

A pilot study of breeding White-tufted Grebes *Rollandia rolland rolland* at selected wetlands on the Falkland Islands, with notes on breeding ecology

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El presente estudio investiga la población de la forma nominal del Macá Común *Rollandia rolland rolland* de 37 lagunas en las Islas Malvinas. De los números de macas encontrados se estima una población media de 8,1–9,3 parejas nidificantes por los 10 km cuadrados visitados. Este nombre es al margen inferior de la estimación del *Atlas of breeding birds of the Falkland Islands* exprimado en parejas/10 km cuadrado. En contraposición a las formas continentales de la especie y atípico por la familia Podicipedidae, una mayoría de los nidos encontrados no fueron flotantes, pero construidos sobre suelo sólido entre islas de *Poa flabellata* o sobre un pequeño saliente debajo de un saledizo de la orilla elevada de las lagunas. También, se observaban copulas a orillas de lagunas sobre tierra firme.

White-tufted Grebe *Rollandia rolland rolland* is endemic to the Falkland Islands and differs in size from the two continental South American subspecies, *R. r. morrisoni*, which is endemic to Lake Junín in Peru, and *R. r. chilensis*, which comprises all other populations. Both of the mainland subspecies are noticeably smaller than *R. r. rolland*, leading some authors to suggest that the Falkland race might be best treated specifically^{4,13}, while others at least did not exclude the possibility^{6,7}. However, whereas the mainland forms *chilensis* and *morrisoni* have been studied in some detail^{2,4,5,8,9}, knowledge of the Falkland Islands population is incomplete. This population is small and, therefore, at greater potential risk of extinction. A complete assessment of its size is lacking, apart from that in the *Atlas of breeding birds of the Falkland Islands*, wherein the total population during 1983–93 was estimated at 750–1,400 breeding pairs¹³. No data were collected prior to the Atlas project and none since, making it impossible to detect any potential population trends. Similarly, no attempts to reassess the taxonomic status of *R. r. rolland* have been made, making its conservation status uncertain, although there is no current evidence of threats.

For a small number of ponds in the Falkland Islands, the present paper presents an assessment of the White-tufted Grebe breeding population. During my surveys, additional data about the subspecies' breeding ecology were obtained to complement our limited knowledge of the nominate form.

Study area and methods

The study was conducted on the islands of Pebble, Saunders, Carcass and East Falkland on 6–20 November 2010, complemented by data obtained on the islands of Sea Lion, Bleaker, Pebble and

East Falkland during 16–26 January 2008. The 2010 visit was entirely devoted to observations of White-tufted Grebes and consisted of a mean nine hours of field work per day. All ponds visited were subject to a complete shoreline survey on foot, and observations were made using binoculars. All GPS readings were taken using a WAAS-enabled Geko 201 (Garmin).

Results

Breeding population.—The population in 2010 amounted to 47–55 breeding pairs. Long Pond (8–9 pairs) and Big Pond (6–7 pairs), both on Pebble Island, and Swan Inlet Pond 4 (7–9 pairs) on East Falkland held the most important populations. White-tufted Grebes appear to use Carcass Island only in the non-breeding season and none was observed during the 2010 complete survey (Table 1).

In 2008, the species was not recorded on Sea Lion Island where five ponds were visited on 21 January. On Bleaker Island, three pairs were present on Big Pond, whereas two smaller ponds further north did not hold any grebes.

Considering these records in terms of the 10-km grid system used in the Atlas¹³, square UC85 held the largest population with 19–22 pairs followed by square UD21, which comprises all Pebble Island ponds, with 15–17 pairs and square UC75 on East Falkland with 8–9 pairs. Four additional squares each held <5 pairs and two squares held none (Table 2). On average, the seven squares where White-tufted Grebes were recorded held 7.1–8.3 breeding pairs. This figure certainly requires upward correction as two squares were only surveyed partially. Assuming that in both squares the populations relative to the water surface in the parts surveyed and not surveyed were identical, a correction of one additional breeding pair could be applied.

Table 1. Ponds visited and White-tufted Grebes *Rollandia rolland* recorded in 2010 and 2008.

	Pond	Coordinates		Approximate size (ha)	Grebes observed ²	Breeding pairs
		S	W			
Pebble	Big Pond	51°18'842	59°34'199	40	5 × 2 + 2 × 1	6–7
	Long Pond	51°18'906	59°33'545	20	7 × 2 + 2 × 1	8–9
	Quark Ponds	51°17'580	59°32'026	15	0	
	Betts Pond	51°17'677	59°31'676	20	1 × 2	1
	Green Pond*	51°18'228	59°30'755	40	0	
	Swan Pond	51°17'350	59°30'284	50	0	
Saunders	'Little' Pond	51°18'939	59°35'149	2	0	
	Rookery Flat Pond 1	51°18'942	60°05'473	1.2	0	
	Rookery Flat Pond 2	51°19'094	60°05'442	3	1 × 2	1
Carcass	Big Pond	51°22'286	60°06'189	20	4 × 1	2–4
	'Gentoo' Pond	51°18'512	60°31'432	0.5	0	
	'Airfield' Pond 1	51°15'344	60°35'553	2	0	
	'Airfield' Pond 2	51°15'612	60°35'826	5	0	
	'Airfield' Pond 3	51°16'226	60°35'792	0.5	0	
	Goose Green Pond 1	51°49'687	58°58'759	0.3	1 × 1	1
East Falkland	Goose Green Pond 2	51°49'722	58°58'530	0.3	0	
	East of Isla Pond	51°49'379	58°45'089	15	2 × 2 + 3 × 1	4–5
	Laguna Ronde	51°49'126	58°44'078	50	2 × 2 + 1 × 1	3
	Pond west of Ronde	51°49'872	58°42'794	10	0	
	Shingly Pond**	51°49'810	58°41'100	130	0	
	Ewe Pond	51°50'110	58°44'078	10	1 × 2 + 1 × 1	2
	Laguna Isla	51°49'606	58°46'160	130	3 × 2 + 1 × 1	4
	Laguna Verde*	51°47'867	58°53'254	0	0	
	Swan Inlet Pond 1	51°49'763	58°38'999	100	1 × 2	1
	Swan Inlet Pond 2	51°50'778	58°38'659	90	2 × 2	2
	Swan Inlet Pond 3	51°50'777	58°37'353	30	2 × 2 + 1 × 1	3
	Swan Inlet Pond 4	51°50'663	58°36'625	50	4 × 2 + 6 × 1	7–9
Swan Inlet Pond 5	51°50'337	58°36'865	5	0		
East of Mt. Misery pond	51°51'363	58°38'218	75	2 × 1	1–2	
Extension Bodie Creek	51°13	59°02		1 2	1	
Total 2010						47–55
Bleaker ¹	Big Pond	52°12	58°51	14	2 × 2 + 1 × 1	3
	North of Big Pond 1	52°12	58°51	0.5	0	
	North of Big Pond 2	52°12	58°51	0.5	0	
Sea Lion ¹	Long Pond	52°26	59°05	5	0	
	Beaver Pond	52°26	59°05	20	0	
	Next to Beaver	52°26	59°05	6	0	
	Tussac Pond	52°26	59°05	5	0	
Total						50–58

¹ results from 2008 (only included for ponds not visited in 2010)² a distinction is made between grebes encountered in pairs (x 2) and singly (x 1)

* reduced to c.50% of normal size during survey

** reduced to c.10% of normal size during survey

Additional observations.—Three copulations were observed in 2010, all on land, the grebes hopping ashore and walking up to 2 m before the female invited copulation.

In 2010, a total of 13 nests and platforms were found. Seven were located under the overhanging bank of ponds, two in small ditches connected to larger ponds and also below overhanging banks



Figure 1. Nest of White-tufted Grebe *Rollandia r. rolland*, under an overhanging bank, Big Pond, Pebble Island, Falkland Islands, November 2010 (André Konter)



Figure 2. Nest of White-tufted Grebe *Rollandia r. rolland*, on an island of tussac grass, east of Laguna Isla, East Falkland, Falkland Islands, November 2010 (André Konter)

(one nest c.50 m from the pond itself), three on tussac grass *Poa flabellata* islands and one in rushes (Juncaceae) in the shallows of a pond. None of these platforms was floating. Nine rested on the mud of an elevated bank (Fig. 1) and three were sited in stands of tussac (Fig. 2), all above water level, and the last was in rushes in water c.10–15 cm deep, with its base completely sunk into the ground. Three platforms were observed in 2008, one in a bank below overhanging grasses and two floating on pondweed *Myriophyllum quitense*. White-tufted Grebes incubating under the overhanging vegetation of a bank can observe little of their surroundings. They are well hidden from potential predators, but can only escape forwards.

Nest contents were observed only twice and consisted of two stained eggs in both cases. In 2010 seven pairs and in 2008 four pairs tending young were observed. Ten of them had one chick and just one had two chicks. One chick at Long Pond, Pebble Island, was c.2 weeks old on 9 November 2010. Another chick observed at Laguna Ronde, East

Table 2. Distribution of pairs of White-tufted Grebes *Rollandia rolland* by 10-km square.

Square no.	Location	Pairs observed
TD51	Carcass	0
TD80	Saunders, Big Pond	2–4
TD81	Saunders, Rookery	1
UD21	Pebble, all ponds	15–17
UC71	Bleaker ponds	3
UB58	Sea Lion	0
UC65	East Falkland, Goose Green	2
UC75	East Falkland, Laguna Verde to east of Laguna Isla	8–9
UC85	East Falkland, Laguna Ronde to Swan Inlet Ponds	19–22
	Total	50–58

Falkland, on 18 November 2010 was c.80% of adult size and had already acquired juvenile plumage; it was probably c.4 weeks old. Two additional chicks seen on Swan Inlet Pond 4, East Falkland, on 19 November 2010 were only slightly younger, being c.3–4 weeks old.

Discussion

Woods & Woods¹³ estimated the breeding population during 1983–93 at 750–1,400 breeding pairs (allowing 30% variation from the mean). This estimate was based on observers' counts or estimates in ranges 1–10 or 11–100 from 51 of 90 of the 10-km squares where the species was recorded in possible breeding habitat, with means calculated for the other 39 squares. Per square with a positive record, the mean estimate was 8.3–15.5 breeding pairs. My survey found the species in seven squares with a mean 7.1–8.3 breeding pairs or, taking into account the correction for the two squares not entirely surveyed, 8.1–9.3 breeding pairs. This figure is at the lower end of the mean estimate of Woods & Woods¹³. It would, however, be wrong to conclude that the population has declined over the last 20 years, as my survey was insufficiently broad geographically to draw archipelago-wide conclusions. Nevertheless, it provides an accurate figure for the wetlands visited.

The statement that egg laying generally occurs in October and that eggs have been found between mid October and January^{3,12} is confirmed, although following mild winters (as in 2010) the first eggs may be laid earlier. Indeed, assuming an incubation period of three weeks and considering the age of the chicks encountered, the first eggs must have been laid by late September or very early October. Breeding rates in successful pairs appears to be usually one chick, with two chicks being possibly more unusual.

In the recent literature, the nest of the Falkland Islands race is stated to be floating^{10,12,14}. Only Cobb³ observed nests under the bank of a pond and Brooks¹ was informed by an island resident that 'these grebes nest on the shore very near the water'. Based on my observations, and in contrast to the behaviour of grebes (Podicipedidae) in general, floating nests are unusual, although their frequency might increase later in the breeding season in line with the development of floating vegetation. White-tufted Grebes perhaps more regularly build on 'solid' ground to ensure the platform is better protected from waves. From my observations, these platforms are often sited in places where copulation is inhibited thereon, possibly explaining why copulation often, perhaps mainly, occurs onshore. Copulation on land and nesting in cavities under banks have not been reported for mainland *R. r. chilensis* and *R. r. morrisoni*. Behavioural differences between insular and mainland populations require additional study.

Wetmore¹¹ remarked that 'the grebe described from the Falkland Islands as *rollandi* by Quoy and Gaimard is a large representative of the present species (*morrisoni*), distinguished by much larger size and darker colouration. It is sufficiently distinct to be recognized as a separate species on the basis of material available at present, though formerly the name *rollandi* was used for all grebes of this type in South America.' Should specific status be recognised, Fjeldså & Krabbe's⁶ proposal to name the insular form Rolland's Grebe *Rollandia rolland* and the continental forms White-tufted Grebe *R. chilensis* should be followed. Further studies concerning any potential differences in courtship and molecular analyses are certainly required.

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