THE VENEZUELAN RED SISKIN: CASE HISTORY OF AN ENDANGERED SPECIES

SADIE COATS AND WILLIAM H. PHELPS, JR.

Made in United States of America
Reprinted from ORNITHOLOGICAL MONOGRAPHS NO. 36

THE VENEZUELAN RED SISKIN: CASE HISTORY OF AN ENDANGERED SPECIES

SADIE COATS AND WILLIAM H. PHELPS, JR.

*Sociedad Venezolana de Ciéncias Naturales, Caracas, Venezuela, and *Department of Ornithology, American Museum of Natural History, Central Park West at 79th Street, New York, New York, 10024 USA (*mailing address)*

ABSTRACT. Excessive trapping for the cagebird trade during the early 20th century placed the Red Siskin, *Carduelis cucullata,* a Neotropical cardueline finch, in grave danger of extinction. 1981 estimates indicated only 600 to 800 individuals in scattered small populations in the western and central regions of the northern cordilleras of Venezuela, and trapping of these populations still continues. Capture, sale, and export of Red Siskins has been illegal in Venezuela since the 1940's, but protection has not succeeded because trapping occurs in remote regions difficult to police, and the birds are smuggled out of Venezuela to nearby Curaçao. Red Siskins are protected under CITES, but the Netherlands is not a signatory party, hence CITES regulations do not apply in Curaçao or Holland. Red Siskins are semi-nomadic, use many types of habitat including scrub woodland and evergreen forest, and feed on a variety of seeds and fruits. The main breeding season is May–July, with a secondary peak in November–December. Management recommendations include further field studies, establishment of national parks or reserves where Red Siskin populations are numerically strongest, and cooperation by the Netherlands and Curaçao governments in stopping the smuggling of endangered animals into Curaçao.

RESUMEN. La excesiva captura para el comercio de aves de jaula a comienzos del siglo XX puso al cardenalito, *Carduelis cucullata,* un pinzón neotropical, en grave peligro de extinción. Las estimaciones de 1981 indican que hay sólo entre 600 y 800 individuos dispersos en pequeñas poblaciones en las regiones del oeste y central de las cordilleras del norte de Venezuela y las capturas aún continuan en esas poblaciones. La captura, venta y exportación de *C. cucullata* en Venezuela es ilegal desde la década de 1940, pero la protección no ha tenido éxito debido a que las capturas continúan en regiones remotas difíciles de controlar para la policía y las aves son sacadas de contrabando de Venezuela hacia la cercana isla de Curaçao. *C. cucullata* está protegida por CITES (Convención para el Tráfico Internacional de Especies de Flora y Fauna en Peligro de Extinción) pero Holanda no es signataria de la convención, por lo que las regulaciones de CITES no se aplican a Curaçao u Holanda. *C. cucullata* es seminómade, usa muchos tipos de habitats incluyendo bosques arbustivos y perennes y se alimenta de una variedad de semillas y frutas. La principal temporada de reproducción es mayo–julio, con un pico secundario en noviembre–diciembre. Las recomendaciones de manejo incluyen más estudios de campo, establecimiento de parques nacionals y reservas donde las poblaciones de *C. cucullata* son numéricamente más grandes, y cooperación de los gobiernos de Curaçao y Holanda, para detener el contrabando hacia Curaçao, de esta ave en peligro de extinción.

Public awareness of the vulnerability of the natural environment has resulted from cases of extinction or near-extinction of wild species due to human activities. In presenting this case study of the Red Siskin (*Carduelis cucullata*), an endangered Neotropical cardueline finch, we hope to contribute to that awareness and to point out some persisting problems in the regulation of international trade in wildlife. We summarize what little is known about this species, briefly trace the history of its exploitation for the cagebird trade, describe the measures that have been taken to preserve it, and conclude with some recommendations for further action.

The Red Siskin's decline was caused by excessive trapping for the cagebird trade, which reflects the ability of this species to hybridize with the domestic canary (*Serinus canarius*) and produce fertile offspring of various reddish or coppery colors. As the supply of Red Siskins has diminished, international avicultural demand for the species has pushed the price to nearly one thousand dollars per individual in the world markets. Twenty-five years ago, William H. Phelps, Sr., noted (pers. comm.) that if a Red Siskin could be bought for one hundred dollars,

and if there were one million canary fanciers in the world, then there was a pressure of one hundred million dollars on the bird. Today there are more canary breeders, the price has risen considerably, and the number of wild Red Siskins is very small. The pressure is now so great that as a wild species, this bird is probably doomed to extinction.

DISTRIBUTION

The limited geographical distribution of *C. cucullata* is an important factor in its vulnerability. Now essentially a Venezuelan endemic (Phelps and Phelps 1963), earlier it was also found on Monos Island (Chapman 1894), Gasparee Island, and Trinidad (Belcher and Smooker 1937; ffrench 1973), populations which apparently have been extirpated, and south of Cúcuta, Norte de Santander, Colombia (specimens in the Smithsonian Institution). It was introduced (presumably) into Cuba, where its present status is unknown, and into Puerto Rico, where a small, very local, breeding population persists (Raffaele 1983; Coats, pers. observ. 1982).

Within Venezuela, it is very patchily distributed in the piedmontane zone (ca. 280–1300 m), in three separate regions of the northern cordilleras (Fig. 1). The western region includes sites in the states of Lara, Falcón, Portuguesa, Yaracuy, Trujillo, and Mérida; the central region includes small areas in Guárico, Miranda, Anzoátegui, the Distrito Federal, and probably Aragua; the eastern region includes parts of Sucre and Monagas. Historically Red Siskins were much more continuously distributed and much more abundant in each of these regions. They are semi-nomadic, regularly occurring in different localities and habitats at different times of year.

CURRENT STATUS

This section summarizes a study made in Venezuela by the senior author in 1981–1982 (Coats 1982). Specific localities are omitted from published reports to try to protect the few surviving populations from increased exploitation.

In January–May 1981, in collaboration with Antonio Rivero M. of the Instituto Pedagógico, Barquisimeto, Eduardo Lara, Coats surveyed localities where Red Siskins were reported to have occurred. In all, over 70 localities in the western and central regions of Venezuela were visited; the species was found only at five of these localities during the survey period and at a sixth during August, all in the central region. These sightings probably represent six different local populations. Reports from birdcatchers indicate four additional local populations in this region. All are small; extrapolation from the population density in the area of the natural history study (see below) to the area available to each of these local populations gives an estimate of approximately 250 to 300 *C. cucullata* in the central region.

The species was not encountered (except in cages) in the western region during this survey, but Rivero later found it at three localities and received reports of its occurrence in other places. Its distribution in western Venezuela is still under study by Rivero, and it is likely that a few more local populations exist there than in the central region. Western Venezuela has a greater extent of suitable habitat than the central region, but it is also more heavily trapped. Our rough estimate for the western region in 1981 was 350 to 500 birds.

The eastern region has not been studied. Birdcatchers say that the species has been extirpated there, but the matter deserves investigation. Parts of Sucre and Monagas where Red Siskin habitat occurs remain relatively undeveloped at present.

NATURAL HISTORY

Study Area

The natural history of *C. cucullata* was studied in the central region from June 1981 to March 1982. Observations were concentrated in a single area ca. 15 km by 10 km where the movements of the local population were mapped and its ecology studied. The center of the study area was about 65°55′W, 9°57′N, along the border of the states of Guárico and Miranda on the southern edge of the Serranía del Interior in the Cordillera de la Costa. This area encompassed two quite distinct habitat zones. Rising abruptly from the seasonally dry llanos (elev. = ca. 220 m), the southern escarpment of the Serranía is covered with dry deciduous woodland and shrubby grassland. Above approximately 650 m the wetter cordilleran climate dominates, resulting in mixed deciduous and evergreen forest, with a few cafetals, small gardens, and clearings for grazing stock. The narrow zone of transition between these two

FIG. 1. Distribution of *Carduelis cucullata* in South America. Stippled areas represent regions from which the species has been reported since 1940. Black square shows location of study area (Coats 1982).

climatically distinct zones has little of its original vegetation, being now a settlement with approximately 25 families spread along a road distance of 4 km.

HABITAT AND DIET

Carduelis cucullata uses a variety of habitats, including dry deciduous woodland, mixed deciduous forest, evergreen forest, and the savannah-forest ecotone. Breeding areas lie in the moist forests of the higher (750–1300 m) zone. During the post-breeding period, the birds travel many kilometers daily, often feeding in the lower zone but usually moving up the mountainsides (above 650 m) to communal roosts in the evenings. In this study in northern Guárico and southern Miranda, the local population, ca. 30 birds, used or traveled through some 5600 hectares of the 15,000 hectare study area.

Red Siskins were observed feeding on dry seeds and fleshy fruits of five species from three plant families: *Urera baccifera* (Urticaceae); *Cordia currasavica* (Boraginaceae); *Trixis divaricata, Eupatorium odoratum,* and *Wedelia caracasana* (Compositae). Twenty other species in fourteen families are said by local birdcatchers to be food plants (Coats 1982). Most of these fruits and seeds are available for only a limited period each year, and the birds feed on more than one plant species much of the time. When *Urera baccifera* is in fruit, it seems to be the preferred food.

REPRODUCTION AND MOLT

The main breeding period is from May through early July; a second period occurs in November and December, but many fewer juvenile birds are seen in January and February than in August and September. Nesting of wild birds was not observed, but data from captive breeding indicate that a single nesting takes about 45 days from the beginning of nest-building until the young birds begin to feed themselves. It is likely that only one brood is reared each breeding period. Birdcatchers say the nest is placed in clumps of *Tillandsia usneoides* hanging from tall trees (25 m or more). In captivity, the female constructs a cup-shaped nest in a

partially enclosed nest chamber if that is available. The usual clutch is 3 to 5, incubation commencing with the laying of the last or next to last egg. The female incubates, and the male feeds her throughout the 11 to 13 day incubation period. The diet of wild-bred nestlings has not been observed, but many cardueline species rear nestlings primarily on vegetable foods (Newton 1973), and captive-bred Red Siskins develop normally when reared on a varied diet of seeds and fruit.

Fledging occurs 14 to 16 days post-hatching. Family groups appear to stay together to forage and roost for several weeks after the young have left the nest. During the first month after fledglings appeared in the population, the average number of immature birds per group for all apparent family groups (i.e., an adult pair or a single adult with one or more fledglings) was 1.4. This does not take into account those pairs that produced no young.

In the non-breeding season, *C. cucullata* is gregarious. The observed roost trees were in the lower part of the cordilleran zone, but other, undiscovered roosts were used on stormy evenings.

The annual pre-basic molt begins in late July and continues approximately 10 to 12 weeks. A pre-nuptual molt is unknown.

Predation

No predation on *C. cucullata* was observed, but 31 species of raptors (22 Falconiformes and 9 Strigiformes) were found on the study area. On the basis of known food habits, habitat preferences, and times of activity, 20 of these species are considered to be possible predators of Red Siskins, and five species very likely are: *Leptodon cayanensis, Buteo nitidus, Falco femoralis, Falco sparverius,* and *Glaucidium brasilianum.*

Sixteen species of snakes were found on the study area, of which seven, including *Boa constrictor, Epicrates cenchria,* and *Spilotes pullata* are known predators on birds and nests. Other snake species, many arboreal bird predators, also occur in the Red Siskin's breeding habitat, but were not observed during this study.

If the Siskins' nests are placed in clumps of *Tillandsia usneoides* hanging from high branches, as birdcatchers indicate, mammal predation is probably negligible.

Competition

Potential competitors for food plants included 25 species of tanagers and fringillids, most of which were seen to feed on one or more plants also eaten by *C. cucullata.* The only overt agonistic interaction observed between Red Siskins and another species involved a male *Tachyphonus rufus* chasing a pair of adult Red Siskins from a stand of *Urera* and then taking their place feeding on the *Urera* fruits.

HISTORY OF EXPLOITATION

Capture

Most information about birdcatching practices and about the distribution and abundance of *C. cucullata* in Venezuela during this century has come from birdcatchers, either directly to the authors or via notes made by W. H. Phelps, Sr. in the records of the Colección Ornitológica Phelps.

A standard technique is used to catch Red Siskins. A caged Red Siskin, the *pitador,* used to attract the wild birds with its calls, is put where wild Red Siskins are expected to come to forage or to drink, and sticks or stiff wires coated with sticky *Ficus* sap are stuck into the ground or vegetation nest to the cage. Small birds perch on these, become stuck, and are transferred to a cage.

Another, less favored, method is the use of a *trampajaula,* a trap-cage. A central compartment contains the *pitador,* and the spring-loaded tops of two side compartments are opened upward, propped by a delicately positioned piece of wood. When a bird perches on this piece of wood, the wood slips and the door springs shut, trapping the bird.

These methods have been quite successful. It is said that thousands of Red Siskins were trapped yearly during the first third of the twentieth century. It was necessary to catch many more than one planned to sell because of high mortality of captured birds. Many perished during the initial post-capture period, and many more during the long trip to foreign markets.

A veteran birdcatcher for more than 65 years (despite the fact that it has been illegal for many years), whose statements were echoed by other birdcatchers and by campesinos, described recent changes in the practice of hunting Red Siskins. During the early 20th century, Red Siskins were not usually hunted from the onset of the rainy season in March until after

he main breeding season, because the areas used by the birds during this period were generally naccessible. Most captures occurred from July to September when flocks of adults and fledgings fed in certain accessible areas at the base of the mountains. Young birds are preferred ecause they adapt to captivity more easily than adults, and because of their potentially longer ife span. Juvenile Red Siskins that survive the first year after capture may live to 10 or 11 ears in captivity. A bird that has been captured after it has acquired its full adult plumage annot be aged, hence its remaining lifespan is unknown. Previously, most females captured ere released. Males were preferred for their brilliant colors and more vigorous singing (alough females are also excellent singers), and only males were hybridized with canaries.

In recent years new roads have made many breeding areas accessible, and birds are now ken at all times of year. Females are not released and are being hybridized with canaries, lthough not all Red Siskin hens will accept a canary male. Professional birdcatchers do not ften hunt Red Siskins, because other birds can be caught in greater quantity to produce a eady income. Nevertheless, because of the siskins' high market value, it is worthwhile for ird dealers to buy them from those who trap them part time for extra income. For some of e latter, trapping Red Siskins is akin to sport, and the difficulty only heightens the challenge. ith jeeps and pickup trucks, the trappers are mobile and visit many localities, following the edictable movements of the siskins. They also buy birds from campesinos to resell for high ofits. Many of these part time birdcatchers are "Canarios," immigrants to Venezuela from e Canary Islands, where there is a long tradition of keeping Red Siskins to hybridize with naries.

HE MARKET

We do not know if Amerindians in pre-colonial Venezuela kept this species, but it was a mmon cagebird there after the Spanish arrived, and almost certainly was first exported by ips traveling from Venezuela to Spain's other colonies, including the Canary Islands. Cans were imported into Venezuela from early colonial times, and the initial discovery that se species would hybridize may have resulted from the Venezuelan practice of keeping m together in aviaries.

The Red Siskin was made known to science in 1820 when a color plate and description of nale adult *Carduelis cucullata* were published in *Zoological Illustrations, or Original Figures d Descriptions of New, Rare, or Interesting Animals* (Swainson 1820: pl. 7). *Cucullata* means oded, hence, in England it was called the Hooded Siskin until recently. Swainson stated t he had seen only one example of the species, the possession of an Englishman who had eived it along with other rarities from "the Spanish Main" (Swainson 1820: pl. 7).

The Red Siskin was generally unknown in the European cagebird trade during the 1800's. hough the British Museum (Natural History) has a specimen collected in 1867 from Cano, Venezuela, and one collected in 1857 labeled "Trinidad," there is little or no mention this species in the English or American avicultural literature of the 19th century. A major yclopedic work on aviculture, *The Illustrated Book of Canaries and Cage-birds, British d Foreign* (Blakston et al. 1877–1880), mentions neither the Red Siskin nor the "red canary" n though two chapters are devoted specifically to the topic of crossing canaries with other cies, especially siskins, and there is an extensive discussion of color varieties. One of the hors later published a note (Wiener 1903) stating that he had acquired a live Red Siskin 877, but that he had not included it in his section on foreign cagebirds because it was so .

y the early 1800's, however, it was known in the Canary Islands where it was soon being ssed with domestic canary. In 1902, articles were published in which it was stated that on erife this siskin was commonly crossed with the canary to produce a very attractive "mule" tley 1902a, b). Fertility of the hybrids was not mentioned. Small numbers of Red Siskins e soon being bred in captivity and crossed with canaries in many countries (Amsler 1912; acour 1917; Astley 1920; Hopkinson 1920); hence it was soon discovered that some of F_1 males were fertile (Sich 1928).

eproduction of cagebred birds was very low and did not meet the demand for breeding k, which was provided by importation from Venezuela, often through the Canary Islands. ally a siskin cock was crossed with a canary hen. Red Siskin hens were difficult to acquire; as said that they were rarely exported from Venezuela. The price for a male Red Siskin e Canary Islands in 1920 was £5 (Hopkinson 1920), but because this species was a poor eler and difficult to keep alive through the long period of acclimatization to the northern ons, the price in London was undoubtedly much higher.

Among canary breeders, both commercial and amateur, there has long been great interest in producing new genetic varieties, especially "color canaries." Red canaries are highly prized, but so far as is known, they are produced only by the introduction of genetic red factors from the Red Siskin. During the 1920's, scientific experiments on the genetics of plumage color of the canary, using hybridization with species of *Carduelis,* including *cucullata,* showed that several new color varieties could be produced by using different color strains of canaries to make the crosses and back-crosses (Promatova 1930; Duncker 1930). The fertility of the hybrids was soon being discussed in avicultural journals (Lukes 1932; Amsler 1935; Bennett 1935; Ewins 1936). The hybrids tended to inherit the canary size and song, increasing their appeal to canary fanciers. One breeder, however, tried to use hybridization to produce a more cage-hardy Red Siskin rather than a red canary (Amsler 1935). It is a sad paradox that if the time comes when the Red Siskin exists only as a cage species, its natural genotypes may be lost because of such crosses, even though they spring from appreciation of the siskin.

In the early 20th century, interest in birdkeeping and commerce in cagebirds grew concomitantly. The popularity of the canary, with its many varieties, increased enormously when laws prohibiting the taking of native birds were passed in many European countries and in the United States. Thus, as Europe and the United States protected their native birds, an increased demand was created for the Red Siskin, which at that time had no such protection.

PROTECTION OF THE RED SISKIN

By the early 1940's the rarity of the Red Siskin and its persecution by birdcatchers had become a source of concern to Venezuelan ornithologists William Phelps, Sr. and Jr., who communicated their concern to colleagues in the Ornithology section of the Sociedad Venezolana de Ciéncias Naturales (SVCN). The matter was placed before the Ministerio de Agricultura y Cría (MAC), which at that time had governmental responsibility for wildlife; between 1944 and 1947, MAC issued resolutions prohibiting sale and export of the Red Siskin. These measures intended to protect the species had an unforeseen and unfortunate result. The world market was alerted to the precarious situation of the Red Siskin, and demand for them rose enormously, causing the price to increase manyfold, a stimulus to trappers and dealers. Because this was the first time a species had been protected under Venezuelan law, the skilled enforcement needed was lacking. Many ways were found to smuggle birds out of Venezuela, with the usual destination being the nearby island of Curaçao, a colony of the Netherlands. Because it was not native to any Netherlands territory, the Red Siskin was not regulated by law in Curaçao and could be openly shipped from there. It is difficult to verify the actual extent of smuggling, but birdcatchers in Venezuela claim hundreds, even thousands, of Red Siskins were sent to Curaçao annually in the 1940's and 1950's.

MAC continued its efforts to protect the Red Siskin in the late 1940's. Several communications were sent to the Ministry of Hacienda, urging vigilance in preventing illegal export of the birds, and to forestry officials of the state of Falcón, urging use of all legal means available to restrict the trapping of the Red Siskin. An Executive Resolution categorically forbidding the capture of birds that were endangered or threatened was prepared by MAC, but it was shelved for reconsideration because it would have been very unpopular (Muñoz-Tébar 1952). Venezuelans have a long tradition of keeping cagebirds, and it was certain that there would be a vigorous protest.

That resolution was of marginal importance anyway, because the biggest threat to the Red Siskin was not the domestic (Venezuelan) market, but the world market. It was clear that international protection was required. Therefore, the Species Survival Commission of the International Union for the Conservation of Nature and Natural Resources (IUCN) was invited to meet in Caracas to consider the problem. At this meeting in September 1952, William Phelps, Sr., addressed the General Assembly about the Red Siskin and its need for protection at an international level. The main markets for this siskin were assumed to be the United States, the Canary Islands, and Europe, where there were large numbers of canary breeders. International recognition of its endangered status, and enforcement of import prohibitions could greatly diminish the flow of Red Siskins into these countries, and as a result, the number being smuggled out of Venezuela might decrease. The IUCN agreed to include *Carduelis cucullata* on its list of endangered species, an important first step toward protection by international treaty.

A few months later, Ricardo Muñoz-Tébar, of SVCN and the Colección Ornitológica Phelps, published an article about the Red Siskin's situation and the efforts being made to protect it,

n the magazine "El Farol," a Venezuelan publication of the Creole Petroleum Corporation Muñoz-Tébar 1952). He stated that in past decades, the Red Siskin was common in bird ihops in Venezuela and was often shipped to foreign markets in lots of 500, but that now it vas exceedingly rare. This article was one of the first attempts to make an educated and nfluential sector of the public aware of a threat to part of Venezuela's avifauna.

Other efforts during the 1950's and 1960's to make the public aware of and sympathetic to he plight of the Red Siskin included the election of a National Bird, but the siskin lost to the Troupial (*Icterus icterus*).

The Venezuelan government underwent extensive reorganization during those two decades. The Ministerio del Ambiente y de los Recursos Naturales Renovables (MARNR) was created o manage the environment and was given responsibility for protection of the fauna and flora, egulation of hunting and commerce in wildlife, and maintenence and administration of Vational Parks. Preparation of new laws pertaining to wildlife was begun, culminating in the urrent Ley de la Proteccion de la Fauna Silvestre (Law for the Protection of Wildlife), issued n 1970. Under command of the Fuerzas Armadas de Cooperación, a new enforcement branch, he Guardería Ambiental y de los Recursos Naturales Renovables, was created to police Vational Parks and enforce laws pertaining to the environment.

Despite the new laws and new enforcement branch, Red Siskins continued to be smuggled ut of Venezuela. The remote localities from which they were trapped were generally unknown xcept to birdcatchers and local campesinos, and laws regulating wildlife were virtually unen- orceable (and often unknown) in these areas.

From 1950 to 1970 was also a time of great activity in the international conservation ovement. A treaty regulating international commerce in endangered species was being pre- ared. This document, the Convention on International Trade in Endangered Species of Wild auna and Flora (CITES) was submitted to various countries for ratification in the early 970's, and took effect for the signators in 1977. CITES had three categories for species overed by its regulations, listed in its Appendices 1–3. The most stringent controls were irected toward the species in danger of extinction, Appendix 1, to which *Carduelis cucullata* as added 1 July 1975.

CITES offers protection to endangered species only in the context of international transport nd trade. Within the boundaries of a country, or between various territories of one country, ITES restrictions do not apply. Many countries, including the United States, have passed rict laws governing the internal transport and trade of endangered wildlife, native and non- ative. In June 1976, *Carduelis cucullata* was listed as endangered under the United States ndangered Species Act.

More than 70 countries have now signed the CITES treaty and have established regulatory rocedures for import and export of species it covers. Unfortunately, the Netherlands is not mong them. Neither in the Netherlands, nor in its overseas territories, is commerce in Red iskins restricted. Birds smuggled out of Venezuela or Colombia can be taken openly into uraçao and shipped from there to Holland where they are used to produce hybrid red canaries. he hybrids can be sent to other countries, subject only to regulations for cagebirds. It is said at large scale canary breeding operations in Holland can now make use of as many Red skins as can be smuggled out of Venezuela. Because of the proximity of Curaçao to the estern region of Venezuela, from which most captive Red Siskins come, birds can be smuggled ways that are very difficult to detect. They need only be hidden for the brief time that it kes to go through Venezuelan customs and for the airplane or ship to depart; then they can e removed from hiding places. They are also transported by small private boats that can oss from the Port of La Guaira to Curaçao in a few hours. So few of these birds are left in e wild that even this piecemeal form of smuggling constitutes a heavy burden for the species.

In addition to governmental action, efforts to help the Red Siskin have come from private ganizations. International Council for Bird Preservation (ICPB) in conjunction with the ecies Survival Commission of the IUCN publishes the Aves volume of the Red Data Book, the second edition of which *Carduelis cucullata* was included (King 1979).

In 1978 FUDENA, the Venezuelan branch of the World Wildlife Fund, commissioned one its investigators, Jose Laiz B., to gather data on captive breeding of Red Siskins in Venezuela. lthough this was not a field study, Laiz asked birdbreeders in Venezuela about their sources the Red Siskin, and his report (unpublished) was the first information on its present stribution in the wild.

The organization that has had the most significant role in the effort to preserve the Red

Siskin is SVCN, which, in conjunction with ornithologists working with Colección Ornitológica Phelps, brought the bird's peril to the attention of the Venezuelan government, the ICBP, and the IUCN. The President of SVCN for more than 25 years, Ramón Aveledo, has actively worked for greater public and governmental concern in Venezuela for endangered species, especially the Red Siskin. Despite concern about this species, it had never been studied and very little was known about it. Therefore, in 1980 SCVN, with a grant from MARNR, sponsored a 13 month field study (Coats 1982). Much remains to be learned about the Red Siskin in Venezuela, but it is hoped that the findings of that study will enhance protection efforts and will stimulate further investigations.

Recommendations for Conservation

1. Creation of one or more national parks or protected natural reserves, of size and location such that the total area used by a population throughout the year would be protected, is crucial. Areas where the largest Red Siskin populations occur are rich in wildlife, hence other species, including jaguars and other spotted cats, caimans, parrots, and macaws also would benefit. Economic development and rapid increase in human population in northern Venezuela make it imperative to act quickly if these areas, with their rich fauna and flora, are to be preserved for posterity.
2. Further studies, especially radiotelemetric, are needed to provide more precise information on daily and seasonal movements of local populations, and to increase the autecological data base. These studies should be made in an area being considered for a reserve, in order to provide information necessary for setting adequate boundaries for the reserve.
3. Efforts in Venezuela to raise public concern and enlist support for protection of endangered native fauna should be continued and expanded.
4. The cooperation of the Netherlands government and its participation in CITES must be sought. As long as Curaçao can be used as a port of trade by unscrupulous animal dealers, it poses a clear threat to Red Siskins and other species endangered by the exotic pet trade, particularly because of its proximity to mainland sources of those animals.

ACKNOWLEDGMENTS

We wish to thank the following persons for their assistance in various ways during the research reported in this paper: R. Aveledo H., P. Fuster, R. Muñoz-Tébar, A. Rivero M., R. F. Smith, G. J. Nelson, R. S. Bottome, D. Conde, D. Bolívar, K. Phelps, M. L. Goodwin, B. Hicks, A. Arzola and family, F. Canache and family, L. Pérez, R. Pasquier, W. B. King. Financial support for the field study was provided through a grant to the Sociedad Venezolana de Ciéncias Naturales (SVCN) from the Venezuelan Ministerio del Ambiente y de los Recursos Naturales Renovables, and SVCN provided essential administrative support. The following institutions made available collections, libraries, and archives that were essential to this project: American Museum of Natural History, British Museum (Natural History), Coleccion Ornitologica Phelps, Smithsonian Institution, New York Botanical Gardens. M. Foster, R. Ohmart, and R. Pasquier provided very helpful criticism of an earlier draft of this paper.

LITERATURE CITED

Amsler, M. 1912. Breeding of the Hooded Siskin, *Chrysomitris cucullata.* Avic. Mag. (Ser. 3), 4:51–54.

Amsler, M. 1935. Fertility of the Hooded Siskin and canary hybrid. Avic. Mag. (Ser. 4), 13:229–232.

Astley, H. D. 1902a. The Hooded Siskin and the wild canary. Avic. Mag. (Ser. 1), 8:123–124.

Astley, H. D. 1902b. The Hooded Siskin. Avic. Mag. (Ser. 2), 1:47–51.

Astley, H. D. 1920. Miscellanies. Avic. Mag. (Ser. 3), 11:116.

Belcher, C., and G. D. Smooker. 1937. Birds of the colony of Trinidad and Tobago, Part 6. Ibis (Ser. 14), 1:504–550.

Bennett, C. B. 1935. Note on the red color of birds. Roller Canary Journal and Bird World, Feb. 1935, pp. 33 ff.

Blakston, W. A., W. Swaysland, and A. F. Wiener. 1877–1880. The Illustrated Book of Canaries and Cage-Birds, British and Foreign. Cassell, Peter, Galpin, London.

Chapman, F. 1894. On the birds of the island of Trinidad. Bull. Am. Mus. Nat. Hist. 6:1–86.

Coats, S. 1982. The distribution and natural history of the Cardenalito, *Carduelis cucullata,* in Venezuela. Unpubl. report submitted to Soc. Venez. Cienc. Nat., Caracas.

Delacour, J. 1917. Notes on my birds at Villers-Bretonneux in 1916. Avic. Mag. (Ser. 3), 8:69–75.

Duncker, H. 1930. Fettsfarbstoffvererbung bei Kanarienvoegeln im Lichte der Goldschmidtschen physiologischen Vererbungstheorie. Z. Indukt. Abstammungs. Vererbungsl. 54:267–271.

WINS, J. 1936. Colored canaries. Aviculture (Ser. 3), 6:9–10.
FRENCH, R. P. 1973. A Guide to the Birds of Trinidad and Tobago. Livingston Publ. Co., Wynnewood, Pennsylvania.
HOPKINSON, E. 1920. Hooded Siskin mules. Avic. Mag. (Ser. 3), 11:150.
LING, W. B. (comp.) 1979. Red Data Book, Vol. 2: Aves. Int. Union Conserv. Nat., Nat. Res., Morges, Switzerland.
LUKES, W. L. 1932. The thistle finches, pt. 2. Aviculture (Ser. 2), 4:249–254.
MUÑOZ-TÉBAR B., R. 1952. El Cardenalito: un ave en peligro. El Farol 43:20–22.
NEWTON, I. 1973. Finches. Taplinger Publ. Co., New York.
PHELPS, W. H., SR., AND W. H. PHELPS, JR. 1963. Lista de las aves de Venezuela y su distribucion, Vol. 1, Pt. 2, Passeriformes, 2nd ed. Bol. Soc. Venez. Cienc. Nat. 24:(104, 105).
ROMATOVA, A. N. 1930. Hybridization of fringillidae. Biol. Abstr. 4:640. (orig. published 1928 in Russian: J. Biol. Exp., Ser. A, 4:30–64.)
RAFFAELE, H. 1983. The raising of a ghost—*Spinus cucullatus* in Puerto Rico. Auk 100:737–739.
RICH, H. L. 1928. Fertile hybrids. Avic. Mag. (Ser. 4), 6:300–301.
SWAINSON, W. 1820. Zoological Illustrations, Vol. 1. Baldwin, Craddock, and Joy, London.
WIENER, A. F. 1903. The Hooded Siskin. Avic. Mag. (Ser. 2), 1:115–116.