INTRODUCTION

This paper reviews briefly the conservation status of diurnal birds of prey in Mexico. The owls in our country are hardly known; outside of their distributional records, no other studies have been undertaken. For this reason I will concentrate on the diurnal species, with some passing comments on the conservation of the nocturnal ones.

The knowledge we have of diurnal raptors comes from general works such as Blake (1953), Edwards (1972), Peterson & Chalif (1973) and Davis (1972), or works not necessarily from Mexico but covering the species found there on a larger regional scale, e.g. Griscom (1932), Russell (1964), Dickey & Van Rossem (1938), Monroe (1968), Howell (1972), Slud (1960, 1964), Wetmore (1965) & Blake (1977), or on a global scale, e.g. Brown & Amadon (1968); from State works (Paynter 1955 for the Yucatan Peninsula, Grinell 1928 for Baja California, Van Rossem 1945 for Sonora, Urban 1959 for Coahuila, to cite just a few); from local works from small regions within a state (e.g. Sutton & Pettingill 1943; Edwards & Tashian 1959; Wetmore 1943), from specific ecosystems or biological communities (e.g. Marshall 1957), or from accounts of some species documented in detail (e.g. Wilbur & Kiff 1980, Hector 1985).

These works, in general, cover information on distribution (e.g. Friedmann 1950; Friedmann et. al. 1950), nesting (Rowley 1984), general biology and life history parameters (e.g. Hector 1985), ecology (e.g. Thiollay 1978a, 1978b), migration (e.g. Thiollay 1977, Loetscher 1955), wintering biology (e.g. Dominguez Barradas, 1984) or threats of some kind to their populations (Inigo Elias, 1986, this Bulletin). Detailed information on raptors' habitat requirements is very scarce, and the little available can basically be obtained from general works that do not address raptors specifically (e.g. Edwards & Tashian 1959). No comprehensive attempt has been made to evaluate the actual situation of raptorial birds, and their conservation status has scarcely been addressed at all. In these pages I review and discuss their conservation status in Mexico, after outlining the general features of the country, including vegetation types, followed by comments on the diurnal species, their legal protection, status and the threats to their populations, with finally some concluding remarks.

DESCRIPTION OF THE COUNTRY

Mexico is one of the largest countries in Latin America, with an area of two million km², including a wide variety of habitats, from open ocean and coast
land (10,000km) to mountains rising 6000 m above sea level, and with a wealth of different ecosystems. It is located between parallels 14° 30' N and 32° 42' W and resembles in shape a twisted horn with the sharp side to the south-east. The country is dissected by two major mountain chains running from the NW to the SE - the Sierra Madre Oriental and the Sierra Madre Occidental; both join in the Isthmus of Tehuantepec (the narrowest place in the country, 180 km wide) to the transversal Volcanic Axle. Additional mountain chains are present in the Sierra Madre del Sur (from the Pacific Coast of Jalisco to the Isthmus of Tehuantepec), northern Oaxaca, Chiapas (central to southern parts) and in one of the two peninsulas, Baja California, where they run all along its length. The Peninsula de Yucatan is basically flat.

In general the mountains in the west are higher, sharply defined and abrupt, lying closer to the ocean than those on the Gulf side, facilitating isolation and higher degrees of endemism. The mountains on the Gulf side lie farther to the west, leaving fairly flat coastal plains except in a few places like the Sierra de Tamaulipas, the Chiconquiaco Mountains in central Veracruz and an isolated mountain chain in southern Veracruz, the Tuxtla Mountains.

Outside the flat lands of Yucatan Peninsula, most of the country is mountainous. Less than 35% of its surface is below 500 m in altitude, and more than half is above 1000 m. The Mexican Altiplano is formed by the land between the two major mountain chains.

There are also many different islands. Those of the Gulf and Caribbean side are in general smaller and of coral origin, with very low altitudes. Those on the Pacific side are larger and of continental origin. Few are of oceanic origin (e.g. the Revillagigedo).

This complex topography, associated with different soil types and general climatic conditions combined with the geographic location of the country, where two major biogeographical regions - the Nearctic and the Neotropical - meet, promotes a wealth of ecosystems.

**VEGETATION**

There has been a great deal of discussion around the concepts and classification of vegetation types in Mexico; in a recent review on the subject, Rzedowski (1983) briefly describes the ten different vegetation types present.

Mexico is chiefly known as a dry, desert-type country, especially by our northern neighbours. Arid and semi-arid conditions are in fact present in about 40% of the country and support the most widespread vegetation types. They are found in the NW (Baja California and Sonora), most of the Mexican Altiplano from Chihuahua and Jalisco south to parts of Puebla and Oaxaca, and in some areas in the north-eastern section of the Sierra Madre Oriental.

Coniferous forests occupy about 15% of the country and associations between pine-oak forest (13.5%) and oak forest (5.5%) are also very common. As a matter of fact, pine and oak forests and pine-oak forest represent the main vegetation types in areas of temperate and semi-humid climate, mostly in the mountains.

Coniferous forests exist in most regions except the Yucatan Peninsula, their
distribution being associated with the mountain chains at altitudes between 1,500 and 3,650 m except for two species that may reach lower altitudes and warmer climates, nearing sea level: Pinus caribea at 500 m and Pinus oocarpa. At higher altitudes, pine forest might reach up to 4,100 m, mixed with grasses of alpine affinities and other shrubby species of conifer.

Oak forests are also known in most of the country except in Yucatan and Quintana Roo States; they occur from sea level to 3,100 m but most of their range lies between altitudes of 1,200 and 2,800 m. They constitute the most common element in the Sierra Madre Oriental and are also common in the transversal Volcanic Axle, Sierra Madre del Sur, Oaxaca, Chiapas and Baja California.

Tropical evergreen forest was once commonly found in the eastern and south-eastern parts of the country from southern San Luis Potosi and northern Veracruz, south to northern and north-eastern Chiapas, part of Tabasco, Campeche and Quintana Roo. On the Pacific Coast it was found in the Sierra Madre de Chiapas west up to near the Isthmus of Tehuantepec. It probably covered 11% of the territory with about only 10% or even less left at the present time, mostly in southern Veracruz, the Lacandone area and the selva "El Ocote", both in Chiapas (near Oaxaca and Veracruz), and some portions of the Yucatan Peninsula. This type of forest occurs between 0 and 1000 m, and its distribution seems to be limited by frost (isotherm of 0°C).

The tropical semi-deciduous forest seems intermediate between the tropical evergreen and the dry deciduous forest. Its distribution is not well known but it might be said to be found mostly on the Pacific coast in patches from Central Sinaloa south to Chiapas, where it also exists in the central depression and in some areas of the Peninsula de Yucatan. Isolated patches are found in Veracruz and south-eastern Tamaulipas, where it occupies approximately 4% of the country.

The dry deciduous forest is composed of trees that lose their leaves for about six months during the dry season. It is found mostly on the Pacific Coast in large tracts from southern Sonora and SW Chihuahua south to Chiapas, where it is also located in the Central Depression. On the Gulf side it occurs in the following areas: in the Huasteca region (southern Tamaulipas, SE San Luis Potosi and northern Veracruz) in central Veracruz, and in the northern part of the peninsula de Yucatan. It is found between 0 and 1500 m. but in most parts not above 800 m, occupying about 8% of the country.

Thorn forest survives in the NW, from Sonora south to southern Sinaloa and in isolated patches south to the Isthmus of Tehuantepec. On the Gulf side it is commonly found in the coastal area of the north-east, south to San Luis Potosi and central Veracruz. In the Altiplano it is found in the Bajio region from Guanajuato, Queretaro and part of Michoacan, but in isolated patches further north. It occupies about 5% of the country ranging form sea level to 2,200 m.

Grasslands are found on the Mexican Altiplano along the base of the Sierra Madre Occidental from north-western Chihuahua and north-eastern Sonora, south to north-eastern Jalisco and neighbouring areas of Guanajuato. They occupy about 10-12% of the area.

Cloud forest is located in moist areas in the highlands, occupying less than 1% of the Mexican land area in patches from south-western Tamaulipas in
the Sierra Madre Oriental south to San Luis Potosí, Veracruz, Puebla, Hidalgo and Oaxaca to the Isthmus of Tehuantepec. In Chiapas it is found in the Sierra Madre del Sur and part of the central mountains; on the Pacific side in the Sierra Madre del Sur in Guerrero and Oaxaca. Small patches might run up to Michoacán, Colima, Jalisco, Nayarit and northern Sinaloa. It ranges from about 600 m in the northern part up to 2700 m in the south.

The aquatic and subaquatic vegetation of Mexico is poorly known. It is found in most types of climate adequate for plant life but is concentrated mostly in the coastal areas, e.g. southern Tamaulipas, Veracruz, Tabasco and Campeche, the lowlands of Nayarit, northern Michoacán and central Jalisco. The most important kinds of aquatic vegetation for birds of prey are mangrove areas on both coasts, the "popal" (a specific type of vegetation growing in areas of marshy fresh water, basically composed of herbaceous plants up to 10 ft. high with broad leaves that cover the marsh), mostly in the wetlands of Veracruz, Tabasco, northern Chiapas and south-western Campeche, and the marshy vegetation formed by Scirpus spp., Typha spp., Cyperus spp. and Phragmites spp.

THE DIURNAL BIRDS OF PREY

There are about 54 species of diurnal birds of prey in Mexico, amounting to about 20% of the total number in the world. They are represented by the Cathartidae with four (formerly five) out of the seven world species, the Accipitridae (including subfamily Pandioninae) with 38 out of the 208 world species, and Falconidae with 12 (plus one recently extinct) out of the 58 world species (Table 1).

They are widely distributed throughout the country as a group, although they occupy specific habitats and ecosystems as individual species. They range from sea level to the highest mountains where plant life is present. Some species are characteristic of specific ecosystems; for example, most eagles (Harpy, Ornate and Black Hawk Eagles) are typical of tropical rain forests, Golden Eagles mostly occur in dry, scrubby, desert-type environments, whereas other species have a broad range of habitat types (e.g. Red-tailed and Roadside Hawks, Sparrowhawks, etc.).

Among these 54 species, 47 have permanent resident and breeding populations; 16 of these also have transient populations and another 15 species have wintering populations as well. Table 2 shows their relevant status. Some other species have a combination of permanent, transient and wintering populations (e.g. Cathartes aura, Pandion haliaetus, Circus cyaneus, etc.); here the status of the resident populations is obscure due to their mixing. Other species are mostly transient (e.g. Buteo swainsoni) or winter (e.g. B. regalis) or summer residents only (e.g. Elanoides forficatus or Ictinia plumbea). These can be studied only during particular times of the year.

Resident status for many birds has basically been assumed in the past with little evidence at hand, especially for raptors. Many species have confusing plumages during part of their life cycle, invalidating sight records in some cases. Specimens are difficult to obtain, especially for rare raptors, and the records are few and from widely separated regions within our large country and also farther south (see Ramos 1983 for comments). In other cases they are overlooked and not cited; for example, the most recent A.O.U. Check list (1983) gives the northernmost western locality for Spizaetus ornatus as Oaxaca, not including the specimen record of Schaldach (1963) for Colima,
concept, only two species are increasing in number (Eianus caeruleus and Buteo magnirostris); 13 have stable populations and these are species that prefer open or disturbed habitats, and are widespread and generalistic in terms of food and/or habitats. Among these species such as Pandion haliaetus, Accipiter striatus and Buteo swainsoni, have stable transient and 7 or wintering populations, but their permanent resident populations are decreasing.

Twenty-seven species have decreasing populations and include mostly those restricted to specific habitats such as tropical rain forests (e.g. Harpia harpyja) or wetlands (e.g. Busarellus nigricollis), or species adapted to specific food supplies (e.g. Rosthramus sociabilis). Ramos (1985b) commented on the need to define protective measures for forest-dwelling birds. He suggested that some of these species might disappear faster than others, stating further (1985b:309) that "also in danger are those bird species that lay few eggs in a clutch, lay one clutch every two-three years, have a long breeding season with long chick-development periods or depend on undisturbed primary forest for their survival (e.g. large predators such as hawks, eagles, owls, parrots, etc.)..."

Two species are extinct: Polyborus lutosus and Gymnogyps californianus, the latter also close to extinction in the wild in the U.S. In addition, populations of Falco deiroleucus and Daptrius americanus are probably extinct in Mexico.

Thirteen species apparently have stable populations, a few of which may actually be increasing (e.g. Parabuteo unicinctus, Buteo jamaicensis, Falco sparverius). Two more (Falco temoralis and F. rufigularis) have seemingly stable populations; however, the available evidence indicates that the former could be decreasing and the latter increasing. Unfortunately, both could change their situation rapidly and adversely in the near future, due to such factors as the traffic in wild birds.

There are 12 species with population status difficult to appraise. These include mixed groups of species. Some have migratory populations such as Cathartes burrovianus, Ictinia mississippiensis, I. plumbea; some barely reach Mexico to winter, such as Buteo lagopus or B. regalis; some are transient in important numbers but winter in small numbers (e.g. Buteo platypterus) in specific habitats (tropical rain forest); or some are resident and migrant species (Buteo brachyurus and Falco columbarius) of which we know almost nothing in our country. Additional research would help us to define their population status in its likely causes.

CAUSES OF POPULATION STATUS

There are specific causes for these population statuses just described. The overriding factor is the impact of humans, due to their need of natural resources or of land for development. These causes are: habitat modification, pollution and trade, traffic and hunting. In some cases one of these factors is affecting a particular species; the most common case, however, would show a mixture of them to be responsible for the population status of a particular species. For this reason it is extremely important to keep in mind that the effects of these factors on bird populations are not only additive but potentially increased by their addition.

HABITAT MODIFICATION

Habitat modification is playing a key role affecting population numbers. Its
impact works basically in two ways: eliminating those species which depend on specific kinds of habitat (through e.g. deforestation of tropical forests) or, conversely, favouring those species that flourish in man-made environments. The figures assessing vegetation types, as pointed out by Rzedowski (1983), are only estimations. They represent what is believed to have been the original diversity of vegetation covering Mexico before any major human disturbance. However, most of this has been affected by human impacts. Rzedowski (loc. cit.) points out, for example, that there is only one tenth left of the Mexican tropical forest at the present time: birds once common such as Harpagus bidentatus, Micrastur ruficollis and M. semitorquatus, were replaced by such species as Buteo magnirostris, Elanus caeruleus etc., that survive quite well around human environments.

Unfortunately, many areas of wild habitats are under increasing pressures for human development, ignoring the extreme importance of conserving them and the species that depend on them. Unpublished data collected by the Instituto Mexicano de Estudios Sociales (in Ramos, Vasquez and Vega MS.) show, for example, that 80% of the forest opened up for agricultural development in the humid tropics of the Lacandon rain forest in north-eastern Chiapas, Mexico, is used for cattle ranching.

There are no reliable data on deforestation rates in Mexico, or on natural habitat modification as a whole: nevertheless, it is well known that deserts, inland waters, beaches and coastal areas, etc. of all kinds are rapidly falling apart due to human use and abuse.

Table 2 lists 25 species of diurnal raptors whose populations are decreasing due to diminishing habitat availability; only 2 species are increasing due to increasing habitat availability; those species with stable populations may change their status quickly as human pressures increase. There is extreme need to develop research programmes to study the raptor species, especially those that still remain largely unknown in the country.

**PESTICIDE POLLUTION**

Pollution is another factor decreasing raptor populations. There is a growing body of literature on the subject involving birds of prey. It is enough to check any recent issue of such journals as Wildlife Review to appraise the latest developments. Unfortunately, there is very little for Mexican birds in general, and raptors in particular. Some works on the subject are: Kiff & Peakall (1981); Mora-Zacarias (1984), and Anderson (1973).

For Latin America the work by Henny et. al. (1982) on Peregrine Falcons is illuminating. Recent work by Iñigo Elías and L. Albert (unpubl. data) with Coragyps atratus in Chiapas indicate high levels of organochlorine compounds and heavy metals in Black Vultures.

The available information on pesticide uses in Mexico is limited. Albert et al. (1985) summarizes it well, by saying that Mexico uses 60% of the pesticides recorded as dangerous for the health by the International Registrar of Toxic Chemicals. Forty-one percent of this 60% are made within the country, and many are compounds like DDT, BNC, Toxafen, Endrin, etc., whose uses are severely restricted in countries like U.S.A., Japan and the countries of the European community due to their toxic effects on the health and environment in general. These restrictions may have had some influence to facilitate the transfer of their technology to Mexico, transforming our country from an importer to an exporter of dangerous
pesticides. They also stated (10 c. cit:11) that Mexico imports a high percentage of the pesticides used representing an important expenditure of foreign currency.

They conclude (p:12) that Mexico has severe problems with the use of dangerous pesticides, showing the lack of sufficient mechanisms and the inefficiency of the existing ones, to control their use; showing in addition, the lack of toxicological and environmental criteria in the norms established for their control.

For those interested in the subject Albert (Unpubl. MS) has also summarized the legislation on pesticides in Mexico. Considering the amounts of pesticide used in Mexico, the information is limited and widely dispersed, yet Portilla (1984) summarizes it. He points out (1984: 6-8, and Table 1) that not only the number of pesticides produced in Mexico has risen, but also the amounts used: "Insecticidas (clorados) ... han mantenido su volumen en más de 8 mil toneladas anuales en tanto que los segundos (fosforados) a partir de los volumes cercanos a las mil toneladas en 1970, han incrementado su participación en forma sostenida para alcanzar en 1979 cifras del orden de las 9 mil toneladas anuales". Among the international companies involved in the production, import and export of these compounds, he cites (loc. cit. p.q): Bayer, Ciba Geigy, Distribuidora Shell, Quimica Woescht, Union Carbide, Diemond Chemical, Cynamid, Dow Quimica, Stauffer, Dupont, all with official branches within the country.

The internal capacity to produce pesticides also rose between 1970-1980, increasing 8.8% annually to reach 44,000 tons in 1980 - 80% for insecticides, 10.5% for fungicides and 9.4% for herbicides. There are at present 96 companies producing pesticides in different regions of the country (Portilla, loc. cit. p:14, 21, 22.)

As expected, pesticide use is still flourishing with all the associated consequences. Birds of prey have been drastically affected as a result. There is growing recognition of this problem, especially for migratory raptors, in the developed countries, but resident species suffer as well.

TRADE, TRAFFIC AND HUNTING

The trade, traffic and illegal hunting of raptors compound conservation problems in Mexico. We are only able to track the flow of indigenous wildlife leaving the country through the efforts of concerned citizens, and foreign and international organizations. The works by Inskipp (1975), Inskipp & Thomas (1976), Banks (1970, 1976), Banks & Clapp (1972), Clapp (1975), Clapp & Banks (1973a, 1973b), Nilsson (1985) in England and the U.S., and more globally the works of Inskipp & Gammell (1979), Inskipp & Wells (1979), Nilsson (1981) and Brookland et. al. (1985) have created an international concern in the subject, not only for birds but other organisms as well (e.g. mammals, reptiles, insects, cacti, orchids, etc.). Ramos (1982) has summarized the information for birds in Mexico; Inigo-Elias (1986:6) and Inigo-Elias (this Bulletin) has commented specifically on the trade and traffic in live raptors.

The illegal trade is difficult to document. Nilsson (1981) and the U. S. Justice Department (1980) reported that from 50,000 to 100,000 parrots enter the U.S. market illegally every year, with benefits for the smugglers ranging from 10 to 20 million U.S. dollars. Don Carr, Chief of the U.S. Justice Department's Wildlife and Marine Resources Section, is quoted as saying that the volume of illegal bird imports from Mexico is "probably 100
times more than you would guess" (Traffic U.S.A. 1986).

Hunting too, goes on apparently unrestricted. Raptors are especially sought as mounted birds to decorate living rooms of prominent people. Farmers shoot them in the belief that they prey on their chickens. Eggs are sought by egg-collectors.

The trade, traffic and hunting have an important impact on raptors populations. This is specially critical when we consider the fact that some species are slow breeders, with a clutch size of one (specially large species) and a long chick-development period, and at the same time require specific habitats or food types. Ramos (1982) has suggested alternatives to help solve the problem, yet we have to understand that the solutions won't come out of Mexico alone. The trade and traffic in Mexican wildlife (and from other developing countries as well) is spurred largely by demand from the developed world. This demand is never fully satisfied, due to the high mortality during capture, transport, quarantine operations, sale and in the living room of the pet owner. So long as there are offers of 10,000-15,000 U.S. dollars for some of the specially rare tropical birds, there will be someone looking for them in the wild. The inefficiency of the Mexicans authorities, coupled with an ineffective bureaucracy and possible political corruption, open the way for further unchecked increases in the wildlife trade. It is well known, for example, that some exporting companies of wildlife in Mexico are owned by the families of past prominent politicians from the official political party. So solutions will have to come from developed and developing countries as well.

Collision with motor vehicles, electrocution, poisons, nest destruction, etc., appear to be only minor threats as compared with those discussed earlier, and solutions to them have commonly been addressed. Our problem comes from the fact that we always fall short. They are commonly very difficult to tackle. We obviously need to conserve adequate tracts of wild ecosystems (forests, "deserts", marshes, etc.) and the use of pesticides must be controlled and regulated, withdrawing or restricting their use. Laws will have to be improved, their norms and regulations defined, and offenders should be penalized more rigorously. Wise alternatives on the use of natural resources would have to be developed, based on concepts of sustainable use but avoiding the scientific demagogy associated with sustainability. Education must be improved at all levels, and research should be supported. Managing natural resources requires knowledge, knowledge requires research, research requires trained people to carry it out.

There are very few soundly trained Latin Americans to address the conservation issues for the birds of the region, and these few are commonly drowned in multiple commitments to research, teaching and administrative duties. The training of professional scientists and wildlife managers would help to solve some of these problems.

Living in the third world helps us to focus sharply on the difficulty of working on these general ideas. Commitments have to be made, and we will have to work on these to devise adequate alternatives for them.

Let us again not forget the fact that many of these threats do not act individually. Birds depending on tropical forest or desert environments are disappearing due to enroachment on natural habitats. Yet those raptor species living in man-made habitats could also disappear due to the heavy use of pesticides on grassland and crops (e.g. cotton). Additionally, their populations could also decrease due to trade, traffic and hunting. The
impact of these threats may have additive effects and might be potentially increased by their addition.

Time is pressing us to address the subject of conservation of raptors, birds, and natural resources in general more globally and professionally. In order for us to assess the conservation actions needed, we would have to identify the species threatened and the levels of threat, establish the cause of the threat, estimate what should be done to combat it and assess the possibilities of these methods. Once the magnitude of the problems is known we can establish our priorities and define how to try to solve them. For diurnal and nocturnal raptors, present knowledge is not enough to present conclusive evidence as to the present status of some species (see Table 2), and most of the Mexican species would benefit from generating additional solid knowledge. Well designed research projects, generously supported locally, nationally and internationally, would be a strong step in the right direction. There is, however, enough evidence at the present time for corrective measures to be taken.

The final solutions for conserving the environment in Mexico and other parts of the world won't come only from these countries. A global strategy will have to be adopted. IUCN has already defined one (IUCN 1980) but its implementation seems difficult (in my opinion) due to the multiple and conflicting interests world-wide (developing vs. developed countries). In order for us to conserve the environment a new ethic will have to be developed. Let us hope we are wise enough to do so.

CONCLUDING REMARKS

The reasons for the decline of raptor species are very complex and intermingled. The real threats to the survival of most wildlife in Mexico and anywhere else, are the ever-expanding human populations, the accompanying loss and degradation of natural habitats, pesticides, pollution, trade and hunting. There is no real understanding yet of the extreme need for sound, biologically based, conservative land use planning and practice in Mexico and probably most of the Third World as well. The control of human population growth and of human colonization, associated with the establishment and protection of sizeable tracts of wild ecosystems, the development of alternatives for land and soil use, as for wild resources, and solutions to the political, social, economic, educational and technical problems associated with conservation and development would help the conservation of raptors, and many other kinds of organisms. Raptors are and have been the flags for alerting us of major environmental problems; let us keep them all permanently with us.

TABLE 1. - Diurnal Birds of Prey in Mexico

<table>
<thead>
<tr>
<th></th>
<th>World</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cathartidae</td>
<td>7</td>
<td>4 (+ 1 formerly)</td>
</tr>
<tr>
<td>Accipitridae</td>
<td>208</td>
<td>38</td>
</tr>
<tr>
<td>Falconidae</td>
<td>58</td>
<td>12 (+ 1 recently extinct)</td>
</tr>
<tr>
<td>TOTALS:</td>
<td>273</td>
<td>54</td>
</tr>
</tbody>
</table>
TABLE 2

The Status of Mexican raptors by Residence Status, Population Status and Likely Causes for the latter. See Key for meaning of symbols and numbers used. Taxonomic sequence and names are those of the AOU Check List, 1983.

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>RESIDENCE STATUS</th>
<th>POPULATION STATUS</th>
<th>LIKELY CAUSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coragyps atratus</td>
<td>1</td>
<td>D</td>
<td>1, 3</td>
</tr>
<tr>
<td>Cathartes aura</td>
<td>1, 2, 3</td>
<td>D(1), S</td>
<td>3</td>
</tr>
<tr>
<td>Cathartes burrovianus</td>
<td>1, 4(?)</td>
<td>?</td>
<td>5</td>
</tr>
<tr>
<td>Gymnogyps californianus</td>
<td>Extinct in Mexico</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sarcoramphus papa</td>
<td>1</td>
<td>D</td>
<td>1, 3</td>
</tr>
<tr>
<td>Pandion haliaetus</td>
<td>1, 2, 3</td>
<td>D(1), S(2,3)</td>
<td></td>
</tr>
<tr>
<td>Leptodon cayanensis</td>
<td>1</td>
<td>D</td>
<td>1, Possibly 4</td>
</tr>
<tr>
<td>Chondrohierax uncinatus</td>
<td>1</td>
<td>D</td>
<td>1</td>
</tr>
<tr>
<td>Eleanoides forficatus</td>
<td>2, 4</td>
<td>?(2), D(4)</td>
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<td>Elanus caeruleus</td>
<td>1</td>
<td>D</td>
<td>2</td>
</tr>
<tr>
<td>Rosthramus sociabilis</td>
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<td>D</td>
<td>1, 3 Possibly 4</td>
</tr>
<tr>
<td>Harpagus bidentatus</td>
<td>1</td>
<td>D</td>
<td>1</td>
</tr>
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<td>Ictinia mississippiensis</td>
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<td>?</td>
<td></td>
</tr>
<tr>
<td>Ictinia plumbea</td>
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<td>?</td>
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<td>Haliaeetus leucocephalus</td>
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<td>5</td>
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<td>Circus cyaneus</td>
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<tr>
<td>Accipiter striatus</td>
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<td>D(1) S</td>
<td>1, 4</td>
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<td>Accipiter bicolor</td>
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<td>1</td>
</tr>
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<td>Accipiter cooperi</td>
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<tr>
<td>Leucopternis albicollis</td>
<td>1</td>
<td>D</td>
<td>1 Possibly 4</td>
</tr>
<tr>
<td>Buteogallus anthracinus</td>
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<td>Buteogallus urubitinga</td>
<td>1</td>
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</tr>
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<td>Parabuteo unicinctus</td>
<td>1</td>
<td>S</td>
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</tr>
<tr>
<td>Busarellus nigricollis</td>
<td>1</td>
<td>D</td>
<td>1</td>
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<tr>
<td>Harpyhaliaeetus solitarius</td>
<td>1</td>
<td>D</td>
<td>1, 3</td>
</tr>
<tr>
<td>Buteo nitidus</td>
<td>1</td>
<td>S</td>
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</tr>
<tr>
<td>Buteo magnirostris</td>
<td>1</td>
<td>I</td>
<td>2</td>
</tr>
<tr>
<td>Buteo lineatus</td>
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<tr>
<td>Buteo platypterus</td>
<td>2, 3</td>
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<td>Buteo brachyurus</td>
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<tr>
<td>Buteo swainsoni</td>
<td>1, 2</td>
<td>D(1), S</td>
<td>1</td>
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<td>Buteo albicollidatus</td>
<td>1</td>
<td>D</td>
<td>1.3</td>
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<tr>
<td>Buteo albonotatus</td>
<td>1, 2 &amp; possib. 3</td>
<td>S</td>
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<td>Buteo jamaicensis</td>
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<td>S</td>
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<tr>
<td>Buteo regalis</td>
<td>3</td>
<td>?</td>
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</tr>
<tr>
<td>Buteo regalis</td>
<td>3</td>
<td>?</td>
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<tr>
<td>Harpia harpyja</td>
<td>1</td>
<td>D</td>
<td>1, 4</td>
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<td>Aquila chrysaetos</td>
<td>1</td>
<td>D?</td>
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<td>Spizastur melanoleucus</td>
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<td>Spizaetus tyrannus</td>
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<td>Spizaetus ornatus</td>
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<td>SPECIES</td>
<td>RESIDENCE STATUS</td>
<td>POPULATION STATUS</td>
<td>LIKERELY CAUSES</td>
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<tr>
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<td>Daptrius americanus</td>
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<td>D</td>
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<td>S</td>
<td>3, 4 may be affecting their population</td>
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<td>Polyborus lutosus</td>
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<td>Micrastur ruficollis</td>
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<td>Micrastur semitorquatus</td>
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<td>D</td>
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<tr>
<td>Falco sparverius</td>
<td>1, 2, 3</td>
<td>D(1) S</td>
<td>but watch effects of 3, 4</td>
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<tr>
<td>Falco columbarius</td>
<td>2, 3</td>
<td>?</td>
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<tr>
<td>Falco femoralis</td>
<td>1</td>
<td>S?</td>
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<td>Falco rufigularis</td>
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<td>S?</td>
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<td>Falco peregrinus</td>
<td>1, 2, 3</td>
<td>D</td>
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<tr>
<td>Falco mexicanus</td>
<td>1</td>
<td>S</td>
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</table>

**KEY**

**RESIDENCE STATUS**

1. Permanent resident
2. Transient birds
3. Wintering resident
4. Summer visitor
5. Unknown

**POPULATION STATUS**

1 = Increasing
D = Decreasing
S = Stationary or Stable
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REFERENCES


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