

This small hummingbird appears to be confined to two adjacent, heavily cultivated valleys in the desert of Arica department, extreme northern Chile (stragglings north into immediately adjacent Peru), and south to northern Antofagasta province. Its small range renders it vulnerable, although birds appear to fare well in gardens.

DISTRIBUTION The Chilean Woodstar is restricted to a very small area on the Pacific coast from Tacna, Peru, to extreme northern Antofagasta, Chile, being found in the few river valleys in a desert practically devoid of life, and possibly breeding only in Lluta and adjacent Azapa valleys, Arica department, Chile.

Peru Four birds were found in December 1977 at Tacna town, 18°01'S 70°15'W (562 m), Tacna department, and the species may also occur in the infrequently visited foothill valleys of Moquegua and Tacna departments (Parker 1982a; elevation and coordinates from Stephens and Traylor 1983); however, it may not be a regular visitor to Tacna, where another observer (R. A. Hughes *in litt.* 1986) only recorded it once despite much searching during many visits.

Chile The species has been consistently reported only from the Lluta and Azapa valleys in Arica department, Tarapacá province, records (coordinates from OG 1967 or read from IFG 1984) being: Lluta valley, c.18°24-25'S 69°50-70°19'W (Johnson 1967, D. A. Scott *in litt.* 1989; specimen in MCZ collected June 1935); Arica town (at the mouth of the Azapa valley) and its northern suburbs Chinchorro and La Chimba (near sea level), 18°29'S 70°20'W, where seven specimens (in BMNH) were taken in the middle of the last century and three (in MCZ and MNHNS) in November 1943, while a nest with young was found there in August 1968 (Salvin and Hartert 1892, Hellmayr 1932, Philippi 1936, Philippi *et al.* 1944, Johnson 1972; see Remarks 1); and Azapa valley, c.18°29-31'S 70°11-14'W, where five specimens (in LACM and USNM) were collected in March 1948, one (in WFVZ) in August 1968 when an incubating bird was photographed, one (in IRSNB) in September 1976, and three (in WFVZ) in June 1986 (also Philippi *et al.* 1944, Johnson 1972), with sightings in November 1986 (D. A. Scott *in litt.* 1989), March 1989 (P. J. Roberts *in litt.* 1989), January-February 1990 (P. Gregory *in litt.* 1990, P. J. Roberts *in litt.* 1990), and January 1991 at 200-720 m (M. Pearman *in litt.* 1991).

Further south in Tarapacá there are sight records from Chupicilca in the Camarones valley, between Conanoxa (19°02'S 69°59'W; at 400 m), and Taltape (18°59'S 69°47'W; at 780 m) (McFarlane 1975), and at Mamiña (20°05'S 69°14'W; at 2,600 m) (Johnson 1970). In Antofagasta province the species has been taken at Cobija, 22°33'S 70°16'W (two specimens in AMNH; also Bonaparte 1854; see Remarks 2), but these records are considered to represent stragglers only (Johnson 1967, McFarlane 1975), as the species does not appear to have colonized the Loa valley in northern Antofagasta.

POPULATION The Chilean Woodstar was reported to be common in 1935 (Philippi 1936), and very abundant in 1948 (Barros 1954). Philippi *et al.* (1944) and Johnson (1967) reported seeing over a hundred at a single flowering tree in the Azapa valley in November 1943; they also found it in Lluta valley at the same time, but only saw a few (Johnson 1967). Although four specimens were collected in Arica town, the statement by Philippi *et al.* (1944) that it was very abundant in Arica, and that there were more Chilean Woodstars than Oasis Hummingbirds *Rhodopis vesper*, may have referred to Arica department as a whole (including the Azapa valley), rather than the town, and Johnson (1967) reported it to be outnumbered 10:1 by the Oasis Hummingbird in the gardens of Arica town in July, making no comments about it having been commoner there in November 1943. Later observers have found the Chilean Woodstar scarce (McFarlane 1975), but whether an actual serious decline for reasons unknown has taken place (McFarlane 1975, King 1978-1979) or whether the observers reporting it abundant (Philippi 1936, Philippi *et al.* 1944, Barros 1954) simply had the luck to come across a flowering tree favoured by this species, remains unknown.

On 6 October and 1 November 1986 four or more male Chilean Woodstars and eight Oasis Hummingbirds were found near Arica without much searching in just a small part of a large amount of

suitable habitat, and on 2 November 1986 three female woodstars and an Oasis Hummingbird were found in Lluta valley, also without much searching (D. A. Scott *in litt.* 1989). In May 1987 some 10-20 Oasis Hummingbirds and two Chilean Woodstars were seen in gardens of Arica town (NK); in March 1989 15 Chilean Woodstars and 30 Oasis Hummingbirds were seen in the Azapa valley (P. J. Roberts *in litt.* 1989), with five (or more) birds in the valley in January 1990, and five in the gardens of the Azapa hotel in February 1990 (P. Gregory *in litt.* 1990, P. J. Roberts *in litt.* 1990). The species was found to be common in January 1991, when it outnumbered both Peruvian Sheartail *Thaumastura cora* and Oasis Hummingbird, with which it was seen feeding: seven birds were seen between 200 and 240 m, with six between 640 and 720 m (M. Pearman *in litt.* 1991).

ECOLOGY The Chilean Woodstar inhabits desert river valleys and gardens, apparently mainly from sea level to c.750 m, but it has once been recorded as high as 2,600 m (see Distribution and Population). Although usually solitary (Parker 1982a, NK), more than a hundred were noted in November at a single flowering tree which, however, was not identified (Philippi *et al.* 1944, Johnson 1967). In the gardens of Tacna it was seen feeding from *Lantana* and *Hibiscus* flowers, and was frequently driven away by the larger Oasis Hummingbirds and Peruvian Sheartails (Parker 1982a). When not foraging it perched inconspicuously within the cover of shrubs and short trees (Parker 1982a). In Arica two males were seen feeding from and fighting over *Lantana* flowers (NK). Birds have also been seen hawking for insects over a watercourse in the Azapa valley (M. Pearman *in litt.* 1991).

Two nests were found in late August 1968, one in an “olivo blanco” tree, containing two eggs (one incubated and normal, the other empty), and one in a “higuerilla” tree, containing two almost fully fledged young fed by the male only, as the female had become entangled in the nest material and died (Johnson 1972). An immature was collected on 13 November (Philippi *et al.* 1944) and one (described as subadult) was seen on 26 December (Parker 1982a).

THREATS The indigenous plants favoured by the species may be severely threatened, as the valleys where this hummingbird occurs are heavily cultivated (King 1978-1979, NK), and it may now, to a large extent, be dependent on garden flowers.

MEASURES TAKEN All exports of hummingbirds from Peru and Chile are controlled (Inskipp 1987).

MEASURES PROPOSED Plants favoured by the species should be identified, and their continued presence in quantities sufficient for maintaining a viable population of the woodstar should be secured. An education campaign stressing the importance of these plants for this and other species of hummingbird in these valleys, and encouraging the planting of appropriate trees and bushes, would be very worthwhile.

REMARKS (1) Of the seven specimens in BMNH one is labelled “Arica” and one “Arica, Peru”; both are from the Gould collection, and were taken before 1869; two other specimens from the Gould collection are labelled “Peru?”, and are probably also from Arica. The two types from the Loddiges collection labelled “Montevideo” were presumably taken at Arica (Hellmayr 1932) as is probably the case with an unsexed immature from the same collection, with no locality data. Philippi *et al.* (1944) visited the northern suburbs of Arica, La Chimba and Chinchorro, and reported collecting an immature male and three females at La Chimba on 13 and 14 November 1943. An immature male and a female in MCZ taken

on 13 November 1943 are labelled “Chinchorro, Arica”; no collector is given on the label, but these specimens are presumably the same as those reported by Philippi *et al.* (1944). A female in MNHNS taken by Philippi in November 1943 is labelled “Arica” (J. C. Torres-Mura *in litt.* 1988) and is apparently the third of the four specimens reported by Philippi *et al.* (1944). The fourth specimen cannot be traced. A female in AMNH without date or collector is labelled “Arica, Peru”, and may have been collected last century (NK).

(2) A single specimen labelled “Cobija, Bolivia” (Bonaparte 1854) was taken in the garden of a mining establishment on the Antofagasta coast, Chile (Johnson 1967). The presence of the species this far south was considered exceptional by both Johnson (1967) and McFarlane (1975), who were presumably unaware of the two further specimens in AMNH labelled “Cobija, Peru” with no date or collector given.