

AVIAN DIVERSITY IN EL SALVADOR

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ABSTRACT.—Recent field studies have revealed many species of birds new for El Salvador suggesting that the country's few protected areas may be especially important for conserving regional biodiversity. Seventeen percent of the landscape or 359,000 ha is covered with natural forest or scrub habitats, of which 38,000 ha are coastal mangrove forests. An additional 196,000 ha (9% of El Salvador) are coffee plantations, a forest-like habitat used by many birds. Of 508 bird species known to occur in the country, 310 are breeding residents; the others are migratory visitors, transients, or vagrants. Seventeen species occurring in El Salvador are endemic to the highlands of northern Central America and one species is endemic to the Pacific slope lowlands of northern Central America. About 270 species are habitat specialists with highly restricted ranges within El Salvador. In all, 254 species (>50% of the avifauna) are threatened by habitat loss, pollution, hunting, and exploitation for the pet trade. Of these, 117 are in danger of extinction at the national level and three are believed already extirpated. Much additional field work is needed to understand the status and abundance of El Salvador's birds. This report includes a complete list of reported species with classification of residency status, threatened status, and distribution. This list can serve as a resource for interpreting field observations produced by environmental impact studies or conservation projects in El Salvador. A second list includes 73 species that probably occur in El Salvador but have not been reported.

El Salvador is a small nation (20,746 km²) confined to the Pacific slope of northern Central America (Fig. 1). Unlike nearby Belize, which is virtually the same size, but mostly unpopulated and about 75% forested, El Salvador is only about 18% forested (including scrub habitats) and has the densest human population in Latin America. The 1992 population was 5.12 million, increasing 1.42% annually (Dirección General de Estadística y Censos 1995). Biological collectors and tropical ecologists, attracted to countries with extensive wild areas, have largely avoided El Salvador. Only a few museum expeditions (Miller 1932, Dickey and van Rossem 1938, Marshall 1943, Burt and Stirton 1961) have visited the country. Given this minimal international interest, local biological expertise has been even slower to develop. The not surprising result is the ubiquitous perception that El Salvador is depauperate in biodiversity. No scientific study has established an overall lack of biodiversity, however. Recent studies of trees (Berendsohn 1995) and birds (Thurber et al. 1987, West 1988, present study) have discovered so many unrecorded species that the old perception must be thrown out. In the nearby Pacific slope highlands of western

Guatemala, Vannini (1994) reported the "second richest avian province in northern Central America," supporting the assertion that the Pacific slope of northern Central America is rich in biodiversity.

Biodiversity is generally related to diversity of habitats, which in turn is often related to altitudinal range (Hamilton et al. 1964, Johnson 1975). El Salvador has a diverse mosaic of habitats, caused in part by the volcanic geography of the region and an altitudinal range 0–2730 m. On the Pacific coastal plain, there are swamp forests (now very restricted), humid and dry tropical forests, mangrove swamps and estuaries, and freshwater lagoons. Rich offshore waters attract pelagic seabirds. Just inland is a chain of young volcanoes ranging up to 2365 m, which features an extensive cloud forest on the Santa Ana Volcano. The dry central valley provides additional lowland habitats and to the north, the foothills of the geologically ancient Central American mountains (the "cordillera") provide pine and oak-pine forests. The higher points along the Honduras border, such as at Montecristo National Park and El Pital (elev. 2730 m) feature habitat for numerous cloud forest species.

Van Rossem reported 380 species, or 75% of the birds now known from El Salvador, when he collected widely in the country in 1912 and 1925–1927 (Dickey and van Rossem 1938). A few additional species were reported by Marshall (1943). Thurber and co-

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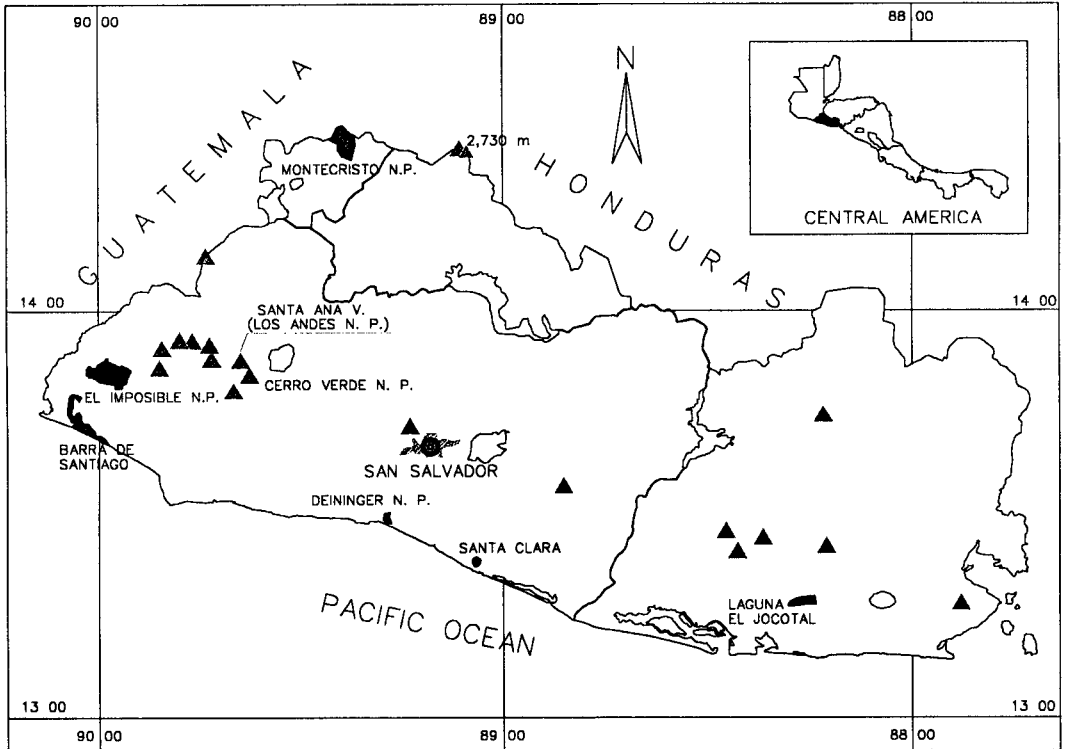


FIG. 1. Protected areas and geographical features of El Salvador. The insert shows El Salvador's position within Central America. (Prepared by Alvaro Moisés-Calderón, based on Reyna de Aguilar et al. 1996.)

workers (1987) added 60 species to the list, summarizing most of the ornithological activity in El Salvador through 1980. That report incorporated unpublished observations from Juan Antonio Gómez, Russell Greenberg, Peter Hamel, Burt Monroe, Larry Naylor, and Jane West (see West 1988), and reviewed new records published in short notes and other relatively obscure sources (e.g., Dickerman 1972, Feduccia 1976, Hellebuyck 1983). One source for pelagic records (Jehl 1974) was not reviewed by Thurber and coworkers (1987). Little new information was added during the El Salvadoran civil war from 1980 to 1992.

Between 1992 and 1996, I spent 22 months studying El Salvador's birds, and have observed 22 species not previously reported (details of documentation for these species have been or will be reported separately, e.g., Komar and Rodríguez 1995). During this same period, Salvadoran aficionados and biologists (Alfredo Chahín, Juan Pablo Domínguez, Alvaro Moisés, Fabricio Pérez, Karla Pérez;

pers. comm.) have reported seven additional species. Three more species not reported elsewhere were collected by the El Salvador Museum of Natural History in the 1970s and 1980s (Figueroa de Tobar 1993).

My objectives in this paper are to review all bird species known to occur in El Salvador by habitat and altitudinal distribution, migratory/resident status, and endemism; and to review endangered and threatened species, conservation effort, and future ornithological studies.

METHODS

Residency status classifications.—A species was classified as "breeding" if observers have noted nest building or the presence of juveniles too young to have completed the post-juvinal molt. Resident or non-migratory species not observed breeding were classified "status uncertain." "Migrants" were species that spend part of each year in El Salvador, generally remaining in El Salvador for an extended period (several months) before returning to their country of origin. The majority of migratory species breed in North

America and spend the northern winter in El Salvador. I classified some migratory species as "transients" if they were not known to winter in El Salvador regularly. Migratory species with both breeding and nonbreeding populations in El Salvador were listed as both breeding and "partial migrants." For at least one species in this category, the Blue Grosbeak (*Guiraca caerulea*), the breeding population may migrate south during the nonbreeding season. Other migratory species that typically can be found all year in El Salvador but are not known to breed were also "partial migrants." Species that breed in El Salvador and then migrate to South America were "breeding visitors."

A species was "vagrant" or "casual" if breeding had not been observed and there were fewer than five reports. A species was "hypothetical" if reported by a reliable observer but without photographic, audiotape, or specimen evidence. New photographic and audiotape documentation was accepted when confirmed directly by the author. I did not review museum collections to confirm specimen documentation reported in the literature.

I followed Bibby and coworkers (1992) in defining "endemic" species as those with breeding distributions smaller than 50,000 km²; thus most species restricted to northern Central America are endemic. When possible, I indicated the presence of endemic subspecies. However, I have not exhaustively analyzed the literature on subspecies and many more recognized subspecies than I have indicated may actually be endemic. I have only indicated endemic subspecies for species restricted to the highlands (Komar 1994).

Criteria for threatened status.—Most threatened species are habitat specialists subject to decline after major habitat loss. Threatened species also experience exceptional human pressure for reasons that include the cage bird trade and poisoning from pesticides. The former applies to parrots, parakeets, owls, toucans, and buntings. The latter applies to hawks, falcons, and owls which may also be killed for superstitious reasons. These species have decreased in suitable habitats throughout the country (Thurber et al. 1987). Species classified as "in danger" are especially vulnerable. They are either (1) reduced to one or two small populations or (2) more widely distributed but present in very low numbers. The El Salvador populations for most endangered species is under 400 individuals and for many species is much lower (see Discussion). Species that have only been reported casually (<5 records) were not considered as threatened or in danger because they may not be part of the regular Salvadoran avifauna. As these species become recognized as resident or part of the regular avifauna, their threatened status should be reevaluated.

Distribution and habitat use classification.—I classified each species as either an altitudinal generalist or highlands or lowlands specialist, and as either an open habitat generalist or specialist, forest generalist or specialist, or aquatic habitat specialist. Lowland specialists are found mostly below 1000 m elevation; highland specialists mostly above 1000 m. I considered

scrub or matorral habitats as open habitats, not forest habitats. I did not distinguish between salt and fresh water habitats because only a few marine species are restricted to salt water habitats. There are virtually no salt marshes in El Salvador, and thus no species specializing in salt marsh habitats.

Species restricted geographically were designated as either west, east, north, or coastal. Species limited to the west are found in the western third of the country, with San Salvador as the easternmost limit of distribution. Species limited to the north are found in the cordillera near the Honduran border. Species limited to the east are found in the eastern third of the country. Coastal species are limited to estuaries, beaches, and marine waters. A species may fall into three or more of these above categories.

Information about habitat use and distribution for some rare or poorly known species in El Salvador was speculated with the hope that the publication of the present analysis will stimulate field workers to publish their own observations so that the information can be corrected.

I derived the list of predicted species in Appendix 2 based on the distribution maps in Howell and Webb (1995). All species listed were shown in the guide as occurring in El Salvador or close to its borders. The taxonomy used for both appendices follows the American Ornithologists' Union (1998).

RESULTS

Despite the high level of deforestation, economic dependence on agriculture, and abundant human presence in virtually all corners of the country, 508 species of birds have been reliably reported from El Salvador (Appendix 1). An additional 73 species are expected to occur in El Salvador (Appendix 2). Belize, with its extensive wilderness and long history of ecological studies and intense nature observation by visiting scientists, has a bird list of 543 species (Miller and Miller 1995). With continued field studies, we may find that El Salvador has more species than Belize.

I have relegated four species previously reported as occurring in El Salvador to Appendix 2 because of lack of a primary source or because recent changes in the political border with Honduras make some collection localities questionable, especially for birds documented from Sabanetas by Thurber and coworkers (1987). Parker and coworkers (1996) listed the Flammulated Owl (*Otus flammeolus*) for El Salvador but I have not found a primary source. Birds known in El Salvador only from Sabanetas (now in Honduras) include Mountain Trogon (*Trogon mexicanus*),

TABLE 1. Status of birds reported in El Salvador.

	No. of documented species	No. of hypothetical species	Total no. of species
Breeding, non-migratory residents	197	0	197
Breeding, partially-migratory residents	34 ^a	0	34
Breeding visitors	3	0	3
Breeding suspected (status uncertain)	74 ^a	2	76
Subtotal for breeding species	308	2	310
Non-breeding visitor	110 ^b	4	114
Transient	16	0	16
Migratory vagrant (status uncertain)	27	21	48 ^c
Non-migratory vagrant (status uncertain)	12	8	20
Subtotal for non-breeding species	165	33	198
Grand total			508

^a Five documented partially-migratory residents have not actually been confirmed as breeding. These are Turkey Vulture, Sharp-shinned Hawk, Zone-tailed Hawk, Collared Plover, and Blue-headed Vireo.

^b At least five documented winter visitors are actually far more abundant as transients: Swainson's Hawk, Merlin, Franklin's Gull, Sabine's Gull, and Kentucky Warbler.

^c Includes at least 22 probable transients (10 documented and 12 hypothetical) recorded only once or twice, and other species that may be irregular winter visitors.

Sedge Wren (*Cistothorus platensis*), and Brown Creeper (*Certhia americana*).

Status classification.—Breeding has been documented for 229 species, although 310 species probably breed in El Salvador (Table 1). Three breeding visitors, Plumbeous Kite (*Ictinia plumbea*), Sulphur-bellied Flycatcher (*Myiodynastes luteiventris*), and Yellow-green Vireo (*Vireo flavoviridis*), spend the winter in South America. Populations of at least 34 resident species are augmented by migratory populations during the northern winter. Apparent "vagrants" of 21 non-migratory species may represent additional breeding residents.

El Salvador provides wintering habitat to at least 114 non-breeding visitors (plus the 34 partially migratory species mentioned above). Many of the 48 migratory vagrants recorded may also be regular winter visitors. Sixteen species are primarily transients in El Salvador, rarely spending a winter or summer. Of the 48 migratory vagrants in Table 1, 22 are probably regular transients in El Salvador, making a total of 38 transient species.

Northern Central America is a center for avian endemism (Bibby et al. 1992), with 18 El Salvador species geographically restricted to northern Central America between the Isthmus of Tehuantepec and the Nicaraguan Depression. Highland habitats are especially important for these endemic species. Of the 18

endemics, 17 are most abundant in the highlands and only one is restricted to the lowlands. Several species are restricted to the Pacific slope of northern Central America, including the White-bellied Chachalaca (*Oryzopsis leucogastra*), Rufous Sabrewing (*Campylopterus rufus*), White-eared Ground Sparrow (*Melospiza leucotis*), and Bar-winged Oriole (*Icterus maculialatus*). More than 75 endemic subspecies of highland-restricted birds occur in El Salvador.

At least 254 bird species, or more than 50% of the known avifauna, are threatened with extinction in El Salvador and 117 of these species are now so restricted in range or population that I consider them in danger (Appendix 1). Three other species recorded this century, the Jabiru (*Jabiru mycteria*), Ornate Hawk-Eagle (*Spizaetus ornatus*), and Scarlet Macaw (*Ara macao*), may in fact now be extirpated, although natural recolonization is possible in the future. No data exist for species extirpated prior to this century.

Diverse natural habitats.—The remnant patches of natural habitat in El Salvador indicate the natural diversity characteristic of the region. The country is geographically and geologically diverse, with both old and new mountain ranges, numerous volcanic formations, and altitudes reaching over 2000 m above sea level in four different parts of the country. Holdridge (1975) described six prin-

TABLE 2. Land use in El Salvador.^a

Land use type	Area (ha)	% of national terrain
Non-permanent farming ^b	1,389,778	66.2
Permanent crops		
Coffee plantations	195,709	9.3
Coconut plantations	1314	0.1
Tree plantations ^c	6584	0.3
Natural forests (other than mangrove) and scrub	320,442	15.3
Mangrove forests	38,344	1.8
Lava flows	9398	0.4
Bodies of water	35,187	1.7
Urban and developed areas	67,910	3.2

^a Source: Dirección General de Economía Agropecuaria (1996).

^b Includes corn, beans, grazing, sugar cane, rice, and miscellaneous crops.

^c Source: Cruz Rodríguez and Gómez Vaquerano (1996).

cial life zones in the country. Recent data on the quantity of natural habitat in El Salvador (Table 2) indicate that 358,786 ha, or 17.3% of the national territory, is presently covered by mangrove forest, natural forest or shrubs. However, more than half of this area is young secondary forest, and may soon be converted into agricultural land. An additional 203,607 ha are permanent crops (coffee, coconut, tree plantations) that provide cover and feeding habitats for birds, and 9400 ha are recent lava flows that may eventually provide vegetation cover.

The presence of a large variety of natural habitat types has permitted the survival, albeit tentative, of many avian species that are habitat specialists. These species have small, patchy distributions and often are present in low numbers. For example, 23 bird species' Salvadoran ranges are mostly restricted to 5000 ha in the El Imposible National Park (Komar and Herrera 1995a). Habitat specialist species are concentrated in forest habitats, especially in the highlands, and in wetlands (Table 3). The majority of the wetland specialists are migratory aquatic species. Wetlands are relatively rare in El Salvador, occupying only 35,187 ha (Table 2).

Habitat use and distribution.—Of the 310 resident and suspected breeding species, 125 are forest specialists, 67 are forest generalists, 39 are open specialists, 61 are open generalists, and 38 live mainly in aquatic habitats (several species are counted in more than one

TABLE 3. Distribution of habitat specialist bird species (recorded at least five times) in El Salvador.

Species restricted to:	Breeding/uncertain	Non-breeding
Forests		
No altitude restriction	8	0
Highland	73	2
Lowland	47	4
Forests subtotal	128	6
Non-forests		
No altitude restriction	2	1
Highland	15	0
Lowland	21	9
Aquatic habitats	38	56
Non-forests subtotal	75	67
Total	191	72

category; Appendix 1). These figures highlight the importance of forests for avian biodiversity in El Salvador.

A breakdown of altitudinal distributions of El Salvador's 282 resident, non-aquatic species indicates the importance of the country's highlands for the conservation of its avian biodiversity. Even though only about 20% of the country has an elevation greater than 1000 m, 104 species (about 20%) are restricted to these highlands. In all, 133 species are restricted to lowlands and 45 are altitudinal generalists. Thus the density of altitudinally restricted species is much greater in the highlands than in the lowlands. Expanding the analysis to all 398 species classified for altitude preference (aquatic species excluded), 191 prefer lowlands, 75 are altitudinal generalists, and 133 prefer highlands.

Despite El Salvador's small size, more than 100 bird species are restricted to geographical areas representing less than one third of the nation. The western third of the country appears to have more diverse bird populations than the central and eastern thirds, with 41 species (plus 3 vagrants) reported only from the west (mostly at El Imposible National Park and Santa Ana Volcano). Six species plus one vagrant are restricted to the eastern third of the country. Indeed, most of the birds restricted to the north and to the coast also occur in the western third of the country. Dividing the country in latitudinal thirds, the northern third is more diverse than the central and

southern (coastal) thirds. Restricted to the north, such as at Montecristo National Park, are 41 residents or regular visitors, plus 7 vagrant species. Thirty species, plus 16 vagrant species, are restricted to the coast or marine waters.

DISCUSSION

Characterizing the biodiversity of a country is not a simple task. Ideally one should describe the diversity of ecosystems, species, and populations (subspecies or other genetically isolated groups), as well as some measure of abundance for each of these entities. Most biodiversity studies develop an index that combines species richness with evenness of abundance (Primack 1993). Since the goal of the present paper was not to compare El Salvador's biodiversity with that of other regions, preparing such an index was not necessary. Also, for the overall characterization, it was hardly possible to analyze evenness of abundance, given the paucity of studies of avian abundance in specific habitat types. Only three studies of forest bird communities in El Salvador have determined a relative abundance index (Komar and Herrera 1995a, b; Komar 1996).

Considering only the number of species present in a region as indicative of its biodiversity value would be misleading. For example, migration monitoring at oceanic islands typically records numerous vagrants wandering off course (e.g., Lynch and Johnson 1974), which may not survive after making landfall on the islands. Thus considering vagrants as part of a site's biodiversity value is unwarranted. I suggest that the presence of breeding species is the most important measure of avian diversity, followed by non-breeding visitors that return to the area as part of their annual cycles. Less important are migratory transients on their way to other areas. Finally, accidental vagrants whose survival is doubtful and whose presence is due to chance and not to the natural attractiveness of local habitats, have little relevance to measures of biodiversity.

Much more field work will be needed to determine the actual number of breeding residents in El Salvador. The possibility exists that some of the 77 non-migratory species recorded as "breeding suspected" in Table 1,

such as Black-crowned Night-Heron (*Nycticorax nycticorax*), Hook-billed Kite (*Chondrohierax uncinatus*), Lesser Swallow-tailed Swift (*Panyptila cayennensis*), and Eastern Meadowlark (*Sturnella magna*) are in fact dispersers from breeding populations in neighboring countries and not part of the regular breeding avifaunal community. Some of these species may be migratory visitors, although migration has not been documented for many of them. Little is known about "intratropical" bird migrations. For example, it is not known to what extent northern migrants supplement El Salvador's resident populations of Red-billed Pigeon (*Columba flavirostris*), Green-breasted Mango (*Anthracothorax prevostii*), Tropical Pewee (*Contopus cinereus*), Clay-colored Robin (*Turdus grayi*), and Red-legged Honeycreeper (*Cyanerpes cyaneus*), all of which have been reported to migrate (Dickey and van Rossem 1938, Thiollay 1977, Howell and Webb 1995). Among the winter visitors to El Salvador is the "Red-throated" Green Parakeet (*Aratinga holochlora rubritorques*) which is reported to migrate from nearby Guatemala and Honduras (Howell and Webb 1995).

In most of El Salvador, where the terrain is cultivated with grains, coffee, sugar cane, or used for pasture (Table 2), species richness is generally low and species tend to be either abundant or rare (this lack of evenness in abundance indicates low diversity). In many areas, low maintenance fincas (farms) with abundant fruit trees or small tree plantations help maintain biodiversity (Thiollay 1995) and serve as biological corridors. One of the principal agricultural crops, coffee, is grown on 9.3% of the national terrain; when managed with traditional shade practices, this agricultural habitat serves moderately well to preserve avian biodiversity. Coffee fincas suit many generalist species, including a large array of Nearctic-Neotropical migratory birds, because of the permanent nature of the crop and the presence of shade trees in most plantations (Vannini 1994). However, Salvadoran plantations often utilize a near monoculture of shade trees (*Inga* spp.), greatly simplifying the structure of the plantations, and limiting the biodiversity within them. Nonetheless, some common birds in coffee plantations would probably disappear if these plantations were

converted to non-permanent crops or to residential and industrial developments.

The principal sanctuaries for El Salvador's still rich biodiversity are the small patches of forest and other natural habitats. Most of these areas are secondary forest; sometimes successional areas only a few years old. Extensive areas of agricultural land in the eastern part of the country were abandoned during the recent civil war (1980–1992) and now appear as scrubby secondary forest. El Salvador still has some areas with climax or old primary forest, such as occur in deep ravines of El Imposible National Park, on the inner slopes of the Cotepeque Caldera (San Marcelino Wildlife Refuge), and on high mountain peaks, such as Santa Ana Volcano (Los Andes National Park) and in Montecristo National Park.

The presence of many endemic species and subspecies of birds in El Salvador suggests that studies of other taxa will also encounter high endemism (Bibby et al. 1992). Isolation of natural habitat patches on volcanoes and mountain ranges in El Salvador has permitted the evolution of at least five bird subspecies completely restricted to El Salvador (Komar 1994) and unknown numbers of endemic plant and animal species. Thus El Salvador may play an important role in the conservation of the region's biodiversity. It is imperative that the natural habitats in El Salvador receive conservation protection and that Salvadoran land managers be well-informed of the importance of their stewardship for the conservation of biodiversity.

Endangered species.—Only one species of bird reported from El Salvador, the Golden-cheeked Warbler (*Dendroica chrysoparia*), is listed as globally threatened (in danger of extinction) by Wege and Long (1995). However, many Salvadorans recognize the importance of protecting their natural heritage for national reasons and do not focus so much on global priorities. Most Salvadoran people and the Salvadoran government accept the problem of Salvadoran species “on the route to extinction” in their country. Therefore, I have analyzed threatened status at the national level. Furthermore, bird population studies and taxonomic works in Latin America are sufficiently scarce that ornithologists can not yet determine with precision which are the globally threatened species in the region. Many endem-

ic populations classified by 19th-century taxonomists as subspecies of wide-ranging forms may qualify as species by today's standards (Peterson et al. 1998) and, because of their restricted ranges, may be globally threatened.

For the first time, we now have a list of threatened Salvadoran birds (Appendix I) for which all bird families were considered based on criteria. An earlier list of threatened species only considered non-Passeriformes (Juárez and Alcides Orellana 1985) and neither that list nor another attempt (Thurber et al. 1987) presented criteria for selection. Some of the endangered species in El Salvador are still locally common in appropriate habitats, but most are generally uncommon or rare within their often restricted habitats.

Most of the 117 nationally-endangered species have small populations of under 400 individuals within El Salvador. Some endangered species have larger populations, such as the White-fronted Parrot (*Amazona albifrons*) and the Emerald Toucanet (*Aulachorynchus prasinus*), but are nevertheless subject to severe population pressure from the pet trade or loss of habitat. One species I consider endangered, the Rufous-browed Wren (*Troglodytes rufociliatus*), numbers over 4000 individuals but may be restricted in El Salvador to just one 600 ha forest patch on the Santa Ana volcano, where it is the most abundant species (unpubl. data). One casual species that may not be part of the regular Salvadoran avifauna, the Golden-cheeked Warbler, was listed as endangered because it is internationally recognized as endangered (Wege and Long 1995), but other species with fewer than 5 records have not been classified as endangered because they do not appear to be regular parts of the El Salvador avifauna.

Wildlife conservation in El Salvador.—Wildlife and habitat conservation is a recent phenomenon in El Salvador; the first national park, Montecristo, was established in 1987 (although the park service was established in 1974). The current protected area system includes eight areas and 10,919 ha, or 0.5% of the country, managed under the authority of either the Salvadoran National Parks and Wildlife Service (in some cases in collaboration with non-governmental organizations) or the Salvadoran Institute for Tourism. Reyna de Aguilar and coworkers (1996) proposed in-

creasing the protected areas to 49,236 ha (2.37% of El Salvador), to encompass 24 conservation areas as part of a Minimum System of Protected Areas. Given the presence of natural vegetation cover of 13–18% of the country, conservation efforts should be expanded further.

One of the largest problems facing wildlife conservationists in El Salvador is uncertainty about where wildlife habitat currently exists. A detailed and accurate habitat map does not exist and recent estimates of El Salvador's forest cover vary widely. Zambrano (1996) estimated current forest cover by applying a deforestation rate of 4500 ha per year to data on forest cover in 1975 and then added an estimate for second growth generated in farming areas abandoned during the recent war. His total estimate of 18.1% of the country is close to the data reported in Table 2 (17.3%). Cruz Rodríguez and Gómez Vaquerano (1996) concluded that only 12% of El Salvador was forested and Reyna de Aguilar and coworkers (1996) reported 13% forest and shrub cover, citing Dirección General de Recursos Naturales Renovables (1981).

As an indication of the precarious existence of the threatened forest-specialist birds in El Salvador, Zambrano (1996) predicted that all 34,298 ha of extant primary forest will be destroyed by the year 2001 should current rates of forest loss continue. Laws and park protection plans exist to prevent such a disaster.

Directions for future ornithological studies.—Compared to political states of comparable size, such as Belize or Massachusetts, El Salvador's ornithology remains poorly known. Relative abundance information for birds is not available for the majority of habitats, or even protected areas such as Montecristo National Park, which contains El Salvador's largest cloud forest. The highest priority should be to inventory (including analysis of relative abundance) avian diversity in every major habitat type in El Salvador, not just within the currently protected areas. Primary habitats should be assessed first. Relative abundance data are important for revealing which habitats are critical for survival of a species. For example, the endemic and endangered Bar-winged Oriole is common in at least one mid-elevation, humid evergreen forest in the Lake Coatepeque caldera but uncommon in coffee

plantations (where breeding is not documented). Without the forest it will likely become extinct. Without the relative abundance information, conservationists might have thought that conserving shade coffee plantations would be sufficient for the survival of the oriole. Conservation activists need comprehensive surveys in order to identify critical habitats and specific sites for conservation of bird species (see Stotz et al. 1996, for an excellent discussion on deriving conservation priorities). Salvadoran biologists and ornithologists should begin to plan such projects.

Avian densities or relative abundances must be calculated during both the breeding and non-breeding seasons. The latter season is when the avian communities are augmented by the arrival of Nearctic-Neotropical migrants. Taxonomic work, including some scientific collecting, is also necessary to establish which species live in El Salvador. These future inventories represent a huge amount of work for Salvadoran ornithologists. Life history and ecological studies are needed to determine the survival needs of endangered and threatened species. Populations of the 190 vulnerable habitat-specialist resident species should be monitored over the long-term (multiple years), with companion studies of breeding productivity and survivorship. Another major task and critical step for bird conservationists will be to determine the exact distribution and amount of each natural habitat type and then arrange for the permanent protection of these lands.

In summary, there is a great need for continued and expanded ornithological studies in El Salvador. If funding were available, many ornithologists could be kept busy for many years. In reality, professional Salvadoran ornithologists number fewer than six, and none are employed regularly to study birds. Nonetheless, abundant human resources, widespread interest in wildlife conservation among the educated sector of El Salvador, and the present relatively strong financial support for environmental projects suggest the possibility of increased training opportunities for biology students, and for encouraging numerous ornithological field studies. Birds are the most visible and attractive component of El Salvador's faunal biodiversity; the study and promotion of the country's avian treasures, such

as its national bird the Turquoise-browed Motmot (*Eumomota superciliosa*), are keys to the future preservation of El Salvador's biodiversity, natural resources, and environment.

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APPENDIX I. Status and distribution of all documented and hypothetical bird species observed in El Salvador.^a

Family English name	Scientific name	Status	Distribution
TINAMIDAE			
Thicket Tinamou	<i>Crypturellus cinnamomeus</i>	B, d	FG, L
PODICIPEDIDAE			
Least Grebe	<i>Tachybaptus dominicus</i>	B, d	W
Pied-billed Grebe	<i>Podilymbus podiceps</i>	B, d	W
Eared Grebe	<i>Podiceps nigricollis</i>	M, d	W
PROCELLARIIDAE			
Wedge-tailed Shearwater	<i>Puffinus pacificus</i>	T, H, C(2)	W, c
Audubon's Shearwater	<i>Puffinus lherminieri</i>	T, H, C(2)	W, c
HYDROBATIDAE			
Black Storm-Petrel	<i>Oceanodroma melania</i>	M, H	W, c
PHAETHONTIDAE			
Red-billed Tropicbird	<i>Phaethon aethereus</i>	VU, C(2), H	W, c
SULIDAE			
Masked Booby	<i>Sula dactylatra</i>	T	W, c
Blue-footed Booby	<i>Sula nebouxii</i>	T, H, C(2)	W, c
Brown Booby	<i>Sula leucogaster</i>	MP	W, c
Red-footed Booby	<i>Sula sula</i>	T, H, C(2)	W, c
PELECANIDAE			
American White Pelican	<i>Pelecanus erythrorhynchus</i>	M, d	W
Brown Pelican	<i>Pelecanus occidentalis</i>	MP	W, c
PHALACROCORACIDAE			
Neotropic Cormorant	<i>Phalacrocorax brasilianus</i>	B, D	W
ANHINGIDAE			
Anhinga	<i>Anhinga anhinga</i>	B, D	W
FREGATIDAE			
Magnificent Frigatebird	<i>Fregata magnificens</i>	MP	W
ARDEIDAE			
Pinnated Bittern	<i>Botaurus pinnatus</i>	VU, C(4)	W, e
American Bittern	<i>Botaurus lentiginosus</i>	M, d	W, e
Least Bittern	<i>Ixobrychus exilis</i>	B, D	W
Bare-throated Tiger-Heron	<i>Tigrisoma mexicanum</i>	B, D	W
Great Blue Heron	<i>Ardea herodias</i>	M, d	W
Great Egret	<i>Ardea alba</i>	B, MP, d	W
Snowy Egret	<i>Egretta thula</i>	B, MP, d	W
Little Blue Heron	<i>Egretta caerulea</i>	MP	W
Tricolored Heron	<i>Egretta tricolor</i>	B, MP, d	W
Reddish Egret	<i>Egretta rufescens</i>	MP, d	W, c
Cattle Egret	<i>Bubulcus ibis</i>	B	W
Green Heron	<i>Butorides virescens</i>	B, MP	W
Agami Heron	<i>Agamia agami</i>	VU, C(1), H	W
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	U, d	W
Yellow-crowned Night-Heron	<i>Nyctinassa violacea</i>	B, MP, d	W
Boat-billed Heron	<i>Cochlearius cochlearius</i>	B, D	W
THRESKIORNITHIDAE			
White Ibis	<i>Eudocimus albus</i>	B, MP, d	W
White-faced Ibis	<i>Plegadis chihi</i>	VM, C(2)	W
Roseate Spoonbill	<i>Ajaia ajaia</i>	MP, D	W

APPENDIX I. Continued.

Family English name	Scientific name	Status	Distribution
CICONIIDAE			
Jabiru	<i>Jabiru mycteria</i>	VU, C(2+), X	W
Wood Stork	<i>Mycteria americana</i>	MP, d	W
CATHARTIDAE			
Black Vulture	<i>Coragyps atratus</i>	B	OG, AG
Turkey Vulture	<i>Cathartes aura</i>	U, MP	OG, AG
Lesser Yellow-headed Vulture	<i>Cathartes burrovianus</i>	VU, C(2), H	OS, L, w
King Vulture	<i>Sarcoramphus papa</i>	B, D	FG, AG, w
ANATIDAE			
Black-bellied Whistling-Duck	<i>Dendrocygna autumnalis</i>	B	W
Fulvous Whistling-Duck	<i>Dendrocygna bicolor</i>	B, d	W
Snow Goose	<i>Chen caerulescens</i>	VM, C(1), H	W, OS, L
Muscovy Duck	<i>Cairina moschata</i>	B, D	W
American Wigeon	<i>Anas americana</i>	M, d	W
Blue-winged Teal	<i>Anas discors</i>	M	W
Northern Shoveler	<i>Anas clypeata</i>	M, d	W
Northern Pintail	<i>Anas acuta</i>	M, d	W
Green-winged Teal	<i>Anas crecca</i>	M, d	W
Lesser Scaup	<i>Aythya affinis</i>	M, d	W
Masked Duck	<i>Nomonyx dominicus</i>	B, D	W
Ruddy Duck	<i>Oxyura jamaicensis</i>	U, MP, d	W
ACCIPITRIDAE			
Osprey	<i>Pandion haliaetus</i>	MP, d	W
Gray-headed Kite	<i>Leptodon cayanensis</i>	B, D	FS, L
Hook-billed Kite	<i>Chondrohierax uncinatus</i>	U, D	FG, AG
Swallow-tailed Kite	<i>Elanoides forficatus</i>	T, C(1), H	FG, L
White-tailed Kite	<i>Elanus leucurus</i>	B	OG, L
Snail Kite	<i>Rostrhamus sociabilis</i>	VU, C(3)	W, OS, L
Double-toothed Kite	<i>Harpagus bidentatus</i>	VU, C(3)	FG, AG
Mississippi Kite	<i>Ictinia mississippiensis</i>	T, C(1), H	FG, AG
Plumbeous Kite	<i>Ictinia plumbea</i>	BM, D	FS, L
Black-collared Hawk	<i>Busarellus nigricollis</i>	B, D	W, FS, L
Northern Harrier	<i>Circus cyaneus</i>	M, d	OG, L
Sharp-shinned Hawk	<i>Accipiter striatus</i>	M	OG, FG, AG
	<i>Accipiter striatus</i> <i>chionogaster</i>	U, EE, d	H
Cooper's Hawk	<i>Accipiter cooperi</i>	M, H, d	FG, AG
Crane Hawk	<i>Geranospiza caerulescens</i>	U, D	FG, L
White Hawk	<i>Leucopternis albicollis</i>	B, D	FS, L, w
Gray Hawk	<i>Asturina nitida</i>	B, d	FG, L
Common Black-Hawk	<i>Buteogallus anthracinus</i>	B, d	FG, L
Mangrove Black-Hawk	<i>Buteogallus subtilis</i>	B, d	FS, L
Great Black-Hawk	<i>Buteogallus urubitinga</i>	B, D	FG, L
Harris's Hawk	<i>Parabuteo unicinctus</i>	U, D	OS, L
Solitary Eagle	<i>Harpophalioetus solitarius</i>	VU, C(1), H	FG, H, n
Roadside Hawk	<i>Buteo magnirostris</i>	B, d	OG, L
Broad-winged Hawk	<i>Buteo platypterus</i>	M, d	FG, H
Short-tailed Hawk	<i>Buteo brachyurus</i>	U, d	FG, AG
Swainson's Hawk	<i>Buteo swainsoni</i>	T, M	OG, L
White-tailed Hawk	<i>Buteo albicaudatus</i>	U, D	OG, L
Zone-tailed Hawk	<i>Buteo albonotatus</i>	U, MP	OG, L
Red-tailed Hawk	<i>Buteo jamaicensis</i>	B, MP, EE, d	FG, H
Black Hawk-Eagle	<i>Spizaetus tyrannus</i>	B, D	FS, AG, w
Ornate Hawk-Eagle	<i>Spizaetus ornatus</i>	U, X	FS, L

APPENDIX I. Continued.

Family English name	Scientific name	Status	Distribution
FALCONIDAE			
Barred Forest-Falcon	<i>Micrastur ruficollis</i>	U, D	FS, AG
Collared Forest-Falcon	<i>Micrastur semitorquatus</i>	B, D	FG, L
Crested Caracara	<i>Caracara plancus</i>	B, d	OG, L
Laughing Falcon	<i>Herpetotheses cachinnans</i>	B, d	FG, L
American Kestrel	<i>Falco sparverius</i>	MP	OG, AG
	<i>Falco sparverius tropicalis</i>	B, EE	H
Merlin	<i>Falco columbarius</i>	T, M	OG, L
Bat Falcon	<i>Falco rufigularis</i>	B, D	OS, L
Peregrine Falcon	<i>Falco peregrinus</i>	M, d	OS, L
CRACIDAE			
White-bellied Chachalaca	<i>Ortalis leucogastra</i>	B, E, d	FG, L
Crested Guan	<i>Penelope purpurescens</i>	B, D	FS, L, w
Highland Guan	<i>Penelopina nigra</i>	B, E, D	FS, H, w
Great Curassow	<i>Crax rubra</i>	B, D	FS, L, w
ODONTOPHORIDAE			
Buffy-crowned Wood-Partridge	<i>Dendrortyx leucophrys</i>	B, EE, d	FG, H
Singing Quail	<i>Dactylortyx thoracicus</i>	U, EE(3), d	FS, H
Ocellated Quail	<i>Cyrtonyx ocellatus</i>	U, E, D	FS, H, n
Crested Bobwhite	<i>Colinus cristatus</i>	B	OG, L
RALLIDAE			
Ruddy Crake	<i>Laterallus ruber</i>	B, d	W
Rufous-necked Wood-Rail	<i>Aramides axillaris</i>	B, D	FS, AG, w
Gray-necked Wood-Rail	<i>Aramides cajanea</i>	U, D	FS, L, w
Sora	<i>Porzana carolina</i>	M, d	W
Yellow-breasted Crake	<i>Porzana flaviventer</i>	B, D	W, e
Spotted Rail	<i>Pardirallus maculatus</i>	VU, C(2)	W
Purple Gallinule	<i>Porphyrius martinica</i>	B, d	W
Common Moorhen	<i>Gallinula chloropus</i>	B, MP, d	W
American Coot	<i>Fulica americana</i>	B, MP, d	W
ARAMIDAE			
Limpkin	<i>Aramus guarauna</i>	B, D	W
BURHINIDAE			
Double-striped Thick-knee	<i>Burhinus bistriatus</i>	B, D	OS, L, e
CHARADRIIDAE			
Black-bellied Plover	<i>Pluvialis squatarola</i>	MP	W, c
American Golden-Plover	<i>Pluvialis dominica</i>	T	W, OS, L
Collared Plover	<i>Charadrius collaris</i>	U, MP	W, c
Snowy Plover	<i>Charadrius alexandrinus</i>	M, D	W, OS, L, c
Wilson's Plover	<i>Charadrius wilsonia</i>	B, MP, d	W, OS, L, c
Semipalmated Plover	<i>Charadrius semipalmatus</i>	MP	W
Killdeer	<i>Charadrius vociferus</i>	M	W, OS, L
HAEMATOPODIDAE			
American Oystercatcher	<i>Haematopus palliatus</i>	B, D	W, OS, L, c
RECURVIROSTRIDAE			
Black-necked Stilt	<i>Himantopus mexicanus</i>	B, MP, d	W, OS, L
American Avocet	<i>Recurvirostra americana</i>	M	W
JACANIDAE			
Northern Jacana	<i>Jacana spinosa</i>	B	W, OS, L

APPENDIX I. Continued.

Family English name	Scientific name	Status	Distribution
SCOLOPACIDAE			
Greater Yellowlegs	<i>Tringa melanoleuca</i>	M	W
Lesser Yellowlegs	<i>Tringa flavipes</i>	M	W
Solitary Sandpiper	<i>Tringa solitaria</i>	M	W
Willet	<i>Catoptrophorus semipalmatus</i>	MP	W, c
Wandering Tattler	<i>Heteroscelus incanus</i>	M	W, OS, L, c
Spotted Sandpiper	<i>Actitis macularia</i>	MP	W
Whimbrel	<i>Numenius phaeopus</i>	MP	W, c
Long-billed Curlew	<i>Numenius americanus</i>	M	W, c
Marbled Godwit	<i>Limosa fedoa</i>	MP	W, c
Ruddy Turnstone	<i>Arenaria interpres</i>	MP	W
Surfbird	<i>Aphriza virgata</i>	VM, C(2)	W, OS, L, c
Red Knot	<i>Calidris canutus</i>	MP	W, c
Sanderling	<i>Calidris alba</i>	MP	W, c
Semipalmated Sandpiper	<i>Calidris pusilla</i>	MP	W
Western Sandpiper	<i>Calidris mauri</i>	MP	W
Least Sandpiper	<i>Calidris minutilla</i>	M	W
Baird's Sandpiper	<i>Calidris bairdii</i>	T, C(1)	W, OS, L
Pectoral Sandpiper	<i>Calidris melanotos</i>	T	W
Stilt Sandpiper	<i>Calidris himantopus</i>	T	W
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	T, C(1)	W
Short-billed Dowitcher	<i>Limnodromus griseus</i>	M	W
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	VM, C(1), H	W, OS, L
Common Snipe	<i>Gallinago gallinago</i>	M	W, OS, L
Wilson's Phalarope	<i>Phalaropus tricolor</i>	T	W
Red-necked Phalarope	<i>Phalaropus lobatus</i>	M	W, c
Red Phalarope	<i>Phalaropus fulicaria</i>	T, H, C(2)	W, c
LARIDAE			
Pomarine Jaeger	<i>Stercorarius pomarinus</i>	T, H, C(2)	W, c
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	VM, C(1), H	W, c
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>	T, H, C(2)	W, c
Laughing Gull	<i>Larus atricilla</i>	M	W
Franklin's Gull	<i>Larus pipixcan</i>	T, M	W
Bonaparte's Gull	<i>Larus philadelphia</i>	VM, C(1), H	W, c
Ring-billed Gull	<i>Larus delawarensis</i>	M, H	W, c
California Gull	<i>Larus californicus</i>	VM, C(1)	W, c
Herring Gull	<i>Larus argentatus</i>	M	W, c
Sabine's Gull	<i>Xema sabini</i>	T, M	W, c
Gull-billed Tern	<i>Sterna nilotica</i>	MP	W, c
Caspian Tern	<i>Sterna caspia</i>	M	W
Royal Tern	<i>Sterna maxima</i>	MP	W, c
Elegant Tern	<i>Sterna elegans</i>	T	W, c
Sandwich Tern	<i>Sterna sandvicensis</i>	M	W, c
Roseate Tern	<i>Sterna dougallii</i>	T, C(1)	W
Common Tern	<i>Sterna hirundo</i>	M	W, c
Arctic Tern	<i>Sterna paradisaea</i>	T, C(1)	W, c
Forster's Tern	<i>Sterna forsteri</i>	VM, C(3)	W
Least Tern	<i>Sterna antillarum</i>	B, MP, D	W, c
Bridled Tern	<i>Sterna anaethetus</i>	VU, C(1), H	W, c
Sooty Tern	<i>Sterna fuscata</i>	T, C(1)	W, c
Black Tern	<i>Chlidonias niger</i>	M	W, c
Brown Noddy	<i>Anous stolidus</i>	T, C(1), H	W, c
RYNCHOPIDAE			
Black Skimmer	<i>Rynchops niger</i>	B, MP, d	W, OS, L

APPENDIX I. Continued.

Family English name	Scientific name	Status	Distribution
COLUMBIDAE			
Rock Dove	<i>Columba livia</i>	B	OG, AG
Red-billed Pigeon	<i>Columba flavirostris</i>	B	FG, AG
Band-tailed Pigeon	<i>Columba fasciata</i>	B, d	FG, H
White-winged Dove	<i>Zenaida asiatica</i>	B, MP	FG, OG, AG
Mourning Dove	<i>Zenaida macroura</i>	M	OG, L
Inca Dove	<i>Columbina inca</i>	B	OG, L
Common Ground-Dove	<i>Columbina passerina</i>	B	OS, L
Plain-breasted Ground-Dove	<i>Columbina minuta</i>	U	OS, L, w
Ruddy Ground-Dove	<i>Columbina talpacoti</i>	B	OG, L
Blue Ground-Dove	<i>Claravis pretiosa</i>	B, D	FS, L
Maroon-chested Ground-Dove	<i>Claravis mondetoura</i>	VU, EE, C(1)	FS, H, n
White-tipped Dove	<i>Leptotila verreauxi</i>	B	FG, L
White-faced Quail-Dove	<i>Geotrygon albifacies</i>	B, EE, D	FS, H, w
Ruddy Quail-Dove	<i>Geotrygon montana</i>	B, D	FS, L, w
PSITTACIDAE			
Green Parakeet	<i>Aratinga holochlora</i>	M, EE, D	FS, H
Pacific Parakeet	<i>Aratinga strenua</i>	B, d	FG, AG
Orange-fronted Parakeet	<i>Aratinga canicularis</i>	B, d	FG, L
Scarlet Macaw	<i>Ara macao</i>	U, X	FS, L, e
Orange-chinned Parakeet	<i>Brotogeris jugularis</i>	B, d	FG, L
White-fronted Parrot	<i>Amazona albifrons</i>	B, D	FS, L, w
Yellow-naped Parrot	<i>Amazona auropalliata</i>	B, D	FS, L
CUCULIDAE			
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	T, C(2)	OG, FG
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	T	FG, L
Mangrove Cuckoo	<i>Coccyzus minor</i>	B, MP?, d	FS, AG
Squirrel Cuckoo	<i>Piaya cayana</i>	B	FG, L
Striped Cuckoo	<i>Tapera naevia</i>	B	FG, L
Pheasant Cuckoo	<i>Dromococcyx phasianellus</i>	U, d	FS, L
Lesser Ground-Cuckoo	<i>Morococcyx erythropygus</i>	U	OS, L
Lesser Roadrunner	<i>Geococcyx velox</i>	B, EE, d	OG, H
Groove-billed Ani	<i>Crotophaga sulcirostris</i>	B	OG, AG
TYTONIDAE			
Barn Owl	<i>Tyto alba</i>	B, d	OG, L
STRIGIDAE			
Pacific Screech-Owl	<i>Otus cooperi</i>	B, d	FS, L
Whiskered Screech-Owl	<i>Otus trichopsis</i>	B, EE, d	FS, H, n
Crested Owl	<i>Lophotrix cristata</i>	VU, C(1)	FS, H
Spectacled Owl	<i>Pulsatrix perspicillata</i>	B, D	FS, L
Great Horned Owl	<i>Bubo virginianus</i>	U, D	FG, AG
Ferruginous Pygmy-Owl	<i>Glaucidium brasilianum</i>	B	FG, L
Burrowing Owl	<i>Athene cunicularia</i>	VM, C(3)	OS, L
Mottled Owl	<i>Ciccaba virgata</i>	B, d	FG, AG
Black-and-white Owl	<i>Ciccaba nigrolineata</i>	B, D	FS, L, w
Fulvous Owl	<i>Strix fulvescens</i>	U, E, D	FS, H, n
Striped Owl	<i>Pseudoscops clamator</i>	B, D	OS, L
Unspotted Saw-whet Owl	<i>Aegolius ridgwayi</i>	U, EE, D	FS, H, n
CAPRIMULGIDAE			
Lesser Nighthawk	<i>Chordeiles acutipennis</i>	B, MP, d	OS, L
Common Nighthawk	<i>Chordeiles minor</i>	VM, C(1), H	OG, AG
Pauraque	<i>Nyctidromus albicollis</i>	B	OG, L
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	T	FG, L
Whip-poor-will	<i>Caprimulgus vociferus</i>	B, MP, EE	FG, AG, H

APPENDIX I. Continued.

Family English name	Scientific name	Status	Distribution
NYCTIBIIDAE			
Northern Potoo	<i>Nyctibius jamaicensis</i>	U, D	OG, FG, L
APODIDAE			
Black Swift	<i>Cypseloides niger</i>	VU, C(3), H	OG, H
Chestnut-collared Swift	<i>Streptoprocne rutila</i>	U	OG, AG
White-collared Swift	<i>Streptoprocne zonaris</i>	U	OG, L
Chimney Swift	<i>Chaetura pelagica</i>	T, H, C(2)	OG, L
Vaux's Swift	<i>Chaetura vauxi</i>	U	OG, H
White-throated Swift	<i>Aeronautes saxatalis</i>	U	OG, H
Lesser Swallow-tailed Swift	<i>Panyptila cayennensis</i>	U, H	OG, L, w
Great Swallow-tailed Swift	<i>Panyptila sanctihieronymi</i>	U, H	OG, H, w
TROCHILIDAE			
Rufous Sabrewing	<i>Campylopterus rufus</i>	B, E, D	OS, H
Violet Sabrewing	<i>Campylopterus hemileucurus</i>	B	FG, H
Green Violet-ear	<i>Colibri thalassinus</i>	B, MP, d	OS, H
Green-breasted Mango	<i>Anthracothorax prevostii</i>	B, MP	OG, L
Emerald-chinned Hummingbird	<i>Abeillia abeillei</i>	U, E, D	FS, H, w
Canivet's Emerald	<i>Chlorostilbon canivetii</i>	B	FG, L
Blue-throated Goldentail	<i>Hylocharis eliciae</i>	B, D	FS, L
White-eared Hummingbird	<i>Hylocharis leucotis</i>	B, EE, d	FS, H, w
Azure-crowned Hummingbird	<i>Amazilia cyanocephala</i>	U, EE, d	FS, H, n
Berylline Hummingbird	<i>Amazilia beryllina</i>	U	FG, L
Blue-tailed Hummingbird	<i>Amazilia cyanura</i>	U	L, c
Cinnamon Hummingbird	<i>Amazilia rutila</i>	B	OG, L
Green-throated Mountain-gem	<i>Lampornis viridipallens</i>	U, E, EE(2), D	FS, H, w
Amethyst-throated Hummingbird	<i>Lampornis amethystinus</i>	U, EE, D	FS, H, n
Garnet-throated Hummingbird	<i>Lamprolaima rhami</i>	U, EE, D	FS, H, n
Magnificent Hummingbird	<i>Eugenes fulgens</i>	B, EE, d	OS, H
Long-billed Starthroat	<i>Heliomaster longirostris</i>	B, D	L
Plain-capped Starthroat	<i>Heliomaster constantii</i>	B, d	OG, L
Slender Sheartail	<i>Doricha enicura</i>	U, E, D	OS, H
Sparkling-tailed Hummingbird	<i>Tilmatura dupontii</i>	U, D	OS, H
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	M	OG, FG, AG
Wine-throated Hummingbird	<i>Atthis ellioti</i>	U, E, EE, D	OS, H, w
TROGONIDAE			
Black-headed Trogon	<i>Trogon melanocephalus</i>	U, d	FS, L
Violaceous Trogon	<i>Trogon violaceus</i>	B, d	FG, L
Elegant Trogon	<i>Trogon elegans</i>	B, d	FG, L
Collared Trogon	<i>Trogon collaris</i>	B, D	FG, H, n
Resplendent Quetzal	<i>Pharomachrus mocinno</i>	B, EE, D	FS, H, n
MOMOTIDAE			
Tody Motmot	<i>Hylomanes momotula</i>	U, D	FS, L, w
Blue-throated Motmot	<i>Aspatha gularis</i>	B, E, D	FS, H, n
Blue-crowned Motmot	<i>Momotus momota</i>	B	FG, AG
Turquoise-browed Motmot	<i>Eumomota superciliosa</i>	B	OG, L
ALCEDINIDAE			
Ringed Kingfisher	<i>Ceryle torquata</i>	B, D	W, OS, L
Belted Kingfisher	<i>Ceryle alcyon</i>	M	W, OS, L
Amazon Kingfisher	<i>Chloroceryle amazona</i>	U, D	W, OS, L
Green Kingfisher	<i>Chloroceryle americana</i>	B, d	W, OS, L
American Pygmy Kingfisher	<i>Chloroceryle aenea</i>	B, d	FS, L, c
BUCCONIDAE			
White-necked Puffbird	<i>Notharchus macrorhynchos</i>	U, D	FS, L

APPENDIX I. Continued.

Family English name	Scientific name	Status	Distribution
RAMPHASTIDAE			
Emerald Toucanet	<i>Aulacorhynchus prasinus</i>	B, EE(2), D	FS, H
Collared Araçari	<i>Pteroglossus torquatus</i>	B, d	FG, L
PICIDAE			
Acorn Woodpecker	<i>Melanerpes formicivorus</i>	U, EE, d	FS, H, n
Golden-fronted Woodpecker	<i>Melanerpes aurifrons</i>	B	OG, FG, L
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	M	FG, H
Ladder-backed Woodpecker	<i>Picoides scalaris</i>	U	FG, AG, e
Hairy Woodpecker	<i>Picoides villosus</i>	U, EE, d	FS, H, n
Smoky-brown Woodpecker	<i>Veniliornis fumigatus</i>	B, D	FS, L
Golden-olive Woodpecker	<i>Piculus rubiginosus</i>	B	FG, AG
Northern Barred-Flicker	<i>Colaptes auratus</i>	B, EE, d	FS, H
Lineated Woodpecker	<i>Dryocopus lineatus</i>	B, d	FS, AG
Pale-billed Woodpecker	<i>Campephilus guatemalensis</i>	U, D	FS, L
FURNARIIDAE			
Rufous-breasted Spinetail	<i>Synallaxis erythrothorax</i>	B, d	OS, L
Scaly-throated Foliage-gleaner	<i>Anabacerthia variegaticeps</i>	U, D	FS, H, n
Ruddy Foliage-gleaner	<i>Automolus rubiginosus</i>	U, D	FS, H, n
DENDROCOLAPTIDAE			
Ruddy Woodcreeper	<i>Dendrocincla homochroa</i>	B, D	FS, L, w
Olivaceous Woodcreeper	<i>Sittasomus griseicapillus</i>	U, d	FG, L
Strong-billed Woodcreeper	<i>Xiphocolaptes promeropirhynchus</i>	U, EE, D	FG, H
Northern Barred-Woodcreeper	<i>Dendrocolaptes sanctithomae</i>	B, D	FS, L
Ivory-billed Woodcreeper	<i>Xiphorhynchus flavigaster</i>	B, d	FG, L
Spotted Woodcreeper	<i>Xiphorhynchus erythropygius</i>	VU, EE?, C(2)	FS, H, n
Streak-headed Woodcreeper	<i>Lepidocolaptes souleyetii</i>	B, d	FS, L
Spot-crowned Woodcreeper	<i>Lepidocolaptes affinis</i>	B, EE, d	FS, H
THAMNOPHILIDAE			
Barred Antshrike	<i>Thamnophilus doliatus</i>	B	OS, L
FORMICARIIDAE			
Scaled Antpitta	<i>Grallaria guatemalensis</i>	B, EE, D	FS, H, w
TYRANNIDAE			
Northern Beardless-Tyrannulet	<i>Camptostoma imberbe</i>	U, d	FS, L
Greenish Elaenia	<i>Myiopagis viridicata</i>	B	FG, L
Yellow-bellied Elaenia	<i>Elaenia flavogaster</i>	B	OG, L
Mountain Elaenia	<i>Elaenia frantzii</i>	B, EE, d	FG, OG, H
Ochre-bellied Flycatcher	<i>Mionectes oleagineus</i>	B, D	FS, L, w
Paltry Tyrannulet	<i>Zimmerius vilissimus</i>	B, d	FS, H, w
Northern Bentbill	<i>Oncostoma cinereigulare</i>	B, D	FS, L
Common Tody-Flycatcher	<i>Todirostrum cinereum</i>	B, d	OS, L
Eye-ringed Flatbill	<i>Rhynchocyclus brevirostris</i>	B, d	FS, H, w
Yellow-olive Flycatcher	<i>Tolmomyias sulphurescens</i>	B	FG, L
Stub-tailed Spadebill	<i>Platyrinchus cancrominus</i>	U, D	FS, L
Royal Flycatcher	<i>Onychorhynchus coronatus</i>	U, D	FS, L
Belted Flycatcher	<i>Xenotriccus callizonus</i>	U, E, D	FS, H
Tufted Flycatcher	<i>Mitrephanes phaeocercus</i>	U, EE, D	FS, H, n
Olive-sided Flycatcher	<i>Contopus cooperi</i>	T	FG, AG
Greater Pewee	<i>Contopus pertinax</i>	U, MP?, EE, d	FS, H, n
Western Wood-Pewee	<i>Contopus sordidulus</i>	T	FG, AG
Eastern Wood-Pewee	<i>Contopus virens</i>	T, H, C(2)	FG, L
Tropical Pewee	<i>Contopus cinereus</i>	B, MP?, d	FS, L
Yellow-bellied Flycatcher	<i>Empidonax flaviventris</i>	M	FG, L

APPENDIX I. Continued.

Family English name	Scientific name	Status	Distribution
Willow Flycatcher	<i>Empidonax traillii</i>	M	OG, L
White-throated Flycatcher	<i>Empidonax albigularis</i>	U, EE, D	OS, H
Least Flycatcher	<i>Empidonax minimus</i>	M	FG, L
Hammond's Flycatcher	<i>Empidonax hammondi</i>	M, d	FS, H, n
Yellowish Flycatcher	<i>Empidonax flavescens</i>	B, EE, d	FS, H
Buff-breasted Flycatcher	<i>Empidonax fulvifrons</i>	U, EE, d	FS, H, n
Black Phoebe	<i>Sayornis nigricans</i>	B, D	FS, L, w
Bright-rumped Attila	<i>Attila spadiceus</i>	B, D	FS, L
Dusky-capped Flycatcher	<i>Myiarchus tuberculifer</i>	B	FG, AG
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	VM, C(1)	L
Nutting's Flycatcher	<i>Myiarchus nuttingi</i>	U	OG, L
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	M	FG, L
Brown-crested Flycatcher	<i>Myiarchus tyrannulus</i>	B, MP, d	FS, L
Great Kiskadee	<i>Pitangus sulphuratus</i>	B	OG, FG, L
Boat-billed Flycatcher	<i>Megarynchus pitangua</i>	B	FG, AG
Social Flycatcher	<i>Myiozetetes similis</i>	B	FG, L
Sulphur-bellied Flycatcher	<i>Myiodynastes luteiventris</i>	BM	FG, L
Tropical Kingbird	<i>Tyrannus melancholicus</i>	B	OG, L
Western Kingbird	<i>Tyrannus verticalis</i>	M	OG, L
Eastern Kingbird	<i>Tyrannus tyrannus</i>	T	OG, AG
Scissor-tailed Flycatcher	<i>Tyrannus forficatus</i>	M	OG, L
INCERTAE SEDIS			
Gray-collared Becard	<i>Pachyramphus major</i>	U, EE, D	FS, H
Rose-throated Becard	<i>Pachyramphus aglaiae</i>	B	FG, L
Masked Tityra	<i>Tityra semifasciata</i>	B	FG, AG
PIPRIDAE			
Long-tailed Manakin	<i>Chiroxiphia linearis</i>	B, d	FS, L
VIREONIDAE			
Mangrove Vireo	<i>Vireo pallens</i>	U, D	FS, L, c
Bell's Vireo	<i>Vireo bellii</i>	M, d	OS, L
Yellow-throated Vireo	<i>Vireo flavifrons</i>	M, d	FG, L
Blue-headed Vireo	<i>Vireo solitarius</i>	U, MP?, EE?, d	FS, H
Warbling Vireo	<i>Vireo gilvus</i>	M	FG, AG
Brown-capped Vireo	<i>Vireo leucophrys</i>	U, EE, D	FS, H, w
Philadelphia Vireo	<i>Vireo philadelphicus</i>	M, d	FG, H
Red-eyed Vireo	<i>Vireo olivaceus</i>	T, C(2)	FG, AG
Yellow-green Vireo	<i>Vireo flavoviridis</i>	BM	FG, L
Lesser Greenlet	<i>Hylophilus decurtatus</i>	B	FG, L
Green Shrike-Vireo	<i>Vireolanius pulchellus</i>	U, D	FS, L, w
Rufous-browed Peppershrike	<i>Cyclarhis gujanensis</i>	B	FG, AG
CORVIDAE			
Steller's Jay	<i>Cyanocitta stelleri</i>	U, EE, D	FS, H, n
White-throated Magpie-Jay	<i>Calocitta formosa</i>	B	OG, AG
Brown Jay	<i>Cyanocorax morio</i>	VU, C(1)	FG, L, n
Bushy-crested Jay	<i>Cyanocorax melanocyaneus</i>	B, E, EE(2), d	FG, H
Black-throated Jay	<i>Cyanolyca pumilo</i>	B, E, D	FS, H, n
Unicolored Jay	<i>Aphelocoma unicolor</i>	U, EE, D	FS, H, n
Common Raven	<i>Corvus corax</i>	B, D	OG, H
HIRUNDINIDAE			
Gray-breasted Martin	<i>Progne chalybea</i>	B	OG, AG
Tree Swallow	<i>Tachycineta bicolor</i>	VM, C(2), H	OS, L
Mangrove Swallow	<i>Tachycineta albilinea</i>	B, d	W, FS, L
Violet-green Swallow	<i>Tachycineta thalassina</i>	M	OG, FG, AG

APPENDIX I. Continued.

Family English name	Scientific name	Status	Distribution
Black-capped Swallow	<i>Notiochelidon pileata</i>	B, E, d	OS, H, n
Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	B, MP?	OG, AG?
Bank Swallow	<i>Riparia riparia</i>	T	OG, L
Barn Swallow	<i>Hirundo rustica</i>	M	OG, AG
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	T	OG, L
Cave Swallow	<i>Petrochelidon fulva</i>	M, d	OG, L
TROGLODYTIDAE			
Band-backed Wren	<i>Campylorhynchus zonatus</i>	B, d	OS, H, n
Rufous-naped Wren	<i>Campylorhynchus rufinucha</i>	B	OG, L
Rock Wren	<i>Salpinctes obsoletus</i>	B, EE, d	OS, H
Spot-breasted Wren	<i>Thryothorus maculipectus</i>	B, d	FS, OS, H
Rufous-and-white Wren	<i>Thryothorus rufalbus</i>	B, d	FS, AG
Banded Wren	<i>Thryothorus pleurostictus</i>	B, d	FS, L
Plain Wren	<i>Thryothorus modestus</i>	B	OG, AG
House Wren	<i>Troglodytes aedon</i>	B	OG, FG, H
Rufous-browed Wren	<i>Troglodytes rufociliatus</i>	B, E, EE(2), D	FS, H, w
Gray-breasted Wood-Wren	<i>Henicorhina leucophrys</i>	B, EE, D	FS, H, n
SYLVIIDAE			
Long-billed Gnatwren	<i>Ramphocaenus melanurus</i>	U, D	FS, L
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	M, H	FG, L, n
White-lored Gnatcatcher	<i>Polioptila albiloris</i>	B, d	OS, L
TURDIDAE			
Eastern Bluebird	<i>Sialia sialis</i>	B, EE, d	FS, H
Brown-backed Solitaire	<i>Myadestes occidentalis</i>	B, EE, d	FS, H
Slate-colored Solitaire	<i>Myadestes unicolor</i>	U, D	FS, H, n
Orange-billed Nightingale-Thrush	<i>Catharus aurantiirostris</i>	B, d	FS, H
Ruddy-capped Nightingale-Thrush	<i>Catharus frantzii</i>	B, EE, D	FS, H, w
Spotted Nightingale-Thrush	<i>Catharus dryas</i>	U, EE, D	FS, H, n
Swainson's Thrush	<i>Catharus ustulatus</i>	M	FG, AG
Hermit Thrush	<i>Catharus guttatus</i>	VM, C(4)	FG, H
Wood Thrush	<i>Hylocichla mustelina</i>	M	FG, H
Black Robin	<i>Turdus infuscatus</i>	B, D	FS, H, w
Mountain Robin	<i>Turdus plebejus</i>	B, EE, D	FS, H, n
Clay-colored Robin	<i>Turdus grayi</i>	B, MP?	FG, AG
White-throated Robin	<i>Turdus assimilis</i>	B, EE, d	FS, H
Rufous-collared Robin	<i>Turdus rufitorques</i>	B, E, d	OS, H, w
Aztec Thrush	<i>Ridgwayia pinicola</i>	VM, C(1), H	FG, H
MIMIDAE			
Gray Catbird	<i>Dumetella carolinensis</i>	VM, C(3)	FG, H, w
Tropical Mockingbird	<i>Mimus gilvus</i>	B	OG, L
Blue-and-white Mockingbird	<i>Melanotis hypoleucus</i>	B, E, d	OS, H, w
MOTACILLIDAE			
American Pipit	<i>Anthus rubescens</i>	VM, C(2)	OS, AG
BOMBYCILLIDAE			
Cedar Waxwing	<i>Bombycilla cedrorum</i>	M	FG, AG
PEUCEDRAMIDAE			
Olive Warbler	<i>Peucedramus taeniatus</i>	U, EE, D	FS, H, n
PARULIDAE			
Blue-winged Warbler	<i>Vermivora pinus</i>	M	FG, H
Golden-winged Warbler	<i>Vermivora chrysoptera</i>	M, d	FG, H
Tennessee Warbler	<i>Vermivora peregrina</i>	M	FG, AG

APPENDIX I. Continued.

Family English name	Scientific name	Status	Distribution
Orange-crowned Warbler	<i>Vermivora celata</i>	VM, C(2), H	OG, H
Nashville Warbler	<i>Vermivora ruficapilla</i>	M	OG, H
Crescent-chested Warbler	<i>Parula superciliosa</i>	B, EE, d	FS, H
Northern Parula	<i>Parula americana</i>	T, C(1)	FG, L
Yellow Warbler	<i>Dendroica petechia</i>	B, MP, d	FS, L
Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>	T, C(1)	
Magnolia Warbler	<i>Dendroica magnolia</i>	M	FG, L
Cape May Warbler	<i>Dendroica tigrina</i>	VM, C(2)	
Yellow-rumped Warbler	<i>Dendroica coronata</i>	M	OG, H
Golden-cheeked Warbler	<i>Dendroica chrysoparia</i>	VM, C(2), H, D	FG, H?, w
Black-throated Green Warbler	<i>Dendroica virens</i>	M	FG, AG
Townsend's Warbler	<i>Dendroica townsendi</i>	M	OG, FG, H
Hermit Warbler	<i>Dendroica occidentalis</i>	VM, C(4)	FS, H
Blackburnian Warbler	<i>Dendroica fusca</i>	T	FG, L
Yellow-throated Warbler	<i>Dendroica dominica</i>	VM, C(3)	FS, H
Grace's Warbler	<i>Dendroica graciae</i>	U, EE, d	FS, H, n
Prairie Warbler	<i>Dendroica discolor</i>	VM, C(2)	OG, FG, AG
Bay-breasted Warbler	<i>Dendroica castanea</i>	T, C(1)	FG
Black-and-white Warbler	<i>Mniotilta varia</i>	M	FG, AG
American Redstart	<i>Setophaga ruticilla</i>	M, d	FS, L
Prothonotary Warbler	<i>Protonotaria citrea</i>	M, d	FS, L
Worm-eating Warbler	<i>Helmitheros vermivorus</i>	M	FG, AG
Ovenbird	<i>Seiurus aurocapillus</i>	M	FG, AG
Northern Waterthrush	<i>Seiurus noveboracensis</i>	M, d	FS, L
Louisiana Waterthrush	<i>Seiurus motacilla</i>	M, d	FS, L
Kentucky Warbler	<i>Oporornis formosus</i>	T, M	FG, AG
Mourning Warbler	<i>Oporornis philadelphia</i>	T	OG, FG?, L
MacGillivray's Warbler	<i>Oporornis tolmiei</i>	M	OG, FG, H
Common Yellowthroat	<i>Geothlypis trichas</i>	M	OG, AG
Gray-crowned Yellowthroat	<i>Geothlypis poliocephala</i>	B, d	OS, AG
Hooded Warbler	<i>Wilsonia citrina</i>	M	FG, AG
Wilson's Warbler	<i>Wilsonia pusilla</i>	M	FG, H
Canada Warbler	<i>Wilsonia canadensis</i>	T	FG, AG
Red-faced Warbler	<i>Cardellina rubrifrons</i>	VM, C(3)	FG, H
Painted Redstart	<i>Myioborus pictus</i>	B, EE, d	FS, H, n
Slate-throated Redstart	<i>Myioborus miniatus</i>	B, EE, d	FS, H, w
Fan-tailed Warbler	<i>Euthlypis lachrymosa</i>	B, D	FS, L
Golden-crowned Warbler	<i>Basileuterus culicivorus</i>	U, D	FS, H, w
Rufous-capped Warbler	<i>Basileuterus rufifrons</i>	B	FG, AG
Golden-browed Warbler	<i>Basileuterus belli</i>	U, EE, D	FS, H, n
Yellow-breasted Chat	<i>Icteria virens</i>	M	OG, L
THRAUPIDAE			
Common Bush-Tanager	<i>Chlorospingus ophthalmicus</i>	U, EE, d	FS, H, n
Red-crowned Ant-Tanager	<i>Habia rubica</i>	B, D	FS, AG
Red-throated Ant-Tanager	<i>Habia fuscicauda</i>	B, d	FS, L
Hepatic Tanager	<i>Piranga flava</i>	U, EE, d	FS, H, n
Summer Tanager	<i>Piranga rubra</i>	M	FG, L
Western Tanager	<i>Piranga ludoviciana</i>	M	FG, AG
Flame-colored Tanager	<i>Piranga bidentata</i>	U, d	FS, H
White-winged Tanager	<i>Piranga leucoptera</i>	B, d	FS, H
Blue-gray Tanager	<i>Thraupis episcopus</i>	B	OG, L
Yellow-winged Tanager	<i>Thraupis abbas</i>	B	OG, AG
Scrub Euphonia	<i>Euphonia affinis</i>	B	FG, L
Yellow-throated Euphonia	<i>Euphonia hirundinacea</i>	B, d	FS, AG, w
Elegant Euphonia	<i>Euphonia elegantissima</i>	B, D	FG, H
Blue-crowned Chlorophonia	<i>Chlorophonia occipitalis</i>	B, D	FS, H, w
Red-legged Honeycreeper	<i>Cyanerpes cyaneus</i>	B, MP	FG, L

APPENDIX I. Continued.

Family English name	Scientific name	Status	Distribution
EMBERIZIDAE			
Blue-black Grassquit	<i>Volatinia jacarina</i>	B	OG, AG
White-collared Seedeater	<i>Sporophila torqueola</i>	B	OG, L
Ruddy-breasted Seedeater	<i>Sporophila minuta</i>	B	OS, L
Blue Seedeater	<i>Amaurospiza concolor</i>	VU, C(2)	w
Yellow-faced Grassquit	<i>Tiaris olivacea</i>	U	OG, H
Slaty Finch	<i>Haplospiza rustica</i>	VU, C(3)	FS, H, n
Cinnamon-bellied Flowerpiercer	<i>Diglossa baritula</i>	B, EE, D	OS, H, w
White-naped Brush-Finch	<i>Atlapetes albinueha</i>	B, EE(2), d	FS, H, w
Chestnut-capped Brush-Finch	<i>Buarremon brunneinuchus</i>	B, EE, D	FS, H, n
Prevost's Ground-Sparrow	<i>Melospiza biarcuatum</i>	B, d	FS, H
White-eared Ground-Sparrow	<i>Melospiza leucotis</i>	B, EE, D	FS, H, w
Stripe-headed Sparrow	<i>Aimophila ruficauda</i>	B	OG, L
Rusty Sparrow	<i>Aimophila rufescens</i>	B, EE(2), d	OS, H
Chipping Sparrow	<i>Spizella passerina</i>	B, MP, d	FS, H, n
Lark Sparrow	<i>Chondestes grammacus</i>	VM, C(3)	OS, L
Savannah Sparrow	<i>Passerculus sandwichensis</i>	VM, C(2), d	OS, L
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	M, d	OS, AG
Lincoln's Sparrow	<i>Melospiza lincolnii</i>	M	OG, H
Rufous-collared Sparrow	<i>Zonotrichia capensis</i>	B, EE	OG, H
Dickcissel	<i>Spiza americana</i>	M	OG, L
CARDINALIDAE			
Grayish Saltator	<i>Saltator coerulescens</i>	B	OG, AG
Buff-throated Saltator	<i>Saltator maximus</i>	VU, C(1)	OS, AG
Black-headed Saltator	<i>Saltator atriceps</i>	B	OG, FG, AG
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>	M	OG, FG, AG
Blue Bunting	<i>Cyanocompsa parellina</i>	B, d	FS, L
Blue Grosbeak	<i>Guiraca caerulea</i>	U, MP	OG, L
Indigo Bunting	<i>Passerina cyanea</i>	M, d	OS, L
Painted Bunting	<i>Passerina ciris</i>	M, d	OG, L
ICTERIDAE			
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	B, d	OS, L
Eastern Meadowlark	<i>Sturnella magna</i>	U, d	OS, AG, w
Melodious Blackbird	<i>Dives dives</i>	B	OG, AG
Great-tailed Grackle	<i>Quiscalus mexicanus</i>	B	OG, AG
Bronzed Cowbird	<i>Molothrus aeneus</i>	B	OG, AG
Black-vented Oriole	<i>Icterus wagleri</i>	U, d	FS, H, n
Bar-winged Oriole	<i>Icterus maculialatus</i>	B, E, D	FS, H
Orchard Oriole	<i>Icterus spurius</i>	M	OG, L
Yellow-backed Oriole	<i>Icterus chrysater</i>	U, d	FS, H, n
Streak-backed Oriole	<i>Icterus pustulatus</i>	B	OG, FG, AG
Spot-breasted Oriole	<i>Icterus pectoralis</i>	B, d	OG, FG, L
Altamira Oriole	<i>Icterus gularis</i>	B	OG, FG, L
Baltimore Oriole	<i>Icterus galbula</i>	M	OG, FG, L
Bullock's Oriole	<i>Icterus bullockii</i>	VM, C(2)	OG, AG
Yellow-billed Cacicque	<i>Amblycercus holosericeus</i>	B	FG, L
Yellow-winged Cacicque	<i>Cacicus melanicterus</i>	VU, C(1), H	OG, FG, L
FRINGILLIDAE			
Red Crossbill	<i>Loxia curvirostra</i>	VU, EE, C(1), H	FS, H, n
Black-headed Siskin	<i>Carduelis notata</i>	B, EE, d	FS, H, n
Lesser Goldfinch	<i>Carduelis psaltria</i>	B	OG, AG
Hooded Grosbeak	<i>Coccothraustes albeillei</i>	B, EE, D	FS, H, n
PASSERIDAE			
House Sparrow	<i>Passer domesticus</i>	B	OG, L

^a KEY TO STATUS CODES: B = Breeding confirmed; BM = Breeding visitor; C = Casual (number of reports given in parentheses); d = Threatened; D = In danger of extirpation; E = Endemic to northern Central America; EE = Subspecies endemic to northern Central America (number indicates how many endemic subspecies occur in El Salvador if more than one); H = Hypothetical; M = Migratory winter visitor; MP = Partially migratory; T = Transient; U = Status uncertain (suspected to breed); VM = Migratory vagrant (visitor or transient status uncertain); VU = Non-migratory vagrant—breeding status uncertain; KEY TO DISTRIBUTION CODES: AG = Altitudinal generalist; FG = Forest generalist; FS = Forest specialist; H = Mainly in highlands; L = Mainly in lowlands; OG = Open habitat generalist; OS = Open habitat specialist; W = Water habitat specialist (c = coastal; e = east; n = north; w = west).

APPENDIX II. List of bird species expected to occur in El Salvador but not reported.

Family	English name	Scientific name
PROCELLARIIDAE	Kermadec Petrel	<i>Pterodroma neglecta</i>
	Juan Fernandez Petrel	<i>Pterodroma externa</i>
	Dark-rumped Petrel	<i>Pterodroma phaeopygia</i>
	Tahiti Petrel	<i>Pterodroma rostrata</i>
	Parkinson's Petrel	<i>Procellaria parkinsoni</i>
	Pink-footed Shearwater	<i>Puffinus creatopus</i>
	Sooty Shearwater	<i>Puffinus griseus</i>
	Christmas Shearwater	<i>Puffinus nativitatis</i>
	Townsend's Shearwater	<i>Puffinus auricularis</i>
HYDROBATIDAE	Leach's Storm-Petrel	<i>Oceanodroma leucorhoa</i>
	Wedge-rumped Storm-Petrel	<i>Oceanodroma tethys</i>
	Least Storm-Petrel	<i>Oceanodroma microsoma</i>
ANATIDAE	Wood Duck	<i>Aix sponsa</i>
	Cinnamon Teal	<i>Anas cyanoptera</i>
	Canvasback	<i>Aythya valisineria</i>
	Redhead	<i>Aythya americana</i>
	Ring-necked Duck	<i>Aythya collaris</i>
ACCIPITRIDAE	Black-and-white Hawk-Eagle	<i>Spizastur melanoleucus</i>
FALCONIDAE	Red-throated Caracara	<i>Daptrius americanus</i>
CRACIDAE	Plain Chachalaca	<i>Ortalis vetula</i>
ODONTOPHORIDAE	Spotted Wood-Quail	<i>Odontophorus guttatus</i>
RALLIDAE	Virginia Rail	<i>Rallus limicola</i>
HELIORNITHIDAE	Sungrebe	<i>Heliornis fulica</i>
SCOLOPACIDAE	Upland Sandpiper	<i>Bartramia longicauda</i>
	Hudsonian Godwit	<i>Limosa haemastica</i>
LARIDAE	South Polar Skua	<i>Catharacta maccormicki</i>
	Heermann's Gull	<i>Larus heermanni</i>
PSITTACIDAE	Barred Parakeet	<i>Bolborhynchus lineola</i>
STRIGIDAE	Flammulated Owl	<i>Otus flammeolus</i>
	Bearded Screech-Owl	<i>Otus barbarus</i>
	Vermiculated Screech-Owl	<i>Otus guatemalae</i>
	Northern Pygmy-Owl	<i>Glaucidium gnoma</i>
	Central American Pygmy-Owl	<i>Glaucidium griseiceps</i>
	Stygian Owl	<i>Asio stygius</i>
CAPRIMULGIDAE	Buff-collared Nightjar	<i>Caprimulgus ridgwayi</i>
APODIDAE	White-chinned Swift	<i>Cypseloides cryptus</i>
TROCHILIDAE	White-necked Jacobin	<i>Florisuga mellivora</i>
	Black-crested Coquette	<i>Lophornis helenae</i>
	White-bellied Emerald	<i>Amazilia candida</i>
	Stripe-tailed Hummingbird	<i>Eupherusa eximia</i>
	Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>
TROGONIDAE	Mountain Trogon	<i>Trogon mexicanus</i>
PICIDAE	Hoffmann's Woodpecker	<i>Melanerpes hoffmanni</i>
FURNARIIDAE	Tawny-throated Leaf-tosser	<i>Sclerurus mexicanus</i>
DENDROCOLAPTIDAE	Black-banded Woodcreeper	<i>Dendrocolaptes picumnus</i>
TYRANNIDAE	Pine Flycatcher	<i>Empidonax affinis</i>
	Cassin's Kingbird	<i>Tyrannus vociferans</i>
	Thick-billed Kingbird	<i>Tyrannus crassirostris</i>

APPENDIX II. Continued.

Family	English name	Scientific name
VIREONIDAE	Hutton's Vireo	<i>Vireo huttoni</i>
	Chestnut-sided Shrike-Vireo	<i>Vireolanius melitophrys</i>
CORVIDAE	Green Jay	<i>Cyanocorax yncas</i>
	Azure-hooded Jay	<i>Cyanolyca cucullata</i>
HIRUNDINIDAE	Purple Martin	<i>Progne subis</i>
	Blue-and-white Swallow	<i>Notiochelidon cyanoleuca</i>
AEGITHALIDAE	Bushtit	<i>Psaltriparus minimus</i>
CERTHIIDAE	Brown Creeper	<i>Certhia americana</i>
TROGLODYTIDAE	Sedge Wren	<i>Cistothorus platensis</i>
	White-breasted Wood-Wren	<i>Henicorhina leucosticta</i>
CINCLIDAE	American Dipper	<i>Cinclus mexicanus</i>
REGULIDAE	Golden-crowned Kinglet	<i>Regulus satrapa</i>
	Ruby-crowned Kinglet	<i>Regulus calendula</i>
TURDIDAE	Black-headed Nightingale-Thrush	<i>Catharus mexicanus</i>
	Gray-cheeked Thrush	<i>Catharus minimus</i>
PTILOGONATIDAE	Gray Silky-flycatcher	<i>Ptilogonys cinereus</i>
PARULIDAE	Tropical Parula	<i>Parula pitiayumi</i>
	Pink-headed Warbler	<i>Ergaticus versicolor</i>
COEREBIDAE	Bananaquit	<i>Coereba flaveola</i>
EMBERIZIDAE	Spotted Towhee	<i>Pipilo maculatus</i>
	Botteri's Sparrow	<i>Aimophila botterii</i>
	Yellow-eyed Junco	<i>Junco phaenotus</i>
ICTERIDAE	Montezuma Oropendola	<i>Psarocolius montezuma</i>
FRINGILLIDAE	Pine Siskin	<i>Carduelis pinus</i>
	Black-capped Siskin	<i>Carduelis atriceps</i>