

Subject to enormous, long-term (but, since the 1940s, illegal) pressure from trappers because of its capacity to hybridize with canaries, this small, semi-nomadic seed- and fruit-eating finch of foothills in northern Venezuela has become extremely rare throughout a now fragmented range, and may not survive if the trapping is not controlled. The species has disappeared from Trinidad; a tiny population exists in Colombia, and another, derived from escaped cagebirds, in Puerto Rico. Fuller field studies, combined with the creation or extension of some protected areas, reintroductions, and a major publicity campaign, are urgently needed.

DISTRIBUTION The Red Siskin is now very patchily distributed in several areas of northern Venezuela, with a tiny outlying population in north-east Colombia and an introduced colony in south-east Puerto Rico; there are a very few records from Trinidad and its islands where it is almost certainly now extinct, while reports from Cuba appear to be based on escaped cagebirds that never established themselves.

Colombia Records are from near Cúcuta, Norte de Santander department. Two specimens were collected at Villa Felisa, 750 m, 20 km south of Cúcuta on the Pamplona highway, in October 1947, with another male and two females seen at the same time, and with a later (November) sighting at 1,500 or 1,700 m in evidently a second area to the south of Cúcuta (Dugand 1948, Meyer de Schauensee 1966, Hilty and Brown 1986; specimens in USNM, which give an altitude of 420 m and 18 km south of Cúcuta, on Pamplona highway). Hilty and Brown (1986) mention a sighting in 1978 in the east of the department, and their map shows two adjacent localities aligned north–south on the Venezuelan frontier.

Venezuela Evidence gathered by Rivero (1983), repeated in less detail in Coats and Rivero (1984) and Coats and Phelps (1985), suggests that the species once extended throughout the northern cordilleras of the country from the Andes of Mérida north-east as far as Miranda, breaking in western Anzoátegui to reappear in Sucre and northern Monagas (see Remarks 1), but that today it is only known with certainty from Falcón and Lara in the west (but see below under Barinas), and Miranda, Distrito Federal, northern Guárico and Anzoátegui in the centre of this former range. In the following breakdown it should be noted that the evidence of Rivero (1983) was based very largely on information from trappers, and that all states except Zulia were mentioned by Coats and Phelps (1985); localities are given roughly from west to east, and coordinates are taken from Paynter (1982).

Zulia Rivero (1983) knew of two sites near San Juan (see Remarks 2). *Mérida* The only site known to Rivero (1983) was evidently that derived from a specimen (in AMNH) taken at “Sabaneta” (La Sabana), 8°35'N 71°28'W, 600 m, in September 1898 (also Hellmayr 1938, Phelps and Phelps, 1950, 1963; specimen om AMNH).

Barinas A male bird was seen in a coffee plantation in the vicinity of Barinitas, March 1984 (S. Whitehouse verbally 1992). Because this record is from a previously unpublished site and extends the range into a new state, it is possibly unknown to trappers; the details are therefore withheld.

Trujillo Rivero (1983) knew of five sites near Carache in the far north-east of the state in the Andean foothills.

Portuguesa Rivero (1983) knew of five sites near Biscucuy in the far north-west of the state in the Andean foothills.

Lara Rivero (1983) knew of 58 sites in the region of Aguado Grande, Duaca, Sanare and Los Humocaros. In a brief survey of 11 of these in January 1981, no birds were found in the wild but six captive birds (three recently taken) were found in mountains near Siquisique, and others were found near El Copey, where many birds, mostly immatures, had been caught in unusual numbers in July–September 1980 (Coats and Rivero 1984). The southernmost part of the Serranía de Chumuguara just extends into northernmost Lara (Rivero 1983; see under Falcón below), and it would appear that these are those near (just north of) Siquisique. El Copey remains untraced. Rivero (1983) also indicated that (1) the Andean foothills in the west of the state (shared with Zulia, Trujillo and Portuguesa) remained important for the species (see Population), with birds formerly using at least seven sites around Barquisimeto, (2) the Serranía de Ziruma-Baragua in the north-west of the state reportedly held birds until 1975, and that they could recolonize from the mountains to the east (i.e. Chumuguara), and (3) the Serranía de Bobare-Matatare in the east of the state reportedly held birds until 1977, and that birds still visited the area annually in search of food.

Falcón Rivero (1983) knew of 82 sites in the districts of Mene Mauroa, Federación Petit, Zamora, Acosta and Silva, the areas in question being the Sierra or Serranía de San Luis and the Serranía de Churuguara, where important numbers survived in 1981 (see Population).

Yaracuy Rivero (1983) knew of nine sites near Nirgua, 10°09'N 68°34'W. These seem to be different from the extension of the Serranía de Bobare-Matatare into the north-west of the state (see under Lara above) but four of them occurred in the Sierra or Serranía de Aroa, also in the north-west, where the last birds were seen in 1974, and presumably the others were in El Macizo de Nirgua in the central-south of the state, where the last populations were seen in 1976 (Rivero 1983).

Carabobo Rivero (1983) knew of two sites near Valencia.

Aragua Rivero (1983) knew of 13 sites in the districts of Girardot, Ricaurte, San Sebastián and Mariño. Curiously, Coats and Phelps (1985) only listed this as a probable range state.

Distrito Federal Rivero (1983) knew of six sites near Caracas. The species had been recorded from near Caracas in 1867 (Sclater and Salvin 1868a; hence presumably Phelps and Phelps 1950), and reliable reports in 1981 indicated its survival in low numbers in one or two populations, possibly ranging into El Avila National Park (Coats and Rivero 1984).

Miranda Rivero (1983) knew of 43 sites near Ocumare del Tuy. In February 1981 more than 30 sites were visited in the Serranía del Interior, and birds were found at five (see Remarks 3) in this and Guárico state, all roughly aligned east-west, at distances of 14, 10, 42 and 15 km from each other (Coats and Rivero 1984); the study area that was used following this survey was at 9°57'N 65°55'W, on the southern edge of the Serranía del Interior in the Cordillera de la Costa (Coats and Phelps 1985), this seemingly just inside Miranda. M. L. Goodwin (*in litt.* 1992) referred to small groups being seen between February and June in the mountains near Cúa, and this appears to be identical or close to the study area above.

Guárico Rivero (1983) knew of 41 sites near Altagracia de Orituco. Some of these were surveyed in 1981 (see under Miranda above).

Anzoátegui Rivero (1983) knew of 11 sites near Clarines in the north-west of the state, indicating that this was the easternmost point of a once continuous range from the Andes before a natural break until the species reappeared in Sucre. However, there is a skin in USNM taken in 1952 and labelled “probably from Barcelona” in the north-east of the state. In giving a population estimate for the central area, Rivero (1983: 69) implies that birds survive in the west of the state.

Sucre Rivero (1983) knew of nine sites near Cumaná. These doubtless included records based on two specimens (in BMNH) from Carúpano on the north coast of the Paria Peninsula, one dated February 1867 (Sclater and Salvin 1868a), plus those from the plain near Cumaná, plus “Quebrada Secca” (= Villarroel), 10°18'N 63°57'W, Campos Alegre valley, 10°10'N 63°45'W, La Tigra, 10°15'N 63°45'W, forest of Los Palmales, 10°17'N 63°45'W and Rincón de San Antonio, 10°16'N 63°43'W, all taken in February–April 1898 and all in AMNH (sites listed in Hellmayr 1938, Phelps and Phelps 1963).

Monagas Rivero (1983) knew of six sites near Maturín, these doubtless including San Antonio, Bermúdez, 10°07'N 63°43'W, July 1896, and La Montaña del Guácharo, 10°09'N 63°32'W, February 1898 (specimens in AMNH; sites listed in Hellmayr 1938, Phelps and Phelps 1963; also Phelps 1897). Rivero (1983) also had reports from an ornithologist in the state that the bird no longer occurs there.

Trinidad and Tobago Whether the species was formerly resident in the country remains uncertain (French 1973), with records concentrated in the north-west peninsula and adjacent islands (see map in French 1973): Monos Island, May 1893 (Chapman 1894); Gasparee Island, November 1921 (Belcher and Smooker 1934-1937); Carenage, June 1926 (Belcher and Smooker 1934-1937); Arima valley, May 1960 (French 1973). A nest (“in the stout vertical fork of a small tree at about 12 feet from the ground”) believed to be of this species, taken near the River Estate, Diego Martin, in August 1926 (Belcher and Smooker 1934-1937), does not conform well with the scant information that exists on the subject (see Ecology), and this record is better treated as provisional. There are at least 11 skins simply labelled “Trinidad” (in AMNH, ANSP, BMNH, FMNH, MNHN, USNM), but the significance of these in indicating a former population on the island remains unclear; Hellmayr (1906a) dismissed those in BMNH as of the “Orinoco” make and “certainly not from the island”. On current evidence, at least, the bird is no longer present (see Population).

Cuba The only concrete record appears to have referred to a cagebird (see Hellmayr 1938; also Population).

Puerto Rico Reports and observations suggest that a population, derived from escaped cagebirds, has established itself in a small area bounded by the towns of Guayama, Coamo and Aibonito in the south-east of the island (Raffaele 1983, 1989). However, two specimens (in USNM; see Remarks 4) taken in June 1977 are from north-east of Salinas, which is south-west of the area covered by the three towns mentioned above.

POPULATION The total number of wild Red Siskins remaining is unknown, but it is certain that an enormous decline has taken place (King 1978-1979). Studies in Venezuela in the early 1980s, although undertaken by co-workers, appear to have resulted in very different assessments of status.

Colombia From a remark in Stepan (1966), it appears that bird fanciers were aware of small numbers coming out of the country, apparently fairly continuously, in the 1960s. The modern status of the species is uncertain, birds being very local although still seen in small numbers, e.g. one small flock in 1978 (Hilty and Brown 1986). Fieldwork around Cúcuta in 1986 indicated that the species was indeed very rare there (some birds being reported) and apparently declining owing to trapping (G. Arango *in litt.* 1986).

Venezuela The Red Siskin is considered the most threatened bird in the country (G. Medina-Cuervo *in litt.* 1986). Its plight came to national attention in the 1940s following a period of three decades in which thousands were trapped and exported (see Measures Taken), but even during the 1940s and 1950s “hundreds, even thousands, ...were sent to Curaçao annually” (Coats and Phelps 1985); indeed Phelps (1952) commented that ten years before it had been relatively common but that at the time of writing it was almost extinct. Similarly, Muñoz-Tébar (1952) indicated that the species was formerly common in bird shops in the country and was often flown to foreign markets in lots of 500, but that now people had to queue to buy a single bird.

Coats and Phelps (1985) divided the Venezuelan range into three areas (although their map shows six) and by extrapolation from fieldwork they presented estimates for the two areas they studied, namely the west, in which they suggested 350-500 birds survived, and the centre, for which they suggested a total of 250-300, while for the east (Sucre, Monagas) they reported the claims of bird-dealers that the species was already extinct, thus yielding a possible national total of only 600-800 birds. These findings generally conform with data in Coats and Rivero (1984), who also indicated roughly 300 birds in the central region, although they speculated that the reason the eastern population was judged extirpated by dealers in Caracas was that trappers might have found other trading routes for their birds (but they agreed that any surviving populations there would be in poor condition; and see Distribution: Monagas).

The most curious challenge to the figures in Coats and Phelps (1985) comes from Rivero (1983), who only addressed in detail the situation in the western area: as indicated under Distribution, he reported apparent extinction of birds in the serranías of Ziruma-Baragua (Lara) and of Bobare-Matatera (Lara, Yaracuy), Sierra de Aroa (Yaracuy) and Macizo de Nirgua (Yaracuy), but reported its survival in the Sierra de San Luis, where he judged 1,000 birds to be present (despite 200 being trapped in 1981; see Remarks 5), the Serranía de Churuguara, which he judged to hold almost half of the entire western area's population, i.e. some 3,000 birds, and the north-eastern Andean foothills, where he thought some 500 birds might survive. Later in the same work he referred to Lara and Falcón holding 4,500 birds, apparently indicating that this is 75% of the western area's total (i.e. again implying some 6,000 birds there; but see Remarks 6), and added that some 1,500 might occupy the central area; he also indicated (somewhat paradoxically) that the Venezuelan population lies between 2,000 and 20,000 birds; finally he suggested that the total was around 6,000 (Rivero 1983). If his figures of captured birds in the period 1975-1982 (see third paragraph under Threats) approximate to the truth, it certainly appears impossible to accept the total figures proposed for the wild population in Coats and Phelps (1985), if only because in 1982 alone more birds were trapped than Coats and Phelps credit for the entire country.

Whether in the high hundreds or the low thousands, however, the total population is clearly very small indeed; Coats and Phelps (1985) felt that it was probably doomed to extinction, and the evidence from campesinos in 1986 was that the trapping pressure was still present and the trend still down (S. Coats

in litt. 1986). This is a point that is also stressed in Rivero (1983), who argued that the species could be extinct in the country as soon as 1984.

Trinidad and Tobago The species is probably now extirpated from the country, where it was never anything but rare; even the bird-trappers of the island do not know it (R. French *in litt.* 1986, V. C. Quesnel *in litt.* 1986).

Cuba It is very doubtful that any feral populations exist now or ever became established in Cuba (O. H. Garrido *in litt.* 1991).

Puerto Rico Some 12 birds were seen at one site in June 1976 (Raffaele 1983), but despite speculation that the population on the island “may well represent the largest remaining pool” (Raffaele 1983; hence also Diebold 1986) the species has been described as “very rare and local” (Raffaele 1989). Although records go back into the last century, the species was probably an introduction and it seems likely that it became established on the island in the 1930s when South American populations were still high and there was probably heavy demand for the bird in Puerto Rico (Raffaele 1983). Small numbers were seen in 1982 (Coats and Phelps 1985).

ECOLOGY The Red Siskin is a semi-nomadic inhabitant of the foothills and lower montane slopes, ranging altitudinally between 280 and 1,300 m, occupying a variety of habitats from moist evergreen forest to shrubby grassland and pastures (Coats and Phelps 1985; also King 1978-1979); its characterization as a bird of open forest and forest edge (Stepan 1966) appears accurate. In the main study area in Cordillera de la Costa, 1981-1982, birds used two distinct habitat zones: dry deciduous woodland and shrubby grassland at 220-650 m, and mixed deciduous and evergreen forest with cafetals (small coffee plantations), small gardens and clearings, from 650 m upwards, and it was in this zone, from 750 to 1,300 m, that the breeding area lay (Coats and Rivera 1984, Coats and Phelps 1985). Habitat choice appeared to depend on several factors including the availability of food, water for drinking and bathing, song perches (these were preferably at least 4 m above ground), roost trees and nesting sites; all sites where the species was found had in common the presence of food-plants, water, and nearby trees at least 8-9 m high (Coats and Rivero 1984). In Colombia birds occupy open grassy areas with bushes and low trees, favouring drier areas (Hilty and Brown 1986); in Puerto Rico they are found in “scrubby foothills well removed from urban areas” (Raffaele 1983).

On Monos Island Chapman (1894) saw two birds feeding on the fruit of a large cactus. In the 1981-1982 study birds were observed feeding on the dry seeds and fleshy fruits of five species of plant: *Urera baccifera*, which grows in moist, partly shaded areas usually above 600 m and is particularly abundant in cafetals and forest openings, fruiting in February–April when it appears to be the most favoured food, birds in one instance flying a circuit of c.10 km each day to visit several stands in turn; *Trixis divaricata*, a scandent shrub of dry deciduous forest and savanna above 400 m, most abundant at woodland edge including roadcuts and streamsides, fruiting in December–January; *Eupatorium odoratum*, which grows up to 950 m as a low compact shrub 1-2 m tall at woodland edge, along woodland streams and in savannas (i.e. frequently near *T. divaricata*), often abundant in areas cleared for grazing, fruiting in January–February; *Wedelia caracasana*, an erect, tough-stemmed herb 1-2 m tall in sunny, rocky areas usually above 600 m, abundant in areas cleared for roads and pastures, especially on ridge-tops and slopes of interior valleys, producing seeds from late July to November or December (this plant, under the name *W. calycina*, being considered an “indicator” species for the presence of Red Siskins by Rivero 1983); *Cordia currasavica*, a compact shrub up to 1.5 m tall that grows on rocky soils in open areas and savannas above 650 m, commonest in interior valleys cleared for pasture and in transition zones between savannas and gallery forest, often near *W. caracasana* and fruiting from August to early October (Coats and Rivero 1984; also Coats and Phelps 1985; see Remarks 7). Plants reported by trappers to be used by Red Siskins (times of fruiting in parentheses) are: *Panicum maximum* (probably all year), *Urera caracasana* (September–October), *Coccoloba caracasana* (probably June–August), *Amaranthus dubius* (September–November), *A. spinosus* (February–April), *Xylopia aromatica* (November–March), *Brassica vulgaris* (unknown), *Capparis hastata* (probably July–October), *Senna bacillaris* (perhaps February–May), *Bursera simaruba* (perhaps September–December), *Cochiospermum orinocense* (May–August),

Lemaireocereus deficiens (unknown; but, as *Ritterocereus*, it is said to ripen after the main rains by Rivero 1983), *Hyptis suaveolens* (December–February), *Borreria verticillata* (November–June), *Brickellia diffusa* (December–April), *Lagascea mollis* (August) (described as the main and most sought-after food for the bird and its young), *Mikania micrantha* (October–January), *Synedrella nodiflora* (unknown; but Rivero 1983 gives September–November), *Trixis frutescens* (February–April), *Wedelia parviflora* (unknown) (Coats and Rivero 1984). In addition to these, Rivero (1983) mentions *Wedelia ambigens* as an important food-source in the driest periods, *Sclerocarpus coffaeocolus* (June–August), *Oyedaea verbesinoides* (period not given), *Bidens pilosa*, *Elephantopus mollis*, *Taraxacum officinale* (all three September–November), flowers of *Chamissoa altissima* (March–May), flowers of *Parthenium hysterophorus* (October–December), *Rubus robustus* (August–November), nectar of *Erythrina poeppigiana* (an important shade-tree for coffee; February–May), *Acanthocereus tetragonus* (after the main rains), *Capparis odoratissima* (July, August), *Pithecellobium unguis-cati* (period not given), flowers of *Cedrela odorata* (March–May), nectar of *Bursera simaruba* (April–June), fruits and flowers of *Acalypha carpinifolia* (March–May).

The main breeding period is from May to early July, with a second period in November–December, many fewer juveniles being seen in January–February than in August–September (Coats and Phelps 1985); the rainy season extends from May to the end of November (Coats and Rivero 1984). The two birds collected in October in Colombia were in breeding condition (Hilty and Brown 1986), as was at least one of the birds collected in June in Puerto Rico (data on label in USNM; see also below). Data from captive breeding indicate that a single nesting cycle (from nest-building to self-feeding young) takes at least 45 days, and therefore there is probably only one brood per breeding period (Coats and Rivero 1984, Coats and Phelps 1985). There are reports of males being serially polygamous (Rivero 1983, Coles 1986); in captivity, a male took no part in nest-building, incubation or care of the young, but he was on hand throughout to provide the female with food (Amsler 1912). In moister areas the nest is constructed in tall trees such as *Erythrina poeppigiana* and *Inga* sp.; in semiarid areas in trees such as *Guazuma ulmifolia* and *Prosopis juliflora* (Rivero 1983). Within the tree itself the nest is reportedly placed in clumps of bromeliads *Tillandsia usneoides* (also *T. barbata*: Rivero 1983) hanging from tall (25 m high or more) trees; and certainly tall trees festooned with this epiphyte are commonly used as song perches, February–June (Coats and Rivero 1984). On Puerto Rico in June 1976, a female was seen carrying *Tillandsia* to a nest apparently under construction roughly 1.5 m below the crown of a gumbo limbo *Bursera simaruba* (Raffaele 1983). In captivity, where it has been noted that the female prefers to nest very high up within an aviary (Frey 1985), clutches range from three to five eggs, incubation starts with the last or penultimate egg and lasts 11–13 days, and fledging occurs at 14–16 days (Coats and Rivero 1984, Coats and Phelps 1985). Family groups stay together for several weeks after fledging; during the 1981–1982 study a mean of 1.4 offspring per successful pair was determined during the first month after fledging, but allowing for total failure the true productivity is probably more like 0.5–1 (Coats and Rivero 1984, Coats and Phelps 1985).

During the post-breeding period at the 1981–1982 study site, birds travelled many kilometres daily, often feeding in the lower, dryer zone but usually moving up the mountainsides to communal roosts in the evening; in one case the roost-trees were an *Inga* and an adjacent *Acacia* in the lower part of the wet forest zone (Coats and Rivero 1984, Coats and Phelps 1985). The extent to which birds wander widely after breeding, as implied in King (1978–1979), is not clear, although Rivero (1983) reported localities at which birds were only known to use for feeding, for example the Serranía de Bobare-Matateré, and those apparently far from wet forest near Barquisimeto, in Lara, and concluded that migrations over 50 km took place. On Monos Island, Trinidad, Chapman (1894) was told birds were common there at times, suggesting seasonal influxes. Birds are generally gregarious, foraging throughout the year in groups of 10 or more, although the usual observed flock-size, 1981–1982, was around 2–4; birds may remain in mated pairs throughout the year (Coats and Rivero 1984).

THREATS Excessive and relentless trapping for the cagebird trade since at least 1835 is the single known cause of the decline of the Red Siskin towards extinction: although part of the problem was the use of skins or feathers in the manufacture of ladies' hats (mid-nineteenth century), it is particularly because the species hybridizes with the domestic canary to produce fertile offspring of various reddish colours and with enhanced singing capacity, much prized by bird fanciers and widely known to them since the start of the twentieth century (Amsler 1935, Muñoz-Tébar 1952, King 1978–1979, Coats and Phelps 1985). At that time, there was no trapping from the onset of the rainy season until after the end of the main breeding

period, since the nesting areas were relatively inaccessible, so that most trapping took place in July–September when flocks were feeding at the base of the mountains; young birds were preferred as they adapted better and sold better (they could be seen to have a long life-span ahead of them), while most females were released, although the high mortality among the birds meant that more had to be captured than were intended to be sold (Coats and Phelps 1985). The popularity of the species very rapidly grew (big numbers were first imported into Germany in 1909-1911: Stepan 1966), and was intensified with the outlawing of the capture of native birds in the U.S.A. and Europe; ironically, however, following the protection of the species in Venezuela in the mid-1940s interest in it merely redoubled, and trade went underground, with hundreds and even thousands being reputedly smuggled out of the country via the Dutch offshore island of Curaçao (Coats and Phelps 1985). The failure of the Netherlands to accede to CITES meant that this trade route remained open for many years after the species was placed on Appendix I (see Measures Taken).

In recent years new roads have opened up many breeding areas so that now birds are taken at all times of the year, and females are also retained to be hybridized; although other birds are easier and more plentiful to trap, the high prices fetched by Red Siskins (approaching US\$1,000 in the mid-1980s for a single bird) maintain the pressure on them and in fact some trappers – many of them originally from the Canary Islands, where the longest tradition of crossing them with canaries exists (see, e.g., Astley 1902, Hopkinson 1920) – pursue them as a kind of sport, following them around in jeeps and trucks, buying them up from campesinos (Coats and Phelps 1985). Although habitat is more extensive in the western part of its now disjunct range, hunting pressure is also greater; meanwhile the eastern part, which was once a major source of birds, may have been completely depleted (Coats and Phelps 1985; but see Population). The preferred food-plants (i.e. the five known species) are very common species of secondary and disturbed vegetation in the more seasonal regions of Venezuela, which obviously helps make the bird a prime target for trappers (A. M. Sugden *in litt.* 1986).

Rivero (1983) devotes two pages of tables to reported captures of birds in each of its known states in each year from 1975 to 1982, condensed with western area first, central area second, as follows: 2,400 and 450 (1975), 2,350 and 250 (1976), 1,500 and 300 (1977), 1,800 and 450 (1978), 1,250 and 550 (1979), 1,750 and 700 (1980), 1,600 and 800 (1981), 300 and 750 (1982) (see Remarks 8). As an example of the interest in the species at national level, a birdwatcher stopping at random at a garage for repairs in Caracas in 1984 counted 10 Red Siskins in cages around the walls of the establishment (S. Whitehouse verbally 1992). The pressure of trade was still very strong inside and outside the country in 1986, with campesinos reporting trapping despite the arrest of bird-catchers (S. Coats *in litt.* 1986).

The species appears always to have been under pressure in Colombia, Stepan (1966) referring to the country as a source of birds for Europe because of the tightening of the laws in Venezuela (although this is barely consistent with the above), and Venezuelan trappers themselves crossing into the Cúcuta area to take birds in the 1980s (G. Arango *in litt.* 1986). Even on Puerto Rico, where the population is almost certainly derived from escaped cagebirds, birds are apparently under trapping pressure, as a boy was reported to be selling them by the roadside near a known site in early 1976 (Raffaele 1983). Nevertheless, the idea that “populations formerly thought safe on several Caribbean islands have been discovered by illegal traffickers and have been systematically decimated” (Amos 1986) seems to be mistaken.

Other threats Rivero (1983) pointed out that while traditional campesino clearance of land had apparently favoured the species (witness the known food-plants: see Ecology), intensive agriculture and the clear-felling of large areas have affected it adversely. Rivero (1983), Coats and Rivero (1984) and Coats and Phelps (1985) listed the species's most likely natural enemies.

MEASURES TAKEN The first prohibitions on sale and export from the mid-1940s, achieved through the agitation of the Phelps family, only had the effect of increasing demand and sending the trade underground (Coats and Phelps 1985), though by 1952, when the species was designated threatened at the IUCN General Assembly in Caracas (see Muñoz-Tébar 1952, Coats and Phelps 1985), it was almost impossible to obtain an export permit and there were real hopes for a recovery (Phelps 1952). The species was placed on Appendix I of CITES in July 1975 and on the U.S. Endangered Species Act (as “endangered”) in June 1976 (Coats and Phelps 1985). The 1981-1982 field study of the species was organized by the Sociedad Venezolana de Ciencias Naturales with a grant from the country's ministry for renewable resources, MARNR (Coats and Phelps 1985). The smuggling of birds through Curaçao, common since the 1940s and undiminished by the Appendix I listing of the species (Coats and Phelps 1985), was presumably

rendered less easy with the accession of the Netherlands to CITES in July 1987. Throughout the 1980s the non-governmental conservation group FUDENA has worked to initiate a programme of conservation and reintroduction, and the Venezuelan Audubon Society and the Federación Ornitológica Venezolana have also conducted publicity work to highlight the need for action to save the species (M. L. Goodwin verbally 1987). Birds are not known to occur in any protected area (but see Measures Proposed).

In certain published accounts the names of specific sites in Venezuela have been suppressed in order to give them greater security (e.g. in Meyer de Schauensee and Phelps 1978, Rivero 1983, Coats and Phelps 1985), yet it is perfectly clear from the latter two references and others that the trappers know all the sites already while the conservationists and ornithologists know hardly any. Raffaele (1983) also suppressed names of localities on Puerto Rico for fear of "collectors", but if the area is to be secured in the manner he suggested (see Measures Proposed) these details will quickly become available.

Captive breeding An increase in breeding effort as a means of taking the pressure off wild populations was proposed as long ago as the mid-1960s (Stepan 1966), and this call was repeated in the early 1980s by Venezuelan conservationists (e.g. Goodwin 1982). The American Federation of Aviculture duly responded with an attempted worldwide survey of captive stock (Amos 1986, Coles 1986) and the establishment of a consortium to build a self-sustaining population (Diebold 1986), this project now issuing its own newsletter, *Siskin News*, and expanding to protect habitat in the wild and reintroduce birds where feasible (Gorman 1990, 1992). In Europe both Kühn (1987) and Radtke (1991) reported that an exceptionally high, healthy breeding stock had been built up over 30 years, especially in Germany, and had made importations redundant (but see Measures Proposed). Rivero (1983) indicated that countries with major captive stocks of the species are Germany, Argentina, Belgium, Spain and the Netherlands. Captive breeding information is given in Stepan (1966), Rivero (1983), Galliano (1984), Frey (1985), Coles (1986), Märzhäuser (1986), Kühn (1987) and Radtke (1991); as an example of reproductive capacity in captivity, Coles (1986) reported on three Italian breeders who in 1984 obtained respectively 129 young from 18 pairs, 59 young from eight pairs, and 124 young from 12 males and 15 females.

MEASURES PROPOSED Small populations are reputed to occur in Guatopo and Terepaima National Parks (B. Swift *in litt.* 1988), and there is a possibility that another occurs in El Avila National Park (Coats and Rivero 1984); these three areas need to be carefully surveyed as soon as possible. The recommendations of Coats and Phelps (1985) were to undertake (1) the creation of one or more reserves of sufficient size to give the species year-round protection (something that might best be achieved by an extension of the boundaries of Guatopo National Park, if the birds prove not to be present but only in an adjacent area: Coats and Rivero 1984); (2) further field studies, involving radiotelemetry, to determine daily and seasonal movements of local populations and to define the area to be encompassed by a reserve; (3) the promotion of public concern and involvement through campaigns; and (4) training of staff in Guatopo National Park concerning the Red Siskin and its plight. Obviously the situation in the eastern area of occurrence, which was not addressed in the 1981-1982 fieldwork, needs to be investigated (Coats and Rivero 1984). In response to these points, FUDENA has a proposal to study and protect the species in the wild, control commerce, promote public awareness, breed the species in captivity and reintroduce it where possible, all of which requires financial backing (G. Medina-Cuervo *in litt.* 1987). It is worth noting that, in spite of Europe being reportedly self-sufficient in Red Siskins, there seems to be little contact between countries or continents in order to agree and coordinate future work, and there ought to be sufficient resources, in terms of both stock and finances, for the avicultural communities of the developed world to support work such as outlined above. It is also worth noting that the localities identified but not named by Rivero (1983) need to be catalogued and deposited with Venezuelan government and non-government authorities and with ICBP, so that they can be used responsibly by conservationists.

Outside Venezuela, further fieldwork in Colombia might help elucidate the bird's status there: the area from which it is recorded is apparently relatively unspoilt (G. Arango *in litt.* 1986), suggesting that control of trapping, especially if done by Venezuelans, might lead to the recovery of the population(s) there. In Puerto Rico its status requires fuller investigation, and consideration should be given to declaring its range critical habitat under the U.S. Endangered Species Act (Raffaele 1983), although the idea of reintroducing birds to Venezuela (Raffaele 1983) sounds perhaps too generous (at least at present) with what is a very valuable reserve stock, which merits being managed as such in perpetuity.

REMARKS (1) There is an undated skin in USNM labelled "Orinoco", which is probably simply a

mistake but might represent some extension further east than otherwise known. (2) This is presumably the source for the only area mapped in the state by Coats and Phelps (1985), although they mark an area in the foothills of the Sierra de Perijá whereas the coordinates (10°08'N 72°21'W) for the only locality of this name in the state given by Paynter (1982) suggest a lowland area further east. Meanwhile, Rivero (1983) referred to the former range of the species in the north-eastern foothills of the Andes, involving the states of Lara, Portuguesa, Trujillo and Zulia, so it is possible that the area intended by his "San Juan" lies to the east of the Lago de Maracaibo, which is consistent with another map (Figure 3) in Rivero (1983), which shades in an area of foothills in Zulia at roughly 9°N 71°10'W. Curiously, the main text in Coats and Phelps (1985) omits any mention of Zulia. OG (1961) lists a San Juan at 8°54'N 71°41'W. (3) Coats and Phelps (1985) referred to this fieldwork finding the species at six sites rather than five, all in the central part of its range. (4) These skins presumably replaced the ones lost in 1976 (see Raffaele 1983). (5) It is evident that the figure for the Sierra de San Luis was guesswork, since Coats and Rivero (1984) mentioned that their planned visit there in May 1981 was prevented by landslips. (6) Rivero (1983) is vague and ambiguous at key places when giving population estimates: the figure of 3,000 for Serranía de Churuguara could, for example, refer to the total population of the western area or, as assumed based on other pronouncements, half of that total; at any rate, in his concluding summary he indicated that the western area held 75% and the central area 25% of the country's populations, which implies that his preferred total for the west was 4,500, not 6,000. (7) These names are as given in Coats and Phelps (1985); Coats and Rivero (1984) give *Wedelia calycina* and use the spelling *curasavica*. (8) Paradoxically, in his final recommendations Rivero (1983) ignored this table and referred to a total of 400 being captured in 1980 and 200 in 1981.