Dept. of Environment ?? - to be supplied

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ANNEX 3

PRESS RELEASE

Successful translocation of a Critically Endangered Tongan bird, the Niuafo'ou Megapode.

A critically endangered bird with a unique reproduction system and found on only one northern Tongan island has been saved from possible extinction, according to the results of a survey late last month which were released today.

A survey of Fonualei island in Tonga's Vava'u Group funded by the Van Tienhoven Foundation for International Nature Protection confirmed that the future of the Malau or Niuafo'ou Megapode appeared much more secure after a breeding population was established on this uninhabited volcanic island. Eggs of the Malau were transferred from Niuafo'ou Island where cats, dogs and human activity had dramatically reduced the numbers of this very special Tongan bird.

'This is a wonderful story with potential implications for other critically endangered species in the region that it is possible to work for the future health and well-being of a bird pushed almost to the edge of existence,' said Dick Watling, a Fiji-based ornithologist who undertook the survey on Fonualei.

Fonualei is an active volcanic island comprising a round lava cone 2 km across and 195 m high lying 64 km north of the main island of Vava'u. The island last erupted in 1946/47 when a new cone was formed inside the crater. Fonualei is little-visited because it has no anchorage and is surrounded, for the most part, by jagged lava cliffs.

The Niuafo'ou Megapode was categorised as `Critically Endangered' on the World Conservation Union's `IUCN Red List of Threatened Species' after a survey 10 years ago found an estimated population of about 200 pairs.

In June 1989, the Government of the Kingdom of Tonga initiated a bird conservation programme with the Brehm Fund for International Bird Conservation based in Germany. The Tongan project was directed by Dr Dieter Rinke and in 1993 Dr Rinke supervised the translocation of 30 Malau eggs from Niuafo'ou to the island of Fonualei.

Dick Watling's survey on Fonualei confirmed that from the 30 eggs ten years ago an estimated population of between 300 to 500 Malau were now flourishing on the island. During the two day visit the team observed 56 Malau including three recently hatched chicks and a large nesting area.

As a megapode, the Malau parents do not incubate their eggs but lay them in warm soil close to hot thermal vents, relying on the natural heat produced to incubate the chicks. When hatched, the chicks are fully-developed and are ready to fly from the moment they break the surface of the sand or soil in which the eggs have been laid.

For further information contact:

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Dr Dieter Rinke office@vogelpark-walsrode.de

Photograph: A Malau or Niuafo'ou Megapode by Dieter Rinke

ANNEX 3

CRITICALLY ENDANGERED MEGAPODE PULLS BACK FROM BRINK OF EXTINCTION

FOR IMMEDIATE RELEASE

19-06-03

Cambridge, UK – The first survey for 10 years of a remote Polynesian island by BirdLife International's Fiji Affiliate, Dick Watling, has uncovered a doubling of the estimated population of the Polynesian Megapode, which until recently had only been found on one tiny island. [1,2]

Watling's visit to the remote island of Fonualei in the Kingdom of Tonga means that estimates of the megapode's population have been doubled, with an estimated 300–500 on the island, possibly now surpassing the number found on its last native island, Niuafo'ou, where a 1993 survey had revealed a population of only 188–235 pairs. Until now, the Polynesian Megapode, also known as the Niaufo'ou Megapode, or locally as the Malau, has been teetering on the brink of extinction and classified as Critically Endangered. [3,4]

The revelation, which has been reported first in June's issue of BirdLife's award–winning quarterly magazine, *World Birdwatch ,* vindicates the translocation of megapode eggs from Niaufo'ou to Fonualei in 1993/4 by Dr Dieter Rinke of the Brehm Fund for International Bird Conservation in Germany. [5]

Following 1993's survey, Rinke took eggs from Niuafo'ou, where the south west Pacific's last megapode faced extinction from over–harvesting by humans and predation by introduced animals, to Fonualei. This 2–km–wide island, some 20 hours journey from Niaufo'ou, was selected for being uninhabited, little–visited and providing the perfect egg–laying conditions for the megapode, which does not incubate its own eggs but lays them in thermally–heated soil near volcanic vents.

Watling's visit to Fonualei, funded by the Dutch Van Tienhoven Foundation for International Nature Protection, is the first to guage the progress of the translocated megapodes. In 10 hours, the ornithologist observed 56 Malau on a small fraction of the island, and estimated a total adult population of 300–500 birds. "The establishment of a new population of the Malau on Fonualei is a remarkable conservation success and demonstrates the Tongan Government's determination to conserve its unique wildlife heritage," says Watling. "This is a wonderful success story for conservation in a region where conservation is only beginning to emerge from the era of rhetoric and paper parks. It is a tribute to vision and action."

"The news is spectacular. This means that the Malau now occurs on two instead of one island and that the population seems to have doubled in size. With these results we will re–evaluate the threat status of the species", comments René Dekker, chair of the IUCN Species Survival Commission/ BirdLife International Megapode Specialist Group.

For further information, please contact Gareth Gardiner–Jones at BirdLife International in Cambridge,UK:
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ANNEX 3

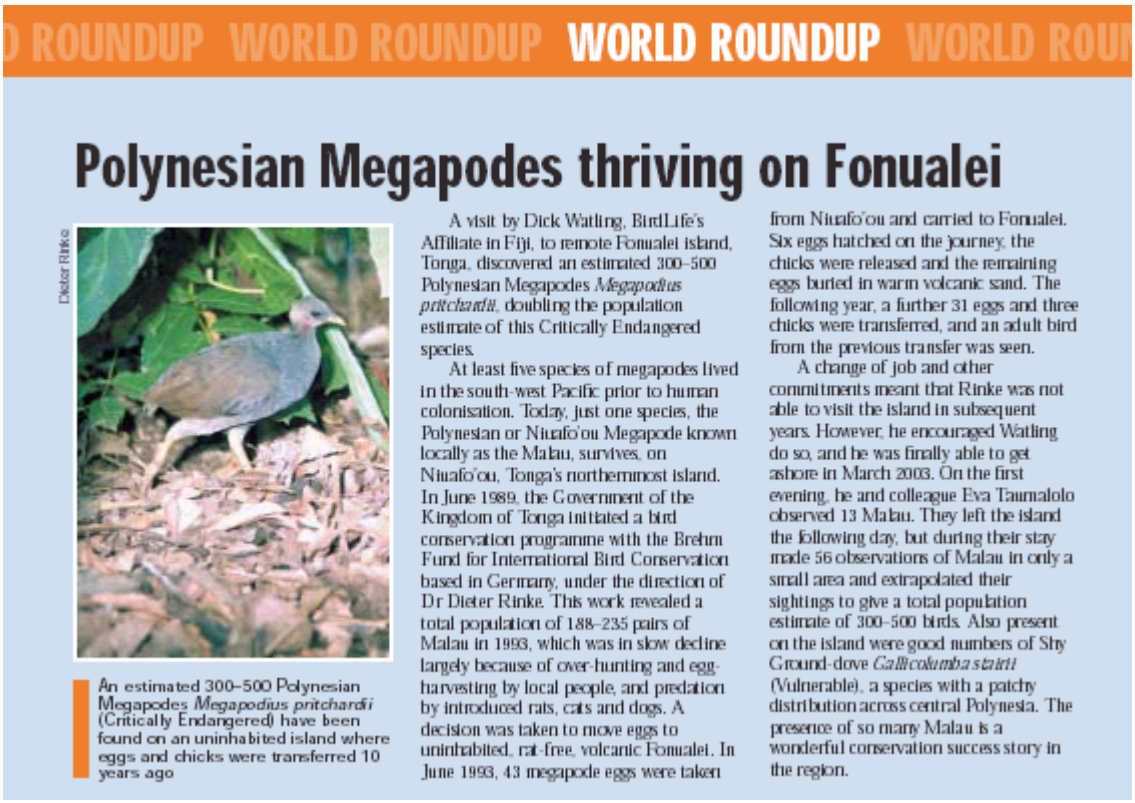
NOTES FOR EDITORS

1) BirdLife International is a global alliance of conservation organisations working in more than 100 countries who, together, are the leading authority on the status of birds, their habitats and the issues and problems affecting bird life.

2) Photographs of the Polynesian Megapode and Fonualei island are available for press and media use upon request, or can be downloaded from the BirdLife International website: http://www.birdlife.org.

3) The Polynesian Megapode is classified as Critically Endangered according to the World Conservation Union (IUCN) Red List criteria. This means it faces an extremely high risk of extinction in the wild in the immediate future. See BirdLife International (2000) *Threatened Birds of the World*. Barcelona and Cambridge, UK: Lynx Editions and BirdLife.

4) The Polynesian Megapode, Niaufo'ou Megapode, or Malau, scientific name *Megapodius pritchardii,* is a medium-sized, brown-and-grey megapode. It is the only one of five megapodes originally found in the south west Pacific to have survived 3,000 years of human colonisation and is the smallest megapode in the world. Megapodes are distinctive for having large feet and for using hot volcanic ash to incubate its eggs and are found



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Polynesian Megapodes thriving on Fonualei

Dieter Rinke

An estimated 300–500 Polynesian Megapodes *Megapodius pritchardii* (Critically Endangered) have been found on an uninhabited island where eggs and chicks were transferred 10 years ago

A visit by Dick Watling, BirdLife's Affiliate in Fiji, to remote Fonualei island, Tonga, discovered an estimated 300–500 Polynesian Megapodes *Megapodius pritchardii*, doubling the population estimate of this Critically Endangered species.

At least five species of megapodes lived in the south-west Pacific prior to human colonisation. Today, just one species, the Polynesian or Niaufo'ou Megapode known locally as the Malau, survives, on Niuafo'ou, Tonga's northernmost island. In June 1989, the Government of the Kingdom of Tonga initiated a bird conservation programme with the Brehm Fund for International Bird Conservation based in Germany, under the direction of Dr Dieter Rinke. This work revealed a total population of 188–235 pairs of Malau in 1993, which was in slow decline largely because of over-hunting and egg-harvesting by local people, and predation by introduced rats, cats and dogs. A decision was taken to move eggs to uninhabited, rat-free, volcanic Fonualei. In June 1993, 43 megapode eggs were taken from Niuafo'ou and carried to Fonualei. Six eggs hatched on the journey, the chicks were released and the remaining eggs buried in warm volcanic sand. The following year, a further 31 eggs and three chicks were transferred, and an adult bird from the previous transfer was seen.

A change of job and other commitments meant that Rinke was not able to visit the island in subsequent years. However, he encouraged Watling do so, and he was finally able to get ashore in March 2003. On the first evening, he and colleague Eva Taumalolo observed 13 Malau. They left the island the following day, but during their stay made 56 observations of Malau in only a small area and extrapolated their sightings to give a total population estimate of 300–500 birds. Also present on the island were good numbers of Shy Ground-dove *Gallicolumba stairi* (Vulnerable), a species with a patchy distribution across central Polynesia. The presence of so many Malau is a wonderful conservation success story in the region.

Photographs of Late Island, Vava'u, Kingdom of Tonga

View of Late from the south east

Boulder beach landing spot on north west coast

Typical Late shoreline

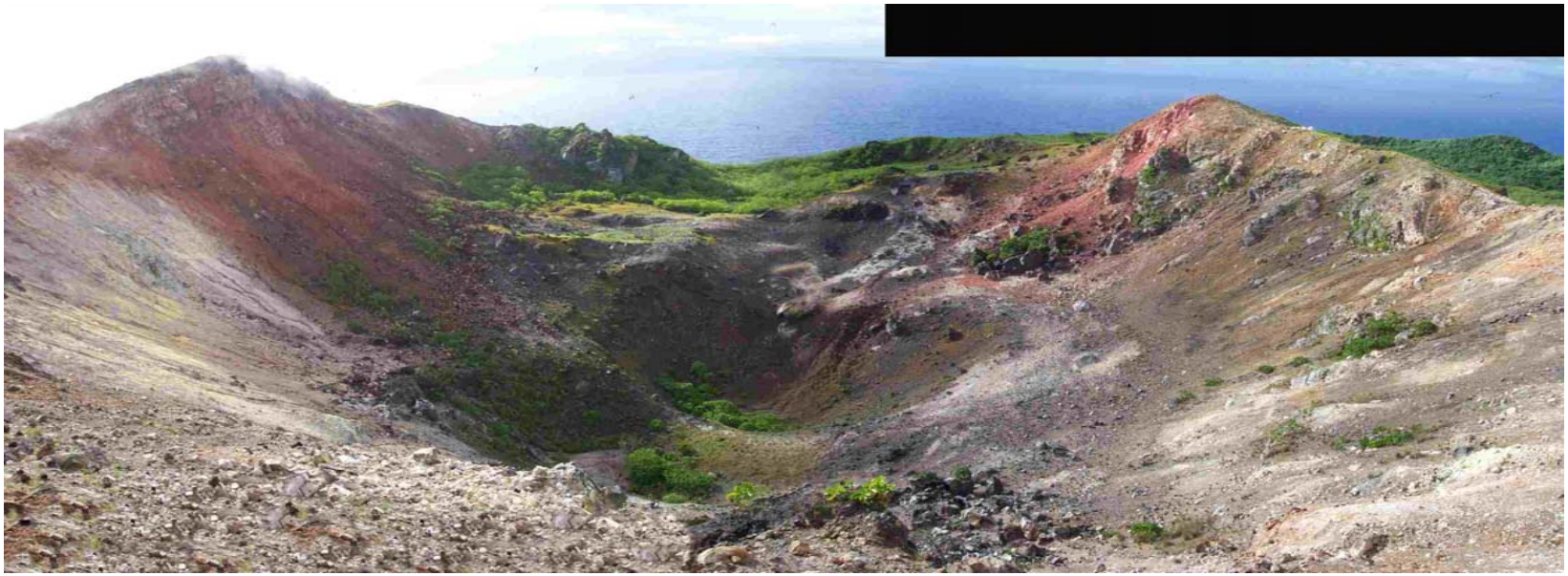
Typical Late vegetation (taken from the 'observation' ridge)

Photographs of Fonualei Island, Vava'u, Kingdom of Tonga

Approaching Fonualei from the south

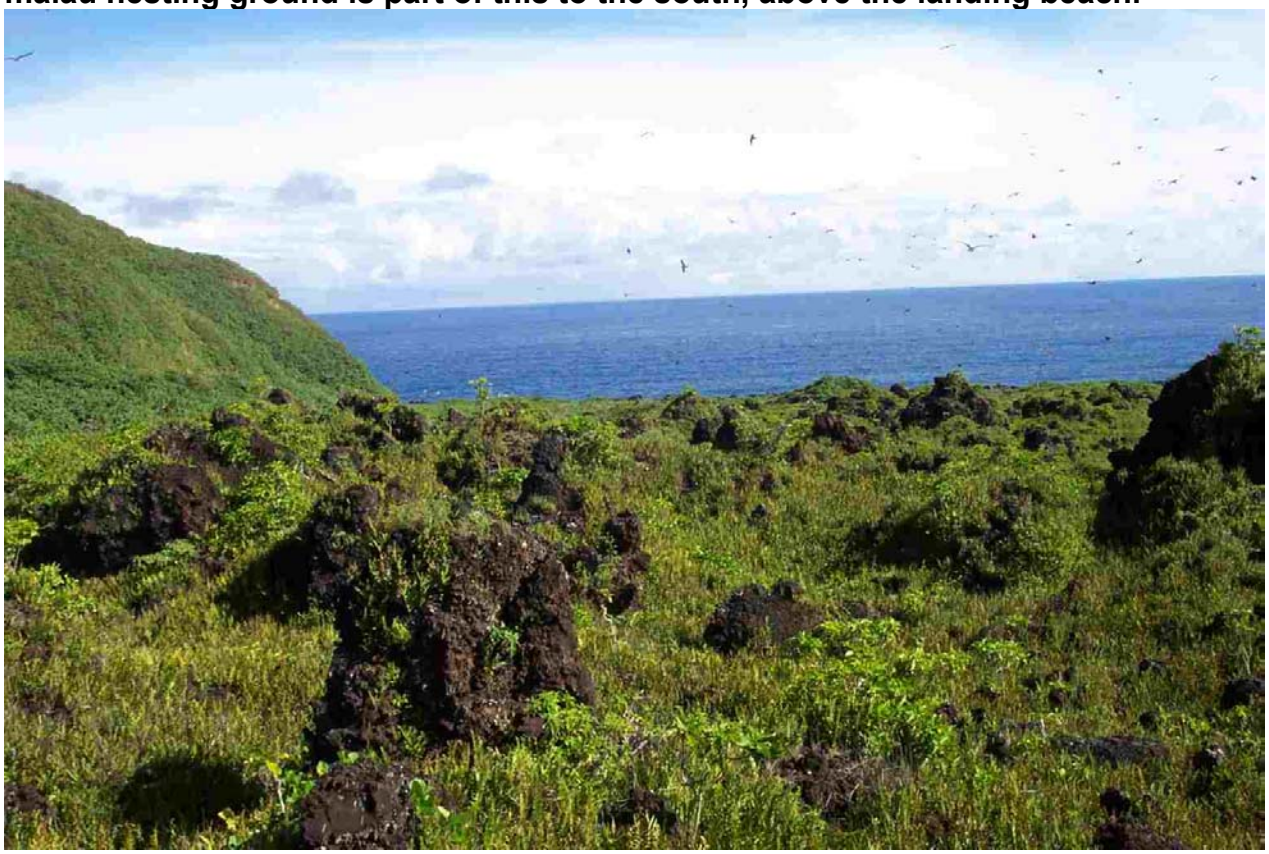
Typical lava cliffs around most of the island

Above: Main call broadcasting site with some of the best habitat on the island across the ravine



The active cone - not visible in the photo, but the base and right side is completely covered with nesting Sooty Terns.

View from the west, just north of landing beach. Bare horizon is `heated' and the malau nesting ground is part of this to the south, above the landing beach.



Looking south west on the lava flow - ' this was the gentle ascent' !!

View from the east to the summit

Megapode on the nesting ground. About 3m from the photographer.