

This rare saltator is confined to the temperate zone of central Bolivia, and Jujuy and Salta provinces in north-western Argentina. It may feed predominantly on mistletoe berries of Polylepis and Alnus woodlands, which are now highly fragmented within most of its range.

DISTRIBUTION The Rufous-bellied Saltator is known from several recent sightings and a large number of specimens, being predominantly recorded in Cochabamba department, but also La Paz and Chuquisaca departments, Bolivia, and in Jujuy and Salta provinces, Argentina, all at elevations between c.2,500 and 4,000 m. Records of this species (coordinates, unless otherwise stated, from Paynter *et al.* 1975 and Paynter 1985) are as follows:

Bolivia (*La Paz*) near Inquisivi, c.17°22'S 67°45'W, at 3,975 m in Sicasica province, the type-locality (d'Orbigny and Lafresnaye 1837); (*Cochabamba*) near Palca (= Independencia), c.17°07'S 66°53'W, at 2,770 m in Ayupayo province (erroneously placed in Chuquisaca department by Hellmayr 1938) (d'Orbigny 1835-1844); Caluyo, 17°13'S 66°01'W, at 3,500 m (specimen in CM); Toncoma, c.17°15'S 66°20'W, at 3,200-3,250 m (Fjeldså and Krabbe 1989); Liriuni, 17°19'S 66°20'W, at 3,000-3,200 m, where a male (in FMNH) was taken in July 1939 (Fjeldså and Krabbe 1989, S. Arías verbally 1991); Tutimayo, c.17°25'S 66°10'W, at 3,200 m (Bond and Meyer de Schauensee 1942-1943); Cochabamba, at 2,570 m (Remsen *et al.* 1988); Tunari National Park, 20-25 km north-east of Cochabamba, between 2,700 and 3,300 m (Remsen *et al.* 1988, S. Arías verbally 1991); Tiraque, 17°25'S 65°43'W, at 3,200 m (Bond and Meyer de Schauensee 1942-1943); Pocona, 17°39'S 65°24'W, at 2,700 m where 15 specimens (in CM and FMNH) were taken in December 1926 and February 1927; Cerro Cheñua Sandra (c.17°39'S 66°29'W: read from IGM 1965a), at 3,800 m (Fjeldså 1987, S. Arías verbally 1991); 8 km east of Pojo, 17°45'S 64°49'W, at c.2,800 m (Nores and Yzurieta 1984); Quebrada Majon, 6.6 km by road beyond López Mendoza, at km 98 on the Cochabamba–Santa Cruz de la Sierra road, Carrasco province (Remsen *et al.* 1988); Pilpina, 17°58'S 65°33'W, at 3,215 m (Fjeldså and Krabbe 1989); (*Chuquisaca*) Bellavista, c.18°40'S 64°17'W, 25 km north of Quillacollo (Remsen *et al.* 1988); El Cabrada, Posta, at 19°05'S 65°05'W (Remsen *et al.* 1988; specimen in BMNH taken at 3,500 m in September 1900); río San Francisco, 20°43'S 64°39'W, at 2,700 m, and río Puca Laja, 20°43'S 64°36'W, at 2,700 m, both in the Cerros Chapeados, where two singles were seen in September 1991 (J. Fjeldså verbally 1991: coordinates read from IGM 1976); near Azurduy village, 20°06'S 64°25'W, at 2,700 m, where a pair and juvenile were seen in October 1991 (J. Fjeldså verbally 1991: coordinates read from IGM 1984);

Argentina (*Jujuy*) El Duraznillo, c.23°35'S 64°55'W, at 3,000 m, Alto Calilegua (Olrog and Contino 1970; correct elevation from Remsen *et al.* 1988); (*Salta*) above Chicoana, c.25°06'S 65°33'W, at c.2,600 m along the road to Cachi, on the east slope of Cumbre de Obispo, where one was seen in November 1985 (R. S. Ridgely *in litt.* 1989); and below Cachi, where a pair was seen at c.2,630 m in November 1990 (B. M. Whitney *in litt.* 1991).

POPULATION This species was described as being very common near Palca and Inquisivi in September 1830 (d'Orbigny 1835-1844), but only two or three pairs were found in a c.4 ha *Polylepis* woodland at Cerro Cheñua Sandra in April 1987, where their retiring habits made them difficult to detect (NK). In Quebrada Majon the bird was noted on 10 of 16 field days (Remsen *et al.* 1988), and in Tunari National Park as many as 50 birds have been recorded moving between a nightly roost in the *Eucalyptus* plantation and a bushy ravine just above the town of Cochabamba, although other Cochabamba localities are inhabited by very few pairs (S. Arías verbally 1991). The species was still found to be common on Cerro Tunari during February and March 1992 (B. M. Whitney and J. L. Rowlett *in litt.* 1992). At the known sites in Chuquisaca department the species appears to be scarce (J. Fjeldså verbally 1991). There are very few records from Argentina, and the species's status there remains unknown (see above).

ECOLOGY In most of its range the Rufous-bellied Saltator inhabits semi-arid regions where it frequents woodland and bushy, often steep-sloped watered valleys with small woodlands, as well as riparian thickets and hedgerows in agricultural areas, sometimes even entering villages (d'Orbigny 1835-1844, Fjeldså and Krabbe 1990). In Bolivia, the bird has rarely been found far from *Polylepis* trees (Remsen and Quintela unpublished), whilst at Serranía de Calilegua and Cachi, Argentina, it was found in bushes and hedgerows

in the alder *Alnus acuminata* zone (Olrog and Contino 1970, B. M. Whitney *in litt.* 1991), the species being found in Argentina, as well as at its easternmost known site (Pojo, Bolivia), in what has been described as humid montane forest and edge (M. Nores *in litt.* 1989).

It occurs in pairs and small groups, sometimes mixing with Golden-billed Saltator *Saltator aurantiirostris* and White-tipped Plantcutter *Phytotoma rutila*, and secretively and slowly forages for berries, especially those of mistletoes and *Schinus molle*, but is also said to eat seeds and insects (d'Orbigny 1835-1844, Fjelds  and Krabbe 1990, S. Ari s verbally 1991). In May it has been seen eating the purplish-red fruits of a 1.5-3 m tall *Berberis* sp. shrub as well as those of *Heteromelas* sp.: other birds feeding on these fruits were Great Thrush *Turdus fuscater*, Red-crested Cotinga *Ampelion rubrocristatus* and Golden-billed Saltator (Remsen *et al.* 1988). On one occasion a group of five birds was observed pecking the ground in a ploughed field (Remsen *et al.* 1988), and the pair seen below Cachi was picking intently at small areas on the ground beneath *Alnus* hedgerows (surrounding stone walls) (B. M. Whitney *in litt.* 1991). Stomach contents of 15 birds taken in May and August were vegetable matter, either green plant fibres or fruit seeds ranging in size from 6x3 to 7x4 mm (Remsen *et al.* 1988). The species may depend strongly on mistletoe fruit, and although it uses alternative food sources, viable populations may require habitat patches with large numbers of mistletoes: apparently the mistletoes on *Alnus* trees fruit only during the rainy season when the trees have leaves, whilst the evergreen *Polylepis* may provide a more constant supply of the berries (J. Fjelds  verbally 1991).

A pair taken in Cochabamba in April had slightly enlarged gonads (specimens in ZMUC), as did a female taken in May (Remsen *et al.* 1988); juveniles have been taken in Cochabamba in May, August and September (d'Orbigny 1835-1844, Hellmayr 1925, Remsen *et al.* 1988). In Cochabamba, birds were noted singing and showed territorial response (to playback) in mid-February 1992, but not in mid-March: with the wet season having just ended in mid-February, it seems likely that nesting occurs during December and January (B. M. Whitney *in litt.* 1992).

THREATS If the species is truly dependent on mistletoes, it may be threatened, as the *Polylepis* and *Alnus* woods are dwindling, becoming restricted to watered ravines and steep slopes, owing both to clearance for cultivation and to regular burning for pasture throughout the semi-arid temperate zone of Bolivia and Argentina (J. Fjelds  verbally 1991, B. M. Whitney *in litt.* 1991).

MEASURES TAKEN The species occurs in Tunari National Park (6,000 ha: IUCN 1992), a reserve situated on the slope immediately north of Cochabamba town (but the management of this park does not seem very adequate: J. Fjelds  verbally 1991), and in Calilegua National Park (76,000 ha: IUCN 1992) in Argentina (see Distribution).

MEASURES PROPOSED A study of this species should be undertaken to determine more clearly its ecological requirements (e.g. the extent to which birds rely on mistletoes in *Polylepis* and *Alnus* woods). The best way of protecting its habitat may be to launch an information campaign aimed at educating local people about the soil-degrading impact of burning the mountain slope vegetation (which also leads to loss of water catchment), and developing alternative ways of more intensive land use: suitable target areas could be Cerro Che nua Sandra, near Azurduy (where a reforestation programme with *Alnus* has already been started) and in Cerros Chapeados (J. Fjelds  verbally 1991). The bird's continued presence near Inquisivi should be established, and the populations and state of habitat must be determined within the two national parks frequented by the species; the integrity of habitat within these parks must be ensured.

At several localities where this species occurs the Cochabamba Mountain-finch *Poospiza garleppi* (see relevant account) is also found, and in Chuquisaca its habitat overlaps that of the near-threatened Alder Amazon *Amazona tucumana*: the best interests of all these species should be considered in any conservation initiatives undertaken.