

The most popular and sought-after amazon in trade, this species is known from four discrete areas, three in Mexico (Atlantic lowlands, Pacific lowlands, and the Islas Marías) and one in Belize, but has suffered enormously from trade pressures and habitat loss throughout its Mexican range, and it may also be under pressure in Belize. A suite of actions, including surveys, studies, site protection and management, and local education campaigns, is required.

DISTRIBUTION The Yellow-headed Amazon (see Remarks 1) is confined to Mexico and Belize in four apparently discrete populations, namely the race *tresmariae* on Mexico's Islas Marías (“Tres Marías” islands) off the coast of Nayarit, a population of nominate *oratrix* on the Pacific slope of Mexico in the states of Jalisco, Colima, Michoacán, Guerrero and Oaxaca, another population of nominate *oratrix* (sometimes considered a distinct race, *magna*: but see Remarks 2) on the Atlantic slope of Mexico in the states of Tamaulipas, San Luis Potosí, Veracruz, Tabasco and Chiapas (with records or claims also for Guanajuato, México, Puebla, Campeche and Yucatán), and *belizensis* in Belize (for records concerning Guatemala, see Remarks 3; for other distributional reports, see Remarks 4).

Mexico The following account is organized primarily by discrete populations (*tresmariae*, *oratrix* and “*magna*”) and then by state, from north to south and with localities within them from north to south or west to east; unless otherwise stated, coordinates are derived from OG (1956a).

Islas Marías The race *tresmariae* occurs on all four islands – San Juanito, María Madre, María Magdalena and María Cleofas – in the group (Stager 1957, Grant and Cowan 1964), and because nomadic within and between islands (e.g. Konrad 1984, 1986) it has no clearly identified key sites or sites repeatedly mentioned in the literature; nonetheless, in April 1983 “literally hundreds (if not thousands)” of birds congregated daily in the main seaport of Balleto on María Madre, because of the fruit trees in the vicinity, while elsewhere they were hard to find (Hansen 1984), which indicates that there may be some very definite areas of importance for the species.

Jalisco Records are by P. Hubbell near Chamela in the 1960s, and by K. Radamaker, who saw two adults 13 km north of Barra de Navidad in December 1991 (both *per* S. N. G. Howell *in litt.* 1992).

Colima Lawrence (1874) listed the “Tupila River” and the río de Coahuayana as localities where J. Xantus, who was reported to have worked only in the Colima and Manzanillo areas, had collected the species; the former cannot be traced but both are indicated for the state by Ridgway (1916), the latter, at 18°41'N 103°45'W, evidently lying at the frontier with Michoacán. However, all Schaldach's (1963) records were from the base of Cerro del Sacate (with specimens from the adjacent Llano de Garritas, coordinates for both, as read from his map, being almost exactly 19°N 104°W) and other mountain massifs in the central part of the state, the species not being seen elsewhere.

Michoacán Certain authorities, lacking evidence, have resisted including this state in the range of the species, despite its position between Colima and Guerrero (e.g. Ridgway 1916, Friedmann *et al.* 1950, Forshaw 1989), while at the other extreme Monroe and Howell (1966) shaded the entire coastal region of the state as part of the bird's distribution, and AOU (1983) involved it through the phrase “Colima south to Oaxaca”; yet there appear to be only two records, both previously unpublished. A male was taken at La Placita on 8 July 1950 (specimen in UMMZ); however, the collector of this specimen, R. W. Storer (*in litt.* 1992), in indicating that La Placita is a village on the east bank of the río Maquili c.1 km from the sea and c.20 km south-east of the Coahuayana estuary, also reported that he found the species “fairly common in coconuts and small trees” in the vicinity, and he has field notes that suggest that several hundred amazons nearby at Ostula (c.15 km from the sea on the río Ostula, which meets the Pacific south-east of La Placita) may have been this species. In November 1987 R. Bowers saw 25 at Km 100 on the main coastal highway (S. N. G. Howell *in litt.* 1992).

Guerrero Evidence for the listing of this state (Friedmann *et al.* 1950, Forshaw 1989; and by map and by implication – see above – Monroe and Howell 1966 and AOU 1983 respectively) appears to reside with just two records, a specimen from Papayo (Ridgway 1916) and one from Cuajinicuilapa (Monroe and Howell 1966). OG (1956a) lists only two localities called Papayo, but both within this state, at 17°02'N 100°17'W and 17°55'N 100°32'W, the former being perhaps the more likely as seemingly at a lower

altitude and closer to the coast (see Ecology); Cuajinicuilapa is listed at 16°28'N 98°25'W, i.e. close to the coast. There are no credible recent reports from the state (S. N. G. Howell *in litt.* 1992).

Oaxaca Birds have been recorded from two disjunct areas: in the south-west at Llano Grande, Minitán, Río Grande (near Puerto Escondido) and 15 km west-north-west of San José Estancia Grande; and in the east at “Petapa” (this probably Santo Domingo Petapa), 16°49'N 95°09'W, and El Barrio, 16°48'N 95°08'W (Binford 1989, whence also the coordinates). Binford (1989) expected the race *magna* to occur in the northern part of the state, but there appear to be no records (but see, e.g., Playa Vicente under Veracruz).

Tamaulipas Records are from the centre of the state southwards, as follows: Villagrán, nineteenth century (specimen in BMNH marked “Villa Gran, N.L.” but doubtless from the Tamaulipas locality, which is close to the Nuevo León border; see Remarks 4); Hidalgo (Ridgway 1916, Monroe and Howell 1966); Jiménez (Ridgway 1916, Monroe and Howell 1966); río Cruz (presumably río de la Cruz as in Ridgway 1916; now río Purificación), 23°58'N 98°42'W (Phillips 1911); río Pilón, 23°58'N 98°42'W (Ridgway 1916, Monroe and Howell 1966); río Corona at 250 m (23°55'N 99°00'W in Gehlbach *et al.* 1976; also Ridgely 1981a), including near Güemez (Sutton and Burleigh 1939, also *Amer. Birds* Christmas Bird Count site); (Villa de) Casas, 23°44'N 98°45'W (Vázquez undated); Soto la Marina and the river of the same name (Ridgway 1916, Monroe and Howell 1966, Pérez and Eguiarte 1989, Vázquez undated); La Pesca (Baker and Fleming 1962), also a pair in April 1990 (S. N. G. Howell *in litt.* 1992); Ciudad Victoria and environs, including 35 km to the east (specimen in UMMZ) and the Sierra Madre Oriental above (i.e. to the west) (Ridgway 1916, Sutton and Burleigh 1939, Monroe and Howell 1966, Vázquez undated); Aldama (Ridgway 1916, Vázquez undated) and the Los Colorados Ranch, east-north-east of Aldama (see map in Pérez and Eguiarte 1989); Gómez Farías, 23°03'N 99°09'W, this area including the Rancho Rinconada and the río Frío district (Sutton and Burleigh 1939, Sutton and Pettingill 1942; also an *Amer. Birds* Christmas Bird Count site, specimen in DMNH); 5 km north-west of Acuña, 23°12'N 98°26'W, in the Sierra de Tamaulipas (specimen in DMNH); Tampico (Ridgway 1916, Monroe and Howell 1966). An untraced locality in the state is “S. F. de Presas” (Monroe and Howell 1966), which Ridgway (1916) recorded as “Santa Fé de Presas”.

San Luis Potosí Records are from the easternmost part of the state at: El Naranjo (Las Abrisas at the centre of this area), 22°30'N 99°24'W (*Amer. Birds* Christmas Bird Count site), this also being “El Salto”, where a pair was seen in April 1990 (S. N. G. Howell *in litt.* 1992); Ebano and 15 km west of Ebano; El Bonito (untraced); Hacienda Limón (untraced); and 3 km north of Tamuín (all from Monroe and Howell 1966). A further untraced locality is “El Banito”, where a specimen (in FMNH) was collected on 27 June 1940.

Guanajuato Records from this state have been dismissed as referring to escaped cagebirds (Friedmann *et al.* 1950), but this ignores the testimony (and apparently only basis for listing the state) of Dugès (1899), who indicated that the occurrence of flocks around Silao (20°56'N 101°26'W) was abnormal and caused by loss of food to heavy frosts in Veracruz.

Veracruz Records are from throughout the low coastal plains (as indicated by Sumichrast 1869), at: río Tamesí near Rayón (San Antonio Rayón is at 22°25'N 98°25'W) (Ridgway 1916, Monroe and Howell 1966), and near Paso del Haba (specimen in DMNH; also Chapman 1914b); Pánuco (Monroe and Howell 1966); Misantla (Ridgway 1916; see Remarks 5); Jalapa (Ridgway 1916); río Blanco, 20 km west-north-west of Piedras Negras (Lowery and Dalquest 1951); Alvarado (Salvin and Godman 1888-1904); near San Andrés Tuxtla (Sclater 1857b); 12 km north of Catemaco (*Amer. Birds* Christmas Bird Count site, this possibly the same as the preceding area; Playa Vicente (Sclater 1859b), at 17°50'N 95°50'W (in Binford 1989, who placed the locality in this state rather than in Oaxaca (*contra* Sclater 1859b); Zanja Seca, Playa Vicente municipality on Oaxaca border (specimen in DMNH); 10 km south-west of Jimba, 17°55'N 95°25'W (Lowery and Dalquest 1951); 20 km east of Jesús Carranza, at 90 m (Lowery and Dalquest 1951); Paso Nuevo (if this is the “Pasa Nueva” of Ridgway 1916, Monroe and Howell 1966), 18°01'N 94°27'W. Untraced localities include Santa Ana (Ferrari-Perez 1886, Ridgway 1916) and San Juan (Ridgway 1916).

Chiapas Ridgely (1981a) listed the species for north of the state without indicating the evidence, but on 3 March 1987 a single adult was seen by S. N. G. Howell and S. Webb (*in litt.* 1992) along the road

to El Cuyo north of Catazajá in the far north-east, i.e. c.17°40'N 91°55'W (as read from PM 1988), and other records of up to four birds have been reported to these observers from this and adjacent areas during the 1980s.

México Records from this state (Ridgway 1916, presumably based on Lawrence 1871) have been dismissed as referring to escaped cagebirds (Friedmann *et al.* 1950).

Puebla Rinconada was listed by Ridgway (1916) based on Lantz (1900), the only such locality in OG (1956a) that occurs in the state being a railway station at 19°06'N 97°40'W.

Tabasco There appear to be two records, from 15 km north of Reforma (which TAW 1986 and PM 1988 place just inside Chiapas against the Tabasco border) (Brodkorb 1943) and from 15 km north of Balancán in the east of the state (Monroe and Howell 1966).

Belize The apparently endemic race *belizensis* is known from the following localities (north to south, coordinates from OG 1956b): St Ann's village (C. Pickup *in litt.* 1989), presumably Santa Ana, 17°49'N 88°19'W; Crooked Tree pine ridge, 17°45'N 88°32'W (Russell 1964, specimen in BMNH), where one was seen in March 1991 (S. N. G. Howell *in litt.* 1992); Mussel Creek, 17°39'N 88°24'W (Miller and Miller 1988); Hill Bank (Russell 1964); Gallon Jug, 17°33'N 89°01'W (Russell 1964, Monroe and Howell 1966); lower reaches of Sibun river, 17°26'N 88°16'W (Russell 1964); near Belize City (Counsell 1988); Monkey Bay Wildlife Sanctuary, c.50 km west of Belize City, February 1992 (S. N. G. Howell *in litt.* 1992); near Dangriga (C. Pickup *in litt.* 1989); lower reaches of Sittee river, 16°48'N 88°15'W; All Pines, 16°47'N 88°18'W (Russell 1964, Monroe and Howell 1966); around Placentia, 16°31'N 88°22'W (D. Weyer *in litt.* 1989); Ycacos Lagoon, 16°18'N 88°37'W, and environs (Russell 1964, Monroe and Howell 1966).

U.S.A. Feral populations of members of the *Amazona ochrocephala* group have become established in various parts of North America and the Caribbean (see Long 1981, Lever 1987), although it is not always clear which race or species is involved, and in any case with the possibility that several are, and that they hybridize (Forshaw 1989). Lever (1987) reported that *oratrix* is the form established on Puerto Rico and in Miami, although in the latter it hybridizes with Green-cheeked Amazon *A. viridigenalis*.

POPULATION This species has undergone one of the most dramatic population declines of any bird in the Americas. Its heartland, in terms of abundance and continuity of populations, was the Atlantic lowlands in Tamaulipas and Veracruz, and although it is possible that the two outlying populations in the Islas Marías and Belize are less seriously affected, and that the numbers on the Pacific slope were never high, it is in the Atlantic lowlands that the birds' disappearance has been both widespread and relentless, giving rise to concern for the long-term prospects of the entire species. In 1976 and 1979 surveys were made and the total population (presumably in Mexico) was then estimated to be no more than 17,000 birds, with all subpopulations declining (C. Schouten *in litt.* 1986). Edwards (1989) called the bird rare.

Islas Marías Although the birds were “very abundant” in 1865, only two years later “their numbers had diminished considerably” (Grayson and Lawrence 1871, Lawrence 1874; see Threats). This oscillation apart, however, the population of *tresmariae* has seemingly maintained itself well, with comments such as “common” (Nelson 1899), “very common” on María Cleofas (Bailey 1906), “common on all of the four islands” (Stager 1957), and “hundreds (if not thousands)” on María Madre (Hansen 1984). Transects on María Madre in 1984 yielded a mean of four parrots per 8 km route and, with observations including a count of around 150 during morning feeding flights in the north-eastern third of María Magdalena and of about 100 in the orchards of Nayarit and Rehilete villages, María Madre, the total population of *tresmariae* was estimated to be less than 800 (Konrad 1984). Populations move between islands: on 22 January 1985 between 170 and 220 were seen flying between María Madre and San Juanito (Konrad 1986); thus it is not possible to break down numbers of birds by island.

Pacific slope (race oratrix) Evidence all points to the species being very local and, at best, uncommon: “uncommon” in Colima (Schaldach 1963), “uncommon and local” in Oaxaca (Binford 1989),

and known from a total of three specimens and a handful of records for Jalisco, Michoacán and Guerrero (see Distribution).

Atlantic lowlands (race “magna”) In Tamaulipas it was common along the río Corona in February 1938, though less so near Gómez Farías (Sutton and Burleigh 1939), and in Veracruz it was common in the 1850s and the 1940s, with “literally hundreds” in roosting flights (Sclater 1857b, Lowery and Dalquest 1951). Ridgely (1981a), referring to “a striking reduction in numbers... over, as far as is known, all of its range”, emphasized the loss of birds from this particular region (“a pair or two where great flocks used to occur”), citing an observer with 20 years' experience there. Even in the 1980s, however, the marked decline has continued, with campesinos reporting that each year it is more difficult to find nests and capture young (Vázquez undated). On the 600 ha (though now 4,000 ha) Los Colorados Ranch, 25 birds were estimated present in 1985, revealing a 90% decline from 1976 to 1979 and an 18% further decline to 1985 (Pérez and Eguiarte 1989). The four localities where the species has been recorded during the *Amer. Birds* Christmas Bird Counts have generally yielded very low numbers (single figures or sometimes none at El Naranjo, Gómez Farías and Catemaco), although near Güemez there were counts of 77 in 1983 and 114 in 1985.

Belize The race *belizensis* was reported by Russell (1964) to be common only in the vicinity of Hill Bank and Ycacos Lagoon and along the lower reaches of the Sibun and Sittee rivers, being considered local elsewhere. However, Forshaw (1989) had a report from 1981 that this was the only parrot to have declined dramatically in the country in recent years, a view repeated by C. Schouten *in litt.* (1986) and supported by resident naturalists (e.g. D. Weyer), who have noted a decline in the population along the Sibun River (J. Clinton-Eitniear *in litt.* 1992). Nevertheless, the species was reported to be still fairly common in the country in 1986 (D. S. Wood *in litt.* 1986; see also last clause in Remarks 6), a view provisionally endorsed by S. N. G. Howell (*in litt.* 1992) on the basis of 70-80 roosting at the Monkey Bay Wildlife Sanctuary in February 1992, and observations between mileposts 29 and 32 on the Western Highway; but see Threats.

ECOLOGY The Yellow-headed Amazon occupies xerophytic vegetation (e.g. dense thorn forest), savanna, tall deciduous forest and humid riverine woodland in tropical lowlands (Lowery and Dalquest 1951, Schaldach 1963, Monroe and Howell 1966); in the northern part of the Atlantic lowlands birds favour gallery forest in semi-arid regions, while to the south they occur in more humid savanna country, also with gallery forest (Ridgely 1981a). The species occasionally ranges as high as 500 m (Ridgely 1981a), in Oaxaca 330 m (Binford 1989). In Belize it roosts in pine ridges and feeds in adjacent humid forest (Russell 1964; see Remarks 6). Birds make flights between roosting and feeding areas, sometimes flying very high (Grayson and Lawrence 1871, Baker and Fleming 1962); in one case, birds fed in “the jungles of the humid division” of the regional life-zone and roosted in the arid coastal plain (Lowery and Dalquest 1951); in another they fed on “forested slopes of the interior” (of María Cleofas) and roosted in a heavy stand of large agaves by the coast, actually settling for the night on the lower spiny leaves less than 2 m from the ground (Stager 1957).

Food consists of fruit such as wild figs (Bailey 1906) and other trees both wild and cultivated, such as *Psidium guajava*, *Pithecellobium flexicaule*, *P. dulce*, *Acacia milleriana*, *Acacia* sp., *Macuna* sp., *Zuelania guidonia*, *Bumelia laetivirens*, *Solanum* sp., *Zea mays* and palms, and also the young buds of trees and shrubs (Vázquez and Maldonado Rodríguez 1990; also Nelson 1899, Lowery and Dalquest 1951, Clinton-Eitniear 1990). In some cases, damage may thus be done to certain crops, e.g. of green bananas (Lowery and Dalquest 1951), and on Islas Mariás in the months of March to June (Konrad 1986); on María Madre birds were seen to eat mango flowers and tiny fruit in April 1983 (Hansen 1984). Over the 1991/1992 winter the main food item of a study population in Tamaulipas was the bean of *Pithecellobium ebano* (E. Enkerlin *in litt.* 1992; this is presumably *P. flexicaule* or *P. dulce*). Birds displaced from Veracruz by food privation in March 1899 fed on sweet lemons, avocados and other cultivated fruit, and devastated a lucerne crop (Dugès 1899).

On Islas Mariás Grant (1966) reported breeding later than on the mainland and indicated May as against February. However, this seems mistaken: on the islands in 1984 two broods of two nestlings were

observed in early April, which meant that eggs must have been laid in mid-February, with hatching in mid-March and an anticipated fledging in mid-May (Konrad 1986); in other cases, half-grown young were found in mid-April (Hansen 1984) and mid-May (Nelson 1899). On the mainland, breeding condition males have been collected in mid-February in Oaxaca (Binford 1989) and at the start of April in Tamaulipas (Sutton and Pettingill 1942), the breeding cycle in the latter state lasting from March till June (Vázquez and Maldonado Rodríguez 1990). This pattern is largely repeated in Belize, where nests with eggs have been found in March and April, a nest with young in May, and a female in February and a male in May both in breeding condition (Russell 1964). Birds nest in holes in living and dead trees, 6-15 m up with the cavities sometimes over 4 m deep, laying two or three eggs usually at the end of March or start of April, incubation lasting 30-35 days with chicks hatching in early May and leaving the nest 30 days or more later (Vázquez and Maldonado Rodríguez 1990). Six nests found on the Los Colorados Ranch in 1985 were 4-10 m up in the trunks of *Pithecellobium ebano* (four), *Bumelia laetivirens* and *Ficus involuta* (Pérez and Eguiarte 1989). On the Islas Marías holes high in large forest trees (one was identified as locally called “palo prieto”) are again used (Grayson and Lawrence 1871, Lawrence 1874, Nelson 1899). Records on these islands all refer to two eggs or two nestlings (Lawrence 1874, Nelson 1899, Konrad 1984). On the río Corona, breeding density was 1-2 males per 8 ha (Gehlbach *et al.* 1975), with 0.26 birds per ha in coastal Tamaulipas (see Pérez and Eguiarte 1989). In Belize birds nest in pines (Russell 1964).

The species is non-migratory, but food privation and fire cause occasional wanderings (Dugès 1899; see Distribution: Guanajuato) and on the Islas Marías local, possibly seasonal, movements take place between islands (Konrad 1984). Even within flocks birds keep in pairs, and commonly sit in the tops of tall trees (Nelson 1899, Lowery and Dalquest 1951, Edwards 1989). In Tamaulipas no strong flocking behaviour has been recorded in a resident study population of c.50 birds, only groups of 2-5 or lone individuals (E. Enkerlin *in litt.* 1992).

THREATS The massive decline in the numbers of this species is the product of habitat destruction combined with intensive and relentless exploitation for the cagebird trade (Ridgely 1981a, C. Schouten *in litt.* 1986); the Atlantic lowland populations (race “*magna*”) suffered the most, being in the area most devastated by forest clearance and closest to the U.S. border for illegal trafficking (Ridgely 1981a). In Belize these factors may be somewhat less pressing, but are compounded by “considerable hunting pressure” (D. S. Wood *in litt.* 1986).

Habitat destruction Loss of natural habitats has been extensive in north-eastern Mexico (see the relevant section in Threats under Green-cheeked Amazon). Vázquez (undated), discussing Tamaulipas in 1986, referred to continuing cutting and burning of forests, timber extraction, water pollution and insecticide use. In this state, forest destruction has led to birds occupying suboptimal habitat (Pérez and Eguiarte 1989). Elsewhere within the species's range, evidence is much less clear on the status of habitats, except (a) in the case of Belize where, having long remained largely unaffected (D. S. Wood *in litt.* 1986), forests are now suffering conversion in many areas to citrus plantation (and the birds are being persecuted as pests as a consequence) (S. N. G. Howell *in litt.* 1992), and (b) on the Islas Marías, where much forest remains (Konrad 1984, 1986); in general, habitat alteration in the southern part of the species's range (east of Veracruz) has been relatively minor (Ridgely 1981a).

Trade The Yellow-headed Amazon is or at least was “the most in demand of any amazon parrot”, all forms being thought “the most tameable and the best talkers among the neotropical parrots” (Ridgely 1981a). This ability has long been known (Chapman 1914b found dealers who rated it second only to the African Grey Parrot *Psittacus erithacus* in this regard), and before the turn of the century birds on the Islas Marías were being sold directly to visitors but also sent to market in mainland ports, those taken when young being most prized as they proved most docile (Nelson 1899; also Lawrence 1874). Although Low (1972) considered *tresmariae* “rare in aviculture”, Ridgely (1981a) reported “relatively large numbers” being sold in the U.S.A., prompting the work by Konrad (1984, 1986) who, however, found that on María Madre a limit of 20-30 young parrots per year was set on the number that could be taken for private use within the island and their export entirely prohibited; but he noted that many of these captured birds died through lack of care. Some fluctuations in persecution may have taken place on these islands, as A. J. Grayson found the birds tame and unsuspecting in 1865 but shy and wary of man in 1867 (Grayson and

Lawrence 1871, Lawrence 1874), yet they had returned to their confiding ways 30 years later (Nelson 1899) and were once again “as wild as the parrots on the mainland” in 1955 (Stager 1957).

On the mainland, persistent taking of nestlings for the pet market was the suspected cause of the species's scarcity in Colima, with a “great demand” for birds from as far away as Mexico City (Schaldach 1963). In a nine-month period from October 1979 to June 1980 over 2,700 birds were recorded as imports into the U.S.A. (Roet *et al.* 1981), and many more would have been smuggled across the border: “campesinos everywhere are very much aware of how much nestlings are worth” (Ridgely 1981a). Recent studies in Tamaulipas entirely confirm this last point, and indicate that even now trapping is the major factor operating against the species (Vázquez and Maldonado Rodríguez 1990). Even on a relatively well protected site in this state, such as the Los Colorados Ranch, amazon parrot nests (three species) suffered 30% loss to trappers in 1985 (Pérez and Eguiarte 1989). In Belize there is now evidence of considerable trapping for foreign markets (S. N. G. Howell *in litt.* 1992), captive birds being too valuable to be kept as pets (J. Clinton-Eitniear *in litt.* 1992).

Natural causes In Tamaulipas heavy rain can flood nest cavities and drown chicks; and certain reptiles prey on eggs (Vázquez and Maldonado Rodríguez 1990). On the Islas Mariás nest predators may include snakes, iguanas and racoons, while Crested Caracaras *Polyborus plancus* and Peregrines *Falco peregrinus* were witnessed attacking adults (Konrad 1986).

MEASURES TAKEN There have been few concrete achievements. In Belize, a seven-year moratorium on commercial trade in wildlife was imposed in 1981, and all but six species of bird are protected from hunting (Inskipp *et al.* 1988). In Mexico, commercial export of most wildlife has been prohibited since 1982 (Inskipp *et al.* 1988). The survey of the race *tresmariae* called for by Ridgely (1981a) was duly carried out (Konrad 1984, 1986), and the birds were found to be “completely protected” there, albeit young were taken from nests for local interest (Hansen 1984). Recent studies in Tamaulipas (Vázquez undated, Vázquez and Maldonado Rodríguez 1990, and by E. Enkerlin) have begun to provide essential data on the species's status and requirements within the state.

MEASURES PROPOSED Clearly a principal need is for a thorough survey of the Yellow-headed Amazon throughout its mainland Mexican range, using interviews with local people as a major source of evidence of past or present occurrence; on present knowledge, the establishment of reserves in which to manage the species should be a target in Colima, Tamaulipas and Veracruz, in the latter two cases at sites that also hold the threatened sympatric Green-cheeked Amazon (see relevant account for certain possible localities); nest-box deployment at one such site, Los Colorados Ranch in Tamaulipas (see Distribution), has already begun with the support of the Avicultural Society of America; this programme will also involve local education campaigns (see Measures Proposed under Green-cheeked Amazon). A key element in a conservation strategy for both amazons may be the encouragement and commitment of landowners to preserving tracts of habitat and to guarding the birds, particularly when nesting, with the aid of their staff (E. Enkerlin *in litt.* 1992). Surveys should not ignore Jalisco, Michoacán or Guerrero in the west or eastern Veracruz or Tabasco in the east, and some effort to confirm the bird's presence and status in western Campeche (see Remarks 4) and on the Isthmus de Tehuantepec, and in particular in western Oaxaca, is required. Representations are needed with the Mexican authorities to continue the existing policy of non-export from the Islas Mariás (at least part of which is a penal settlement: Konrad 1986) and to manage the islands so that this important small population is fully catered for. In Belize a study of the apparently fairly strong but waning status and distribution of the bird would be very timely.

Captive breeding The Yellow-headed Amazon has been bred fairly widely in captivity and efforts are needed to keep subspecies separate (Bosch 1991). Whether there is scope for using confiscated birds for a captive breeding and release programme (as suggested by Vázquez undated) remains to be evaluated, based on several major considerations (as outlined by Black 1991).

REMARKS (1) The *Amazona ochrocephala* complex (discussed by Monroe and Howell 1966) appears to split into three species, the Yellow-headed Amazon *A. oratrix*, the Yellow-naped Amazon *A. auropalliata* and the Yellow-crowned Amazon *A. ochrocephala* (Ridgely 1981a, AOU 1983, Binford

1989, Forshaw 1989, Sibley and Monroe 1990); although at present this arrangement remains tentative, it is accepted here.

(2) Of the four races, *belizensis* is certainly the most distinct (to the point where its place in *oratrix* might be reconsidered, especially in the light of the second paragraph in Remarks 3), *tresmariae* is widely tolerated although opinions vary since some characters seem only to be age-related (Stager 1957 and Monroe and Howell 1966 thought it well differentiated; Nelson 1899, Salvadori 1906 and Grant 1965 did not), while *magna* has been regarded with considerable scepticism (e.g. by Ridgely 1981a, Forshaw 1989). The describers of *magna* (Monroe and Howell 1966) insisted that “the Pacific and Atlantic slope populations are completely separate from one another for their entire range with the possible exception of the Tehuantepec region, and we know of no unequivocal data that demonstrate a continuity of the two populations across the Isthmus”. However, the type-locality for *oratrix* is in the same drainage and same lowlands (judging from TAW 1986 and Binford 1989) as the birds in Veracruz from east of Jesús Carranza, some 70 km to the north, and it is very difficult to believe that there could ever have been a barrier to the miscegenation of populations in these localities. Nevertheless, it is evidently at the Isthmus de Tehuantepec that the species *oratrix* divides from the species *auropalliata*, the distance between the type-locality of *oratrix* and the closest western site for *auropalliata* also being only some 70 km (judged again from the sources above).

(3) Inskipp *et al.* (1988) pointed out that the single record of “*Amazona ochrocephala*” from the Petén, north-eastern Guatemala, given (it is not clear on what evidence) by Land (1970), may refer to *A. oratrix* (presumably *belizensis*); the presence of *oratrix* either side of northernmost Guatemala is a curiosity that may be an artefact of observation, despite the distinctive appearance of *belizensis*.

There appears to be a population of birds close to *belizensis* (but with less extensive yellow on the face, concentrated on the crown and lores; i.e. perhaps intermediate between *belizensis* and the yellow-crowned population in the Sula valley of north-west Honduras, for which see Monroe and Howell 1966) in the beach scrub and mangroves north of Puerto Barrios on the Golfo de Honduras (J. Bucklin *per* S. N. G. Howell *in litt.* 1992). Captive birds in Puerto Barrios were said to have been caught locally, and thus represent a case of exploitation in trade prior to formal documentation in the scientific literature (S. N. G. Howell *in litt.* 1992).

(4) In Mexico, Nuevo León has been listed for the species (Salvadori 1895a; hence presumably Friedmann *et al.* 1950, and hence presumably Blake 1953, Ridgely 1981a, AOU 1983, Inskipp *et al.* 1988, Forshaw 1989, Sibley and Monroe 1990), but this seems to be based on a single skin in BMNH marked “Villa Gran, N.L.”, discussed above under Tamaulipas (and listed as Villa Grande in Salvin and Godman 1888-1804). Campeche is mentioned as having a population by Ridgely (1981a) but by no-one else. Yucatán was once listed (e.g. by Ridgway 1916, Peters 1935, Friedmann *et al.* 1950) but there appears to be no supporting evidence (Paynter 1955).

(5) Salvin and Godman (1888-1904) and Ridgway (1916) also list “Río Rancho Nuevo” for Veracruz, but this is in fact on the same specimen label (in BMNH) as that responsible for the listing of Misantla.

(6) Monroe and Howell (1966) interpreted this as indicating the species being “confined to the lowland pine savanna and adjacent areas”, which may be accurate; Wood *et al.* (1986) listed it for two broad habitat types, coastal savannas (but this includes lowland areas covered in pines) and northern hardwood forests (which includes gallery forests that cross savannas), adding that it is common in the former, uncommon in the latter.