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The Neotropics (Americas)

Overview

Alejandro Grajal

With nearly 4,130 species, the Neotropics harbour almost 44% of the world's avifauna and a generous representation of parrots (148 species in 27 genera: Wege and Long 1995). Parrot species diversity is especially great in the genera *Amazona* and *Aratinga* (31 and 19 species respectively), although the Neotropics also hosts 10 monotypic genera such as *Leptosittaca*, *Myiopsitta*, and *Gypopsitta*. Sizes range from the diminutive species of parrotlet, *Forpus*, to the hyacinth macaw, the largest parrot in the world. Neotropical parrots live in many different ecological settings and have evolved different life history traits. Some species show significant ecological and behavioural flexibility, and have become naturalised outside their regular ranges. For example, today it is not rare to see feral populations of parrots in suburban and urban areas both in the Neotropics and in warmer subtropical regions. Other species are restricted to specific habitats (for example, *Anodorhynchus leari* is restricted to Sertão palm habitats of the Brazilian Caatinga and *Ognorhynchus icterotis* is restricted to *Ceroxylum* palm forests of the high Andes). Yet others are highly nomadic (e.g., *Nannopsittaca panychlora*, *Leptosittaca branickii* and *Rhynchopsitta pachyrhyncha*).

Parrots are distributed from Northern Mexico to Tierra del Fuego at the southernmost tip of South America, and from the edge of glaciers in the high Andes to the steaming forests of Amazonia. The distribution ranges of some species are large, particularly those parrots associated with lowland humid rainforests and savannas. However, many species have extremely restricted ranges, particularly those of the Northern Andes, the Atlantic forest of south-eastern Brazil, the dry habitats of the Cerrado and Caatinga of Brazil, and the Lesser Antillean Islands of the Caribbean.

The species accounts in this Action Plan discuss 50 species of Neotropical parrots that are classified as globally threatened by Collar *et al.* (1994). Several others have become extinct in historic times, including the Carolina parakeet *Conuropsis carolinensis* in eastern North America, the Cuban macaw *Ara tricolor*, and the glaucous macaw *Anodorhynchus glaucus* in the Misiones forest of southern Brazil, northern Argentina, and Paraguay. Spix's macaw *Cyanopsitta spixii* is now believed to exist almost entirely in captivity (Collar *et al.* 1992, Juniper and Yamashita 1990, 1991, Wege and Long 1995).

The Neotropical species accounts also include several parrot species that were not considered globally threatened

by Collar *et al.* (1994) but for which current information suggests a rapid decline in conservation status or for which discrete populations are under substantial threat. Four species (yellow-billed parrot *Amazona collaria*, Hispaniolan parrot *Amazona ventralis*, great-green macaw *Ara ambigua*, and grey-cheeked parakeet *Brotogeris pyrrhopterus*) are herewith included on the List, in agreement with BirdLife International, bringing the number of threatened species to 46. A further four taxa are noted as being worthy of further investigation of their status. These include the yellow-naped parrot *Amazona auropalliata*, which is under tremendous current trade pressure and deserves priority attention. Also included is the Cuban amazon *Amazona leucocephala*, particularly for its fragile distinct subpopulations in the Bahamas and Cayman Islands. Similarly, the scarlet macaw *Ara macao*, which is relatively common and has a large distribution in South America, probably numbers fewer than 1,000 individuals in all Central America, fewer than 200 in Costa Rica, and possibly a few hundred in the Maya forests of Belize, Mexico, and Guatemala (Wiedenfeld 1994). Without urgent attention, the Central American populations can be expected to disappear in the near future. Finally, the elusive saffron-headed parrot *Pionopsitta pyrilia*, is included as populations are considered very small and its habitat in Colombia is dwindling rapidly.

Threats

The main threats to Neotropical parrot species are habitat loss, hunting, and the live bird trade. Species such as *Anodorhynchus leari* and *Cyanopsitta spixii* face imminent extinction largely due to the live bird trade (Reynolds 1997). Some of the most threatened Neotropical parrots suffer from the apocalyptic double threats of trade and habitat loss. These species include the most attractive parrots and macaws in severely pressurised or impacted habitats, including *Anodorhynchus leari*, *Cyanopsitta spixii*, *Ara militaris*, *Ara ambigua*, *Guarouba* (*Aratinga*) *guarouba*, and a number of *Amazona* species including *A. brasiliensis*, *A. oratrix*, and *A. pretrei*. Table 6 provides a list of threatened parrot species in the Neotropics.

The bird trade

Trapping for the bird trade in the Neotropics has occurred since pre-European times, as Amerindians valued macaws,

parrots, and feather ornaments as ritualistic and trade objects. At present, owning wild parrots as pets remains socially acceptable in most Neotropical countries, even where it is known that their ownership is technically illegal.

International trade in parrots has been significantly reduced during the 1990s, mainly as a result of adoption of national legislation, tighter enforcement of CITES regulations, the reviews of significant trade in Appendix II species by the CITES Animals Committee, adoption of stricter domestic measures under the European Union legislation, adoption of the Wild Bird Conservation Act in the USA, and transportation restrictions imposed by commercial airlines. These measures have contributed to the significant reduction in the overall volume of birds traded from the Neotropics to the rest of the world.

As a result of this reduction in volume, the remaining international trade has concentrated on illegal smuggling of uncommon species that command high prices, such as Lear's and hyacinth macaws and several amazon *Amazona* species. Illegal trade in smuggled parrots apparently continues across the US-Mexico border (Wiedenfeld 1993, 1995) and is sometimes associated with sophisticated smuggling rings dealing mainly in illegal migrant workers or illicit drugs. An international trade route to European markets still exists, perhaps using the Caribbean islands that are commonwealth territories of European countries, such as the Netherlands Antilles and the UK Virgin Islands. The volume reaching the European Community, from mainland Central and South America seems substantial, given the results of a six year monitoring in one European port of entry (Guix *et al.* 1997).

Local and national trade is thought to remain substantial throughout the Neotropics although it is extremely hard to quantify. Most experts are still documenting dramatic downward trends of wild populations of heavily traded species that already have low numbers (e.g., *Amazona pretrei*, *Amazona brasiliensis*, *Amazona barbadensis*, *Guarouba (Aratinga) guarouba*, the Central American *Ara macao* populations, and *Ara ambigua guayaquilensis*). Indeed, even though most countries ban trade in wild birds, it is still possible to see wild parrots being sold in markets, along rural roads, and even in pet shops. Legislation in most Neotropical countries criminalises trade but not the ownership of wild birds. As a result, enforcement is usually negligible or erratic, and in most cases government agencies are legally unable to confiscate parrots owned by individuals.

The root causes of this continuing pressure on wild parrots are a complex mix of several factors: widespread social and cultural approval of parrots as pets, poor enforcement of existing laws, growing purchasing capabilities of urban populations, and the need for supplementary income in impoverished rural communities.

Habitat loss and fragmentation

Habitat loss is an important threat to some of the most threatened parrots in the Neotropics, although understanding of specific "cause and effect" relationships between parrot population declines and changes in land-use patterns remains rudimentary at best, particularly for extremely threatened species such as *Ognorhynchus icterotis*. However, many parrots are not habitat specialists and thrive in heterogeneous mosaics of different successional habitats. For example, many species of lowland forest habitats seem to do relatively well in modified human environments as long as a mosaic of habitats in different successional stages is maintained and the poaching of nestlings and the shooting and trapping of adults remain at low levels.

Parrots that appear to be most threatened by habitat loss occur in the following regions:

- a) Species in the tropical Andes that require altitudinal migrations between different elevations (e.g., *Ognorhynchus icterotis*, *Leptosittaca branickii*, *Ara ambigua guayaquilensis*, and *Hapalopsittaca fuertesi*);
- b) Species living in isolated forest remnants of the Atlantic forest of east and south-east Brazil, (e.g., *Pyrrhura cruentata*, and *Triclaria malachitacea*);
- c) Species restricted to dry or seasonally dry forest habitats such as the Cerrado or the Caatinga of South America (e.g., *Amazona xanthsops*, *Ara rubrogenys*, *Brotogeris pyrrhopterus*, and *Forpus xanthsops*);
- d) Species restricted to forest remnants in the lesser and Greater Antilles of the Caribbean (e.g., *Amazona vittata* and *Aratinga euops*) or in small islands (*Amazona oratrix tresmariae*, and *Aratinga brevipes*).

These biogeographic regions have several factors in common, particularly high rates of deforestation and extensive fragmentation of natural habitats. The factors that induce land clearing for cattle production or agriculture are complex. However, existing economic and social inequalities throughout the Neotropical region continue to push the agricultural frontier further into natural habitats. The sinister persistence of "hidden" subsidies for land clearing in Central America, Northern Andes, and the Atlantic forests of Brazil, continues to accelerate the rate of habitat degradation. Some of these "hidden" subsidies include legal provisions that require habitat conversion to attain legal ownership of the land and corporate or individual tax shelters for industrial-scale land conversion.

Conservation solutions

Conservation solutions have to be locally tailored, as what works in one setting may not in another (see Chapter 2).

Some of the most interesting research and conservation strategies occur in the Neotropics, an example being the conservation of Lesser Antillean parrot species using education and national pride (Butler 1992), law enforcement and foster nest use in Margarita Island, Venezuela (Sylvius 1997), ecotourism based on macaws in Peru, Bolivia, and Brazil (Munn 1992), and artificial nest boxes to enhance populations in Peru (Nycander *et al.* 1995). Some of the conservation biology research needs are discussed in Chapter 2, while other more specific strategies are discussed below.

Education

Surprisingly, few people in the Neotropics (beyond the specialists) understand or appreciate the dire conservation status of many parrot species. Nevertheless, parrots are often excellent species to use in campaigns to raise public awareness of conservation issues or as emblematic species. Parrots are well known to the general public, and inspire high levels of human empathy. Several examples show that, if properly orientated, raising environmental awareness based on parrot conservation can be very effective (Butler 1992, Sanz and Grajal 1998, Sylvius 1997). In some cases, national or local pride is a key to successful conservation campaigns. However, environmental education campaigns need to be properly designed, implemented, and evaluated to avoid unintended consequences (such as the desirability to “save the parrot” by keeping it in a cage!). The threat of national and local trade demands creative studies of the social acceptability of private ownership of wild parrots. Whenever appropriate, environmental campaigns should vigorously attack private ownership of wild parrots, to reduce or eliminate national or local trade. The build-up of significant public opinion against wild bird trade does generally increase scrutiny by enforcement agencies, and eventually limits the overall volume of parrots traded locally or nationally.

Land tenure

As human populations keep growing and natural habitats shrink throughout the Neotropics, it is not surprising that the areas of highest human densities are those which have the largest numbers of threatened species (e.g., Central America, the Caribbean islands, the tropical Andes, and the Atlantic forest of eastern Brazil). The effects of burgeoning populations and habitat destruction have been historically accelerated by unstable land tenure regimes and hidden subsidies for land conversion. Increasing the stabilisation (and equitability) of land tenure can be an important factor in slowing the growth of the agricultural frontier. Similarly, more transparent fiscal policies can

eliminate subsidies for land clearing. Incentives to encourage the maintenance of wildlands must be found. While many of these actions transcend the Psittacine taxonomic scope of this Action Plan, conservationists and decision-makers should be aware of these factors and act opportunistically and appropriately to minimise their impact upon parrots and other threatened species.

Parrot biologists can help to identify critical linkages in habitat connectivity for species facing severe habitat fragmentation. For example, this Action Plan has identified priority actions (land purchases or strict protection) for severely threatened parrots in the Andes of Colombia and Ecuador. Concentrating at a regional scale can make such conservation efforts more effective and efficient.

Similarly, spatial analysis of the ecological representation of various habitats in protected areas can provide an idea of habitat conservation priorities in heavily fragmented areas such as in Brazil's Atlantic forests and Central America. In fact, the current multi-national effort to implement the Mesoamerican Biological Corridor in Central America should maintain and in some cases, create, key linkages for habitat connectivity.

Brazil's recent strategic plans to establish a network of biological corridors between protected areas may advance conservation possibilities for severely threatened parrots in dry habitats of north-east Brazil (Caatinga), the Brazilian Cerrado, and the Atlantic forests of south-east Brazil. In the tropical Andes of Venezuela, Ecuador, and Colombia, protected area boundaries should be rethought, with the idea of increasing both the connectivity between reserves as well as the altitudinal representation of mosaics of important habitats. Since most Andean reserves were historically designed with altitudinal lower limits, many parrot species appear to be suffering from lack of continuous altitudinal habitats for seasonal foraging or reproductive migrations.

Ecotourism

Ecotourism has the potential to provide economic value to large and colourful parrots or macaws. However, most tourism operators are concerned with very localised tourism attractions (such as parrot roosts), and local people are rarely prepared to become fully-fledged tourism operators. As a result, few tourism projects are designed in a way that benefit local people or enhance parrot conservation. The challenge remains to create tourism operations that enhance parrot conservation and therefore add local value to these birds (for more on ecotourism, see Chapter 2).

Not all valuation needs to be financial. Indeed, pride and nationalism can play important incentives in parrot conservation (Butler 1992). This has been particularly valuable in the Caribbean islands, where using emblematic

species of parrots has increased their protection and has built popular support for conservation, enforcement, and legislation.

This global Action Plan should be used as a guide to produce participatory national Action Plans. Concentrating as it does on global priorities, many subspecies or subpopulations are poorly represented in this Action Plan. Therefore, each country or region should develop plans that address its own threatened species or subspecies and which build upon the worldwide priorities outlined here. Venezuela developed a comprehensive Action Plan as part of a national symposium on conservation priorities for parrots. The symposium included the participation of government representatives, non-governmental organisations (NGOs), universities, and aviculturists. The organisers also produced a book with the most recent information on parrot biology and conservation for the country (Morales *et al.* 1994). A similar effort in Brazil resulted in a special edition of the journal of the Brazilian Ornithological Society, *Ararajuba* (Vol.5 No. 2, December 1997), with a section dedicated to parrot biology and conservation. The production of national Action Plans should be encouraged, as they will properly address conservation issues at an appropriate scale, and will provide outlets for existing information.

Species accounts

Black-billed parrot *Amazona agilis*

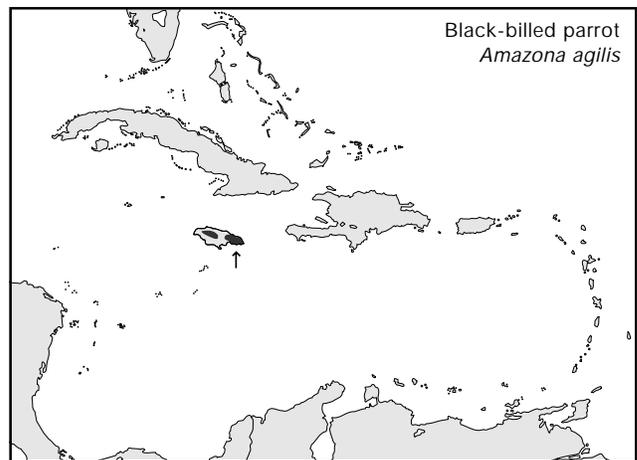
Contributors: Herlitz Davis, Susan Koenig, Wendy A. Lee, Catherine Levy, and Noel Snyder.

Conservation status: IUCN: Vulnerable (C2a).

CITES: Appendix II.

National protection status: Protected under the Jamaica Wildlife Protection Act of 1945.

Distribution and status: The black-billed parrot is endemic to the island of Jamaica. Its range is restricted to mid-level wet limestone forest, which has been severely reduced over the past 40 years. Locally common throughout the Cockpit Country, particularly in disturbed edge habitat where it is more common than the yellow-billed parrot *A. collaria*, with which it occasionally associates. Populations are also found at Worthy Park and Mount Diablo in the centre of the island. Historical reports also placed it at the eastern end of the island, although recent sightings in that area are uncommon. Small flocks have, however, been seen recently in the John Crow Mountains. Preliminary surveys indicate much greater population estimates than previously described, and possibly over 10,000 individuals in the Cockpit Country region (C. Levy *in litt* 1999).



Threats: The greatest threat to population persistence is habitat loss, although illegal hunting and collecting for the pet trade continues. There are reports of birds being shot for food and as crop pests, particularly in areas with cultivated ackee *Blighia sapida*, pimento *Pimenta* spp., and corn *Zea mays*. The most notable impact of chick harvesting is the destruction of nest trees by poachers. Nesting success is 30–50%, with successful nests producing an average of 1.9 chicks. Nests that fail due to natural or anthropogenic factors have a very low likelihood of being used the following breeding season. Poaching, even without destruction, may increase nest switching and cause birds to abandon otherwise suitable cavities for those affording less protection from predators and inclement weather/flooding, two important natural causes of nest failure. Most failed nests do so in the early nestling period, resulting from predation by yellow boa *Epicrates subflavus* (Gruber 1980) and to a lesser extent Jamaican crow *Corvus jamaicensis*. However, low reproductive performance does not appear to be limiting population health. Of unproven, but realistic threat is the possibility of disease transmittal and competition between Jamaica's native parrot species and the several introduced Psittacine species on the island (Long 1981, Lever 1987).

Table 6. A list of Neotropical parrot species that are considered threatened using IUCN Red List criteria.

Also included are additional taxa that may be threatened and are proposed as candidates for the Red List. Species are listed in alphabetical order by their scientific name, together with their distribution and threat status. The criteria under which each species qualifies are given in the appropriate species account. *Denotes changes from *Birds to Watch 2* (and, therefore, the 1996 IUCN Red List of Threatened Animals), which have been agreed to by BirdLife International who maintain the IUCN list of threatened birds.

English name	Scientific name	Distribution	Threat category
Black-billed parrot	<i>Amazona agilis</i>	Jamaica	Vulnerable
Red-necked amazon	<i>Amazona arausiaca</i>	Dominica in the Lesser Antilles	Vulnerable
Yellow-shouldered amazon	<i>Amazona barbadensis</i>	Dry coastal scrub of Venezuela and outlying islands of Margarita, La Blanquilla, and Bonaire	Vulnerable
Red-tailed amazon	<i>Amazona brasiliensis</i>	Brazil's Serra do Mar	Endangered
Yellow-billed parrot*	<i>Amazona collaria</i>	Jamaica	Vulnerable
St Vincent amazon	<i>Amazona guildingii</i>	St Vincent in the Lesser Antilles	Vulnerable
Imperial amazon	<i>Amazona imperialis</i>	Dominica in the Lesser Antilles	Vulnerable
Yellow-headed parrot	<i>Amazona oratrix</i>	Mexico and Belize	Endangered
Red-spectacled parrot	<i>Amazona pretrei</i>	Araucaria forests of south-east Brazil	Endangered
Red-browed amazon	<i>Amazona rhodocorytha</i>	Lowland hardwood areas of Brazil's Atlantic forest	Endangered
Hispaniolan parrot*	<i>Amazona ventralis</i>	Hispaniola	Vulnerable
St Lucia parrot	<i>Amazona versicolor</i>	Saint Lucia in the Lesser Antilles	Vulnerable
Vinaceous amazon	<i>Amazona vinacea</i>	Submontane 'mixed' regions of Brazil's Atlantic forest	Endangered
Red-crowned parrot	<i>Amazona viridigenalis</i>	North-eastern states in Mexico	Endangered
Puerto Rican parrot	<i>Amazona vittata</i>	Forested parts of Puerto Rico	Critically Endangered
Yellow-faced amazon	<i>Amazona xanthops</i>	Cerrado (dry woodland) of interior eastern Brazil	Vulnerable
Hyacinth macaw	<i>Anodorhynchus hyacinthinus</i>	Pantanal of Brazil and Bolivia, and North-eastern Brazil	Vulnerable
Lear's macaw	<i>Anodorhynchus leari</i>	Raso da Catarina, Bahia State, Brazil	Critically Endangered
Great-green macaw*	<i>Ara ambigua</i>	Lowland wet forests between eastern Honduras and western Colombia, western Ecuador	Vulnerable
Blue-throated macaw	<i>Ara glaucogularis</i>	Seasonally flooded Beni Lowlands (Llanos de Moxos) of Central Bolivia	Endangered
Blue-winged macaw	<i>Ara maracana</i>	Gallery forest and forest edge in parts of Brazil, eastern Paraguay, and northern Argentina	Vulnerable
Military macaw	<i>Ara militaris</i>	Mexico, Colombia, Venezuela, Peru, and Bolivia	Vulnerable
Red-fronted macaw*	<i>Ara rubrogenys</i>	Arid intermontane valleys of south-central Bolivia	Vulnerable
Golden-capped parakeet	<i>Aratinga auricapilla</i>	Semi-deciduous forests of the Paraná River Basin, Brazil	Vulnerable
Socorro parakeet	<i>Aratinga brevipes</i>	Socorro Island in the Revillagigedo Islands of Baja California, Mexico	Vulnerable
Hispaniolan parakeet	<i>Aratinga chloroptera</i>	Hispaniola, including the offshore islands	Vulnerable
Cuban parakeet	<i>Aratinga euops</i>	Cuba	Vulnerable
Rufous-fronted parakeet	<i>Bolborhynchus ferrugineifrons</i>	Forest-páramo ecotone of the Central Andes of Colombia	Endangered
Grey-cheeked parakeet	<i>Brotogeris pyrrhopterus</i>	Deciduous and dry forests of south-west Ecuador and north-western Peru	Endangered
Spix's macaw	<i>Cyanopsitta spixii</i>	Caatinga woodland and scrub of the dry region of north-east Brazil	Critically Endangered
Yellow-faced parrotlet	<i>Forpus xanthops</i>	Riparian thickets and desert scrub of the upper Marañón valley in north-central Peru	Vulnerable
Golden parakeet	<i>Guarouba (Aratinga) guarouba</i>	Northern Brazil	Endangered
Rusty-faced parrot	<i>Hapalopsittaca amazonina</i>	High Andean forests of Colombia and Venezuela	Endangered

Table 6 ... continued. A list of Neotropical parrot species that are considered threatened using IUCN Red List criteria.

English name	Scientific name	Distribution	Threat category
Azure-winged parrot (Fuertes's parrot)	<i>Hapalopsittaca fuertesi</i>	Andean forests of the west slope of the central Andes of Colombia	Critically Endangered
Red-faced parrot	<i>Hapalopsittaca pyrrhops</i>	High cloud forests near Páramo on the East Andean slopes of Ecuador and Peru	Endangered
Golden-plumed parakeet	<i>Leptosittaca branickii</i>	Cloud forests of central Colombia, Ecuador and southern Peru	Vulnerable
Yellow-eared conure	<i>Ognorhynchus icterotis</i>	Wax palm forest in the Central Cordillera of Colombia and Northern Ecuador	Critically Endangered
White-breasted parakeet	<i>Pyrrhura albipectus</i>	Upper tropical and subtropical forest of south-east Ecuador	Vulnerable
Flame-winged parakeet	<i>Pyrrhura calliptera</i>	Upper montane forest and páramo on the central eastern Cordillera of Colombia	Vulnerable
Blue-throated parakeet	<i>Pyrrhura cruentata</i>	Atlantic Forest of Brazil	Vulnerable
El Oro parakeet	<i>Pyrrhura orcesi</i>	Very humid upper tropical forest on the west slope of the Andes of south-west Ecuador	Vulnerable
Santa Marta parakeet	<i>Pyrrhura viridicata</i>	Premontane to montane forests of the Sierra Nevada de Santa Marta, Colombia	Vulnerable
Thick-billed parrot	<i>Rhynchopsitta pachyrhyncha</i>	Pine forests in mountain areas of northern Mexico	Endangered
Maroon-fronted parrot	<i>Rhynchopsitta terrisi</i>	Pine forests in mountain areas of northern Mexico	Vulnerable
Brown-backed parrotlet	<i>Touit melanonota</i>	Mid-altitude humid forests of Rio de Janeiro, São Paulo and Bahia, Brazil	Endangered
Spot-winged parrotlet	<i>Touit stictopectera</i>	Upper tropical and lower subtropical montane forests of Colombia, Ecuador, and northern Peru	Vulnerable
Golden-tailed parrotlet	<i>Touit surda</i>	Humid lowland forests of north-eastern and south-eastern Brazil	Endangered
Blue-bellied parrot*	<i>Triclaria malachitacea</i>	Atlantic forest of south-eastern Brazil	Vulnerable
Species proposed for consideration for inclusion on the Red List			
Yellow-naped parrot	<i>Amazona auropalliata</i>	Mesoamerica	To be considered Vulnerable
Cuban amazon	<i>Amazona leucocephala</i>	Cuba, the Bahamas Islands, and Cayman Islands	To be considered Vulnerable
Northern Central American populations of the scarlet macaw	<i>Ara macao cyanopectera</i>	Southern Mexico through Central America	To be considered Endangered
Saffron-headed Parrot	<i>Pionopsitta pyrrhura</i>	Humid montane forest and cloud montane forest of Venezuela and Colombia	To be considered Vulnerable

There were no wild caught specimens of the species recorded in international trade between 1991 and 1995 (CITES Annual Report database). The species was proposed for inclusion in CITES Appendix I in 1997 but this was rejected by the Parties on the basis that international trade did not appear to threaten the species.

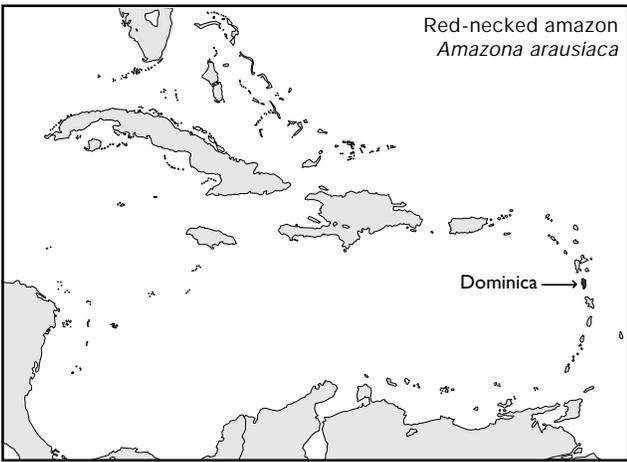
Actions: The black-billed parrot has been bred in captivity (Noegel 1979). The Blue and John Crow Mountain National Park was declared in 1993, but topography, lack of awareness, and lack of human resources for protection deter effective conservation action. The Cockpit Country has been identified as a priority area for conservation but has not yet been declared a protected area. Two research

projects are in progress under the sponsorship of the Gosse Bird Club. These projects are compiling information on distribution and population estimates, and breeding biology.

Red-necked amazon *Amazona arausiaca*

Contributors: Paul Butler, Billy Christian, Susan Koenig, and Noel Snyder.

Conservation status: IUCN: Vulnerable (D1; D2).
CITES: Appendix I.



National protection status: In 1976, the Forestry and Wildlife Act made it illegal to hunt parrots (Evans 1991).

Distribution and status: This species is found only on the island of Dominica in the Lesser Antilles. Recent surveys indicate that the main stronghold of the population is in and around the forests of Morne Diablotin from 300–800m, although the species is also found in other forested areas of the island. Numbers have apparently risen in recent years, from a low of 150 in 1980 to more than 500 by 1993 (Collar *et al.* 1994). Biologists of the Dominican Ministry of Agriculture place the population at not less than 2500 birds. *Amazona arausiaca* occurs at much higher densities than the sympatric *A. imperialis*. Flocks of up to five individuals can be seen regularly, although pairs and trios are more common. Parrots have been observed eating citrus fruits, opening the rind, and eating seeds.

Threats: The historic decline was presumably caused by a combination of hunting for food, habitat conversion, trade, and hurricanes (Evans 1991).

Actions: Although biological research on this species has been intermittent since the late 1970s, key aspects of its biology remain unknown. Such studies are needed and desired by the local government. Efforts to establish the proposed Morne Diablotin National Park should be continued, since the long-term survival of the two endemic parrots will be largely dependent on the continued existence of the intact forest in this proposed protected area (Lambert *et al.* 1993). Methods of protecting crops from damage by red-necked amazons should also be investigated as it may help reduce the human-wildlife conflict with citrus farmers. With the growing tourist trade in Dominica, this species, along with the imperial amazon, holds great promise as a target of ecotourism development.

Yellow-shouldered amazon *Amazona barbadensis*

Contributions: Adriana Rodriguez-Ferraro, JonPaul Rodriguez, Franklin Rojas-Suarez, Virginia Sanz, and Chris Sharpe.

Conservation status: IUCN: Vulnerable (C2a).

CITES: Appendix I.

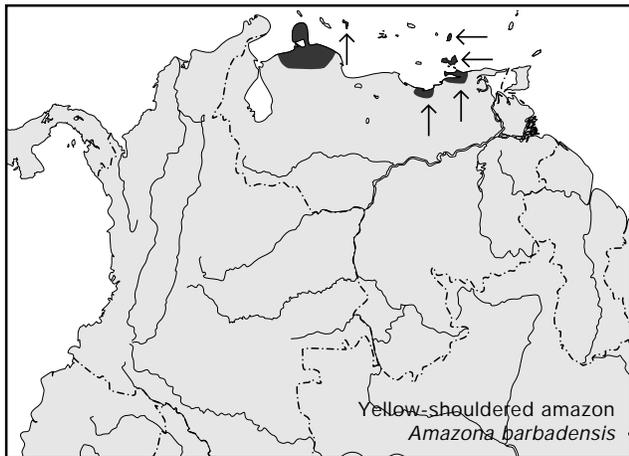
National protection status: Information unavailable.

Distribution and status: This species is endemic to the Falcon, Sucre, and Anzoátegui States of Venezuela, and to the outlying islands of Margarita, La Blanquilla, and Bonaire. It is considered extinct in Aruba. *Amazona barbadensis rothschildi* occurs on Margarita Island (1900 individuals) and on Isla La Blanquilla there are an estimated 80–100 individuals (Rodriguez-Ferraro 1996). *A. b. barbadensis* is found in Falcon and Anzoátegui states. The total population of Falcon is estimated at 400–700 individuals and at least 100 for Cerro La Misión (M. Goodwin pers. comm. 1997, Wege and Long 1995). The subspecific designation for the two races may not be valid (Amato 1995). There are also populations of unknown size in the states of Lara (Carora), and Sucre (Peninsula de Araya). On the island of Bonaire, Netherlands Antilles, the population is estimated at 450 individuals (R. Hensen pers. comm. 1992).

Threats: The main threat continues to be the trade for the national and international pet market, which particularly affects the western populations of Falcon and Lara states. In Cerro La Misión, birds are captured as local household pets. Nearly 120 individuals were confiscated in the islands of Aruba and Curaçao between 1994 and 1996, all



Alejandro Grajal



originating in the Western mainland population. There were 60 wild caught specimens recorded moving internationally between 1991 and 1995, with an annual maximum of 37 in 1994; 33 parrots were sent to Venezuela from the Netherlands Antilles where they had been seized (CITES Annual Report database).

In Margarita, habitat destruction still poses a significant threat to the recovering population of Macanao peninsula, particularly as seasonal watercourses are mined for construction materials (sand and gravel). These seasonal watercourses (quebradas) are the main nesting and feeding grounds for *A. barbadensis*. In some areas, this parrot is hunted as it is considered a pest of *Spondias purpurea* orchards.

Actions: For the Margarita and La Blanquilla island populations, Provita (a Venezuelan conservation organisation) is running a successful programme, which should be supported. This programme has combined a successful environmental education campaign (*A. barbadensis* was declared the State bird in 1990) with strong linkages to local enforcement agencies (National Guard, Ministry of the Environment), resulting in arrests for poachers, confiscations, and a fruitful foster nest programme to relocate chicks from nests at risk from poaching. Yearly census have shown the population to increase from 800 individuals in 1989 to 1900 in 1996. Detailed studies of its diet and habitat use were pivotal in an experimental and successful re-introduction project for eight animals using radio-telemetry techniques (Sanz and Grajal 1998). As the only protected area that (marginally) protects the species, La Restinga National Park in Margarita Island should be strengthened. A proposal for the creation of a dedicated wildlife refuge in the Macanao Peninsula (Rodríguez and Rojas-Suarez 1995), although supported by local government and institutions, has been stalled by the national government.

Further actions should include a census of western populations of Falcon and Lara States to assess population trends. The talks and awareness campaigns at La Blanquilla Island should be continued. An ecotourism programme in Margarita Island, focusing on the natural habitats of Macanao Peninsula, might be developed. The possibility of re-introducing *A. barbadensis* in Aruba should be explored.

Red-tailed amazon *Amazona brasiliensis*

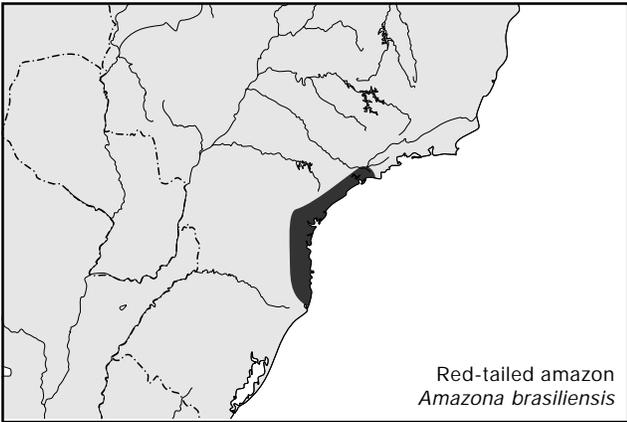
Contributors: Paulo Martuschelli, Fábio Olmos, and Pedro Scherer-Neto.

Conservation status: IUCN: Endangered (A1b,c; A2c,d; B1+2c,e; C1; C2a).

CITES: Appendix I.

National protection status: Information unavailable.

Distribution and status: The red-tailed amazon is endemic to the eastern slopes of Brazil's Serra do Mar (from sea level to 700m), in southern São Paulo and Paraná states, and northern Santa Catarina state. The total area of distribution of this species is approximately 3,000km². The species inhabits a mosaic of habitats, including mangroves, restinga flooded forests, and dense rainforest (six recognised habitat types) that occur in the narrow stretch of land (10–30km wide) from the sea to the mountains. The range includes several islands immediately offshore that are used by the parrots as overnight roosts. The most important islands are Peças, Rasa, and Superagui,



Red-tailed amazon
Amazona brasiliensis

with the largest roost at Pinheiro Island. Pinheiro island is considered within the category of “Areas of relevant ecological interest”, and part of the “Area of environmental protection of Guaraqueçaba”. The population of red-tailed amazons for Paraná State, once thought to be relatively stable with circa 3,000 birds in 1988, is estimated to have declined by a third, to about 2,000 individuals in 1992 (P. Scherer Neto *in litt.* 1992). The total population of red-tailed amazons in 1997 was estimated between 3,500 and 4,500 individuals (P. Scherer-Neto *in litt.* 1997).

Threats: The main threat is capture of both adults and young for the pet trade, particularly by local people and fishermen on the offshore islands. Guarani Indians invaded Superagui National Park and Ilha Cardoso State Park and are believed to be partly responsible for low recruitment rates, through shooting of adults. These reserves receive almost no protection while the proposed Ilha Comprimida State Park and Itapanhapina Ecological Station are still in

the design phase. The proposed construction of a bridge to the mainland at Ilha Comprimida will increase tourism pressure and habitat conversion (F. Olmos *in litt.* 1997). About 356 birds were taken from the wild in the municipality of Cananeia alone in 1991/1992. Three wild caught specimens were recorded in international trade between 1991 and 1995, all in 1993 (two seized birds and one circus bird: CITES Annual Report database). Shooting, loss of nest-trees to boat builders, and deforestation for banana plantations, cattle grazing land, and beach houses are additional serious threats.

Actions: Regular monitoring of all the significant remaining populations of the species, and a major public awareness and education programme for guards and local inhabitants are urgently required. Vigilance against poaching, hunting, and tree felling should be increased in and around all the twelve protected areas within the range of the species, and the small but important Ilha do Pinheiro should be included in the adjacent Superagui National Park.

Yellow-billed parrot *Amazona collaria*

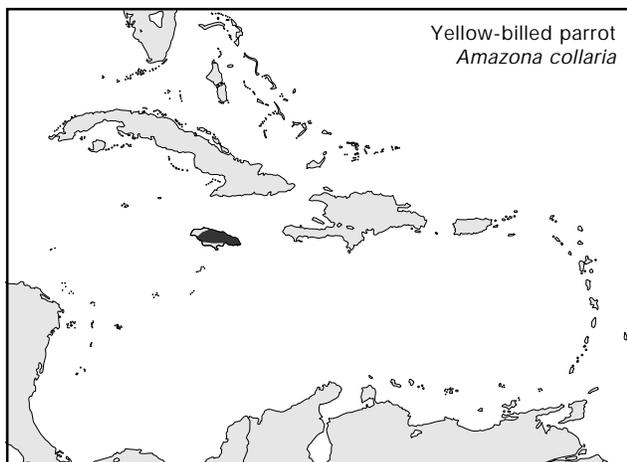
Contributions: Herlitz Davis, Susan Koenig, Wendy Lee, Catherine Levy, and Noel Snyder.

Conservation status: IUCN: Vulnerable (A1c,d).
CITES: Appendix II.

National protection status: Since 1986, both *A. collaria* and *A. agilis* have been listed as “threatened” by the Jamaican government.

This is an addition to Collar *et al.* (1994) and hence the IUCN Red List. Although there are still moderate numbers of yellow-billed parrots, it is included because it is believed to have suffered a precipitous population decline and there is strong pressure on its populations from both cagebird harvest and habitat destruction.

Distribution and status: The yellow-billed parrot is endemic to Jamaica, this species is still widespread, more so than the other Jamaican *Amazona* species, the black-billed parrot *Amazona agilis*, although no thorough island-wide surveys have yet been conducted. Flocks of 50–60 individuals are observed year-round, particularly in the non-breeding season, moving from the forest interior to edge habitat to forage. This species is particularly found in Cockpit Country, Mt. Diablo, and the John Crow Mountains. A small (presumably feral) population is also established at Hope Gardens in Kingston. In the Cockpit Country, an area which has long been considered the stronghold of this species, recent studies indicate that *A. collaria* is less abundant than *A. agilis*, possibly a result of



A. collaria being a more colourful species and preferred in trade. While *A. agilis* currently found nesting throughout Cockpit, including disturbed plantation areas along the edges, *A. collaria* now nests almost exclusively in relatively remote interior regions. Local reports suggest a significant overall decline in Cockpit and a higher degree of threat than for *A. agilis*. Preliminary population counts suggest 5,000 individuals in the Cockpit Country, Mt. Diablo, and the John Crow Mountains (C. Levy *in litt.* 1999). The species is often difficult to distinguish from *A. agilis* at a distance and potential misidentifications may have affected the validity of some earlier reports on its abundance and distribution.

Threats: Illegal trade has been a much greater threat to *A. collaria* than to *A. agilis*, presumably because the latter is relatively difficult to keep healthy in captivity and is less

colourful. Existence of a feral *A. collaria* population in disturbed habitat in Kingston suggests that the species may have been more threatened by trade than by habitat destruction, although both factors appear to have been involved. One wild caught specimen was recorded in international trade in 1991 and none between 1992 and 1995 (CITES Annual Report database). Some persecution for crop and garden damage, especially citrus, has also been reported. Nesting success in recent studies in Cockpit Country has been lower than for *agilis*, with a high percentage (circa 70%) of pairs exploring and defending nest sites but failing to lay eggs.

Actions: A major study of both Jamaican amazons was initiated in 1995 by the Gosse Bird Club with the ultimate goal of developing conservation recommendations. Conservation efforts important to both *A. collaria* and *A. agilis* include protection of habitat, control of harvesting for the pet trade, and control of shooting. The Forestry Acts of 1937 and 1973 provide certain forms of protection to some habitat, such as the Cockpit Country Forestry Reserve, and other areas have been established as sanctuaries. Portions of the lands important to native parrots (Blue Mountains, John Crow Mountains, Portland Ridge, Cockpit Country, and major swamps) have been designated potential (and in some cases established as) national parks under the National Physical Plan for Jamaica. In 1986, both *A. collaria* and *A. agilis* were listed as “threatened” by the Jamaican government. Also, stringent gun control has been instituted by the Jamaican government. All of these policies have resulted in a general awareness of the legal status of parrots among Jamaicans. However, they are still harvested illegally for local and international trade, and a stricter enforcement policy on poaching of nests is needed. Cockpit Country is not yet an officially established national park, and comprehensive protection of this area is believed to be a central need for conservation of Jamaica’s parrots.

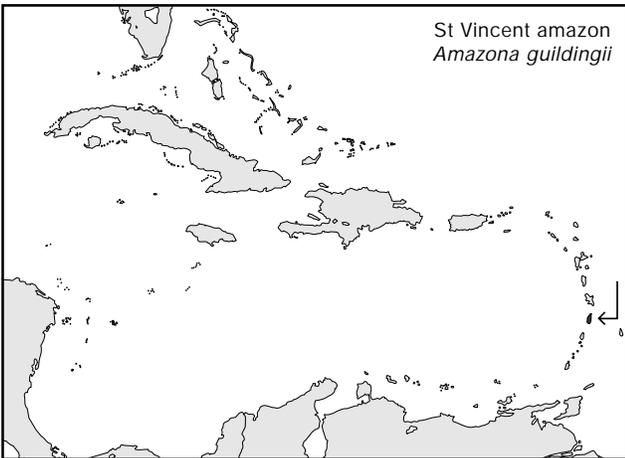
St Vincent amazon *Amazona guildingii*

Contributors: Paul Butler, James Gilardi, David Jeggo, and Fitzroy Springer.

Conservation status: IUCN: Vulnerable (D1; D2).
CITES: Appendix I.

National protection status: Information unavailable.

Distribution and status: This species is found only in the forested areas of the island of St Vincent in the Lesser Antilles. Biennial surveys conducted since the late 1980s suggest that the population is quite stable, possibly increasing recently to 800 birds (Collar *et al.* 1994).



Approximately 30 individuals are currently in captivity in an aviary in the Botanical Gardens in St Vincent. Approximately 60 birds are also found in Barbados, North America, and Europe combined. All known captive birds are registered in a studbook for this species.

Threats: Historically the major threats have been hunting for both food and the pet trade, and to a lesser extent, habitat conversion. Chicks were taken from nests which partially explains why there are more of these birds in captivity than there are St Lucia parrots, which were apparently never collected.

Intermittent hurricanes may have reduced population numbers in the past, particularly Hurricane Allen in 1980. The eruption of the Soufriere volcano in 1979 directly eliminated undetermined numbers of parrots as well as destroying a considerable amount of the remaining forest

on the island (Nichols 1981). Both types of natural disasters are to be expected in the future and can only be effectively countered by a healthy population of parrots in a healthy quantity of habitat.

Actions: As with all the amazons of the Lesser Antilles, this species has received considerable domestic and international attention (Butler 1992). Initiated in the late 1980s, education campaigns and political action have led directly to meaningful protection of the rainforest and of this species. This species has itself become the St Vincent and the Grenadines' National Bird (Butler 1988).

This species remains one of the least studied of all the Caribbean amazons. Beyond the population surveys and the description of several nest sites, little is known of its biology. In addition to continued protection and censusing, a study of the reproductive success, movement patterns, and habitat requirements of this species is fundamental to its continued recovery.

Imperial amazon *Amazona imperialis*

Contributors: Paul Butler, Billy Christian, Susan Koenig, and Noel Snyder.

Conservation status: IUCN: Vulnerable (D1; D2).

CITES: Appendix I.

National protection status: Dominica's Forestry and Wildlife Act of 1976 prohibits the hunting of parrots.

Distribution and status: This species is found only in the rainforests of Morne Diablotin and in the southern mountains east of Rousseau on Dominica in the Lesser Antilles. In the early 1990s it numbered less than 100 individuals (Evans 1994), although recent observations suggest higher numbers. In 1994 close to 100 individuals were observed in just one valley on the west side of Morne Diablotin. The total population was roughly estimated to be in the low 100s (N. Snyder *in litt.* 1997). Biologists at the Dominican Ministry of Agriculture estimate the population for 1998 at 250 to 300 birds.

Threats: Shooting for food was historically the most important threat but this threat has been much reduced in recent years. There has been some deforestation but the occupied habitat of the species is still in relatively good shape. Presumably Hurricane David in 1979 reduced the population somewhat, but the main effects of the storm were in the southern part of the island.

Little is known of the threats from potential competitors. Red-necked parrots apparently initiate nesting earlier in the season, and in one instance a pair of red-necks used an historic imperial amazon nest site.



Conservation status: IUCN: Endangered (A1a,c,d; A2c,d; C1; C2a).
 CITES: Appendix II.
 National protection status: Endangered in Mexico (Peligro de extincion, NOM-ECOL-059-1994).

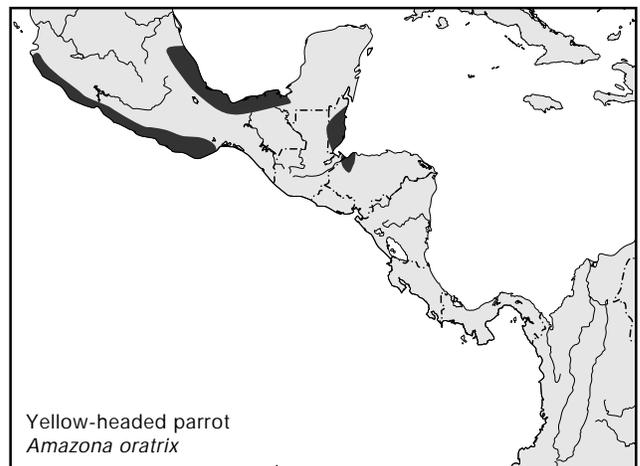
Distribution and status: This species is native to Mexico, Belize, Guatemala, and Honduras. Populations have dramatically declined through most of its range. Four forms or races are considered but have yet to receive official subspecific recognition (Clinton-Eitniear *in litt.* 1997). *A. o. oratrix* and *A. o. "magna"* are respectively found primarily along the eastern and western coasts of Mexico. *A. o. tresmariae* is endemic to the Tres Marias Archipelago off the coast of Nayarit, Maria Madre, Maria Magdalena, and Maria Cleófas in Mexico. *A. o. belizensis*, once formerly widespread in coastal Belize, is now primarily found in north-western Belize, and along the northern Guatemala-Honduras border. Its present range is very similar to its historic range although its distribution is

Actions: In recent years the imperial amazon has benefited from joint government and NGO efforts to protect its habitat and sensitise local citizens to its needs. Although biological research on the biology of this species has been intermittent since the late 1970s, key aspects of its biology remain unknown.

Efforts to establish the proposed Morne Diablotin National Park should be of top priority, since the long-term survival of the two endemic parrots will be largely dependent on the continued existence of the intact forest in this proposed protected area. With the growing tourist trade in Dominica, this species along with the red-necked amazon holds great promise as a target of ecotourism development. Very little is known about the ecology of this species and what factors are currently affecting its status. Such studies are needed and desired by the local government. Late news: the Morne Diablotin National Park was established in January 2000.

Yellow-headed parrot *Amazona oratrix*

Contributors: Sergio Aguilar, Alvaro Aragón-Tapia, Mauro Berlanga, Jack Clinton-Eitniear, Ernesto Enkerlin-Hoeflich, Jaime Gonzalez-Elizondo, José Luis Manzano-Loza, Carolyn Miller, Ernesto Ruelas, Mario A. Vazquez, and Paul Wood.



currently contracting and is now reduced to isolated populations within its core range (see also map in Howell and Webb 1995).

Threats: *A. o. oratrix* is highly sought after by both the national and international pet market (Enkerlin-Hoeflich and Packard 1993). It is evidently still present in illegal national trade since juvenile and yearling birds (recognised by the extent of yellow on the head and other subtle characteristics) are still found openly exhibited by proud owners who upon questioning argue that they have had the pet for “many years” (Enkerlin-Hoeflich *in litt.* 1997). *A. oratrix* is the second most important species in the number of confiscated parrots at the Mexico-Texas border after *A. auropalliata* (Gobbi *et al.* 1996). *A. oratrix* most likely originate in Mexico, whereas *A. auropalliata* are presumed to be passed through Mexico from Honduras and Guatemala. There were 53 wild caught specimens of the whole species recorded in international trade between 1991 and 1995, with an annual maximum of 25 individuals in 1995 (CITES Annual Report database).

Actions: Increased awareness campaigns are the greatest hope for the species. Several organisations within Mexico such as TEYELIZ and Naturalia have initiated country-wide campaigns to educate the public of those Psittacines species that may be traded legally. Colourful posters depicting illegal species are posted in every airport and customs check points throughout the country. Mexican wildlife authorities through PROFEPA have greatly improved their capabilities for law enforcement and confiscation. Jail sentences and follow-up actions are still the exception but the exposure of offenders is creating enough awareness amongst the great majority of the public.

Ample opportunity lies with education and pride generation in rural areas. The majority of the land in Mexico is privately owned. Co-operation with landowners appears to provide the greatest opportunity to ensure effective conservation measures. The Centre for the Study of Tropical Birds in conjunction with Mexican institutions has started the “Día de los Loros”, a one day festival in the remaining core area for the species in north-east Mexico (J. Clinton-Eitnien *in litt.* 1997). In terms of intensive population management, reduction of pre-fledging mortality seems to hold most promise as *A. oratrix* do not commonly double clutch and do not seem limited by nest sites. Elimination of predation by snakes might allow for minimum increased recruitment of approximately 10% of active nests in Mexican areas. Such an increase in productivity would be considerable for a population comprising a few thousand individuals. Other alternatives would be to implement nest guarding. This approach has been used in the conservation of the Puerto Rican parrot (Lindsey 1992). We envision however that the use of

intensive techniques for conservation of species *per se* is unlikely to be required. Instead, such techniques will remain to be used only as a last resort especially when the cost effectiveness of education and enforcement is considered.

Tres Marias population (*A. o. tresmariae*)

Distribution and status: *A. o. tresmariae* is endemic to Tres Marias Archipelago off the coast of Nayarit, Maria Madre, Maria Magdalena, and Maria Cleófas in Mexico.

Threats: *A. o. tresmariae* individuals continue to be trapped by local island residents. Reports of Tres Marias parrots being moved within the market in mainland Mexico are frequent but impossible to substantiate (J.C. Cantata *in lit.* 1997). The Mexican Government recently authorised the extraction of nine pairs for “conservation through aviculture” to a private breeding facility, which might increase demand by other aviculturists. The Government of Mexico has also announced a national programme to establish “units for wildlife use and conservation” (UMAs) around Mexico. Whilst this scheme may eventually prove to be successful, at present it poses a serious threat to a number of parrot species, including *A. oratrix* for which increased trade will result as these facilities start. As controls are currently lax, it will also greatly increase the probabilities for laundering wild caught birds. Fifty three wild caught specimens of the whole species were recorded in international trade between 1991 and 1995, with an annual maximum of 25 in 1995, together with an individual noted as this subspecies in 1992 and another 1994 (CITES Annual Report database).

Actions: Fortunately for the future of *A. o. tresmariae*, the archipelago will remain under the control of Mexican prison authorities. The Secretaría de Gobernación (Ministry of Government Affairs) intends to afford protected status designation to the islands and include a sea buffer area around them (J. Díaz de León *in litt.* 1997). A proposed project will evaluate the state of endemic birds, with special emphasis on the two parrots *A. o. tresmariae* and *Forpus cyanopygius insularis*, and mammals. Another project will propose and implement measures to reduce and ultimately eradicate introduced goats, cats, and deer.

Belize population (*A. o. belizensis*)

Distribution and status: Once widespread in suitable habitat in coastal Belize, this species is now primarily found in north-western Belize, and along the northern Guatemala-Honduras border. There is reportedly a “good” population in a private reserve, the Rio Bravo Conservation and Management Area, in the north-western part of Belize.

Interestingly, this area includes Hillbank where the species was reported to be common in the 1960s (Russell 1964). Another population is reported from Monkey Bay Wildlife Sanctuary in the central part of the country along the Western Highway. (See Collar *et al.* 1992 for an ample description and account).

Threats: Although *A. o. belizensis* is well protected at the Rio Bravo and Monkey Bay properties, the population is thought to be declining throughout the country. Recent development of extensive housing tracts presents a new threat to populations in unprotected savanna areas. *A. o. belizensis* is also frequently shot as a citrus pest and citrus development is currently expanding in Belize. There is limited, if any, export of *A. o. belizensis*. There were 53 wild caught specimens of the whole species recorded in international trade between 1991 and 1995, with an annual maximum of 25 individuals in 1995 (CITES Annual Report database).

Actions: Government conservation officials in Belize have expressed interest in developing a captive parrot banding registration scheme for *A. o. belizensis*. After captive birds are banded and registered, newly captured birds can be confiscated, and owners can be prosecuted. The Belize Zoo has been active over the years in discouraging parrots as pets, and most school children visit the Belize Zoo. However, there has been no widespread campaign targeted at this species. The Belize Audubon Society is initiating a publicity campaign beginning with a press release and they are developing further educational efforts targeting this species.

Ecotourism is the second largest revenue generator in Belize but it has tended to bypass savanna areas. Ecotourism is being developed at the Rio Bravo Conservation Area and *A. oratrix* could conceivably be an aspect of ecotourism. Bird watchers constitute a large percentage of Belize's tourists and they would no doubt be delighted to add this bird to their list. The following actions are suggested for the conservation of *A. oratrix* in Belize: evaluation of existing wild populations to determine the distribution and quality of protection; banding and registering captive populations, and an education campaign in English, Spanish, and Chinese creating conservation awareness of the species.

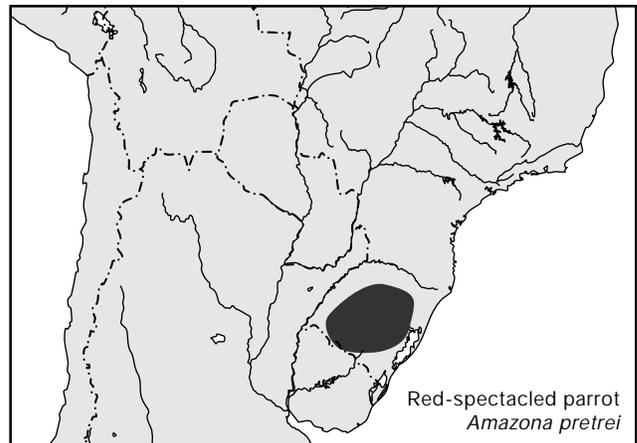
Red-spectacled parrot *Amazona pretrei*

Contributors: Jaime Martinez, and Nemora Prestes.

Conservation status: IUCN: Endangered (A1c,d; A2c,d; C1).
CITES: Appendix I.

National protection status: Information unavailable.

Distribution and status: This species is endemic to south Brazil, and distributed only in the states of Rio Grande do Sul and Santa Catarina (Martinez 1996). A few individuals have been recorded in the Misiones forests of north-eastern Argentina (Chebez 1994) and it has also recently been reported from Paraguay (see Lowen *et al.* 1997). A nomadic species, *A. pretrei* tends to concentrate in the remaining *Araucaria* forests of south-eastern Santa Catarina between March and June to feed on the mass seed production of *Araucaria augustifolia*. During August and January, *A. pretrei* disperses in small flocks that range from tens to hundreds of individuals in a wide distribution throughout Rio Grande do Sul, particularly at the habitats of Campos da Cima da Serra, Planalto Medio, Alto Uruguai, Depression Central, and Serra do Sudeste. A census in 1994 estimated total population at 10,000 individuals, repeated censuses have shown population sizes of about 12,600 individuals in 1996, and approximately 16,300 individuals in 1997 (J. Martinez *in litt.* 1997, N. Prestes *in litt.* 1997).



Threats: The main threat is thought to be the illegal domestic trade, particularly occurring in the municipalities of Lagoa Vermelha, Barracão, Esmeralda, and Muitos Capões. Approximately 500 chicks are taken annually from nests to be sold in the large urban centres of Caixas do Sul, Florianópolis, Curitiba, and São Paulo (Prestes *et al.* 1997). Reductions in the *Araucaria* seed supply may have been the cause for the change in feeding grounds from Aracuri Biological Station in 1991 (Muitos Capões municipality) to the areas around the south-east of Santa Catarina. Here the remaining *Araucaria* forest patches may provide enough seed to feed the populations of *A. pretrei*. Intense cattle grazing and agriculture have nearly eradicated *Araucaria* forest habitat. These habitat impacts have reduced natural regeneration, and may have also reduced the number of nesting sites in old trees.

Actions: The continuing monitoring programme in southern Brazil, through regular censuses in its feeding and reproduction areas, together with recent advances in radio-telemetry, are providing information on yearly movements and population dynamics. Many land owners are engaged in protection of the trees where the parrot nests. The awareness programme includes an intense environmental education programme directed at students, professors, ranchers (fazendeiros), and rural workers, using posters, presentations, and other publications. One of the communal roosts in the middle of a reproductive area was protected with the creation of the Carazinho Municipal Park. In the last two years artificial nests have been installed, but these boxes have not been used despite a potential limitation in suitable nesting trees. Further intensification of environmental education campaigns, enforcement of anti-poaching regulations, and provision of alternative sources of income for trappers could diminish the capture for the pet trade.

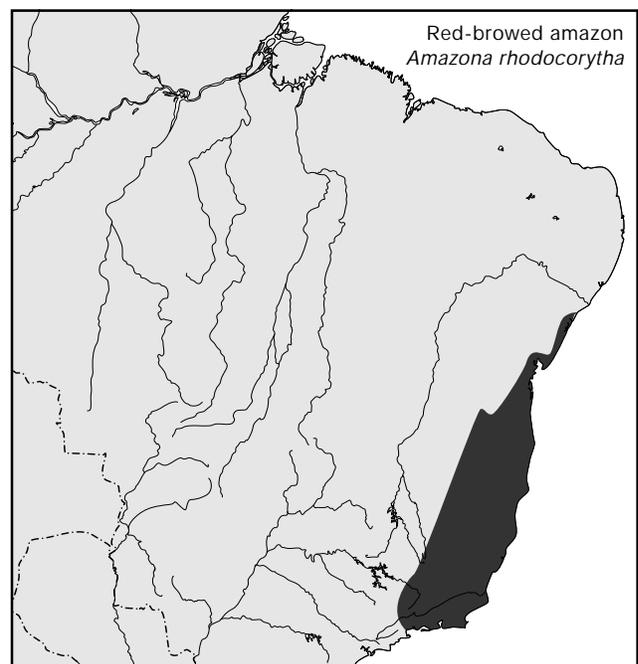
Red-browed amazon *Amazona rhodocorytha*

Contributors: Paulo Martuschelli, Fábio Olmos, and Carlos Yamashita.

Conservation status: IUCN: Endangered (B1+2c,e; C2a; D1).
CITES: Appendix I.
National protection status: Information unavailable.

Distribution and status: This species is endemic to the lowland hardwood areas of Brazil's Atlantic forest, ranging from southern Alagoas state to extreme northern São Paulo state. Its population size is unknown but it is assumed to be rapidly declining as habitat diminishes.

Threats: Habitat destruction is the main threat; the forest where this species occurs is now highly fragmented. Cocoa production was formerly the main economy in the parrot's most suitable habitats (southern Bahia state). The decline of cocoa production has led to large trees that provide suitable shade and nest sites being felled. Landless people



(“sem terras”, many of whom formerly worked the cocoa plantations) have expanded into protected areas, where they are involved in illegal logging operations. Illegal trade may also be a threat, as it is for all large parrots in Brazil (i.e., macaws and amazons).

Actions: The red-browed amazon’s most pressing need is for the location and immediate protection of additional remnant forest areas within its range. A major survey to identify the key sites for the conservation of parrot populations ranging from the eastern part of Minas Gerais in the south, to Ceará in the north is therefore the most pressing priority. The impacts of illegal trapping and other threats should be assessed by a study of parrots in Sooretama Reserve. Specifically, it is important to recognise the biological importance of the Porto Seguro Reserve (also known as Estação Veracruz) in Bahia and assign total protection to it. This reserve was purchased by a cellulose producing company from the (electric utility) Companhia de Vale do Rio Doce. All forest patches left in southern Bahia State deserve protection. These forests are vanishing quickly, as cocoa prices are dropping and landowners are selling timber to earn money. Authorities in Rio de Janeiro state should take the necessary steps to protect forests outside park boundaries where the species has been recorded, i.e., at Desenganho State Park and on Ilha Grande. The removal of nestlings as well as the capture and shooting of adult birds may be reduced by an education campaign in the areas adjacent to the breeding sites. In addition, curbing and enforcing anti-trafficking laws on the roads connecting Monte Pascoal National Park with the rest of southern Brazil may reduce the pressure on the local bird population.

Hispaniolan parrot *Amazona ventralis*

Contributor: James Wiley.

Conservation status: IUCN: Vulnerable (A1c,d).

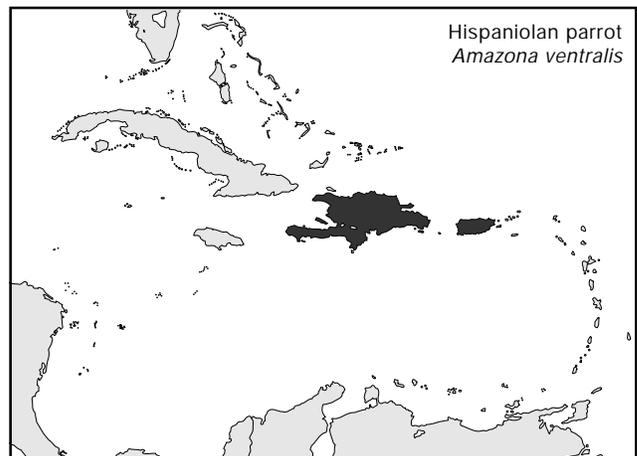
CITES: Appendix II.

National protection status: The parrot is protected by law (DR- 1975-Regulation 601) against chick harvesting and hunting in the Dominican Republic.

This is an addition to Collar *et al.* (1994) and hence the IUCN Red List. Although a relatively common parrot in Hispaniola, there has been an inferred substantial recent reduction in available habitat. Deforestation in the last protected areas and habitat strongholds is likely to accelerate in the next few years.

Distribution and status: This species is endemic to Hispaniola and outlying islands, including Grande

Cayemite, Gonäve, Saona, and Beata. The species was formerly common throughout the main island, but is now greatly reduced in numbers to the point of being extirpated or uncommon in most areas (Woods and Ottenwalder 1987, 1992; Dod 1992). In Haiti, it still occurs in suitable numbers in the Massif de La Selle and Massif de La Hotte (Woods and Ottenwalder 1992). It is considered threatened throughout its native range, where it is rapidly decreasing in distribution and number. Dod (1978, 1992) reported that its numbers declined dramatically in the 1970s and that the parrot would soon become extinct in the Dominican Republic. Woods and Ottenwalder (1992) classified the parrot as Threatened throughout its range, but noted that



the populations in Haiti are Endangered. It was introduced to Puerto Rico where it is established and locally common, especially in western and north-central parts of the island (Long 1981, Lever 1987, Raffaele and Kepler 1992).

Threats: The main threat is the loss of habitat from conversion to agriculture uses. The parrots form small to large foraging flocks that sometimes depredate crops, whereupon birds are shot or poisoned. Demand in the local and international pet trade has apparently affected most populations. Despite legislation and some vigorous efforts to curb that trade, parrots are still being harvested throughout the island. Trade was thought to be partly driven by the high price these birds command on the international market, although only 15 birds were recorded in international trade from 1991–1995 (CITES Annual Report database). Although several important parrot habitats have been established as protected areas, at least some of these (e.g., Parque Nacional Los Haitises) are poorly protected and parrot populations have continued to decline. Parrot populations in other protected areas (e.g., Parque Nacional Sierra de Baoruco) have shown relatively positive population increases, from low levels of the early 1980s, as a response to adequate habitat conservation and protection against shooting and harvesting of chicks.

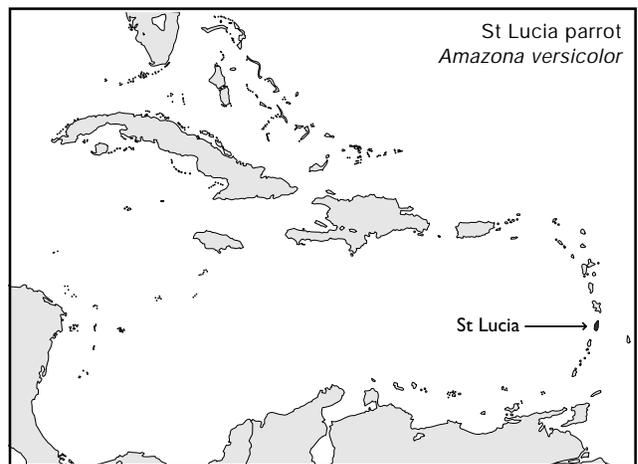
Actions: Additional protected habitat is needed. Much of the habitat which has been established as reserves requires stronger enforcement of wildlife laws and regulations. The Hispaniolan parrot has been bred in captivity in several facilities, but there is currently no need for a captive propagation and release programme (Gates 1971, Carpenter 1977, Wiley and Gee 1981, Snyder *et al.* 1987).

St Lucia parrot *Amazona versicolor*

Contributors: Andrew Alexander, Donald Anthony, Michael Bobb, Paul Butler, Alwin Dornelly, James Gilardi, David Jeggo, C. Lyndon John, and Noel Snyder.

Conservation status: IUCN: Vulnerable (D1; D2).
CITES: Appendix I.
National protection status: Information unavailable.

Distribution and status: The St Lucia parrot is found only in the rainforests of St Lucia in the Lesser Antilles. Although once depleted from much of its range, surveys in 1996 and 1997 found the St Lucia parrot in most of the island's intact forests above 300m. Pairs have recently been observed north of the Barre de Lisle ridge (Forestiere) and flying over the town of Soufriere. Estimates from the mid-1970s suggested that the population may have dipped to as



few as 100 individuals (Jeggo 1976, Butler 1987). A survey in August 1996 roughly estimated the population to number 350–500 birds (D. Jeggo unpublished data).

There are currently five captive individuals in St Lucia, approximately 20 birds in a captive breeding programme at the Jersey Wildlife Preservation Trust (JWPT) in the British Isles, and two males at Paradise Park in England. No other St Lucia parrots are known to be in captivity.

Threats: The primary causes of the decline were a combination of habitat destruction, shooting for food, sport, and the pet trade. Currently the forest is well protected, as is the parrot. Hunting of all native wildlife is currently banned, but this legislation is in the form of a temporary moratorium that is reinstated annually.

Actions: Since the late 1970s, this species has received considerable attention both locally and internationally. Censuses have been conducted on a roughly biennial basis by the Forest and Lands Department and JWPT (see Jeggo and Anthony 1991). A large scale and highly successful education campaign was launched in 1978 involving educating adults and children, designing a

“parrot bus” as a mobile display, designating the species as the National Bird, and protecting a large portion of the species’ remaining habitat in the Parrot Reserve.

Since 1992, intensive efforts to study the ecology of this species have been undertaken by the Department of Forest and Lands, JWPT, and for the last few years by their sister group, Wildlife Preservation Trust International (WPTI). Breeding success appears to be normal for a Caribbean amazon; approximately half of the nests produce fledging chicks each year. Parrot densities in the core of the parrots’ range (Quillesse and Edmond Forests) may be approaching pre-human impact levels. Outside this area however, particularly in the northerly forests, densities remain quite low and should continue to be monitored.

While it remains to be seen what effect changes in the banana industry will have on the health of St Lucia’s forests, there remains significant pressure to resume hunting of wildlife species in the Parrot Reserve. The presence of firearms in the forest will almost certainly lead to parrot deaths and disturbance even if they are not targeted by the hunt. It would be impossible to monitor illegal hunting of parrots. Legislation to permanently ban hunting in the forest or in the country as a whole is likely to be the most constructive conservation action that could be taken in the next few years. The recent history of the St Lucia parrot has been one of the great success stories in wildlife conservation and has brought together important changes in legislation, education of native St Lucians, development of ecotourism, and scientific exploration. To allow hunting for a few individuals at this time would be a most unfortunate reversal of this tremendous success.

Vinaceous amazon *Amazona vinacea*

Contributors: Jaqueline Goerck, Paulo Martuschelli, Fábio Olmos, and Carlos Yamashita.

Conservation status: IUCN: Endangered (A1a,c,d; A2c,d; C1; C2a).

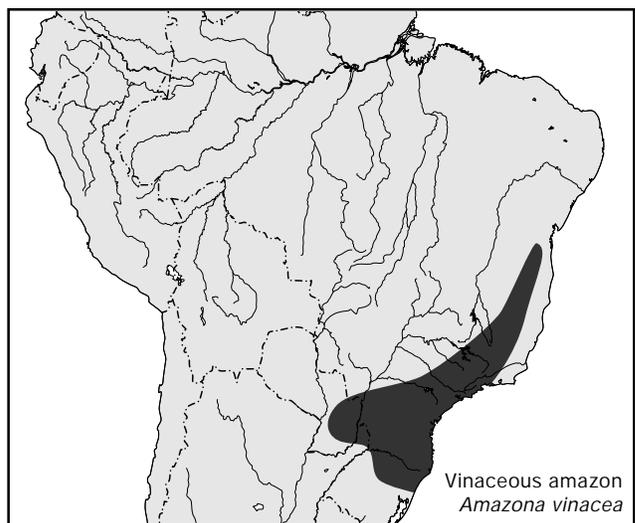
CITES: Appendix I.

National protection status: Information unavailable.

Distribution and status: This species is endemic to submontane “mixed” regions of Brazil’s Atlantic forest, ranging from Minas Gerais state to extreme northern Rio Grande do Sul state. The range consists of mixed *Podocarpus* and *Araucaria* subtropical forest. Fruit orchards also occupy much of the habitat. In Santa Catarina and Rio Grande do Sul *A. vinacea* is partially sympatric with (i.e., originated within part of the range of) *A. pretrei*.

Threats: All the populations are isolated on “islands” of suitable habitat (usually steep hills e.g., Serra de

Paranapiacaba, and Serra de Mantiquiera). Habitat destruction is the main threat, the forest being highly fragmented. Cocoa production was the main economy and was cultivated within habitat most suitable for parrots (southern Bahia state). The decline of cocoa production has led to felling of the larger trees that provided shade and suitable nest sites. Landless people (“sem terras”, many of whom formerly worked the cocoa plantations) have expanded into protected areas, where they are involved in illegal logging operations. The threat from the local pet



Vinaceous amazon
Amazona vinacea

trade is a greater threat for *A. vinacea* than it is for *A. rhodocorytha* due to its popularity.

At Campos do Jordao State Park (São Paulo), approximately 20 pairs suffer thefts of nestlings and no recruitment. The park is not adequately protected despite having field personnel. A population of approximately 180 birds occurs in the 1,500km² Jacupiranga State Park near the Paraná border. Nearly 500km² have been destroyed by just under 5,000 squatters since the 1970s. In addition to land speculation and nestling theft, a major road (the BR116) that cuts through the park is being expanded by two additional lanes with money from the Inter American Development Bank (IADB). Despite payments by the bank for environmental mitigation, these scarce funds have been used to develop tourism facilities and community development projects instead of resettling people or strengthening the park management and protection. Jacupiranga Park is an important site for parrot conservation as it still harbours significant amounts of suitable habitat for *Amazona brasiliensis*, *Triclaria*, and probably *Touit surda* and *melanonota*. A major project to turn this park into a real conservation area should be considered.

Actions: See *A. rhodocorytha*

Red-crowned parrot *Amazona viridigenalis*

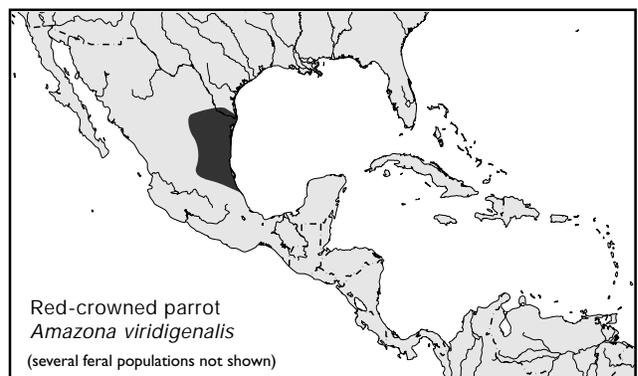
Contributors: Alvaro Aragón-Tapia, Jack Clinton-Eitniear, Ernesto Enkerlin-Hoeflich, Jaime Gonzalez-Elizondo, Teresa Lopez de Lara, José Luis Manzano-Loza, and Mario A. Vazquez.

Conservation status: IUCN: Endangered (A1a,c,d; A2c,d; C1; C2a).

CITES: Appendix I (it was transferred from Appendix II in 1997).

National protection status: Endangered in Mexico (Peligro de extincion, NOM-ECOL-059-1994).

Distribution and status: This species is resident within suitable habitat in a limited distribution of approximately 50,000km², mainly in Tamaulipas, San Luis Potosí, Nuevo León and north-eastern Veracruz, Mexico. Established feral populations are increasing in several cities in Texas, Florida, California, Puerto Rico, and Hawaii, and in the cities of Monterrey, Villa de Garcia, Mérida, Morelos, Tijuana, and Tampico, Mexico. The ability of this bird to colonise new habitat, especially urban and suburban, poses questions as to the validity of declaring an extension of the “natural” range to areas such as Uxpanapa in southern Veracruz, the Sierra in Queretaro State, or Tampico. As of 1995, the southern California population was estimated at



750–1,000 individuals (Garret 1997), a striking increase since 1972 when it was considered very rare (Hardy 1973).

The density estimate in 1992–94 of 5.7 birds/ha (Enkerlin-Hoeflich 1995) is within the range of estimates from two previous studies (7.3 for 1985 and 4.72 for 1986: Perez 1986), but considerably less than the 25.2 birds/ha reported in 1970s (Castro 1976). The 1992–94 estimate is based on number of nests per hectare, in contrast to the variable circular plot technique used by previous researchers. Part of the difference in density estimates could be due to problems in identification of *A. autumnalis*. Observers not thoroughly familiar with particular species can easily mistake *A. autumnalis* with historically more regionally abundant *A. viridigenalis* (Enkerlin-Hoeflich and Packard 1993).

Threats: Local eradications of *Amazona* parrots in many areas of north-eastern Mexico are due to habitat loss and capture (Enkerlin-Hoeflich 1995). However, the ability of *A. viridigenalis* to successfully make use of disturbed habitat mosaics, leads one to assume that capture is the main problem. Sixteen thousand four hundred and ninety individuals (Iñigo-Elias and Ramos 1997), largely nestlings, of *A. viridigenalis* were legally exported to the USA between 1970 and 1982, with estimates of similar numbers illegally

leaving Mexico. Pre-export mortality was estimated at greater than 50% (Enkerlin-Hoeflich and Packard 1993). The estimated minimum level of harvest was approximately 5,000 *A. viridigenalis* per year for a 12 year period, based on combined legal and illegal trade, and expected mortality. This is a very large number of individuals considering the limited range of the species. There were 63 wild caught specimens recorded in international trade between 1991 and 1995, with annual peaks of 23 in 1993 and 29 in 1995 (CITES Annual Report database).

Poaching also effects nest site availability in Mexico as poachers often fell trees to extract chicks from nest cavities. Tree-felling facilitates poaching and increases the overall impact of direct habitat loss. *A. viridigenalis* does not appear sensitive to clearing if enough nesting cavities are available (Enkerlin-Hoeflich and Hogan 1997). Given the high availability of suitable cavities, destruction of nest cavities itself is not one of the major threats to the viability of *A. viridigenalis* (Enkerlin-Hoeflich 1995).

Actions: Red-crowned parrots use cavities with a wide range of characteristics, in a variety of tree species. Acceptance of different cavity characteristics and vegetation assemblages suggests conservation of *A. viridigenalis* could be successful in mosaics of disturbed vegetation if tree replacement by native species, such as ebony, coma, and strangler fig is authorised and promoted (Enkerlin-Hoeflich and Packard 1993). If adequately promoted, pastures could instead be used as a basis for protection through education and agreements with landowners. While conservation measures should include an array of approaches, those that can rapidly reduce levels of unsustainable harvest should receive priority over more long term habitat management (Enkerlin-Hoeflich and Packard 1993). Woodlots are crucial for maintaining nesting habitat and providing germplasm for the regeneration of trees in presently treeless areas. The prevalent practice in north-eastern Mexico of clearing understorey vegetation from cattle pastures (leaving standing trees at densities of nine or more per hectare), would still provide nesting habitat for parrots in the short-term. While ranchers are becoming increasingly aware of the benefits of maintaining large trees on pastures, current pasture management schemes will continue to reduce tree density within pastures. Large expanses of land used for cattle production could be integrated into parrot conservation schemes. Given that knowledge of parrots ecology is still in its early stages, a policy of enhancing tree regeneration and maintenance of all remaining forest patches seems the safest strategy. It may be the most important component of long-term conservation, not only for *A. viridigenalis*, but for many additional species as well (Enkerlin-Hoeflich and Packard 1993).

Re-introductions have been considered for some parrot species, but given the risks inherent in such efforts (Wiley

et al. 1992) and the current status of *A. viridigenalis*, this approach does not seem to be needed or warranted. Conservation practice would benefit by considering aggregated nesting in a selection of areas targeted for management or protection of *A. viridigenalis* (Enkerlin-Hoeflich and Hogan 1997). A site- and species-specific approach for protecting known nesting areas (similar to clusters or colonies of red-cockaded woodpecker *Picoides borealis*: Haig *et al.* 1993), coupled with broader-scale but less intense protection of areas for feeding and dispersal, can be more efficient than protecting large tracts of “parrot-empty” areas. Whilst conservation of large tracks is a safe and proven strategy, it is frequently not feasible. Thus, strategies combining both conservation and development are needed, especially in developing countries such as Mexico (Enkerlin-Hoeflich 1995). CITES Appendix I listing of this species should prevent international trade, although illegal international trade from Mexico to the USA has been well documented (Gobbi *et al.*, 1996). National trapping and commercial trade of this species were banned in 1983, but more creative thought on how to implement this ban is needed.

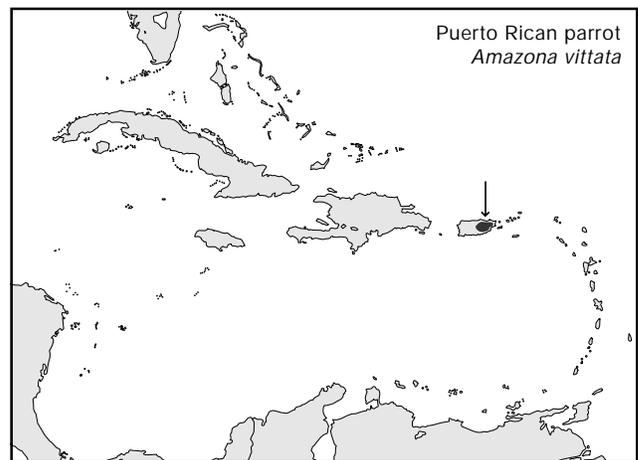
Puerto Rican parrot *Amazona vittata*

Contributors: James Wiley, Joseph Wunderle, Ann Smith, Fernando Nuñez, and Jose Chabert.

Conservation status: IUCN: Critically Endangered (D1; D2). CITES: Appendix I.

National protection status: Protected by Puerto Rico Commonwealth and United States federal laws.

Distribution and status: The endemic Puerto Rican parrot was formerly common and widespread. It occurred throughout the forested areas of Puerto Rico and the islands of Culebra (where an endemic subspecies, *A. v. gracilipes*, is extinct), Mona, and Vieques (Snyder *et al.*



1987). An estimated 100,000 parrots existed when Columbus arrived in Puerto Rico in 1493 (Wiley 1980). Now it is Critically Endangered and one of the rarest birds in the world. In 1975, only 13 parrots were known to survive in the wild (with an additional eight birds in captivity), all in the rainforest of the Luquillo Mountains (Snyder *et al.* 1987). By 1989, the wild parrot population had increased to 48 birds, but Hurricane Hugo, which swept across Puerto Rico on 18 September of that year, reduced the population to approximately 20–22 birds. As of August 1996, the Puerto Rican parrot numbered 48 wild birds and 87 in captivity.

Threats: The most important factor contributing to the decline of the parrot was the near island-wide removal of its original habitat (Wiley 1980, 1985, Snyder *et al.* 1987). Other factors included persecution by farmers, harvesting for the pet trade, and competition with and predation by native and exotic species (Snyder 1978, Snyder and Taapken 1978, Snyder *et al.* 1987). Important current threats include disease spread from exotic species of parrots, and competition with these and other species of birds and other introduced animals. The small, local (restricted to one area) population of parrots is at risk from another direct hit by a hurricane (Wiley and Wunderle 1993). There is also concern regarding genetic problems resulting from the depressed diversity of a population consisting of no more than six breeding pairs per year for three decades.

Actions: The parrot's habitat, now entirely confined within the boundaries of the Caribbean National Forest, is protected from most threats. Nevertheless, a recent threat to this reserve came from the USA Forest Service to harvest timber from the reserve in 1986. Those plans were thwarted by negative public response. The latest threat is the proposal to reopen a major highway through parrot habitat in the forest that has been closed for sometime. Through seed money from the World Wildlife Fund for Nature (WWF) and the interest of the US Fish and Wildlife Service and the US Forest Service, an intensive programme of research and conservation began in 1968. The programme has continued through to the present, with the primary involvement of the US Fish and Wildlife Service, US Forest Service, and the Commonwealth of Puerto Rico Department of Natural Resources. A captive breeding programme was begun in 1970. The captive flock consists of 93 birds, split between aviaries in the Luquillo Mountains (50 birds) and Río Abajo (43). The stock is of good genetic diversity and is genetically representative of the wild population. The first captive-produced chick was raised in 1979. That chick, as well as several other captive-produced parrots, has been used to bolster wild production through fostering into wild nests or releases of free-flying birds.

The goal of the conservation programme is to develop a strategy for the parrot's recovery, based on sound

biological data. The programme consists of (i) predator and competitor control; (ii) management of nest cavities; (iii) close guarding of active nests to maximise chick survival; and (iv) captive breeding and release.

Yellow-faced amazon *Amazona xanthops*

Contributors: Paulo Martuschelli, Carlos Yamashita.

Conservation status: IUCN: Vulnerable (A1b).
CITES: Appendix II.

National protection status: Information unavailable.



Distribution and status: This species is endemic to the formerly extensive Cerrado (dry woodland) of interior eastern Brazil (found within the states of Maranhão, Piauí, Tocantins, Goiás, Mato Grosso, Mato Grosso do Sul, Bahia, Minas Gerais, and São Paulo), eastern Bolivia, and northern Paraguay. Nearly 60–70% of this area has been converted to mechanised soybean croplands in the past 20 years and the species has become extremely scarce in many areas. It moves semi-nomadically, ranging over huge areas. Although it occurs in protected areas, such as Brasília National Park, Grande Sertões Veredas, Chapada dos Veadeiros, Chapada dos Guimarães, and Emas National Park, its nomadic nature means that no protected area can permanently hold a population (A. Whittaker *in litt.* 1993).

Threats: Habitat conversion to mechanised soybean cultivation is among the threats facing this species. Nine wild caught specimens were recorded in international trade between 1991 and 1995, with an annual maximum of four in 1994 (CITES Annual Report database).

Actions: Information is urgently required on distribution, population status, and threats.

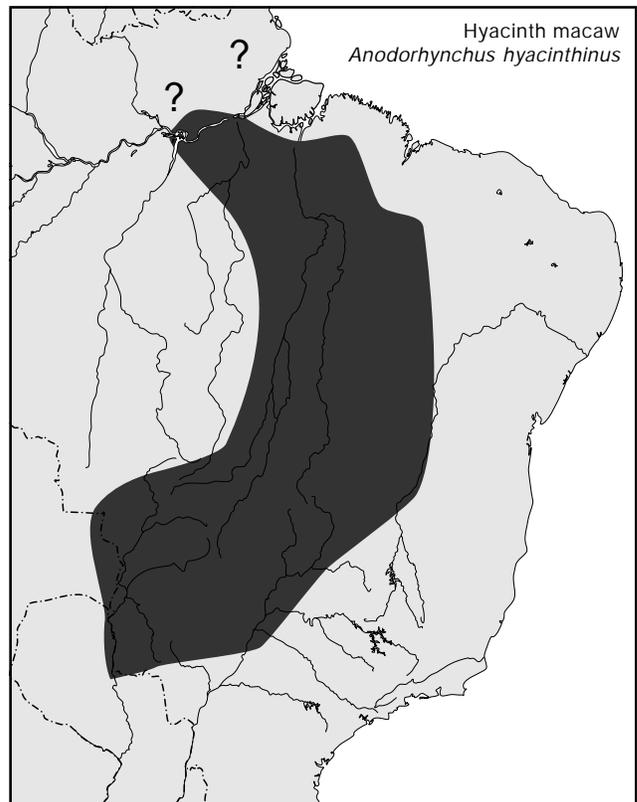
Hyacinth macaw *Anodorhynchus hyacinthinus*

Contributors: Jaqueline Goerck, Neiva Guedes, Charles Munn, and Carlos Yamashita.

Conservation status: IUCN: Vulnerable (A1c,d; A2c,d).
CITES: Appendix I.
National protection status: Protected under Brazilian law.

Distribution and status: The Pantanal population may number a maximum of 5,000 birds (N. Guedes *in litt.* 1997). Recent work in the Chapada das Mangabeiras by BioBrasil has confirmed that a population of between 1,000 and 2,500 hyacinths still thrives in the cliff and dry forest regions of south-western Piauí State, south-western Maranhão State, north-western Bahia State, and extreme eastern Tocantins State, Brazil.

Threats: Nest-trees are still often cleared to provide areas for cattle. Illegal trapping remains a problem in some areas. The hyacinth macaw is protected under Brazilian law and has been listed on Appendix I of CITES since 1987, and is thus banned from international trade. There were 54 specimens recorded in international trade between 1991 and 1995, with an annual maximum of 17 in 1993 (mostly zoo animals and pets: CITES Annual Report database). In the Pantanal, deforestation and forest burning are a serious threat to the supply of nesting trees.



Conservation of stands of the palms *Schellea phalerata* and *Acrocomia aculeata* is considered a keystone for their survival.

Actions: Accurate studies of the species' current range and population numbers in all parts of its range are needed. Investigations of the possible illegal trading of the species throughout its range are also required. Experimental ecotourism should be developed at one or two key sites. To support this work, a broad political constituency must be built to attract donors (both from Brazil and the public abroad) to broaden funding and to protect this species in the wild.

Assessing the effectiveness of experimentally erected nest boxes should also continue. Of 11 boxes hung in 1992, all but two were visited or used. The colonisation of artificial nests by aggressive Africanised bees is a problem.

Lear's macaw *Anodorhynchus leari*

Contributors: Pedro Lima, Charles Munn, Jaqueline Goerck, and Michael Reynolds.

Conservation status: IUCN: Critically Endangered (A2b; B1+2C, C1; C2b; D1).

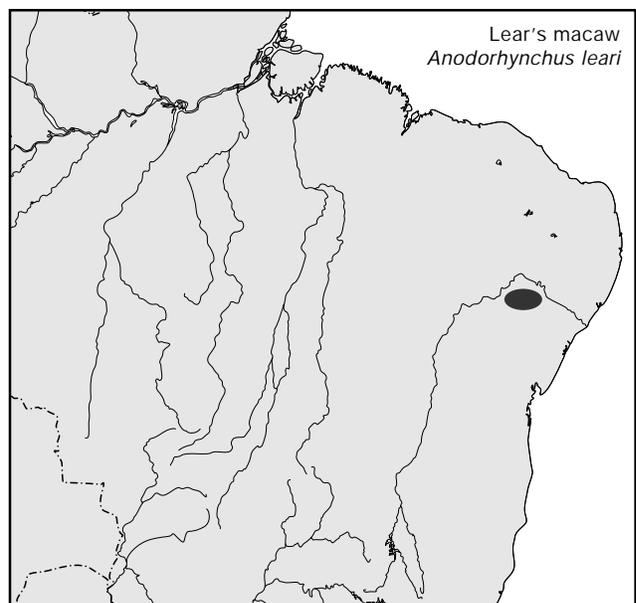
CITES: Appendix I.

National protection status: Information unavailable.

Distribution and status: This species occurs in Raso da Catarina, Bahia State, Brazil and the municipalities of Jeremoabo, Canudos, and Euclides da Cunha. Between 100 and 200 individuals are confirmed living in the wild. In 1997, Marcus de Ra counted 30 birds in a recently discovered second population. There are officially six in captivity. However, according to Yamashita and Martuschelli (*in litt.* 1997), more than 25 birds were trapped for trade over the last three years. Caught birds have been reported from Singapore, Switzerland, eastern Europe, the UK, and Brazil.

Threats: The main threat to this species is the illegal pet trade by specialised trappers who systematically catch adults and chicks with mist nets at the nest cliffs of the Toca location. This area is still only partially protected by IBAMA, the national wildlife authorities. These populations are also thought to experience food shortages as the Licuri palm nut *Syagrus coronata* experiences poor recruitment due to cattle overgrazing. This palm is a slow growing species with a long lifetime (probably several centuries).

Actions: Following the extreme drought of 1993, 50,000 *Licuri* palm seedlings were planted in plastic containers at



Fazenda Piauï near the town of Ituberá, and will be transplanted to fenced areas to protect the seedlings from livestock grazing.

In an unorthodox, but effective way to investigate the trade in Lear's macaws, the tight trading network was infiltrated with an ex-poacher-turned-conservationist. This individual proved crucial in deactivating trading within clandestine networks and providing information on key buyers and witnesses.

The recently formed BioBrasil Foundation of Bahia, Brazil, has maintained guards since 1997 at the Serra Branca nest cliffs at the suggestion and full co-operation of the land owner. A detailed plan for land acquisition and/or the establishment of reserves, including the Ecological Station close to the site, has been developed (Machado and Brandt 1990).

Priorities and funds needed to conserve this species require an absolute stop to the illegal pet trade, through

private police work in the trapping region, guarding the cliff nests, and through investigations in Rio and São Paulo. International investigations would also assist conservation of the species. It is estimated that the cost of local patrolling to stop trapping would be more cost effective and safer than trying to investigate, detain, and prosecute Brazilian and international smugglers.

Further actions for the conservation of this species should include a study of the nesting ecology to estimate reproductive success and to determine home range. Once this nesting information has been gathered, it might be possible to consider double clutching. This has been undertaken with the echo parakeet *Psittacula echo* and many others species. Additional reproductive output may require the provision of supplemental food. A further field study should describe the ranging patterns of birds at both known sets of nest cliffs, both during the nesting and non-nesting seasons. Finally, a long-term strategy should seek to mitigate the effects of long-term habitat degradation from livestock overgrazing by planting Licuri palms in safe (i.e., fenced), ungrazed locations for populations of Lear's macaw that appear to experience food shortages. Food limitations might be detectable through ranging studies and from accumulating nestling growth data in wild nests.

Great-green macaw

Ara ambigua

(also known as Buffon's macaw)

Contributors: Thomas Arndt, Robin Bjork, Eric Horstman, Niels Krabbe, Robert Pople, George Powell, Paul Salaman, and David Waugh.

Conservation status: IUCN: Endangered (A2c,d; C2a).

CITES: Appendix I.

National protection status: Information unavailable.

This is an addition to Collar *et al.* (1994) and hence the IUCN Red List. The great-green macaw has a small and isolated population in Ecuador, and low but unknown population numbers in Central America. It may well number fewer than 2,500 mature individuals, with no subpopulation greater than 250 mature birds. With many threats facing the species (including habitat loss, trapping, and persecution), a decline of 50% over three generations in terms of range and number of mature individuals is projected.

Central America and Colombia populations

Ara a. ambigua

Distribution and status: *Ara a. ambigua* occurs in humid lowland forests on the Atlantic slope of eastern Honduras,

Nicaragua, and Costa Rica, locally on both slopes in Panama, and north-western Colombia (AOU 1983, Ridgely 1982, Forshaw 1989, Sibley and Monroe 1990, Stiles and Skutch 1989). The Central America populations apparently exist in four separated subpopulations that are restricted primarily to Atlantic lowland forests. The westernmost population occurs in north-eastern Honduras and north-western Nicaragua. J. Barborak (*in litt.* 1997) reports that it is uncommon in Rio Plátano, Honduras, its primary refuge in that country. Its status in north-western Nicaragua is unknown. The second Central American population of *A.a.ambigua* is restricted to Atlantic wet forest in eastern Nicaragua and Costa Rica. Stiles (1985) reported that on the Costa Rican side, the species had been reduced to dangerously low levels and attributed its decline during the previous 15 years primarily to habitat loss and fragmentation. That situation has continued to worsen and there are now thought to be fewer than 36 pairs nesting in Costa Rica (Powell *et al.* 1996). Another discrete Central American population is a small relic of perhaps only a few individuals in the wetter forests on the southern tip of the Azuero Peninsula (D. Tovar *in litt.* 1997). The Darien populations in eastern Panama and the Chocó of western Colombia are still relatively common at least in



the Darien Biosphere Reserve (R. Ridgley 1982, G. Angehr *in litt.* 1996). In Colombia it has been reported at Los Katíos National Park and around Utría National Park in Serranía de Baudó (P. Salaman *in litt.* 1997).

The most detailed information comes from Costa Rica, where fragmented distribution reports of the species suggest that it is dependent on a diverse array of Caribbean slope forests throughout their annual cycle. The sequences of their use is not clear (Stiles and Skutch 1989, Loiselle and Blake 1992). Preliminary data from a radio-telemetry study of nesting great-green macaws in Costa Rica revealed that some individuals migrate at least 150km north into south-eastern Nicaragua during the non-breeding season (Bjork and Powell 1994).

Threats: The greatest threats to great-green macaw populations are loss of habitat, poaching of nestlings for the cage-bird trade, and to some extent, poaching birds for food. With the exception of fragmented habitat in western Costa Rica, where remaining forest remnants are in private hands, most of the Central American habitat has been given some level of legal protection. However, the declaration of large protected areas, such as the Rio Plátano Biosphere Reserve in Honduras, Bosawas and the Indio-Maíz Reserve in Nicaragua, has not stopped the destruction of remaining macaw habitat in those areas. Colonisation around and within these reserves continues to lead to extensive habitat loss.

In Costa Rica, nestlings were reported to be worth approximately US\$150 to US\$300 each. Poaching in the relatively accessible breeding range of the Costa Rican population is widespread (Bjork and Powell 1995). Although, all Psittacines in Costa Rica receive legal protection against being taken from the wild, rarely are the laws enforced; poachers have little fear of being apprehended. The situation in eastern Panama with the Darien reserve is apparently more stable. In Colombia's upper Sinú Valley in 1995, this species was trapped intensively and the area is in danger of deforestation (T. Arndt *in litt.* 1997). Eight specimens of the entire species were recorded in international trade between 1991 and 1995, with an annual maximum of five in 1995 (zoo animals, pets and pre-CITES-listing birds: CITES Annual Report database).

What may be a more immediate threat in some parts of the species range, is loss of a specific component of the forest: large trees for nesting. As exemplified in Costa Rica, in the first documented description of nesting by the species, 10 of the 11 observed ($n = 3$) or reported ($n = 8$) nests were located in natural cavities of large *D. panamensis* trees (Bjork and Powell 1995). The diameter at breast height of all these nest trees was greater than four metres. Furthermore, the seeds of this leguminous tree species are important in the birds' diet (Bjork and Powell 1995, Stiles and Skutch 1989, G. Mayne *in litt.* 1997). Until recently,

the trees were protected *de facto*, because their wood was too hard for processing in the saw mills (K. Batchelder *in litt.* 1994). Consequently, they were generally left standing in the selectively logged forests and even in the clear-cut pastures. This undoubtedly has allowed the macaws to exist in areas that otherwise have been heavily fragmented and degraded. However, the technology has recently been developed to process this wood as other, formerly abundant, hardwoods become depleted.

Actions: In Central America, it is urgent that the reserves in Honduras and Nicaragua are fully implemented and maintained as protected areas. International support of these national efforts is critical to their success and fully justified in recognition of their global significance. Hard wood of *D. panamensis* is now highly sought after (K. Batchelder *in litt.* 1994) and trees are being removed both from pastures and remaining forest. A moratorium on logging of *D. panamensis* trees was recently announced by the Costa Rican government, but its effects remain to be seen.

Ecuador populations *Ara ambigua guayaquilensis*

Distribution and status: The Guayas great-green macaw is found on the Pacific slopes of west-central Ecuador, in Esmeraldas and Guayas provinces (lowlands up to 600m, Pople *et al.* 1997). In Esmeraldas province, it is estimated that there are no more than 100 birds (Waugh 1995). In Bosque Protector Cerro Blanco, there is a remnant population that "barely survives" (Parker and Carr 1992), however a successful nesting pair was recorded there in 1994. It is recently thought that there are nine birds in the reserve (Waugh 1995). Said to be "easily seen" at Hacienda Gonzalez (40km north-west of Guayaquil, Ecuador), it is not known whether the population breeds there. Recent sightings have been confined to Machalilla National Park, the Chongón-Colonche Cordillera (in 1991: Parker and Carr 1992), and Bosque Protector Cerro Blanco which forms the end of the Chongón hill range (Parker and Carr 1992, R. Ridgely *in litt.* 1997). These rare sightings are undoubtedly of very small, relict populations. Fjeldsa *et al.* (1987: in Sibley and Monroe 1990) suggested that the population in western Ecuador is intermediate between *A. ambigua* and *A. militaris* and probably of hybrid origin.

Threats: In Ecuador, habitat loss, pet trade, and hunting as a cultivation pest appear to be the primary threats (Pople *et al.* 1997, Waugh 1995, Fjeldsa *et al.* 1987). Large scale clearance of the lowland wet and dry forests, where it occurs in very small numbers, is continuing rapidly. An illegal internal market still operates as may be evident by the number of captive birds in private hands; a minimum of 20 individuals were recorded in Guayaquil city alone (E. Horstman *in litt.* 1997) Eight specimens of the entire

species were recorded in international trade between 1991 and 1995, with an annual maximum of five individuals recorded in 1995 (zoo animals, pets, and pre-CITES-listing birds: CITES Annual Report database).

Actions: In Ecuador, Fundación Natura continues to try to confiscate birds as a deterrent to would-be owners and to dampen demand. This organisation also distributes large amounts of educational materials, which could feature *A. a. guayaquilensis* to a greater extent than at present. No known sustainable use of forest projects are operational in the region nor are any planned in the near future. Cemento Nacional, the country's largest cement-producing company, has formed Fundación Pro-Bosque which is working jointly with Fundación Natura (in a project named Proyecto Aspiazú). The aims of this group are to map all remaining forests, and to protect forested areas near Manglaralto using the community-owned forest approach. Fundación Pro-Bosque is studying the species in the Cerro Blanco Protection Forest in the Guayas Province of Ecuador and conducting an environmental education campaign.

The potential exists to use captive birds very effectively in education programs, and possibly for captive breeding purposes and release into the reserve. Fundación Pro-Bosque has the possibility to establish a great-green macaw captive centre within the Bosque Protector Cerro Blanco Reserve (BPCBR), and to receive a donated captive *A. a. guayaquilensis* from a rescue centre in Ecuador. It seems appropriate that when other conservation actions are more advanced for wild *guayaquilensis* in the reserve, the BPCBR could have a productive centre for captive macaws. Other areas of conservation activity that merit support are: (i) the continuing integration of neighbouring farmers (campesinos) into the guarding of macaws and the reserve in general by offering inducements, at least in the short-term; (ii) support for the Fundación Pro-Bosque education programme focused around *A. a. guayaquilensis*; and (iii) the centre for rescued captive *A. a. guayaquilensis*.

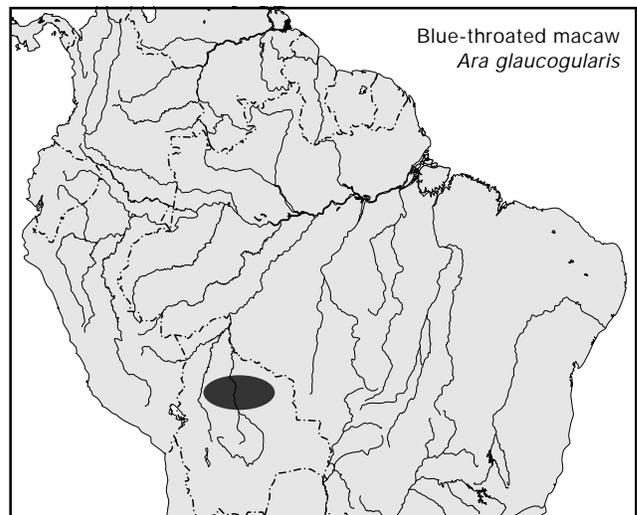
Blue-throated macaw *Ara glaucogularis*

Contributors: Paulo Martuschelli, Charles Munn, and Carlos Yamashita.

Conservation status: IUCN: Endangered (C2b; D1).
CITES: Appendix I.

National protection status: Information unavailable.

Distribution and status: This species is endemic to forest islands in the seasonally flooded Beni Lowlands (Llanos de Moxos) of Central Bolivia (Jordan and Munn 1993). The minimum population in 1994 was 54 individuals. The



most optimistic figure is 200 (Yamashita and Machado de Barros 1997). Recent estimates indicate that there are between 75 and 150 individuals in the wild.

Threats: Trapping for the pet trade could still be a problem although some protection for known populations is in place (see below). There were 14 specimens in international trade between 1991 and 1995, with an annual maximum of 12 in 1992 (probably captive-bred: CITES Annual Report database). Not enough is known of the ecology and behaviour of this species. It may always have been competitively inferior to the larger and more abundant blue-and-yellow macaw *Ara ararauna*.

Actions: A local guard of the Eco Bolivia Foundation (Bolivia) patrols known populations by foot and by motorbike. Parallel to this, the Armonía Association of Santa Cruz, Bolivia, is searching the Beni for more scattered populations of this species. It is also working on an environmental awareness campaign. This will be aimed at

the cattlemen's association to ensure trappers do not hunt these birds.

Priorities for the conservation of this species include the continuation of protection by full time guards; searching for additional populations of the species; a study of the nesting and non-nesting ecology of this bird; and a study of ecological interactions with the blue-and-yellow macaw *Ara ararauna*.

Blue-winged macaw *Ara maracana*

Conservation status: IUCN: Vulnerable (A1a,b; C1; C2)
CITES: Appendix I.
National protection status: Information unavailable.

Distribution and status: *Ara maracana* formerly occupied a large range in central-eastern South America, including parts of Brazil (Perbambuco, Piauí, Maranhão, Pará, Tocantins, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, and Rio Grande do Sul), eastern Paraguay, and northern Argentina (Misiones). Its habitat preferences include gallery forest and forest edge. It has undergone a steep decline, although it is recolonising one area in Rio de Janeiro State and may be more common there than anywhere else in its range. C. Yamashita (cited by Collar *et al.* 1994) has reported its last strongholds to include the Serra Negra in Pernambuco and the Serra do Cachimbo in southern Pará.

Threats: Habitat destruction has apparently contributed to the decline of this species, but the rate of decline suggests involvement of other factors as well (see Ridgely 1982, Forshaw 1989, Olmos 1993, Collar *et al.* 1994).

Actions: Information is urgently needed on the current distribution, population status, and threats to this species.

Military macaw *Ara militaris*

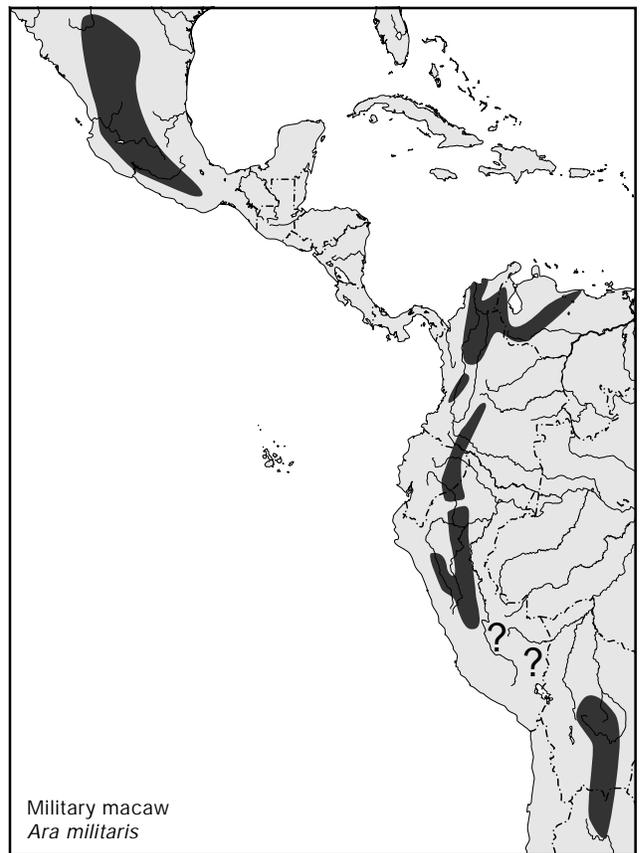
Contributors: Ernesto Enkerlin-Hoeflich, Niels Krabbe, Charles Munn, JonPaul Rodriguez, Chris Sharpe, Paul Salaman, and David A. Wiedenfeld.

Conservation status: IUCN: Vulnerable (A1c,d; C2a). Formerly Vulnerable (A1b; C2a: see Collar *et al.* 1994).
CITES: Appendix I.
National protection status: Information unavailable.

Distribution and status: This is a species with a large geographic distribution in mostly localised populations.

Its status is difficult to evaluate because these birds have ranges over large areas in rugged mountains.

In Mexico, populations are reported in and around El Cielo Biosphere Reserve in Tamaulipas, at El Naranjo in San Luis Potosí, in the Sierra Gorda de Queretaro (recently declared a Biosphere Reserve), on the Cuixmala Ecological Reserve, and other sites on the Pacific slope of the Sierra Madre Occidental. See also recent map in Howell and Webb (1995).



Military macaw
Ara militaris

The species does not currently occur in Guatemala although it may have in the past (Gardner 1972). A recent attempt to introduce captive-bred *A. militaristo* a volcanoes in south Guatemala failed.

In Venezuela, it is recorded on the north slopes of El Ávila, Guatopo, Cerro La Misión, and Sierra de Perijá National Parks. There are also apparently exceptional records of numbers in Cojedes State (Desenne and Strahl 1994), and on the northern slopes of Henri Pittier National Park (Fernández-Badillo *et al.* 1994).

In Peru and Bolivia, military macaws have a patchy distribution throughout the eastern foothills of the Andes. In Peru, flocks of 40–50 individuals are seen daily at Atalaya on the Madre de Dios. They are also seen on the upper Tambopata River up to elevations of 900m near the border with Bolivia. In Bolivia, this species occurs in small flocks on the southern edge of the Amboró National Park, and is also reported from the hills of the south central Madidi National Park (near the Canyon del Beo). It is also reported by the Native Americans to live in the forests just above or around the Pongo de Mainique of the Urubamba River, Peru.

In Colombia, little is known about the five or so disjunct populations in the central Andes (see map and description in Hilty and Brown 1986). The species was recorded recently from Guajira peninsula, Tayrona, Las Orquídeas, and Cueva de los Guácharos National Parks. At Cueva de los Guácharos National Park large flocks (up to 16 individuals) were observed daily, particularly just before dusk, flying overhead.

In Ecuador, approximately 20 individuals occur on Sumaco, and the same or less in Zamora-Chinchi. No information is currently available on the population(s) in northern Argentina.

The military macaw may be conspecific with the great-green macaw *Ara ambigua* (Fjeldsá *et al.* 1987). However, until further studies are made to establish its taxonomic status, they are retained here as separate species.

Threats: This large macaw lives in some of the most fragmented habitats in the Neotropics, the lower montane wet forests of the Andes. Its deciduous forest habitat in Mexico is in a similar state. Habitat destruction in the Andes and Mexico threaten the viability of many local populations. Surprisingly, *A. militaristo* is still traded nationally in Mexico and other countries (Gobbi *et al.*, 1996).

Actions: Many populations need to be surveyed to assess its status and habitat use. In Mexico, the use of “sinkholes” (cenotes) as an ecotourism spectacle could have some potential (for example at Sierra Gorda and El Cielo Biosphere Reserve), although it is unknown whether human presence will interfere with successful nesting. In the case of the El Cielo sinkhole, where at one time over 50 birds

circled in and out of the sinkhole several times a day, the population was decimated by a single trapper in the mid-1980s (Aragón-Tapia *in litt.* 1989). The populations in Peru and Bolivia require detailed surveys.

In Venezuela, controls on national movement and sales, although difficult to implement, could help all parrot species. Fortunately, most of *A. militaristo*' range falls within existing protected areas (El Ávila, Guatopo, Henri Pittier, and Sierra de Perijá National Parks). Nevertheless, although this may reduce the speed at which habitat is lost, it does little to prevent capture for trade. Improved methods of enforcement are needed. Sierra de Perijá is in a particularly bad situation, being deforested for narcotics, land speculation, and cattle.

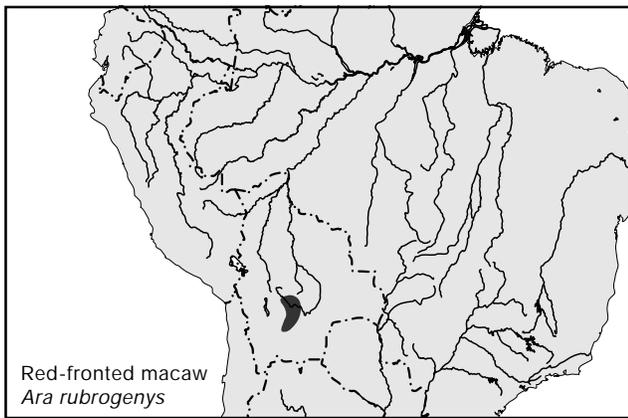
Red-fronted macaw *Ara rubrogenys*

Contributors: Mette Bohn Christiansen, and Elin Pitter.

Conservation status: IUCN: Vulnerable (C1). Formerly considered Endangered (C2a; D1: see Collar *et al.* 1994). CITES: Appendix I.

National protection status: Information unavailable.





Distribution and status: This species is endemic to Bolivia, where it inhabits fairly arid, scrubby inter-montane valleys in south-central Bolivia (Santa Cruz, Cochabamba, and Chuquisaca provinces: Collar *et al.* 1992). Found from 1,100 to 2,500 metres. The species is resident and locally common here, but is restricted to the drainage areas of the Mizque, Grande, and Pilcomayo rivers. Pitter and Christiansen (1995) estimated the total population at 2,000–4,000 individuals and do not believe it to be “severely fragmented” as was suggested previously (Collar *et al.* 1992). Since they occur in gallery forests of large rivers, the populations are believed to be interconnected. In two areas studied, populations seemed healthy and stable, although a local trapper noted that the population had declined during the last 12 years due to habitat destruction and trapping.

Threats: Although the situation is not considered critical, rapid conversion of riparian habitats to agricultural land is forcing *Ara rubrogenys* to feed in other drier areas and on domestic crops. Nearly 40% of its original habitat may have been already destroyed (Clarke and Durán Patiño 1991). It is locally considered a serious pest to maize cultivation, and is persecuted by farmers. Trapping for the pet trade also threatens this species and still continues along the Chico River and Vallegrande. There were 23 specimens recorded in international trade between 1991 and 1995, with an annual maximum of 14 in 1994 (pets and zoo animals: CITES Annual Report database). The birds nest semi-colonially in cliffs, making them particularly vulnerable to trapping and nest destruction.

Actions: Further protection of the habitat of *Ara rubrogenys* should be a high priority. Although locally common, the conservation situation can change rapidly, since pressures to develop agricultural lands along rivers is increasing. Methods to minimise attacks on maize crops should be designed with local farmers. Several large conservation and development projects are working in the area; these should focus on maintaining natural semi-deciduous vegetation on the edges of rivers, both for the red-fronted

macaw and for local people. Fencing of key patches of gallery forests will limit cattle grazing and allow regeneration of natural vegetation.

Golden-capped parakeet *Aratinga auricapilla*

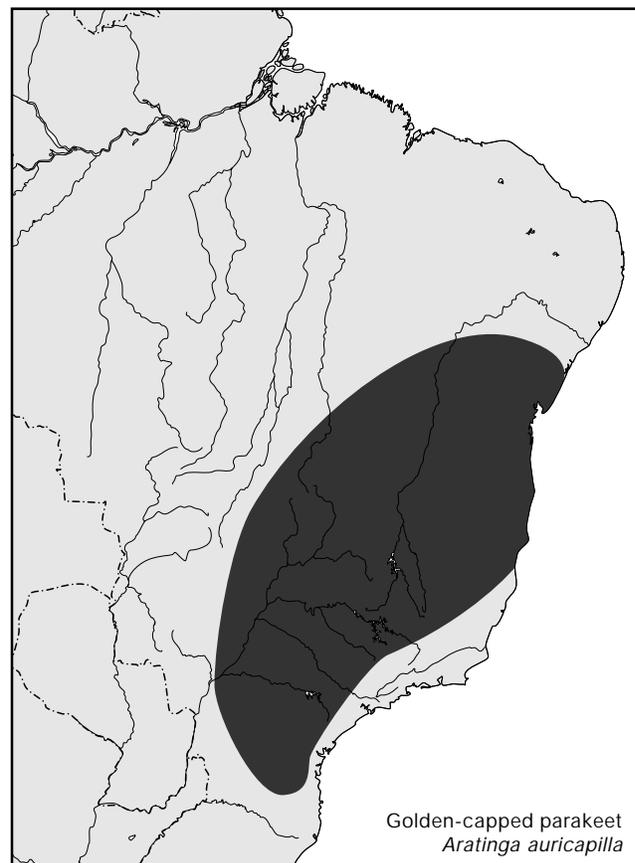
Contributors: Rita Cerqueira de Souza, Paulo Martuschelli, Fábio Olmos, and Carlos Yamashita.

Conservation status: IUCN: Vulnerable (A1a,b; C1; C2a).
CITES: Appendix II.

National protection status: Information unavailable.

Distribution and status: The golden-capped parakeet is found in semi-deciduous forests of the Paraná River Basin, Brazil, occurring in the following states: Goiás, São Paulo (Lins, Guararapes, Ilha Solteira, and Agua Vermelha), Paraná, Minas Gerais (Vale do Jequitinhonha, Furnas do Bom Jesus), Bahia, and Espírito Santo. It has disappeared from much of its original range. In São Paulo state for example, whilst there are many records of skins, there are no signs of this species today.

Threats: Habitat destruction for coffee, soybean, and sugar cane plantations occur in São Paulo. Cattle ranching



is a serious problem in Goiás and Minas Gerais. There were 16 specimens recorded in international trade between 1991 and 1995, with an annual maximum of 10 in 1991 (CITES Annual Report database).

Actions: Information is urgently required on distribution, population status, and threats.

Socorro parakeet *Aratinga brevipes*

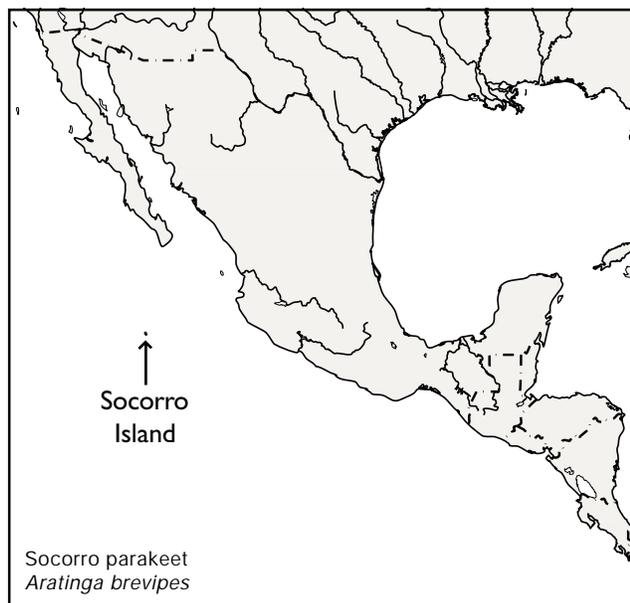
Contributor: Ernesto Enkerlin-Hoeflich.

Conservation status: IUCN: Vulnerable (D1).
CITES: Appendix II (as *Aratinga holochlora*).
National protection status: Threatened in Mexico (NOM-ECOL-059-1994).

Distribution and status: The Socorro parakeet is found only on Socorro Island in the Revillagigedo Islands southwest of the tip of Baja California. The population in 1991 was estimated to be 400–500 birds and numbers appear to be stable (Rodríguez-Estrella *et al.* 1992).

Threats: The range of this species is thought to have contracted over the past 30 years. Overgrazing by sheep may be degrading the parakeets' habitat, and predation by introduced cats remains a potential threat (Rodríguez-Estrella *et al.* 1992).

Actions: Although the Socorro parakeet is not presently threatened, the spread of soil erosion caused by overgrazing by sheep could put the status of this and other endemic birds species at risk.



Hispaniolan parakeet *Aratinga chloroptera*

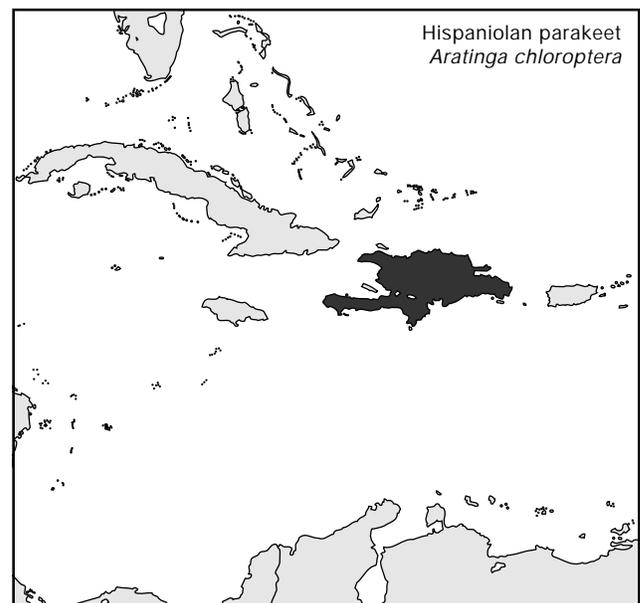
Contributor: James Wiley.

Conservation status: IUCN: Vulnerable (C2a).
CITES: Appendix II.
National protection status: Information unavailable.

Distribution and status: This species is endemic to Hispaniola, including the offshore islands. Formerly common throughout Hispaniola and on several offshore islands with suitable habitat. Still fairly common in undisturbed habitat, but elsewhere the Hispaniolan parakeet is rapidly declining in numbers and reduced in distribution. Whilst not found in the Massif de la Hotte, Haiti, it is found in the Morne la Selle (Woods 1982, Woods and Ottenwalder 1987, 1992). Introduced and established locally in Puerto Rico (Lever 1987, Raffaele and Kepler 1992). Dod (1992) considers the parakeet declining toward extinction.

Threats: Hispaniolan parakeets are not favoured as captives, but they are severely persecuted as crop pests. The most serious threat is from habitat loss (Wiley 1991). There were 12 specimens in international trade between 1991 and 1995, with an annual maximum of eight in 1994 (CITES Annual Report database).

Actions: The parakeet is protected by law against hunting and harvesting for pets in the Dominican Republic, although its legislation is not adequately enforced to ensure the species' continued survival. Even though several nature reserves and national parks have been established in the Dominican Republic, protection has not been



sufficient to save the parakeet from total eradication in some of these, such as in the Parque Nacional Los Haitises. Additional areas need protection and all areas should be provided with better enforcement of wildlife protection laws. The Hispaniolan parakeet has been successfully bred in captivity (e.g., Ottenwalder 1980, Low 1991, van der Heyden and Paulmann 1987), although captive propagation is not a conservation need at this time.

Cuban parakeet *Aratinga euops*

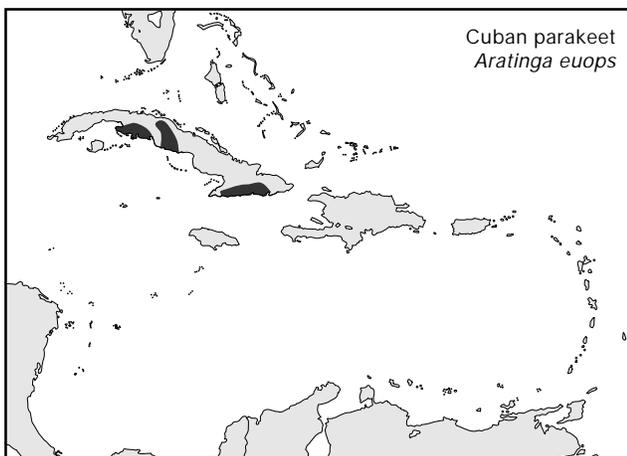
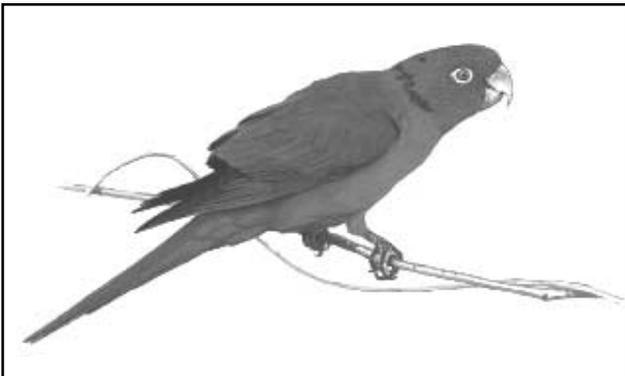
Contributors: Xiomara Gálvez, and James Wiley.

Conservation status: IUCN: Vulnerable (A1c,d; B1+2c; C1; C2a).

CITES: Appendix II.

National protection status: Information unavailable.

Distribution and status: The Cuban parakeet is endemic to Cuba, where it has declined and now has a fragmented distribution. It remains fairly common in Peninsula de Zapata, Trinidad mountains, Sierra de Najasa, and in the eastern part of the island. With the exception of Peninsula de Zapata, the parakeet is absent from the western



provinces. In Central Cuba, it occurs in Guasimal, Trinidad, Peralejo, and Camagüey (Najasa). It is found also in the eastern provinces of Holguín, Santiago de Cuba, and Guantánamo. Formerly common on the Isla de la Juventud (formerly Isla de Pinos), it was extirpated there in the late 1800s. Gálvez (1996a and b) considers the species seriously endangered. Of 14 populations studied, four are in serious decline. Paradoxically, while *A. leucocephala* has been increasing its effective population size (in response to intense habitat manipulation and protection), *Aratinga euops*, the only true endemic species of Cuban psittacid, is close to extinction.

Threats: The parakeet is in less demand as a pet than the Cuban amazon *A. leucocephala*, although 10 specimens were recorded in international trade between 1991 and 1995, all in 1995 (CITES Annual Report database). The main cause of its decline has been large-scale destruction of forest and the dependence of *A. euops* on dead palms for nest sites (*Roystonea regia* and *Sabal palviflora*: de las Pozas and González 1984, Gálvez 1996a,b). This rigid nest site preference appears to make the parakeet more vulnerable than *Amazona leucocephala*, which exhibits more flexibility in its nesting behaviour. Habitat alteration and the exposure of individual palms results in nesting sites becoming more vulnerable to the effects of fires, hurricanes, and human disturbances.

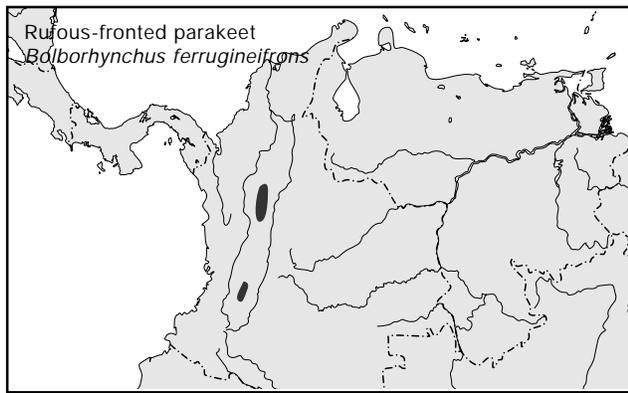
Actions: The parakeet is protected by law and receives additional protection within seven environmental reserves, including the Ciénaga de Zapata National Park and Refuge, and six other sites administered by the Empresa Nacional para la Conservación de la Flora y la Fauna. Further research is needed on the species' biological requirements, especially its nesting habitat needs. Additional habitat must be conserved for the parakeet. Given its small and fragmented populations, conservation efforts for this species should be locally tailored and should include environmental awareness campaigns and protection of nesting sites (dead palms). Ecotourism programmes in the areas of Mogotes de Jumagua and Hanabanilla have been initiated. This species has not bred in captivity despite numerous attempts. A plan to translocate mainland Cuban parakeets to the Isla de la Juventud is being developed to re-establish the extirpated population.

Rufous-fronted parakeet *Bolborhynchus ferrugineifrons*

Contributors: Luis Miguel Renjifo, and Paul Salaman.

Conservation status: IUCN: Endangered (B1+2c; C2a; D1). CITES: Appendix II.

National protection status: Information unavailable.



Distribution and status: This species is endemic to the shrublands in the temperate forest-páramo ecotone (3,200–4,000m) of the Central Andes of Colombia. It is known from a few specimens and observation in the Puracé Volcano in Cauca, and the Ruiz-Tolima volcanic massif complex along the junction of Caldas, Risaralda, Quindío, and Tolima. It may occur in the páramos of Las Herosas along the border of Tolima and Valle del Cauca, and in Nevado del Huila at the junction of Cauca, Huila, and Tolima (Graves and Giraldo 1987, Collar *et al.* 1992); the latter two areas are located between Tolima and Puracé Volcanoes.

Although this species is a páramo and a forest-páramo ecotone inhabitant, it has been recorded in areas as low as 2,835m (Ridgely 1982). Little is known of the natural history of this species. A few sightings indicate that this species eats grass seeds (Graves and Giraldo 1987) and achenes of *Espeletia hartwegiana* (Renjifo 1991, J. Hernández *in litt.* 1995), and nests in burrows in banks (D. Uribe *in litt.* 1996, J. Hernández *in litt.* 1997). The total population has been estimated at 1,000–2,000 individuals (Graves and Giraldo 1987) but is perhaps lower (Collar *et al.* 1992). Rufous-fronted parakeets were seen in 1993 and 1994 between 3,000m and 3,900m in Los Nevados National Park (Salaman and Giles *in litt.* 1997).

The species' habitat is far from intact. The species is considered common by farmers in the vicinity of Laguna del Otún. The rufous-fronted parakeet was observed twice (four and six individuals respectively) during circa 30 days of bird censuses over a one year period. Other rare parrots such as *Hapalopsittaca fuertesi* were seen more often (Renjifo 1991). *B. ferrugineifrons* may be more at risk than previously suspected.

(See multi-species remarks in *Ognorhynchus icterotis*.)

Threats: Information on wild *B. ferrugineifrons* appears to have been so scarce because of its restricted range, and particularly because of its specialised niche in the forest-páramo ecotone. Although this zone, the “potato-belt”, has been highly modified, it still appears suitable for the species and most recent observations are from agricultural fields.

Given the species' apparent preference for feeding in old fields it seems questionable that deforestation poses an immediate risk. It would also appear that, like *B. orbynesius*, the species nests in ground burrows on a cliff-face/steep slope, thus tree-cavity nests largely restricted to old growth forest do not seem to limit nesting resources. Other, more subtle medium-term changes may be affecting this and other parrot species within its range, these include agricultural intensification (e.g., widespread use of herbicides), and increasing páramo overgrazing and burning.

The two areas from which the species is known are currently located within national parks, namely Los Nevados National Park and Puracé National Park. Nevertheless, extensive habitat loss has occurred and is still continuing within these and other areas where the species could potentially be found (N. Gomez and W. Vargas *in litt.* 1997, L.M. Renjifo *in litt.* 1997). The underlying problem is that although these areas have received legal protection, the Colombian State has been unable to purchase pre-existing landholdings within the national parks. As a result, extensive overgrazing, seasonal páramo burning to obtain new sprouts for cattle, and agriculture to a minor extent, are modifying most of the range of this species within and outside “protected” areas. Failure to protect the remaining good quality habitat and to restore altered habitat will result in further decline of this already endangered species.

Actions: Clearly, studies of the species population movements and its densities and distribution would be ideal; threats could be clarified and future conservation action proposed. Also, confirmation of nesting habits is very important in assessing the species' conservation priority.

Grey-cheeked parakeet *Brotogeris pyrrhopterus*

Contributors: Niels Krabbe, Michael Parr, Felipe Campos, and David Wege.

Conservation status: IUCN: Endangered (A1b, c,d).

CITES: Appendix II.

National protection status: Information unavailable.

Distribution and status: This species is endemic to deciduous and dry forests of south-west Ecuador and extreme north-west Peru and occurs in the Manabi south and Los Rios, Guayas, Azuay to Loja and crosses into Peru in the Tumbes and Piura regions (Juniper and Parr 1998). Two main and possibly disjunct populations exist, one in the coastal area of Manabi and Guayas in Ecuador and a second in the Ecuador and Peru border (Juniper and Parr



1998). Birds are seen in small groups and feed on a variety of local fruits and sometimes in local maize and banana crops (Best *et al.* 1995).

Threats: An estimated 59,320 birds were recorded in international trade between 1983 and 1988 (Best *et al.* 1995). It is suspected that the population may have declined by more than 70% in the last ten years (Juniper and Parr 1998). Although locally common, local trade and accelerated habitat destruction (Campos *et al.* 1998) may have led to catastrophic pressure being exerted on existing populations.

Actions: International trade is banned from both Ecuador and Peru (Juniper and Parr 1998). The bird occurs in four protected areas: the Cerro Blanco protected forest, Arenilla military reserve, and Manglares Churute Ecological reserve in Ecuador; and the Tumbes Reserve Zone in Peru. Rapid habitat destruction for marginal cattle and goat herding are the main threats. Priority actions include an education

campaign and further research of the species habitat needs and population size.

Spix's macaw *Cyanopsitta spixii*

Contributors: David Waugh and Carlos Yamashita.

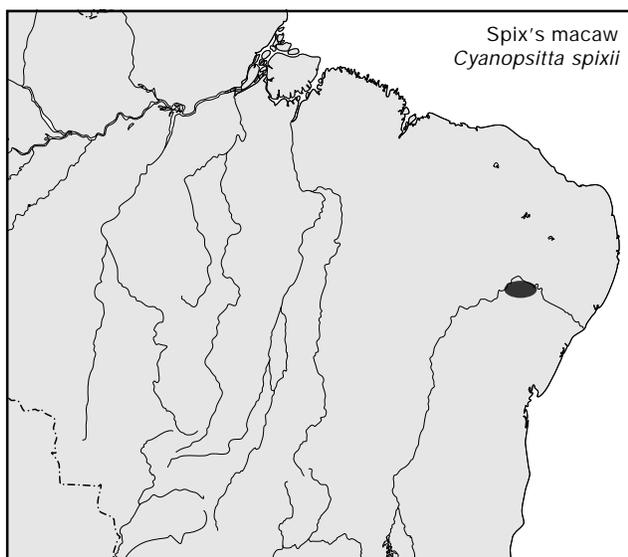
Conservation status: IUCN: Critically Endangered (D1; D2). CITES: Appendix I.

National protection status: Protected by Brazilian legislation.

Distribution and status: With only one known bird remaining in the wild, and at least 42 in captivity spread over three continents, the Spix's macaw is one of the most threatened parrot species in the world. Its Caraiba woodland habitat has suffered long-term habitat destruction, and has always been a small and scarce habitat within the more widespread Caatinga woodland and scrub of the dry to semi-arid region of north-east Brazil. However, the trapping of adult birds has been the most significant force in its population decline. In 1995 a wild caught female was re-introduced from captivity. During the second month the female paired with a wild male though after this second month the female could not be found.

Threats: The Spix's Caraiba woodland habitat has suffered habitat destruction for a very long time, possibly centuries. The trapping of adult birds during the 1970s was the main cause for the recent decline of an already threatened species with a very restricted range. With only one lone male remaining in the wild, and all other known individuals in captivity, strong co-ordination of the captive breeding programme is the only hope for this parrot. However, co-ordination among parties has not been entirely transparent, despite efforts by the Brazilian authorities and the Recovery Committee (see below). Prospects for the captive breeding





programme are not optimistic. As a former holder of this parrot, Smith (1991) commented: "The truth is that captive breeding attempts so far have been appalling. The few reared do not make up for the numbers of adults that have died, and continue to die". There is scant information on the most recent captive-rearing results, and they do not tend to offset this pessimistic outlook. All parties should remember that time is the most critical factor in the conservation of Spix's macaw (Collar *et al.* 1992, Reynolds 1997).

Actions: An extensive account of previous actions is reported by Collar *et al.* (1992: 266–282). A meeting co-ordinated by the CBSG (Captive [now Conservation] Breeding Specialist Group of the Species Survival Commission of IUCN-The World Conservation Union) at Loro Parque, Spain in 1987, established the basis for combined *in situ/ex situ* action. In 1989 the Brazilian Government formed a Special Working Group on the Spix's macaw, followed in 1990 by the establishment of the Permanent Committee for the Recovery of the Spix's macaw (CPRAA). Also, in October 1990 the Brazilian government issued a decree (Portaria 2161) providing amnesty to current holders of captive specimens that agreed to participate in the Permanent Committee to manage the captive populations. A Population and Habitat Viability Analysis (PHVA) was carried out in Brazil in October 1992. A workshop of the CPRAA at the 1989 CITES meeting in Lausanne recommended the re-introduction from captivity of the female Spix's macaw, released in 1985. Although it is considered of high priority to establish, finally, whether further Spix's macaws occur in the wild, after various searches this now seems unlikely. Since 1990 a major *in situ/ex situ* combined programme has been in operation under the direction of the CPRAA. This includes management of the global population, with 42 captive birds (all the Spix's macaws declared to IBAMA/CPRAA) held by some

members of the CPRAA. New pairings are expected to increase breeding success from the presently low rate of captive reproduction. However, recent negotiations for movement of individuals among breeding facilities have often been tortuous. Rumours of captive Spix's macaw individuals outside the declared population tend to surface at regular intervals, but none have been verified.

The field programme is studying the species' ecological needs and is preparing the ground for an eventual re-establishment of the species in the wild. As a prerequisite for re-introduction, protection efforts for remaining habitat in addition to habitat restoration are in progress, as are botanical studies in view of the paucity of information on exact habitat requirements. The possible need for habitat management is also being examined. An assessment of the extent of Caraiba gallery forest forms part of this work. The possibility of purchasing important areas of Caraiba should also be considered. The field programme also includes a strong element of local community involvement, with school-house construction, provision of an environmental/cultural centre, and training of teachers and students from local colleges and universities.

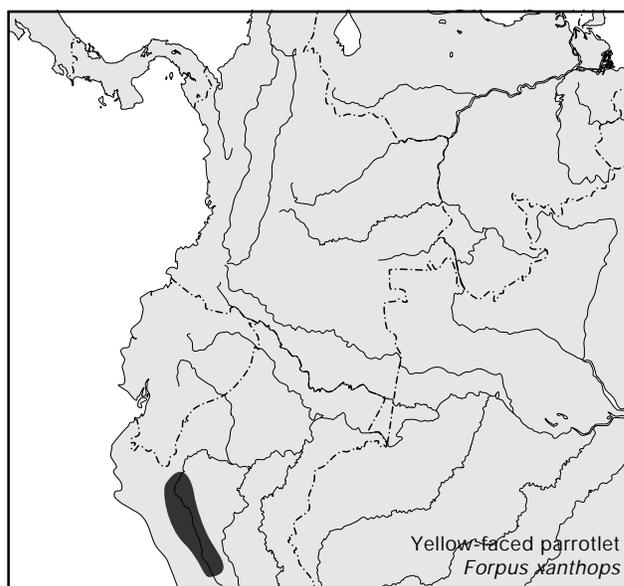
Yellow-faced parrotlet *Forpus xanthops*

Contributors: Alfredo Begazo, Charles Munn, and Thomas Valqui.

Conservation status: IUCN: Vulnerable (A1a,c; B1+2c,e; C1; C2a).

CITES: Appendix II.

National protection status: Resolucion Directorial No. 014-83-DGFF prohibits capture and trade in this species, effective 1983.



Distribution and status: The yellow-faced parrotlet occurs in the arid woodland, riparian thickets, and desert scrub of the upper Marañón valley at 600–1,700m in three areas (southern Amazonas, Cajamarca, and extreme eastern La Libertad) in north-central Peru (Girdler 1982, Riveros *et al.* 1991, Begazo 1996).

Threats: Trapping for the domestic pet trade is the main threat to this species. Captive birds suffer very high mortality rates. Its typical habitat is not well suited for agriculture or intensive grazing. Some habitat loss by subsistence farmers and their goat herds may be occurring in the region.

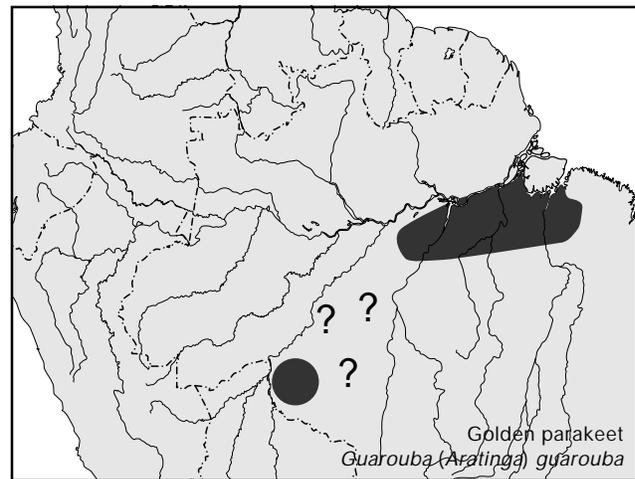
Actions: This species may require a back-up population in captivity as the wild birds are unlikely to attract ecotourism or other attention that might lead to habitat protection. In the Huallaga valley it is not yet possible to predict whether conservation is possible over the short, medium, or long-term. This area is a major coca producing area and the social, political, and the environmental situation is very unstable. This species seems to do well in forest patches comprising of secondary growth and original forest. Therefore it may not need primary habitat. Possibly only two to three families trap this species, which has low local value because of its similarity with *Forpus coelestis*. Given also that the birds breed in colonies in rocky ravines, it might be possible to effectively involve key local people in conservation efforts (A. Begazo *in litt.* 1997).

Golden parakeet *Guarouba (Aratinga) guarouba*

Contributors: Paulo Martuschelli, and Carlos Yamashita.

Conservation status: IUCN: Endangered (A2c,d; C1; C2b).
CITES: Appendix I (as *Aratinga guarouba*).
National protection status: Information unavailable.

Distribution and status: The golden parakeet is restricted to Brazil, where it occurs in northern Maranhão (comprising of five localities, four of them close to or



within the Gurupi Biological Reserve), south-eastern Amazonas, northern Pará (many localities all north of 5°S), and north-central Matto Grosso. Recently the species has been recorded from Rondônia. The most important area is in Pará state, between the Tocantins and lower Xingú Rivers. This species appears to roam widely and is not predictably found in one area at any given season.

Threats: This species suffers from both the destruction of its (almost exclusively *terra firme*) rainforest habitat and illegal trapping (being a much desired aviary bird, both internationally and nationally) and hunting for food. Its main distribution range is centred in an area of land conflicts between farmers, ranchers, forest loggers, Indians, and landless peasants, including the controversy over mining at the Carajas site (Serra Leste). In the eastern part of the range (the Tocantins-Xingú area) illegal logging and mahogany exploration is resulting in habitat destruction. As *Guarouba* roosts in tree cavities at night it is relatively easy to trap.

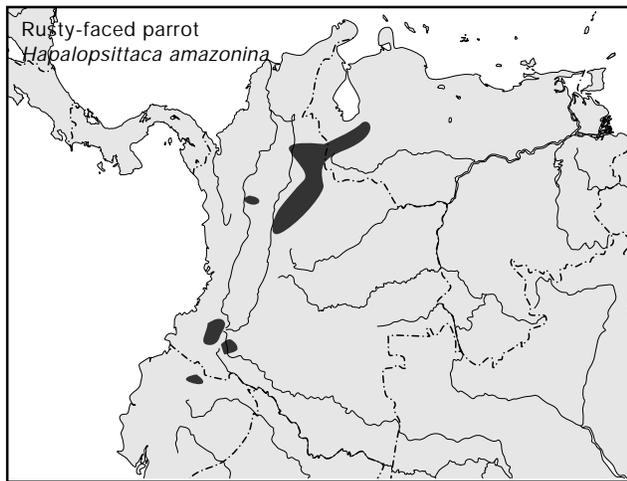
Actions: Information is urgently required on its distribution (including habitat use), status, and threats.

Rusty-faced parrot *Hapalopsittaca amazonina*

Contributors: Luis Miguel Renjifo, JonPaul Rodriguez, Franklin Rojas-Suarez, and Chris Sharpe.

Conservation status: IUCN: Endangered (A1c; A2c; B1+2c,d; C1).
CITES: Appendix II.
National protection status: Information unavailable.

Distribution and status: The rusty-faced parrot is confined to Colombia and Venezuela, are is very local throughout its range. In Venezuela, *H. a. teresaee* occurs in Mérida and



northern Táchira states, from 2,000–3,000m. It is found mainly in the Sierra Nevada National Park, but also in Páramos Batallón and La Negra National Park. A small population may also exist in La Carbonera on the north-west side of the Rio Chama. *H. a. amazonina* occurs in El Tamá and apparently also in Sierra de Perijá National Park (Desenne and Strahl 1994). In Colombia it is found in Norte de Santander, Santander, Cundinamarca, Caldas, and possibly Cauca and Huila. Of the three subspecies, one is endemic to Colombia (*H. a. velezi*), one (*H. a. amazonina*) occurs mainly in Colombia and whose range marginally covers Venezuela, and the third (*H. a. theresae*) is endemic to Venezuela. The two protected areas of relevance to the species in Venezuela are the most threatened areas in the country: Tamá National Park (which may have a population of *H. a. amazonina*) and Sierra Nevada National Park (the only conservation area in existence for *H. a. theresae*). In Colombia the species is recorded in protected areas including Chingaza National Park, Puracé National Park, and Cueva de los Guácharos National Park. It is not known whether it frequents these areas only seasonally. A well protected but probably small population of *Hapalopsittaca amazonina velezi* is found in the Rio Blanco watershed in the outskirts of the city of Manizales. Here the species seems to be a permanent resident (D. Uribe *in litt.* 1996). The area lies within the city boundaries and is conserved for watershed protection. Probably fewer than 1,100 individuals (of both subspecies) occur in Venezuela (Rodriguez and Rojas-Suarez 1995) and population trends are not known.

Threats: In Venezuela, the loss of habitat for cattle raising, subsistence agriculture, and settlements is the main threat to this species. The Andean forests where this species is found are becoming increasingly fragmented. However, even in suitable habitats the species is rare.

Actions: Research should be carried out on the distribution and ecology of the species to clarify whether the existing

protected area system is adequate to ensure the survival of the three subspecies. Preparation of a long-term management plan and protection of Sierra Nevada National Park in Venezuela is also needed. Unprotected forests in the Andes need identifying and require urgent protection, not only for this species, but also for the 25 other endemic birds found there (Collar *et al.* 1992). Currently the environmental group PROVITA is targeting this species in Venezuela. The first steps must be a census and ecological study of their breeding biology and habitat requirements.

Azure-winged parrot *Hapalopsittaca fuertesi*

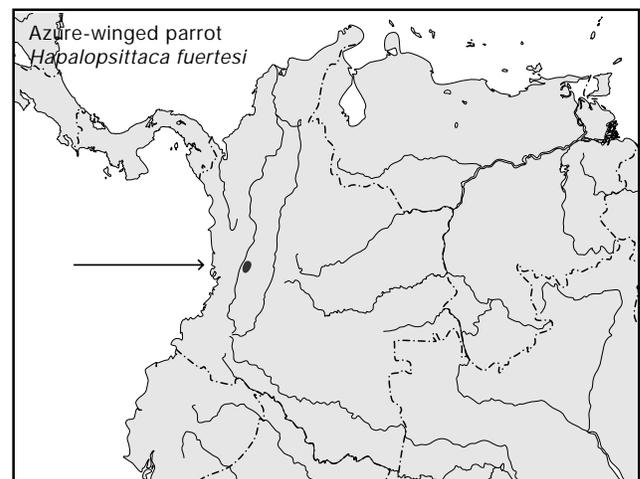
(Fuentes's parrot in Collar *et al.* 1994. Name changed here to conform to Colombian usage.)

Contributor: Luis Miguel Renjifo.

Conservation status: IUCN: Critically Endangered (D1; D2). CITES: Appendix II.

National protection status: Information unavailable.

Distribution and status: The azure winged parrot is known only from the humid temperate forest on the western slope of the central Andes of Colombia in the Alto Quindío, Quindío area. This area is found close to the border of Risaralda, and Tolima areas. The species is known to survive only in the Acaime Reserve and in the Quindío Canyon (2,600–3,500m), where the population is thought to be less than one hundred individuals. It may also occur in the adjacent upper parts of the Toche Canyon. Unfortunately, this pass is being cleared. Local habitat protection efforts such as purchasing discrete parcels of forests can protect impressive forested habitats and would be more effective for this species than for *Ognorhynchus* or *Leptosittaca*. *H. fuertesi* appears to be rather sedentary but is difficult to observe because of its reticent behaviour (as with other species of the genus *Hapalopsittaca*). Often,



the only evidence of their presence is their rather soft vocalisations (which are different between *H. fuertesi* and *H. amazonina*).

(See multi-species remarks in *Ognorhynchus icterotis*.)

Threats: In many parts of its potential range the threat of habitat loss and fragmentation is severe.

Actions: Highest priority should be given to supporting Alto Quindío, where the ecology of azure-winged parrot, especially with respect to feeding and breeding, should be researched, and every step taken to ensure optimum management to maximise the population there. The Los Nevados National Park (and the adjacent Navarco Nature Reserve) should be surveyed for the possible occurrence of this species. Appropriate management should follow if it is found to exist in these areas. The remnant patch of forest in which it may have been sighted in 1980 and adjacent habitat should also be investigated and protected. Institutional support for Fundación Herencia Verde will assist in maintaining their Acaime private reserve.

Red-faced parrot *Hapalopsittaca pyrrhops*

Contributors: Jeremy Flanagan, and Paul Toyne.

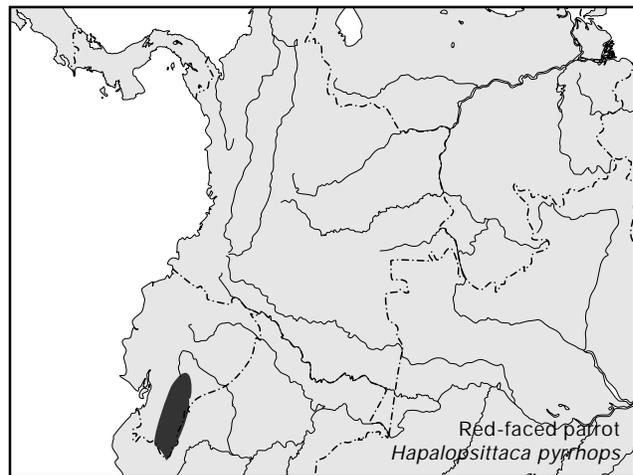
Conservation status: IUCN: Endangered (A1b; A2b; B1+2c; C1; C2a; D1).

CITES: Appendix II.

National protection status: Information unavailable.



Left to right: *Hapalopsittaca pyrrhops*, *H. fuertesi*, *H. amazonina*



Distribution and status: The red-faced parrot is restricted to high Andean cloudforests on the eastern slopes of the Andes of Ecuador (Morona Santiago, Azuay and Loja provinces) and in the adjacent Piura province of Peru. In this area it is rare and uncommon. Surveys in the Podocarpus National Park of Loja Province, from Cajanuma to Yagana reveal that the parrot occurs in low density and is rarely seen in flocks of more than six individuals (Rasmussen *et al.* 1996, Toyne unpublished data). This species is found in greater abundance in the north of Loja Province around the Saraguro area, where surveys located a sedentary population in the community-owned conservation area at Huashapamba (Toyne unpublished data). Selva Alegre forest in north Loja Province, located on the Saraguro-Manu road (see Toyne *et al.* 1995 for details), has a sedentary population of around 20 individuals. A maximum flock size of 29 individuals was recorded by Jacobs and Walker (1999). This small forest patch is heavily degraded by tree clearance and cattle grazing. Red-faced parrots were found to inhabit the fragmented forests around Saraguro e.g., Torr e and El Sauce, Lomo del Oro (Toyne and Flanagan 1996, 1997, Jacobs and Walker 1999). Two pairs with young were recorded at P ramos de Matanga in early 1995/6 (Krabbe *et al.* 1997). Cerro Chinguella in northern Peru, where Parker *et al.* (1982) twice recorded red-faced parrots in the 1970s, still has large tracts of undisturbed cloud forests; however, in a seven day survey in 1996, no *H. pyrrhops* were recorded (Toyne and Flanagan unpublished data).

Threats: The main threat to this species is habitat loss principally through fragmentation from human encroachment (cattle ranching and timber collection for construction and fuel). How tolerant red-faced parrots are to habitat degradation remains uncertain.

Actions: Conservation efforts must be directed to the remaining cloud forests of the Saraguro area where red-faced parrots are found in greater abundance (Toyne

1996). The feasibility of a network of connecting Andean forests should be explored (Toyne and Flanagan unpublished data, see *L. branickii*). Efforts should be made to protect the forest patch between Selva Alegre and Manu in the Chilla mountains.

It is of paramount importance that all mining activities in the Podocarpus National Park are stopped. This would secure habitat for three globally Endangered parrots: The golden-plumed parakeet *Leptosittaca branickii*, the white-breasted parakeet *Pyrrhura albipectus*, and the red-faced parrot *Hapalopsittaca pyrrhops*. In Peru, surveys are required to assess whether viable populations of the species survive, and assess what options for their conservation exist.

Golden-plumed parakeet *Leptosittaca branickii*

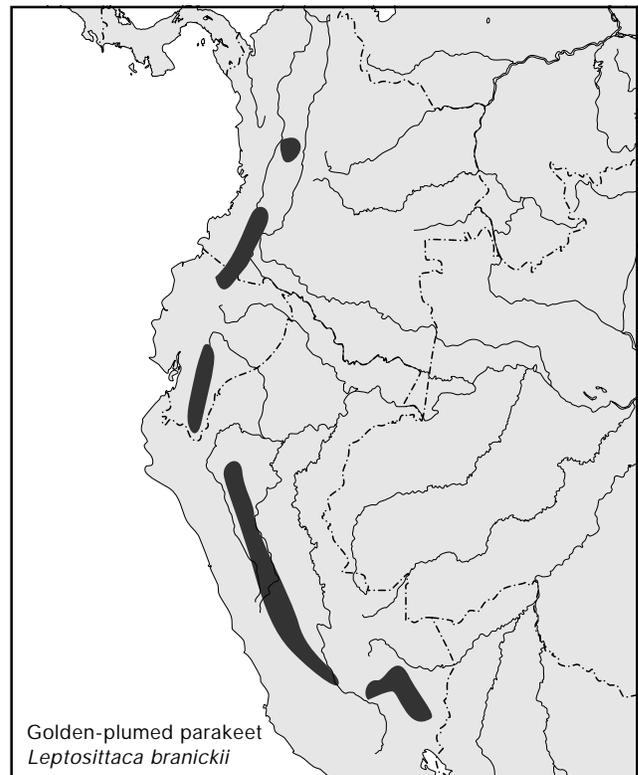
Contributors: Jeremy Flanagan, Gustavo Kattan, Paul Salaman, and Paul Toyne.

Conservation status: IUCN: Vulnerable (A1b; A2b; C1; C2a).

CITES: Appendix II.

National protection status: Information unavailable.

Distribution and status: The golden-plumed parakeet is distributed throughout the Andes from central Colombia to southern Peru. It inhabits temperate cloud forest and elfin woodland usually at 2,400–3,400m, although occasionally as low as 1,400m (Collar *et al.* 1992). Within its range, it is localised and considered nomadic (Fjeldsá and Krabbe 1990, Collar *et al.* 1992), making it difficult to study, which explains why it is a poorly known species.



In Colombia, the species' movements over large areas may follow a temporal pattern, with individuals foraging the same day in areas that are kilometres apart. A large population may exist in and around the Volcán Ruíz-Tolima complex. There is a healthy population in the Central Andes of Ucumarí-Los Nevados-Quindío region with groups of up to 40 individuals commonly seen. Birds seem to cross often from the west to the east slope of the central Andes. The Rio Blanco protected watershed may hold a population of up to 150 individuals within 10km of the City of Manizales.

The species feeds on *Podocarpaceae* fruits, including *Podocarpus* and *Prumnopytis*, but contrary to previous published data, *L. branickii* does not seem to be a true *Podocarpus* specialist (Flanagan and Toyne *in litt.* 1997, Kattan *in litt.* 1997). Since large *Podocarpaceae* are only found in primary forest, the species is closely associated with this habitat. It may depend upon this habitat for most of its food items, and during reproduction. However in Toche as well as in lower parts of Ucumarí Reserve, the species also feeds in secondary forests.

In Ecuador it is only known from nine sites, five of which are in Loja Province. Prior to the 1990s there are few records of this species in Loja Province and consequently their distribution and status in the Province is sparsely documented.

This species has been recently observed in small flocks in the following areas: In Ecuador: Acanama (Huashapamba), Angashcola, El Quingueado, Cordillera de Allapacha, Torré, Hiñuina, Loma del Oro, and El

Sauce. In Podocarpus National Park, flocks have been seen in Cajanuma, Lagunas del Compadre, Yangana-Valladolid (including Quebrada Honda), Quebrada Rabadilla de Vaca, and San Francisco. In Colombia it has been observed in: Ucumari Regional Park, Los Nevados National Park, the Quindío River, Rio Blanco, and the Volcán Galeras. And in Peru in: Selva Alegre and Chilla Mountains in Manu National Park.

Due to *Leptosittaca's* mobility it is difficult to assess its status at any one site. However, it must be deemed as extremely rare and, at present, highly unpredictable.

Threats: The species is threatened by habitat fragmentation resulting in the interruption of altitudinal and seasonal migration, and lack of nesting habitat (possibly in the form of large mature trees within forests). In the Loja province of Ecuador, the main threat is habitat loss due to human encroachment (caused by cattle ranching and tree felling for construction material and fuel).

Actions: Conservation for *Leptosittaca* will require a landscape approach. This includes the conservation of a high variety of habitats with fruit-bearing trees and *Cordia cylindrostachya*, *Axinea macrophylla*, and old growth stands of *Podocarpus*. In both Colombia and Ecuador, a network of interconnected montane forests at various altitudes is needed to secure the long-term future of this and other Andean parrots. The network can include private and community-owned reserves. Efforts should focus on protecting forest patches in the Quindío region in Colombia and at Selva Alegre and Acanama-Huashapamba areas in the Chilla Mountains of Ecuador. In Peru, surveys are required to assess whether viable populations of the species survive, and what options for their conservation exists.

(See multi-species remarks in *Ognorhynchus icterotis*).

Yellow-eared conure *Ognorhynchus icterotis*

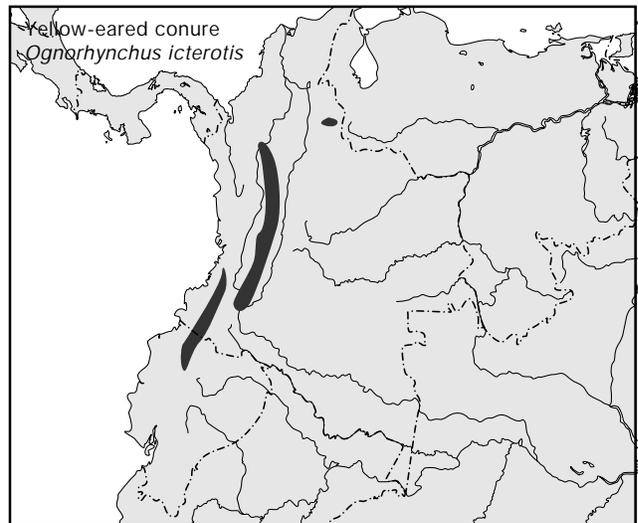
Contributors: Niels Krabbe, Luis Miguel Renjifo, Paul Salaman, Paul Toyne.

Conservation status: IUCN: Critically Endangered (A1b; C1; C2a; D1).

CITES: Appendix I.

National protection status: Information unavailable.

Distribution and status: This large parakeet, once numerous (Collar *et al.* 1992), is now on the brink of extinction as a result of hunting for food and loss of habitat. The species is only known to roost and nest in wax palms *Ceroxylon*. All recent records may refer to three flocks, each of 20–24 birds. These flocks occur in a large wax palm forest in the



Central Cordillera of Colombia; a nearly deforested area in western Ecuador; and south-west Colombia and adjacent north-west Ecuador. After vanishing recently the latter flock is considered extinct. The exact whereabouts of groups for much of the year is still unknown, rendering protective measures difficult.

While the species is strongly seasonal and highly mobile, there are several sizeable areas of apparently suitable habitat existing throughout its historical range. For example, from at least 1983 until 1989 a flock would appear at La Planada Nature Reserve, Nariño, almost every day each year in February (often staying until May). The flock increased in size, reaching a maximum of 21 birds (1985), and roughly that number thereafter. Sadly, in 1990 the flock never appeared, and has never been seen since, despite excellent safe habitat remaining and plenty of observers (Salaman 1994). This population may have moved to the area between Nariño and Carchi, but it is now thought to be extinct (Krabbe and Sornoza 1996).

An undisclosed location on the Volcán Ruiz-Tolima massif, Central Cordillera of Colombia, contains the largest surviving fragment of wax palms, estimated at over 10km² (P. Salaman *in litt.* 1997). These *Ceroxylum quindense* palms are intermixed with montane humid forest and form a mosaic habitat. This habitat also includes pasture. Most Colombian reports of this species in the past seven years originate from this one unprotected location, with the first confirmation in 1997 by L. G. Olarte and later the observation of a flock of 24 birds in October 1997 (P. Salaman *in litt.* 1997). Despite the close proximity to Los Nevados National Park and other private nature reserves, the species has not been recorded from these areas in the past decade. The species is so conspicuous, that it is unlikely to have been overlooked by the many ornithologists working in these areas. In the case of the Volcán Ruiz-Tolima massif, where there appears to be sufficient feeding and nesting habitat, it is suspected that hunting is responsible for the very low population levels. This also appears to be the case in Ecuador. Recent reports of two flocks totalling 61 birds in a remote location of the Central Cordillera of Colombia, and the discovery and monitoring of the first ever active nest in a wax palm have dramatically increased the natural history knowledge base of this species (Salaman and Lopez-Lanus, 1999).

Multi-species remarks: The Volcán Ruiz-Tolima massif, including the High Quindío region and the Toche Canyon of the Colombian Andean Central Cordillera are largely within the Los Nevados National Park and adjacent regional or private reserves. Forest cover is nearly continuous between the High Quindío (western slope) and Toche (eastern slope). Furthermore, the ridge between both slopes has pristine and inaccessible páramo. This area is probably one of the few remaining untouched areas within the range of *Bolborhynchus ferrugineifrons*. In 1989 and 1990 *B. ferrugineifrons* was observed only a few times in areas with more disturbed páramo in the High Quindío (L.M. Renjifo *in litt.* 1997). There is also a healthy population of *Leptosittaca branickii* in the High Quindío-Toche area that moves frequently between the two slopes using the same forested pass. In summary, these areas are the most important areas to preserve globally important populations of *Ognorhynchus icterotis*, *Leptosittaca branickii*, *Bolborhynchus ferrugineifrons*, and *Hapalopsittaca fuertesi* in the Colombian Andes, and certainly the only ones for which there is more detailed information. *Leptosittaca branickii*, *Bolborhynchus ferrugineifrons*, and *Hapalopsittaca fuertesi* have little altitudinal range-overlap with *Ognorhynchus icterotis*, for which protective measures must, therefore, be considered separately.

Threats: Although rapidly diminishing, there are still several sizeable areas of apparently suitable habitat throughout its historical range (Renjifo 1991, Salaman

1994, Krabbe and Sornoza 1996, P. Salaman *in litt.* 1997), suggesting that factors other than habitat destruction are responsible for its rapid decline. It has always been rare in captivity, and only a handful of individuals have ever reached western markets (Collar *et al.* 1992): two wild caught specimens were recorded in international trade between 1991 and 1995, both in 1992 (seized by the USA: CITES Annual Report database). Undoubtedly the severe fragmentation of its habitat, and perhaps in particular the destruction of traditional nesting palms, have had a large impact, but it is suspected that hunting at traditional roosts is the major cause of the species' decline. Indeed, in the valley of a traditional roost in Ecuador, nearly all families had shot the parrot for food at the roost (Krabbe and Sornoza 1996). The conservative habits of the species render it particularly vulnerable. Despite persecution of the roosts in Ecuador, the parrots continued to use the same palm, and when the palm fell, they only then moved to the neighbouring palm (Krabbe and Sornoza 1996). Lack of information concerning the whereabouts of the two remaining flocks for much of the year poses a major obstacle to its conservation. Critically, the largest fragment of wax palms in the Central Cordillera of Colombia is unprotected and highly threatened.

Actions: Without an immediate multilateral conservation strategy and immediate intervention, the species is threatened with total extinction within the next decade. Research is desperately required to locate more breeding areas, roost sites, potential migration routes, and favoured feeding sites. Studies should also identify specific threats and conservation priorities. Conservation actions will require urgent and creative land management strategies, such as strengthening the protection of all roosting and breeding sites (purchasing these areas if possible), and reverting pasturelands adjacent to wax palm to forest. Large-scale propagation of the wax palms is not recommended as a cost-effective conservation action. It is more important to concentrate conservation efforts on establishing secondary growth forest from pasturelands that lie next to the wax palms. Indeed, wax palm forests in general are currently highly fragmented, young wax palms do very well in secondary growth, and the seeds of wax palms are readily dispersed by large frugivores in the region.

The involvement of local people in managing protected areas is necessary as they pose the greatest direct threat. Whenever possible ecotourism development should be considered. However, potential political instability associated to guerrilla warfare should be considered when developing ecotourism initiatives. Community involvement should be enhanced with an active environmental education campaign (i.e., distribution of posters, talks at local schools). But the greatest threat may be avoided by simply locating and talking to local hunters.

In Ecuador, Niels Krabbe, with funding from the Zoological Society for the Preservation of Species and Populations, Fonds fur Bedrohte Papageien, and the Loro Parque Foundation, has begun a long-term conservation programme for the country's last known flock. Approximately 0.5km² of land surrounding a traditional roost in western Ecuador has been purchased and has been reforested with the parrot's favourite food plants, *Sapium* and *Croton* (both Euphorbiaceae). Three areas nearby, all used by *Ognorhynchus* and covering 1.5km² are presently being purchased, and a further 2km² may be added later in 1998. Formerly the parrot was heavily persecuted at this roost, which is now protected effectively (Krabbe and Sornoza 1996).

White-breasted parakeet *Pyrrhura albipectus*

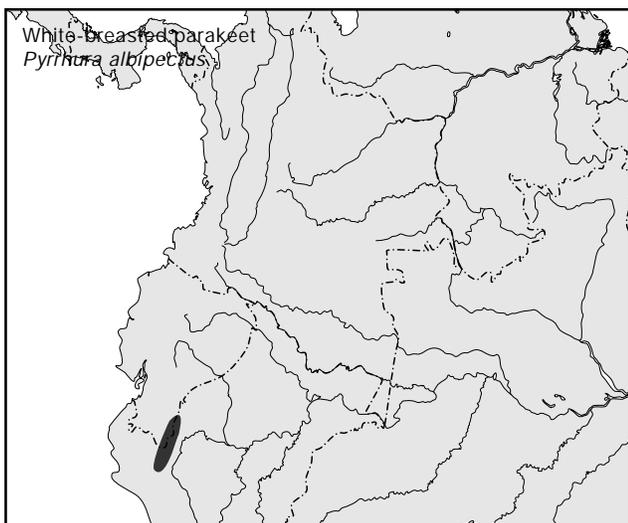
Contributors: C.S. Balchin, Jeremy Flanagan, Niels Krabbe, and Paul Toyne.

Conservation status: IUCN: Vulnerable (C2a).

CITES: Appendix II.

National protection status: Information unavailable.

Distribution and status: The white-breasted parakeet is known from three general areas of south-east Ecuador (Cordillera de Cutucú, Cordillera del Condor, and Podocarpus National Park), where it inhabits upper tropical and subtropical forest and possibly disturbed areas, between 940 and 1,800m (Robbins *et al.* 1987, Collar *et al.* 1992, Toyne *et al.* 1992, Krabbe and Sornoza 1996, Schulenberg and Awbrey 1997). Also possibly recorded in Peru. This parakeet has been recorded in both pristine and degraded habitat, as it has been observed in partially and severely deforested areas around Podocarpus National Park (Toyne *et al.* 1992).



The lower forested slopes of the Río Nangaritzza valley may also prove to be ideal habitat for this parakeet (Toyne *et al.* 1992). They have been recorded here once during a short survey in 1994 (Balchin and Toyne 1998) and were encountered between 1,300 and 1,800m above the Río Mariposa, a tributary of the Río Nangaritzza. However, in nearby Podocarpus National Park the parakeet is a common, permanent resident of Río Bombuscara and Romerillos (Toyne *et al.* 1992). This suggests, at least for the area of Podocarpus National Park, that they are not as severely threatened as first feared (Toyne *et al.* 1992, Toyne 1996).

Threats: Along the southern perimeter of Podocarpus National Park, encroachment by humans along the borders of the park is causing habitat loss. Occasional trapping of this species has been recorded in the areas surrounding Zamora where they are kept as pets (Toyne *et al.* 1992). Gold mining activities (e.g., mercury poisoning of rivers that provide the local water supply) in and around the park also poses threats (Toyne *et al.* 1992, Vallée 1992). Local miners left the park in 1993 but quickly returned in 1994–95 (Toyne 1994). Presently, there are approximately 90 miners in the area of San Luis, and they have formed strong ties with local politicians. Recently the Ministry of Mining (DINAMI) decreed that the miners' activities are illegal; it is now up to the new Ministry of the Environment to take steps to remove them (J. Flanagan *in litt.* 1997).

The two other areas where this species is found (Cordillera de Cutucú and Cordillera del Condor) are also threatened by deforestation, gold mining, and road building, but the current situation is not known (Collar *et al.* 1992, Toyne *et al.* 1992).

Actions: A public awareness and environmental education campaign about Podocarpus National Park and its importance has been initiated by Fundación ArcoIris. This work needs further encouragement and the relevance of the Podocarpus National Park for parrot conservation needs to be highlighted. Fortunately Podocarpus National Park has been receiving international assistance for the last few years. These efforts have led to the strengthening of local institutions (both NGOs and governmental) and a new management plan being published.

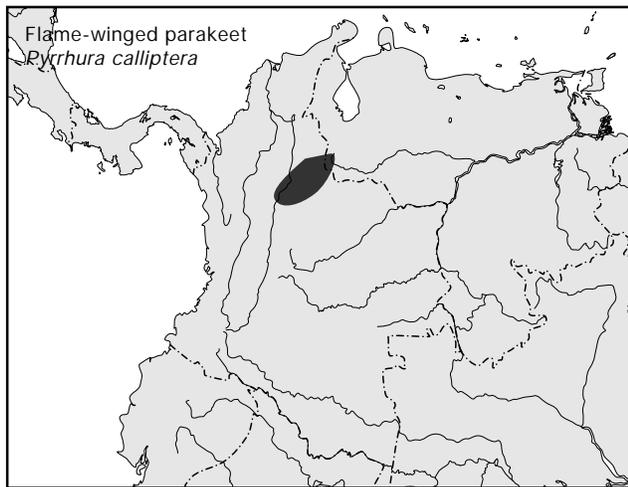
Flame-winged parakeet *Pyrrhura calliptera*

Contributor: Paul Salaman.

Conservation status: IUCN: Vulnerable (A1b; A2b; C1; C2a).

CITES: Appendix II.

National protection status: Information unavailable.



Distribution and status: Population estimates for the flame-winged parakeet range from between 5,000 and 10,000 individuals. It is confined to remnant patches of upper-premontane to montane forest and páramo 1,800 to 3,400m on the central Eastern Cordillera of Colombia. The population is suspected to be similar to *Pyrrhura viridicata* in that it is found to be not uncommon in remaining forest patches within restricted range. However, the species range is far more fragmented and human pressures much greater. Few sizeable forest fragments remain.

Threats: Forest clearance for agriculture and timber is still very active. Road/track construction in the region (although slow and limited owing to rough terrain) will undoubtedly have severe consequences in the future.

Actions: As with other species of the Colombian Andes, a field study on the species should concentrate on determining population densities in different forest types. It should include estimating current population levels according to the area of suitable remaining habitat. Knowledge of the extent of altitudinal movements and the distance travelled over open country (between forest patches) would also be of value.

Blue-throated parakeet *Pyrrhura cruentata*

(Blue-chested parakeet in Collar *et al.* 1994. Name changed here to conform to Brazilian usage.)

Contributor: Jaqueline Goerck.

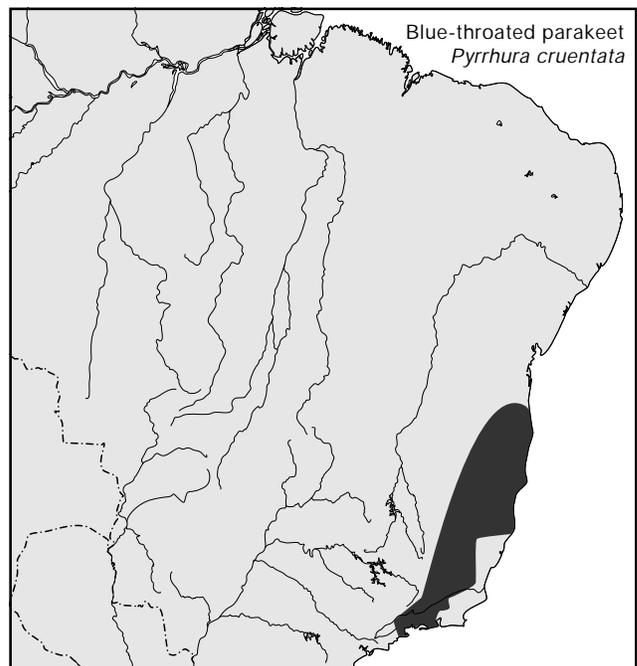
Conservation status: IUCN: Vulnerable (A1b; B1+2c; C2a).
CITES: Appendix I.
National protection status: Information unavailable.

Distribution and status: The blue-throated parakeet is found in scattered Atlantic Forest fragments in southern

Bahia, Minas Gerais, Espírito Santo, and Rio de Janeiro, Brazil. Although sometimes fairly common where it occurs, it may be unable to move between widely dispersed patches of forest, since it seems to be restricted to forested areas.

Threats: Extreme deforestation and fragmentation threatens the species throughout its range. The sparse remaining forest existing in southern Bahia is still being felled. There were four specimens recorded in international trade between 1991 and 1995, all in 1992 (pets: CITES Annual Report database).

Actions: Few actions, if any, are taking place. In fact, one of the areas where this species occurs in Espírito Santo (Córrego do Veado Biological Reserve) had more than half its original area (24km²) irreversibly burnt 12 years ago. This reserve, as many others in Brazil is threatened by



uncontrolled hunting, cattle grazing, and poor enforcement. Required conservation actions would be similar to those of *Amazona rhodocorytha*, since the range of these two species is similar.

El Oro parakeet or Orces parakeet *Pyrrhura orcesi*

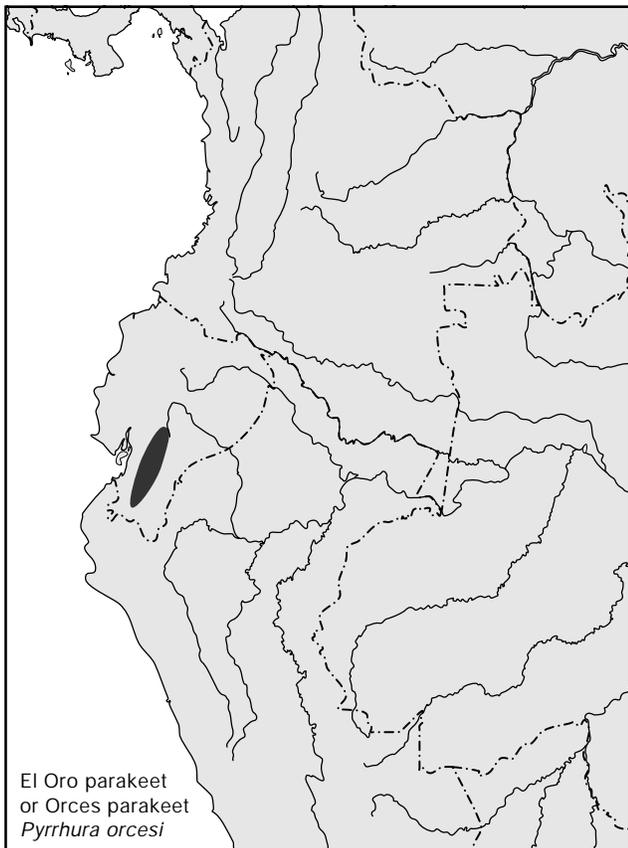
Contributor: Niels Krabbe.

Conservation status: IUCN: Vulnerable (B1+2c; C2a).
CITES: Appendix II.
National protection status: Information unavailable.

Distribution and status: The orces parakeet is restricted to very humid upper tropical forest on the west slope of the Andes in Azuay and El Oro Provinces, south-western Ecuador. In these areas it can be found at altitudes of 300 and 1,300m. Population estimates range from between 2,000 and 10,000 birds.

Threats: Continuing habitat clearance for cattle production threatens this species (Collar *et al.* 1992, Best *et al.* 1993).

Actions: Information is urgently required on its distribution, population status, and threats.



Santa Marta parakeet *Pyrrhura viridicata*

Contributors: Thomas Arndt, and Paul Salaman.

Conservation status: IUCN: Vulnerable (C1; C2b).
CITES: Appendix II.
National protection status: Information unavailable.

Distribution and status: The Santa Marta parakeet is restricted to upper-premontane to montane forest 1,800 to 2,800m on the Sierra Nevada de Santa Marta massif, Colombia. Highly vocal parties (5–20 birds) are commonly observed flying over the San Lorenzo-Cerro Kennedy trail, which has been extensively deforested. Research is required into the extent of remaining suitable habitat for the species. Estimates of population numbers in primary and non-primary forest are also needed. It is suspected that large healthy populations of the species can be found where sizeable forest fragments remain. The total population is estimated at 5,000 to 10,000 individuals.

Threats: Conifer plantations, and forest clearance for agriculture and timber threaten this species. It is a cavity-nester that requires dead limbs, although not necessarily large trunks. It is largely restricted to old secondary and primary forest. Some large and many small fragments of forest still remain on the massif, however the human pressures are very strong in the region. The extent of altitudinal movements is also unknown. Seasonal variation of numbers gained through general observations along the San Lorenzo road may help to provide such data. Until further research clarifies the species status, the species should be designated a threatened status.

Actions: Ideally, research should concentrate on the tolerance of the species to habitat change, population densities in different forest types, and estimates of current population levels.



Thick-billed parrot *Rhynchopsitta pachyrhyncha*

Contributors: Andrew Burton, Javier Cruz-Nieto, Miguel A. Cruz-Nieto, Ernesto Enkerlin-Hoeflich, Alberto Lafón-Terrazas, Dirk Lanning, Tiberio Monterrubio, Jesus Montes, Roger Otto, Jim Shiflett, Noel Snyder, and Diana Venegas.

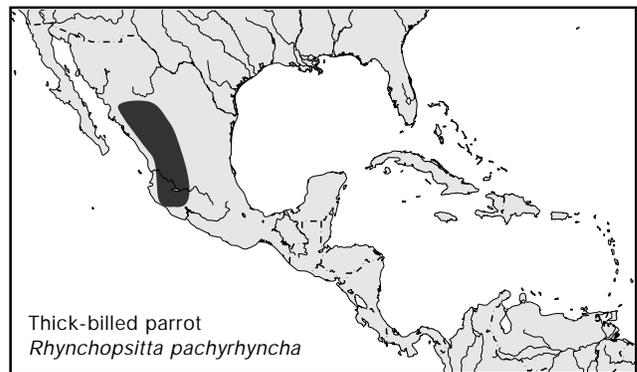
Conservation status: IUCN: Endangered (A1b; A2b; C1; C2a).

CITES: Appendix I.

National protection status: Endangered in Mexico (Peligro de extincion, NOM-ECOL-059-1994) and Endangered in the USA (US Fish and Wildlife Service).

Distribution and status: This species is restricted during breeding to pine forests in mountainous areas of northern Mexico, largely in the states of Chihuahua and Durango and, to a much lesser extent in Sonora and Sinaloa (Howell and Webb 1995; Enkerlin-Hoeflich *et al.* 1996), with some individuals reported in historic times from extreme southern Arizona in the USA. Populations have declined markedly in Mexico. Breeding pairs are now found only in undisturbed remote areas, in disturbed areas with a few remaining suitable nest sites, and in islands of forest on steep slopes and ridges that are not accessible or currently economical to log. In the non-breeding season this species roams more widely within the Sierra Madre Occidental (Enkerlin-Hoeflich *et al.* 1996). See map by Howell and Webb (1995).

The progressive decline in the population of the thick-billed parrot is apparent to all long-term residents across the range (Lanning and Shiflett 1983, Lammertink *et al.* 1996, M.A. Cruz-Nieto *in litt.* 1997). The parrot is only one of many species currently in jeopardy in the region. While the parrot still persists in suitable numbers in the best remaining forested areas, all will surely be cleared of their large trees in the near future unless conservation efforts now being started prove successful. Lammertink *et al.* (1996) have offered a rough estimate for the total wild population still in existence as 500 to 2,000 pairs. Although this estimate may be on the conservative side, no adequate basis for estimating total numbers in the wild has yet been developed. The numbers in captivity were estimated by Snyder and Wallace (1987) to possibly exceed 1,000 individuals almost all taken illegally. At least 200 birds use the general vicinity of Cebadillas de Tosanachic study site in Chihuahua. This may be the last relatively large healthy population, numbering in the low hundreds of pairs, as a fraction of the area contained 61 nests in 1997 (D. Venegas and T. Monterrubio *in litt.* 1997). There is an excellent account of this species in Collar *et al.* (1992) and a full account is found in Snyder *et al.* (1999)



Threats: Unfortunately, the thick-billed parrot suffered heavily from shooting in the USA, and was very likely extirpated north of the border as a result (Snyder *et al.* 1994). Much of the recent decline is undoubtedly due to large scale felling of the pine forests of the Sierra Madre Occidental. This has been carried out since World War II (Lanning and Shiflett 1983, Lammertink, *et al.* 1996, Cruz-Nieto 1998). The species has also been under stress from extensive trapping for the pet and avicultural trades (Snyder and Wallace 1987). The thick-billed parrot is not limited to virgin forest, and can exist in selectively logged areas provided suitable dead standing trees (snags) for nesting are available and shooting and trapping does not occur. Significant efforts to manage and conserve major remaining habitats of the species are now being pursued in Mexico (Enkerlin-Hoeflich *et al.* 1996). Thick-billed parrots are rarely kept as pets because they do not talk, although large numbers of confiscations in the US followed a surge in illegal importation of birds in 1985–1986. They are not known to raid agricultural crops, and are not shot for food.

Actions: Forest management practices need to be modified to conserve thick-billed parrot nesting habitat. Properly

located and managed reserves could protect several prime nesting areas; no such reserves currently exist, although a number of efforts are currently underway (R. Otto *in litt.* 1997, Enkerlin-Hoeflich *et al.* 1996).

A re-introduction project began in south-eastern Arizona in 1986 (reviewed in Snyder *et al.* 1994). Efforts have not yet led to a viable wild population being established. However initial experiments are encouraging and demonstrate that this may be possible. A number of birds still persist in Arizona, and experimentation has shown that at least some wild-caught birds will stay in the region of re-introduction, with reasonable levels of survival and reproduction. Experimentation has also shown that while confiscated wild-caught birds are a viable release source from a behavioural standpoint, they may harbour diseases. Captive-reared thick-bills from various zoos and aviculturists have not proved to be a viable source from both behavioural and disease standpoints. Future efforts should involve direct wild to wild transfers and the employment of extensive disease screening.

Continued efforts to achieve appropriate habitat conservation measures include; additional extensive understanding of the biology of the species, including documentation of wintering ranges of various breeding populations; the development of better means for monitoring population sizes and trends; the reactivation of a programme to re-establish extirpated populations both in Mexico and the US, using wild-caught birds from populations that are vigorous enough to serve as donors. These activities should all take place within the next five years.

Maroon-fronted parrot *Rhynchopsitta terrisi*

Contributors: Ernesto Enkerlin, Aldegundo Garza, Jaime Gonzalez-Elizondo, Claudia Macías, José Luis Manzano-Loza, Sergio Marines, Gabriela Ortiz, Andres M. Sada, Alejandro Salinas, Noel Snyder, and Ruperto Zepien.



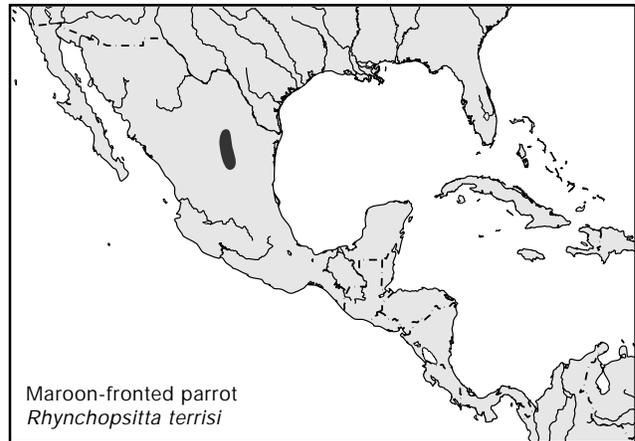
Conservation status: IUCN: Vulnerable (B1+2C; C2a).

CITES: Appendix I.

National protection status: Endangered in Mexico (Peligro de extincion, NOM-ECOL-059-1994) and Endangered in the USA (US Fish and Wildlife Service).

Distribution and status: The maroon-fronted parrot is restricted to pine forests and rock cliffs in the mountain areas of northern Mexico (specifically in Nuevo León and Coahuila states). These areas are used as nesting sites. A degree of winter activity occurs in Tamaulipas State. Breeding colonies are known only from the northernmost 25% of the range. Recent intensive studies (initiated by PROFAUNA [a conservation group based at the Universidad Autónoma Agraria Antonio Narro in Saltillo] and continued by the Monterrey Technological Institute [MTI]) have resulted in an almost complete inventory of nesting cliffs. Approximately 24 nesting areas have been documented. These consist of populations ranging from a single nesting pair to close to 100 nesting pairs each (Enkerlin-Hoeflich *et al.* 1996). Until recently the population had been estimated at between 2,000 and 4,000 birds. This figure was calculated using data obtained in the early 1970s when a flock of approximately 1,500 individuals was observed (Snyder and Lanning cited by Collar *et al.* 1992). Presumed to be declining by some observers (i.e., Gómez-Garza 1991), yet confirmed stable or at least within historic population estimates in 1994 with a simultaneous count of about 1,400 (Snyder and Enkerlin-Hoeflich 1996). A high historic count in 1996 recorded 2,213 birds and a quasi-simultaneous survey in September of the same year yielded an additional count of approximately 300 individuals at nearby nesting cliffs (J.J. Gonzalez-Elizondo *in litt.* 1997). This sets the minimum estimate at 2,500 and suggests a small but relatively stable population.

Threats: The main threats to this species are: (i) destruction of its mixed-conifer forest habitat by fire; (ii) housing development; (iii) logging; and (iv) forest clearing for agricultural purposes. The large Cumbres de Monterrey



National Park exists within the maroon-fronted parrot's range. However an increase in the frequency and intensity of forest fires is causing passive deforestation. Areas that regenerate naturally usually become oak chaparral. This habitat is of no value to the parrots in terms of food. Reforestation with native species is not occurring except in small areas by private landowners. The maroon-fronted parrot is highly dependent on free flowing water on a daily basis. The lack of springs from which to drink have sometimes forced it to drink from water troughs. During the 1994 drought at least 50 birds drowned in a single incident while attempting to drink water from a walled cement tank. Greater understanding of the ecology of the species is needed to propose a variety of measures to avert these threats (Enkerlin-Hoeflich *et al.* 1996).

Actions: In the last few years a long-term conservation programme for the species has evolved. An integrated conservation plan using the maroon-fronted parrot as the flagship species has been initiated by MTI with multiple collaborators both in Mexico and abroad. The plan includes a three level strategy to achieve conservation of habitat. This in turn provides ecological services, and scenic and recreational values to neighbouring cities of Monterrey and Saltillo. The combined population of these cities numbers approximately five million (Enkerlin-Hoeflich *et al.* 1996). The plan includes El Taray Sanctuary, the most important nesting colony. This site harbours nearly 100 breeding pairs which comprise 40% of the breeding population. This site was acquired by the Mexican Commission on Biodiversity (CONABIO) and is managed by a local NGO, the Museo de las Aves de Mexico. A 20-year strategic plan for the reserve includes financial management, conservation management, conservation research, and education and outreach components that hope to make El Taray a show-case for sustainable land use in the region. This plan may even provide a useful model for other regions. The overall effort includes an ecological planning process that would safeguard the most important nesting cliffs. A Mexican foundation (Fundación ARA) is also developing a plan for community-based protection of the second or third most important cliff nesting site known as El Condominio (or "High-rise").

Brown-backed parrotlet *Touit melanonota*

Conservation status: IUCN: Endangered (C2a;D1).
CITES: Appendix II.
National protection status: Information unavailable.

Distribution and status: This small and inconspicuous species is very poorly known. During this century it has been recorded only in Rio de Janeiro State and three sites

in São Paulo, Brazil. It was also recorded in Bahia in the last century. It inhabits humid forest, mainly at moderate elevations (500–1,000m), but descends to lower elevations at times, perhaps seasonally (Collar *et al.* 1994).

Threats: *Touit melanonota* appears to be a victim primarily of widespread habitat loss and fragmentation, with many recent records limited to protected areas (Collar *et al.* 1992).

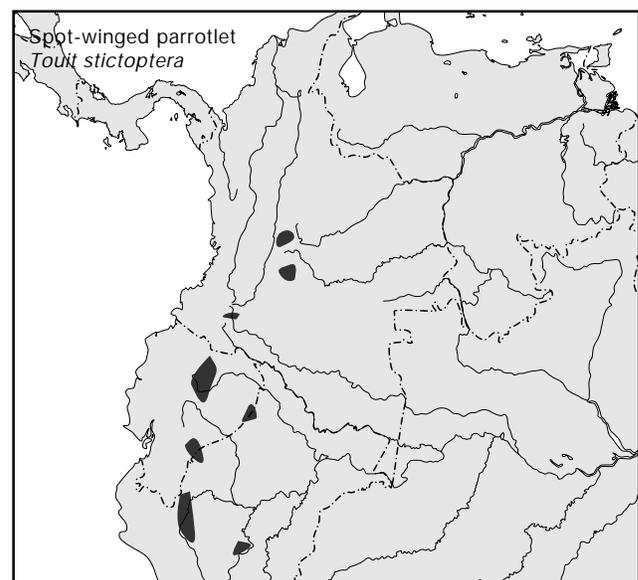
Actions: Information is urgently needed on the current distribution, population status, and threats for this species.

Spot-winged parrotlet *Touit stictoptera*

Contributors: C.S. Balchin, Niels Krabbe, Luis Miguel Renjifo, Paul Salaman, and Paul Toyne.

Conservation status: IUCN: Vulnerable (C2a).
CITES: Appendix II.
National protection status: Information unavailable.

Distribution and status: This inconspicuous species occurs in five general areas extending through Colombia (Cundinamarca, Meta, and Cauca), Ecuador (Napo, Morona-Santiago, and Zamora-Chinchipe), and northern Peru (Cajamarca, and San Martín). It inhabits the upper tropical and lower subtropical zone, using tall humid montane forest at 500–2,300m, though mostly 1,050–1,700m. It was recently recorded in Miazzi and elsewhere in the Cordillera del Cóndor in Ecuador. No recent sightings have been made of this species despite searches in its upper tropical-premontane altitudinal zone on the east slope of the Eastern Cordillera of Colombia.



Threats: Deforestation and fragmentation threaten this species.

Actions: Information is urgently required on the distribution, population status, and threats to this species.

Golden-tailed parrotlet *Touit surda*

Conservation status: IUCN: Endangered (C2a).

CITES: Appendix II.

National protection status: Information unavailable.

Distribution and status: *Touit surda* has been recorded from four states in north-eastern Brazil – Ceará, Paraíba, Pernambuco, and Alagoas – and from four states in south-eastern Brazil – Bahia, Espírito Santo, Rio de Janeiro, and São Paulo. The majority of records have come from humid lowland forest areas up to approximately 800m in the foothills. It appears to be migratory to some degree.

Threats: This species has evidently suffered from continuing large-scale habitat destruction. Many sightings have been limited only to protected areas (Collar *et al.* 1992).

Actions: Information is urgently needed on the current distribution, population status, and threats to this species.

Blue-bellied parrot *Triclaria malachitacea*

Contributors: Glayson Ariel Bencke, Paulo Martuschelli, Marco Aurelio Pizo, and Carlos Yamashita.

Conservation status: IUCN: Vulnerable (B1+2c,d; C1, C2a). Formerly Endangered (C2a: see Collar *et al.* 1994). CITES: Appendix II.

National protection status: Protected under federal law and included on IBAMA's list of Brazilian species threatened with extinction (Bernardes *et al.* 1990).

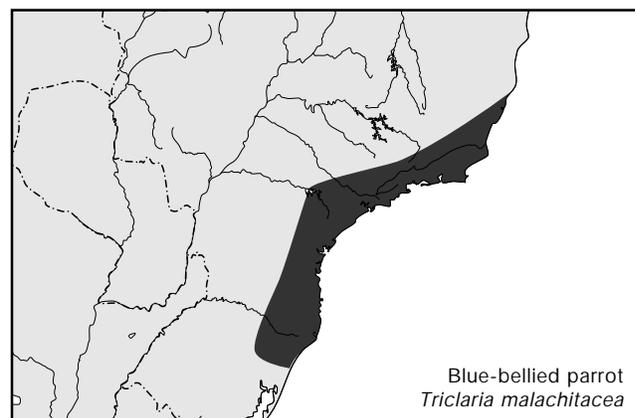
Distribution and status: The blue-bellied parrot *Triclaria malachitacea* is a threatened Psittacine endemic to the Atlantic Forest region of south-eastern Brazil. Its current status has been attributed to its natural rarity coupled with the effects of hunting and loss of habitat. Within its range, *Triclaria* still survives in Rio Grande do Sul, where it inhabits a highly fragmented landscape along the escarpment of the state (Serra Geral) and is confined to remaining patches of forest on hilltops and steep mountain slopes (Bencke 1996). The species is uncommon at Intervales State Park, São Paulo State, and from 1989–1993 there has been no noticeable decline in this population

(Pizo *et al.* 1995). Numbers may be higher than suspected due to the fact that this is one of the most secretive parrots in the world. In central-eastern Rio Grande do Sul *Triclaria* is mostly associated with the humid broadleaf forests along the escarpment, which are now severely fragmented. It is presently restricted to the largest remnants of mature forest. However, preliminary radio-telemetry studies showed that individuals of *Triclaria* are able to disperse among habitat patches using narrow forest corridors, such as strips of second growth woodland, and also crossing small open areas (100–200m).

The total population of *Triclaria* was tentatively estimated at less than 5,000 individuals by Lambert *et al.* (1993). A recent survey (Bencke 1996) of remaining natural vegetation in central-eastern Rio Grande do Sul revealed a forest cover of 17.32%, corresponding to an area of 1,222km² (total area surveyed = 7,056km²). This calculation includes remnants greater than 0.5km² of arboreal vegetation (both primary and secondary) and low second growth. Based on the amount of habitat available its population was estimated at a maximum of approximately 10,000 individuals. This number was calculated assuming a maximum density of 10 individuals per 1km² of forest (an assumption based on field observations conducted mainly at Monte Alverne). However, it is possible that the amount of suitable habitat has been overestimated due to the inclusion of areas of second growth in the survey of remnant vegetation. Therefore, population numbers may be lower.

Unlike other parrots species in the region, *Triclaria* lives primarily in the forest interior, where it often occupies the lower strata. At Monte Alverne, most records inside the forest were of birds in the understorey canopy, between five and ten metres above the ground. *Triclaria* nests in natural cavities inside primary-forest remnants. Three nests have been found in Santa Cruz do Sul and were all quite low (between about three and five metres above ground) and thus easily accessible to nest poachers.

The main foods of *Triclaria* in the region are the seeds and pulp of several common species of native plants, especially those of families Euphorbiaceae (such as *Pachystroma longifolium*, *Actinostemon concolor*, and



Sebastiania brasiliensis) and Myrtaceae (principally *Eugenia rostrifolia* and *Campomanesia xanthocarpa*), and also cultivated maize (Galetti 1997). Some of these plant species proved to be keystone food resources, as they fruit (and are consumed) over extended periods, are available in large quantities in periods of low overall fruit diversity or constitute the main food item during the breeding season. Several reports clearly indicate that the fruits of *Euterpe edulis* are not a particularly important food resource for *Triclaria* in Rio Grande do Sul.

Threats: The main threat currently affecting the population of *Triclaria* in the centre-east of Rio Grande do Sul is the continuing process of habitat degradation and fragmentation. The illegal clearing of forests at a small scale to provide wood for curing tobacco and fuel for the winter is still very common throughout the region. As a result, primary-forest remnants are becoming increasingly smaller and more distant from each other. Additionally, this piecemeal process has been conducive to a progressive substitution of primary forests by second growth and to a consequent process of ecosystem impoverishment in the region. Attempts to evaluate the extent of deforestation in Rio Grande do Sul have been controversial, but all indicate an enormous reduction in forest areas since the time of colonisation. (Forest cover has decreased in area from 35% in 1940 to approximately 2% in 1990, G. Bencke *in litt.* 1998). The continuation of habitat fragmentation through the illegal clearing of primary forests and loss of connections between mature-forest remnants presently poses the most serious threat to the long-term survival of the blue-bellied parrot population in central-eastern Rio Grande do Sul.

Local farmers living around primary-forest remnants throughout the region occasionally take young from parrot nests to keep as pets. The magnitude of the effects of this practice on the local *Triclaria* population is currently unknown. The capture of chicks from nests is the cause of a number of nest failures every year. The forest fragments where the species nests in central-eastern state are small and easily accessible to trappers. Location and capture of *Triclaria* nestlings is further facilitated by the loud vocalisations often delivered by both adults and young near the nest and the usually low heights of nest holes. There were 20 wild caught specimens recorded in international trade between 1991 and 1995, all in 1991 (CITES Annual Report database).

Actions: The main recommended measure to achieve the protection of the species and its habitat in the region is the establishment of protected areas with some degree of connectivity. The hilltop forests near Santa Cruz do Sul and in the boundary with the township of Candelária are among the most representative of Rio Grande do Sul's remaining vegetation deserving protection by the Programa Mata Atlântica-Rio Grande do Sul (Pagel *et al.* 1992). In

spite of this, there is not a single protected area in central Rio Grande do Sul and extensive tracts of undisturbed forest no longer exist in the region. Primary-forest remnants are the only components of the landscape suitable to be set aside as reserves. These remnants are small (few are larger than 4km², but the great majority are much smaller) and often shared by several small land owners (mostly poor tobacco planters with an average property size of 0.02km²: Farias 1993).

A particularly important issue is the protection or enhancement of wildlife corridors between the protected areas (i.e., habitat islands). This may be achieved through the implementation of a local plan for sustainable management of timber (see below). Given the financial constraints on the federal and state conservation bodies, the creation of new public reserves has been recognised as a difficult approach to achieve the protection of habitats for wildlife conservation. Alternatively, the creation of public or private reserves at the municipal level is considered feasible. The process of land acquisition seems to be the most appropriate strategy to achieve the establishment of protected areas in the region because the economic situation in Santa Cruz do Sul region is believed to be favourable for such an approach. Large branch industries of important international tobacco companies established in Santa Cruz do Sul and Venâncio Aires could provide a substantial part of the funds for land purchase. The rest could be sought from national and international conservation agencies.

Another important step to reduce forest degradation would be the implementation of a plan for sustainable management of forest to cease the non-sustainable and inappropriate harvesting of wood from native forests. Brazil is currently the world's leading exporter of tobacco *in natura* and one of the main exporters of cigarettes. International importers of tobacco leaves and manufactured products originating from the Santa Cruz do Sul region should be made aware that the tobacco is planted over areas where a globally threatened species of parrot occurs, and that this activity has resulted in the fragmentation of natural habitats and led to a decline of several wildlife species. Such an "overseas" awareness campaign would certainly be more effective if conducted by external conservation agencies rather than by local groups.

Brazil's tobacco planters association (Afubra) from Santa Cruz do Sul, in conjunction with tobacco companies, started several campaigns aimed at introducing in the region alternative sources of timber to replace the wood from native forests in the curing of tobacco. However, all these actions failed, apparently because of the lack of continuity and inadequate implementation. In view of the ineffectiveness of the previous campaigns, and also because of some fines imposed to farmers during occasional law enforcement activities in the region, the Afubra has recently adopted a different approach. It is now leading a campaign to change the state legislation governing the use of native

forests (Código Florestal Estadual). If approved, the proposed amendment to the law will allow (upon licensing) the exploitation of second growth forests, regardless of their successional stage and location, to use the wood as fuel in the curing of tobacco. However, this proposal is obviously not based on technical criteria and may have catastrophic consequences in areas where secondary forests predominate. The situation is rapidly worsening, particularly in the region around Santa Cruz do Sul. Here the wood used in the curing of tobacco is extracted principally from native forests.

Souza Cruz, one of the largest tobacco companies in the region, has recently announced the installation of a new industrial plant at Santa Cruz do Sul which will significantly increase the company's capacity for processing tobacco leaves. This measure will require an estimated additional 13,700 tobacco planters in the region to satisfy the plant's demand for tobacco, which in turn will result in a corresponding increase of agricultural areas to maintain these farmers and in consumption of wood for curing the leaves. Moreover, tobacco industries have recently been given special incentives by the Rio Grande do Sul's government to install new plants or to increase their investments in the state.

Environmental education and public awareness will remain a high priority. *Triclaría* is an unknown bird for the great majority of the local population. Only rural inhabitants living in farms around primary forest remnants are familiar with the species. Consequently, public awareness and environmental education should be carried out in properties around the largest primary-forest remnants in the region and in elementary schools of communities near these properties. Awareness of urban populations in the region requires a different approach. This target group should be made aware of the situation of forests and wildlife in the interior of the townships, especially the effects of habitat fragmentation. Several species of bird are known to have already vanished from the whole region, and many others are locally threatened, primarily as a result of habitat fragmentation (Bencke 1996). Newspaper articles, lectures, and television interviews should complement the urban public awareness campaign.

Accounts for species proposed for consideration for inclusion on the Red List

Yellow-naped parrot *Amazona auropalliata*

Contributors: Ernesto Enkerlin-Hoeflich, Celia Valverde, and David A. Wiedenfeld.

Conservation status: IUCN: To be considered. Vulnerable A2d.

CITES: Appendix II.

National protection status: Information unavailable.

Distribution and status: The yellow-naped parrot is patchily distributed along the Pacific (southern) coast of Central America from Chiapas, Mexico to north-western Costa Rica, and on the Caribbean slope from central Honduras to central Nicaragua. No formal, or even anecdotal, data are available for Mexico, although it is presumed to be critical in the Mexican part of the range. There are no reports in Mexico of large flocks as in other *Amazona* or *Aratinga* species. Present in at least the low hundreds in southern Guatemala in very disturbed cane and cattle areas. Thurber *et al.* (1987) also reported diminished numbers in El Salvador. In Honduras, the species exists in very low numbers on the Pacific Slope (Wiedenfeld 1993). It takes refuge for roosting and nesting in the mangroves around the Gulf of Fonseca; this may also be true for the remaining birds in El Salvador. On the Caribbean slope of Honduras, the species is restricted to the areas of Colón and Olancho. The Caribbean subspecies *Amazona auropalliata parvipes* is still fairly numerous, with an estimated population of approximately 140,000 individuals in 1992 (Wiedenfeld 1993). On the Caribbean slope, the parrot is restricted to relatively undisturbed habitats, including both broad-leaved forest and pine savanna, but shuns cultivated areas and second-growth (Wiedenfeld 1993). The species may possibly be still extant in the Bay Islands, off the Caribbean coast of Honduras, but reports of birds there may represent escaped captive birds.

In Nicaragua, the yellow-naped parrot numbers approximately 180,000 individuals (Wiedenfeld 1995). As in Honduras, it occurs on both the Pacific and Caribbean slopes, but not in the southern Central Highlands. Its population density is nearly twice as high on the Caribbean as the Pacific slope (Wiedenfeld 1995). Stiles (1985) reported some reductions in yellow-naped parrot populations in Costa Rica, which he attributed to cage bird trapping. He also mentioned that the species had been extirpated from some areas.

Threats: Because of its facility in learning to "talk", this amazon is a preferred pet by Central Americans. As a result, there is great pressure on its populations for internal trade as pets. The threat of capture for internal trade is believed to be much greater than the threat of capture for external trade (both legal and illegal combined). Especially on the Pacific slope of Central America, where yellow-naped parrot populations are already low and human populations are high, the harvest for internal trade may have a very significant effect on the amazon's populations. In Honduras, those who sell amazons usually demand about US\$25 in the field in the Mosquitia, and about US\$60 in Tegucigalpa (Wiedenfeld 1993). The daily minimum wage in Honduras is about US\$2. Heavy

laundering of this species to the USA from Central America through Mexico makes it impossible to judge levels of harvest within Mexico. The average number of yellow-naped parrots exported during 1989–1994 was 733 birds per year (Wiedenfeld 1995). Because of the high value of each amazon and because of the large numbers exported, the yellow-naped parrot accounts for a high percentage of the economic value of the birds in trade. Other export figures are provided by the CITES Annual Report database which recorded 4,018 wild caught specimens in international trade between 1991 and 1995, with an annual maximum of 930 in 1995. The export quota from Nicaragua for 1997 and 1998 was set at 800 ranched birds (CITES Notification to the Parties No. 980, 1997; CITES Notification to the Parties No.1988/07).

Habitat loss is an especially serious threat on the Pacific slope, where human populations are highest and a large amount of habitat has already been destroyed. The mangroves around the Gulf of Fonseca, which serve as a roosting and nesting refuge for the Honduran and El Salvadorian populations of the amazon are presently being cleared for conversion to shrimp farming ponds. To obtain young from the nest, many harvesters fell the nest trees. This has two detrimental effects on the amazons: it kills some of the young when the tree falls, and it reduces the availability of nest sites. On most of the Pacific slope of Central America and in some parts of the Honduran Mosquitia, destruction of nest sites in the process of harvesting may be so severe as to reduce the proportion of the adult population which can breed each year. A multi-year project in southern Guatemala revealed extremely high levels of poaching, little predation from natural predators, and an apparently stable adult population.

Actions: Plans for the conservation of this amazon should be developed soon and implemented quickly, before the situation becomes critical. The yellow-naped parrot is a long-lived species, and most of the birds harvested are taken as young from the nest. Therefore, even if all young are harvested each year, the adult population may show only slight declines for many years. As the adults reach senescence and begin to die from normal old-age mortality, the population could crash in a very short time. It is imperative that a study be completed to determine the extent of the harvest for internal pet market consumption, which remains largely unquantified. A formal programme for monitoring the amazon's population numbers also should be put in place.

In addition, immediate efforts should be made to reduce demand for the amazon in the pet trade, and therefore to reduce the harvest. These should probably include encouragement of captive-breeding programs using birds already in captivity and educational programs in both the importing and exporting countries, so that people will understand the effect of the harvest on this species.

Cuban amazon *Amazona leucocephala*

Contributors: Vicente Berovides, Patricia Bradley, Frederick Burton, Xiomara Gálvez, Rosemarie Gnam, and James Wiley.

Conservation status: IUCN: To be considered. Vulnerable B1 in Cuba and Endangered B3b in Bahama Islands and Cayman Islands.

CITES: Appendix I.

National protection status: Information unavailable.

Distribution and status: This species is native to Cuba, the Bahama Islands, and Cayman Islands. It strictly inhabits forests at all elevations. Populations have dramatically declined through most of its range. There are five races of parrots that comprise the *leucocephala* complex, including two Cuban forms *Amazona l. leucocephala* and *A. l. palmarum*, the Bahama amazon *A. l. bahamensis*, the Grand Cayman amazon *A. l. caymanensis*, and the Cayman Brac amazon *A. l. hesterna* (Peters 1928).

Cuban populations

Amazona leucocephala leucocephala and *A. l. palmarum*

Distribution and status: The Cuban amazon was formerly widespread and common throughout Cuba and Isla de la Juventud (Isle of Pines). The species is locally found in all



of the provinces, except that of La Habana. It is common in some areas, e.g., Ciénaga de Zapata in the Sierra de Najasa (Camagüey), and in some mountainous zones (Sierra Maestra) in Granma and Santiago de Cuba provinces (González *et al.* 1993, Gálvez 1996b). The parrot was formerly abundant throughout Isla de la Juventud, but the population underwent considerable declines, notably in the 1960s. More recently, several populations have increased in numbers.

Threats: Although the Cuban amazon is protected from capture and shooting by national and international law, it is still marketed in Eastern European countries. In 1988, US Fish and Wildlife Service agents seized 49 Cuban amazons en-route to the United States. A lively trade in parrots as local pets continues. Nevertheless, the most serious threat to the parrot is habitat destruction for agriculture, cattle, and firewood, and natural disasters such as hurricanes that limit the number of dead trees for nesting for both *A. leucocephala* and *Aratinga euops* (de las Posas and González 1984).

Actions: The parrot continued to decline in range and numbers throughout Cuba until the late 1970s, when government measures were taken to control the export of parrots for pets. That control resulted in notable increases in several parrot populations in the 1980s. Also, the recovery of some populations has been the result of intensive protection and habitat restoration by the Empresa Nacional para la Conservación de la Flora y la Fauna, for example, in continuing efforts since 1979, this government agency established dead palms with nesting cavities in the Los Indios Ecological Reserve in Isla de la Juventud. The population increased from 196 parrots in 1976 to a total of 1,100 parrots for the northern part of the Isla de la Juventud in 1996.

Both *A. l. leucocephala* and *A. l. palmarum* have been in captivity in Cuba and elsewhere (Tavistock 1916; Noegel 1977, 1978; González *et al.* 1993). Although the important Ciénaga de Zapata and other habitats critical to *A. leucocephala* and *Aratinga euops*' survival have been made reserves, additional large conservation areas are needed in sites where the species persists. The Empresa Nacional para la Conservación de la Flora y la Fauna, in co-operation with the Zoológico Nacional de Cuba, and the Biblioteca Nacional de José Martí, has undertaken a vigorous education programme, including annual conservation festivals involving local communities since 1995, with events to date at the Isla de la Juventud and Ciego de Ávila.

Bahama populations

Amazona leucocephala bahamensis

Distribution and status: The Bahama amazon was once plentiful and probably present on all major islands of the

Bahama Archipelago, although records exist only for Abaco, New Providence, San Salvador, Long, Crooked, Acklin's, Great Inagua, and Long Cay. By the 1940s, it was found solely on Abaco, Acklin's, and Great Inagua. The population on Acklin's was made extinct shortly thereafter. The southern third of Abaco (1,681 km²) is considered the parrot's primary stronghold on that island (Attrill 1980, Gnam 1990). Amazons occur island-wide on Great Inagua (1,544 km²), but are patchy in distribution. The parrots formerly visited nearby Little Inagua, and may continue to do so today. The Abaco population nests in holes in the limestone ground, rather than traditional tree cavities as used by the Inagua population. The population on Abaco was estimated at 450–800 birds in 1976 (Snyder *et al.* 1982). In 1989, the Abaco population was estimated at 830–1082 birds (Gnam and Burchsted 1991). A population survey there in 1995 yielded 1,100–1,200 parrots.

Threats: Populations of *A. l. bahamensis* are thought to be relatively stable (possibly increasing on Abaco), but vulnerable to exotic predators, poaching, possible habitat loss, and hurricanes. With its small population size, restricted distribution, and the threats facing it, this population cannot be considered secure.

Actions: A successful public awareness campaign (Clarke 1993), and a parrot reserve has been established on Abaco. An urgent study to determine current population size and distribution is needed on Great Inagua. A comprehensive long-range management plan based on sound knowledge of parrot biology is needed for Abaco Island. Comprehensive fire policies and feral cat control in the nesting areas on Abaco would be of benefit. Also, it seems timely and prudent to re-establish *A. l. bahamensis* on other islands. A re-introduction on Acklin's Island or northern Abaco Island now appears particularly feasible in view of the parrot's recent extinction, stability of the habitat in these areas, and the present respect by Bahamians of bird protection laws. The great strength of re-introduction is its power to rally public support for conservation. The Bahama race of the Cuban amazon has been bred in captivity (e.g., Fitzgerald and Larson 1989), although translocation of birds from the healthy Abaco population is probably the most feasible strategy for re-establishing populations on other islands.

Cayman Islands populations

Amazona leucocephala caymanensis and *A. l. hesterna*

Distribution and status: Two forms of *Amazona leucocephala* parrots inhabit the Cayman Islands, *A. l. hesterna* from the Cayman Brac, and *A. l. caymanensis* from the Cayman Island. Both races inhabit coastal and inland forests and are of concern because of their small populations and the

small area of available habitat. The Cayman Brac amazon occupies the smallest range of any *Amazona* in the Caribbean. It once occurred on both Cayman Brac and Little Cayman. Cayman Brac birds were said to fly to Little Cayman (7km) to feed, but it was likely that the smaller island had its own breeding population. At present, the parrot is found only in Cayman Brac, where it frequents the dry woodland of the plateau and nearby agricultural holdings along the coast, where the parrots often feed. In 1985, Bradley (1986) estimated a population consisting of approximately 26 adult individuals (including 12 breeding pairs) and 11–15 juvenile individuals. In addition, she estimated that more than 200 parrots were in captivity (four times more than in the wild population) on the island, although Noegel (1976) located only eight captive *A. l. hesterna* on Cayman Brac a decade earlier. Most recently, Wiley *et al.* (1991) estimated a total population of 300–430 parrots. Subsequent population surveys in 1994 and 1997 have resulted in similar population estimates (Baxter 1997).

The Grand Cayman parrot *A. l. caymanensis* ranges throughout Grand Cayman, except for central George Town, the eastern fringe of North Sound, the interior of the Central Mangrove Swamp, Booby Cay in North Sound, and the reclaimed land from Rum Point to Water Point. Within its limited range, *A. l. caymanensis* has been generally described as common. The adult population was estimated in 1985 to be 935 (range = 674–1,239) individuals (Bradley 1986). More recent population surveys have placed that estimate at about 2,000 birds (Baxter 1997). In 1985, the captive population of parrots on Grand Cayman was approximately 500 birds.

Threats: Among the most serious threats that affect parrot reproductive success are: predation by rats, barn owl *Tyto alba*, smooth-billed ani *Crotophaga ani*, greater Antillean grackle *Quiscalus niger*, and feral cats; disease; starvation of young after a hurricane or period of drought; flooded cavities; felling of parrot nesting trees by humans; and human harvest of chicks for pets (Wiley *et al.* 1991, Wiley and Wunderle 1993). Amazons continue to be destroyed as pests, and wounded adult parrots that survive shooting are taken for captivity. Recently, escaped *A. l. caymanensis* pets have been observed free-flying in Cayman Brac and, in at least one case, a mixed pair consisting of *caymanensis* and *hesterna* individuals was observed attempting to breed. Since the initial investigations in the early 1990s, breeding effort by the Cayman Brac amazon populations appears to have substantially declined. Although suitable nesting cavities are few, sites used in earlier years have not been occupied in recent years. However, the most serious threat is the accelerated land development for tourism.

Actions: Major steps have recently been taken by the Cayman Islands government to ensure the survival of the

species. Some bird sanctuaries have been established, but inclusion of larger tracts of habitat are essential to the populations' survival. The parrot was removed from the Cayman Islands game list in 1990. In 1990, the National Trust for the Cayman Islands, in co-operation with the RARE Centre for Tropical Conservation, began an intensive public education programme for the native parrots modelled on the programs successfully used in the Lesser Antilles. There were 115 specimens of the whole species recorded in international trade between 1991 and 1995, with an annual maximum of 42 in 1992 (CITES Annual Report database).

For both races, the conservation education programme should be continued, since it has shown excellent results and is the foundation of other conservation measures (Scharr *et al.* 1992). In 1991, The Nature Conservancy transferred its holding on the Bluff of Cayman Brac to The National Trust. This provided an important first step in protecting adequate habitat for the parrot. However, the creation of a large, or series of smaller, yet effective, parrot reserves on Cayman Brac is needed. Major terrestrial reserves on Grand Cayman include the Salina Reserve (2.53km²), Mastic Reserve (1.55km²), and Central Mangrove Wetland (about 6.48km²). Additional habitat protection is vital to ensuring the survival of the parrot on that island. Further measures should include the regulation and restriction of construction of new roads through the important habitat of the Bluff. The removal of feral cats from parrot nesting and foraging areas is of high priority. Despite the removal of 250 feral cats from Cayman Brac by the Department of Agriculture in 1991, cat populations remain extremely high and pose a potential threat to the survival of the parrot. Given the small population size, regular population surveys are necessary.

Additional research is needed on availability and quality of nesting habitat, as well as reproductive effort and success of the Cayman Brac amazon population. A well-managed captive propagation programme seems appropriate in view of the small population size and restricted range of the Cayman Brac amazon. Individuals for the captive flock should not be taken from the wild, but from extant captives of definite *hesterna* lineage. A captive population will serve both in providing a reserve of birds in the event of a devastating natural disaster to the wild population and as a source of progeny for management of the Cayman Brac population. Re-introductions may be vital in bolstering numbers, and to increase genetic diversity and geographic distribution. The re-establishment of *A. l. hesterna* on Little Cayman appears particularly feasible in view of the parrot's recent eradication. However, recent habitat surveys on Little Cayman have revealed the need for intensive habitat management (e.g., provision of nesting sites) before the parrot can be re-established there. Efforts, including those of a local (Grand Cayman) aviculturist, to breed both races in captivity have been successful.

Scarlet macaw
Ara macao cyanoptera

(Northern Central American populations)

Contributors: Ernesto Enkerlin-Hoeflich, James Gilardi, Christopher Vaughan, and David Wiedenfeld.

Conservation status: IUCN: To be considered. Endangered A1a, b, d.

CITES: Appendix I (transferred from Appendix II in 1985. Liechtenstein, Surinam and Switzerland have reservations on this listing).

National protection status: Information unavailable.

Distribution and status: The scarlet macaw occurs from southern Mexico in Oaxaca southward through Central America and throughout northern South America east of the Andes south as far as Bolivia and southern Brazil. Its northern Central American populations south to central Nicaragua have been recently described as a separate subspecies, *Ara macao cyanoptera* (Wiedenfeld 1994). The remaining populations from Nicaragua southward (including South American populations) comprise the nominate subspecies, *Ara macao macao* and are not considered globally threatened (although some isolated populations may be at risk, such as its northernmost populations in Panama and in the Carrara Biological Reserve in Costa Rica).

Northern Central American populations
Ara macao cyanoptera

Distribution and status: Fewer than 100 birds are believed to survive in Mexico, and most of these are found in the



Marques de Comillas area of the Lacandon forest. See map in Howell and Webb (1995). A small population also persists in north-west Guatemala in the Laguna de Tigre region, although chicks from all known nests are poached (Santiago Billy *in litt.* 1997). At least one population also remains in Belize where a flock of up to 100 individuals visits the Red Bank village intermittently. The scarlet macaw apparently no longer occurs on the pacific slope in El Salvador or Honduras. In Nicaragua, there remains a small population at Volcán Cosigüina. On the Caribbean slope in Honduras, the species remains in low numbers. The majority of individuals occur in the north-eastern part of the country, primarily in Departamento Olancho. Wiedenfeld (1994) estimated the total population of scarlet macaws in Honduras at 1,000–1,500 individuals. As in Honduras, the Nicaraguan population of scarlet macaws is restricted to the Caribbean coast. Numbers in Nicaragua are probably somewhat higher than in Honduras, probably in the range of 1,500–2,500 birds (Wiedenfeld 1995).

Threats: Virtually extirpated from middle America by a combination of capture for the pet trade and habitat loss (Iñigo-Elias 1991), the former being by far the most important factor (Iñigo-Elias *in litt.* 1997). Although the macaw is a CITES Appendix I species, some birds are still apparently taken for illegal international trade. However, the macaw is a popular pet species in its range countries, and the majority of birds harvested for pets probably remain within those countries. There were 314 specimens of the whole species recorded in international trade between 1991 and 1995, with an annual maximum of 171 in 1994 (CITES Annual Report database). Surinam, under its reservation, imposed an export quota of 100 specimens for 1998, although other Parties without reservations are not allowed to import the species (CITES Notification to the Parties No. 1998/07).

Within the next 10 years, all middle American populations will probably disappear except for those in highly protected (i.e., guarded) areas. In Belize a recent sighting of over 60 birds puts this population as a special conservation concern (Saqui *in litt.* 1997). Conservation efforts are being considered for harvest of the species and captive breeding in Mexico despite the numerous risks involved in both courses of action. These efforts are, in the opinion of the authors, misguided.

In Carrara Biological Reserve, Costa Rica, most nests of this species are poached, despite attempts to guard them, although apparently juveniles do occur in the population each year. Nests in more remote areas with lower human populations on the Caribbean slope of Central America may experience lower poaching pressure. Surprisingly, chicks are at least as valuable in their range countries as they are in North America or Europe, suggesting that reduction of international trade would not stop the demand for chicks.

Actions: Biological research is currently being conducted on scarlet macaw populations in Mexico, Guatemala, and Belize. Outreach programs are being implemented in Belize to educate schools and local communities about scarlet macaw ecology and conservation. Similar education programs need to be extended to other threatened macaw populations.

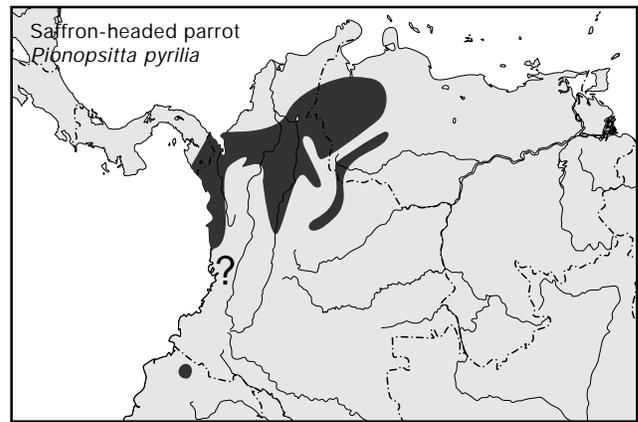
The development of community-based ecotourism may provide an opportunity for local people to extract economic benefit from the tourist appeal of scarlet macaws. In the Marques de Comillas community in southern Mexico and in Red Bank village in Belize, scarlet macaw-based ecotourism projects are currently underway. Similar ecotourism focusing on macaws has been proposed for Costa Rica (Marineros and Vaughan 1995). However, the success of community-based ecotourism depends on effective organisation, training, infrastructure, services, and promotion, and should involve all members of the community (Norris *et al.* 1998).

In Costa Rica, there has been substantial controversy over the management of the Carrara population. An international conference was held in 1995 and recommendations were made to move forward with a combination of ecological studies, nest site protection, and the rescuing of chicks from “unprotectable” nests.

Populations in Nicaragua and Honduras still require attention. The dispersed nature of the remaining scarlet macaw populations in Central America, many of which are located close to national borders, raises the need for a regional approach to conservation which co-ordinates national efforts, and addresses the socio-economic problems of poaching and habitat destruction.

Saffron-headed parrot *Pionopsitta pyrrilia*

Contributors: Franklin Rojas, Jon Paul Rodriguez, Chris Sharpe, Gary Stiles, and Paul Salaman.



Conservation status: IUCN: To be considered. Vulnerable C1.
CITES: Appendix II.
National protection status: Information unavailable.

Distribution and status: A very uncommon parrot of the low humid and high cloudforest of Venezuela, Colombia, and possibly Ecuador. In Venezuela it is rarely seen, even though good habitat is considered sufficient. In Colombia, it may be common at one site, but only seasonally. There are only two other recent records from the country. There is one isolated record in Cotacachi Cayapas National Park in NW Ecuador, and possibly represent roaming birds from nearby Colombia. The species is certainly rare and the estimated population is 10,000, and highly nomadic (Juniper and Parr 1998).

Threats: Significant portions of nearly pristine habitat remain in Venezuela, where national parks in the Andes cover more than 1000km² of suitable habitat. In Colombia, it has been recorded as being trapped for trade (at least nationally), and its habitat is rapidly being lost within its range.

Actions: Further studies on its biology, distribution, population size, and regional movements are needed.