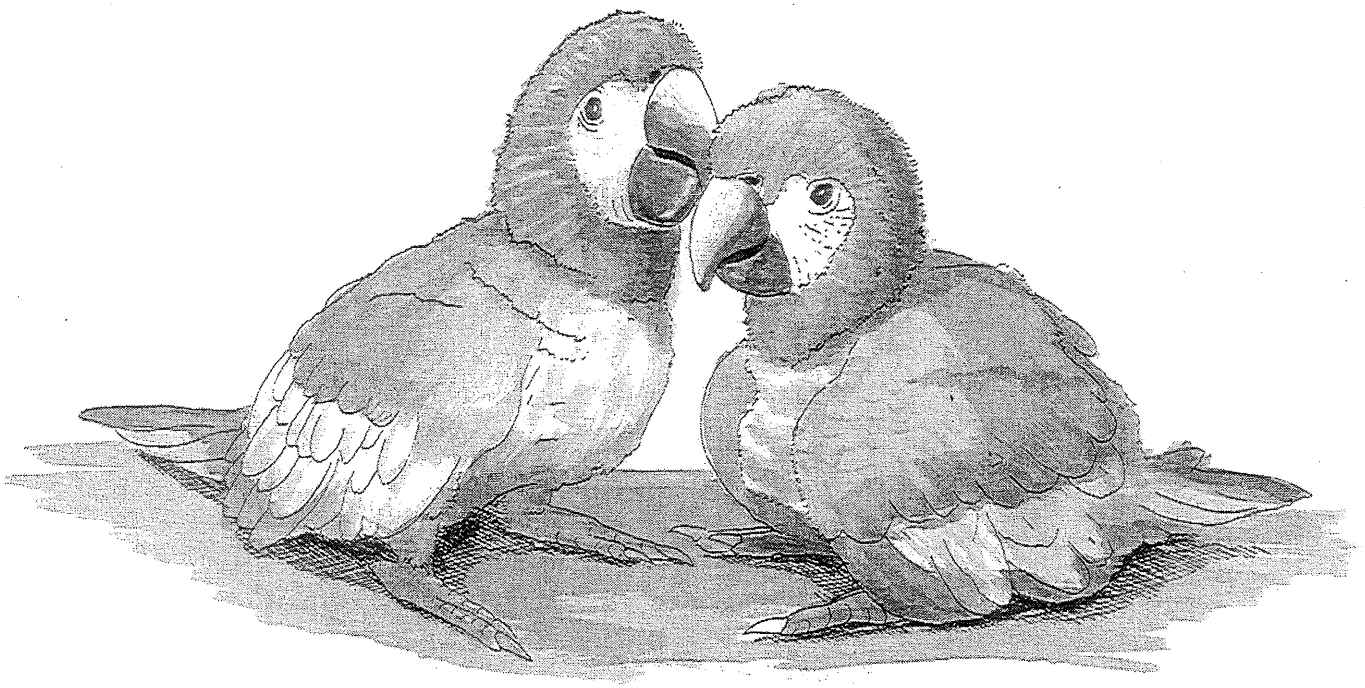
1990
Psittacine Captive Breeding Survey

A Survey of Private Aviculture in the United States



By
Catherine M. Allen and Kurt A. Johnson

TRAFFIC USA
World Wildlife Fund–US
1250 Twenty-Fourth Street, NW
Washington, DC 20037

July 1991

WWF®

1990 PSITTACINE CAPTIVE BREEDING SURVEY

A Survey of Private Aviculture in the United States

By

Catherine M. Allen and Kurt A. Johnson

July 1991

TRAFFIC USA
World Wildlife Fund-US
1250 Twenty-Fourth Street, NW
Washington, DC 20037
U.S.A.

Abstract

An unprecedented 1,221 aviculturists responded to the 1990 TRAFFIC USA Psittacine Captive Breeding Survey, and over 31,000 birds of 183 species were documented. This marks the first time that such a large number of private aviculturists in the United States have responded to a comprehensive national survey of captive breeding. Results of the questionnaire indicate that many private aviculturists in the United States use modern avicultural techniques such as permanent marking systems, surgical sexing, computerized breeding and pediatric records, and artificial incubation of eggs. Aviculture will continue to advance as more and more aviculturists adopt these and other modern techniques. Results of the census confirm that U.S. aviculturists maintain a wide variety of psittacine species in their collections, from very common to very rare, and that they are breeding many species successfully. Private aviculturists have begun to demonstrate their potential for meeting the pet industry's growing demand for captive-bred birds. Popularity as a pet, the value of individual birds, and availability from the wild appear to play an interrelated role in determining what species are emphasized in captive breeding. The results of the 1990 TRAFFIC USA Psittacine Captive Breeding Survey provide a positive step toward understanding the status of captive breeding of psittacines by private aviculturists in the United States.

Acknowledgments

The 1990 Psittacine Captive Breeding Survey would not have been possible without the help and support of a number of individuals and organizations. Our sincere appreciation goes to Teresa Mulliken and Jorgen Thomsen of TRAFFIC International for initiating the pilot survey and for their full support during all phases of the 1990 Survey. We are grateful to the aviculturists and avian veterinarians who generously provided their time and valuable comments during the survey's development, especially Dale Thompson, Kim Joyner, DVM, and Susan Clubb, DVM, for their assistance in developing the survey.

We also wish to thank the members of the Cooperative Working Group on Bird Trade (CWGBT); James Leape, chairman of the CWGBT and senior vice president of the U.S. and Developed Countries Program at World Wildlife Fund (WWF-US); Ginette Hemley, director of TRAFFIC USA; and E. U. Curtis Bohlen, former chairman of the CWGBT, for their support of the survey. A special thank you to Laura Adler of WWF-US for her invaluable assistance in developing the survey's computerized data base. Thank yous go to Judy Dunbar for assisting with data entry and to Holly Reed for her generous assistance.

Finally, we would like to thank the American Federation of Aviculture for distributing the survey form to its membership and to Kathy Lyon for publishing the survey in Bird World magazine.

Table of Contents

List of Tables and Figures

Tables

Figures

I. INTRODUCTION

TRAFFIC USA's involvement in assessing the role of private aviculture in breeding psittacines for the pet market grew out of deliberations of the Cooperative Working Group on Bird Trade (CWGBT). The CWGBT, a group comprised of representatives from the pet industry, animal welfare organizations, aviculture, avian veterinarians, conservation organizations, and the zoological community, was convened in 1988 by World Wildlife Fund (WWF-US) and TRAFFIC USA to address the problems associated with imports of exotic birds into the United States. After two years of intense research and discussion, the CWGBT recommended that U.S. imports of wild-caught birds for the pet trade be phased out over five years, with the goal that wild-caught birds be replaced by captive-bred birds of both foreign and domestic origin. While some imports of wild-caught birds would continue to be allowed for captive breeding purposes, the CWGBT recommended that federal import controls be strengthened and streamlined (CWGBT 1990).

The CWGBT realized that quantitative information on captive breeding by private aviculturists in the United States was virtually non-existent. To address the information void TRAFFIC USA, WWF's international wildlife trade monitoring program, initiated a project to: (1) assess the current and potential ability of private aviculture in the United States to fulfill the pet bird industry's growing demand for captive-bred birds and (2) determine what factors are inhibiting or contributing to the growth of private aviculture in the United States.

A pilot survey of aviculturists was distributed at the American Federation of Aviculture (AFA) annual meeting in 1989. One purpose of the pilot survey was to determine whether aviculturists might participate in a more comprehensive survey of psittacine captive breeding. Although only a small number of U.S. aviculturists participated in the pilot survey, the 135 completed survey forms documented over 18,000 birds. More important, over 85% of the respondents indicated they would be willing to participate in a more comprehensive psittacine captive breeding survey. The results of the pilot survey, published in AFA Watchbird (Allen et al. 1990), inspired the larger and more comprehensive 1990 Psittacine Captive Breeding Survey.

II. METHODS

The 1990 Survey was limited to psittacines (order Psittaciformes) because they are commonly imported for the pet trade, and because harvest for the pet trade threatens some wild populations. Except for two questions specific to them, budgerigars (Melopsittacus undulatus) and cockatiels (Nymphicus hollandicus) were excluded from the survey because they are well established in captivity and their husbandry is well known.

The Survey consisted of a two-part survey form: a questionnaire and a census form (Appendix 1). The questionnaire contained 32 questions in sections devoted to collection inventory, avicultural practices, avian health care, selling and trading, and background information about the respondents. The census form listed 130 species organized into nine categories: amazons, cockatoos, macaws, parrots of primarily African and Pacific origin, conures, lories, pionus, parrotlets, and lovebirds. An "other" category allowed respondents to add species not listed on the census form. A "mixed pairs" category allowed respondents to list mixed breeding pairs (also referred to as hybrid pairs). For each species, information was requested on total number of birds held, origin of the birds, and 1989 breeding information. Nomenclature in this report follows Forshaw (1989) for common names and Morony et al. (1975) for scientific names.

Survey forms were distributed in May 1990. The AFA distributed the survey form to its 5,700 individual members by mail. In addition, the AFA asked each of its affiliated bird clubs around the country to distribute survey forms to club members. Bird World magazine published the survey form as an insert in the May/June 1990 issue. Accompanying letters from two avian veterinarians, a respected aviculturist, and the editor urged readers to participate in the 1990 Survey. Finally, survey forms were sent to all individuals who requested them directly from TRAFFIC USA. Despite overlap of distribution between Bird World readers and AFA members, it is estimated that the survey form reached approximately 15,000 to 20,000 people. To promote the Survey, the principal author spoke to bird clubs and aviculturists in California, Florida, Illinois, and Ohio.

Completed survey forms were accepted through August 1990. Survey forms were checked, coded, and entered into a computer database. Special care was taken to maintain the confidentiality of all individual collection information and names and addresses of respondents.

III. RESULTS AND DISCUSSION

A. Caveats

It is important to bear in mind that the aviculturists who responded to the 1990 Survey do not constitute a random sample of aviculturists in the the United States. Thus, the questionnaire and census information present an accurate profile of only the aviculturists who responded to the 1990 Survey. The extent to which the results of this Survey apply to the U.S. avicultural community as a whole cannot be determined. Any extrapolation of these results to the U.S. avicultural community as a whole must be viewed with caution.

B. General Results

TRAFFIC USA received 1,221 completed survey forms. Assuming that the survey form reached 15,000 to 20,000 people, the return rate was 6 to 8 percent. Considering the varied means by which the survey form was distributed, the unknown number of aviculturists in this country, and the traditional reluctance of private aviculturists to participate in surveys, the return rate was encouraging for a first survey of this type.

C. Questionnaire

Questionnaire data are summarized in Table 1.

1. Collection Information

Respondents listed 32,759 psittacines as being present in 1,183 collections at the end of 1989. Census data from those same collections, however, documented only 31,008 birds, or 1,751 fewer than the questionnaire. This discrepancy could have been a result of respondents who answered the questionnaire "off the top of their heads" and only counted birds (or checked inventory records) when they began filling in the census. Several respondents commented that they caught themselves in this discrepancy and noted that participating in the 1990 Survey helped them better assess their inventory of birds. Almost 60% of the respondents said they had birds other than psittacines in their collections; over 44,000 other birds were listed as present in 716 collections.

Table 1. Summary of Questions from the Captive Breeding Questionnaire (Number of questionnaire respondents = 1,221)

COLLECTION INVENTORY INFORMATION

Question	Total Birds	Number of Respondents (%)
1. Total number of psittacines in collections as of December 31, 1989:	32,759	1,183 (97%)
Average number of psittacines per collection:	28	
2. Total number of birds other than psittacines in collections as of December 31, 1989:	44,052	716 (57%)
3. Total number of psittacines removed from collections in 1989 by any of the following means: sale, death, trade loan, loss, theft, etc. (excluding offspring hatched in 1989)	4,689	592 (48%)
4. Estimated number of psittacines added to collections in 1989, including birds that were acquired by trade and/or loan (excluding offspring hatched in 1989):	6,815	790 (65%)
5. Direct source of psittacines added to collections in 1989:		
A) Breeder (bird known to be captive-bred)	1,987	442 (36%)
B) Breeder (bird not known to be captive-bred)	1,215	249 (20%)
C) Private pet owner or collector	1,492	384 (31%)
D) Retail outlet (including pet stores)	462	196 (16%)
E) Direct from quarantine	654	103 (8%)
F) Wholesale dealer	916	145 (12%)
Total birds added to collections in 1989:	6,726	
6. Total number of respondents with Budgerigars and Cockatiels in their collection as of December 31, 1989:		
A) Budgerigars	15,157	358 (29%)
B) Cockatiels	10,718	586 (48%)
7. Total number of Budgerigar and Cockatiel chicks raised as of December 31, 1989:		
A) Budgerigars	26,584	167 (14%)
B) Cockatiels	16,379	337 (28%)

AVICULTURAL INFORMATION

Question	Total Birds	Number of Respondents (
8. Total number of respondents using one of the following identification systems on their psittacines:		
A) Closed band		327 (27%)
B) Chip (transponder)		6 (.4%)
C) Tattoo		17 (1%)
D) Open band		95 (8%)
9. Total number of respondents who had their psittacines sexed in 1989 by the following methods:		
A) Feather sexing		67 (5%)
B) Surgical sexing		415 (34%)
C) Fecal steroid sexing		5 (.4%)
10. Total number of psittacines respondents paid to have sexed in 1989:	3,588	517 (14%)
11. Total number of respondents who artificially incubate their psittacines' eggs:		279 (23%)
12. Total number of respondents who regularly candle eggs to check for fertility:		603 (49%)
13. Total number of respondents who maintain the following breeding/pediatric records:		
A) Number of eggs laid		620 (51%)
B) Number of fertile eggs		522 (43%)
C) Number of young that died in egg		425 (35%)
D) Weight loss of eggs		65 (5%)
E) Number of young hatched		630 (52%)
D) Weight gain of young (if hand reared)		333 (27%)
F) Number of young fledged		590 (48%)

SELLING/TRADING INFORMATION

Question	Total Birds	Number of Respondents (%)
14. What respondents did with their offspring hatched in 1989:		
A) Kept in collection	2,230	376 (31%)
B) Sold/traded directly to another breeder	2,519	259 (21%)
C) Sold/traded directly to retailer	5,538	281 (23%)
D) Sold/traded directly to wholesaler	2,378	102 (9%)
E) Sold to pet owner	2,622	320 (26%)
F) Other	1,447	39 (3%)
Total offspring:	16,734	
15. Total number of respondents who advertise their birds in the following publications:		
A) Newspapers		215 (18%)
B) Bird trade magazines		80 (7%)
C) Advertise in both		79 (6%)
16. Number of respondents who sold their offspring hatched in 1989 at the following ages:		
A) Weaned		256 (21%)
B) Unweaned		52 (4%)
C) Weaned and unweaned		219 (18%)

HEALTH CARE INFORMATION

Question	Total Birds	Number of Respondents (%)
17. Total number of adult psittacines (older than 1 year) in collections that were sick one or more times in 1989:	1,310	497 (41%)
18. Total number of adult psittacines (older than 1 year) in collections that died in 1989:	821	351 (29%)
19. Number of respondents who took one or more psittacines to see a veterinarian in 1989:		780 (64%)
20. Number of respondents who had a veterinarian visit their collection in response to a health problem:		108 (9%)

21. Estimated veterinary expenses 834 respondents spent on their psittacines in 1989:

Total expenses	$483,000.00
Average cost per collection	$ 579.00
Average cost per bird	$ 20.00

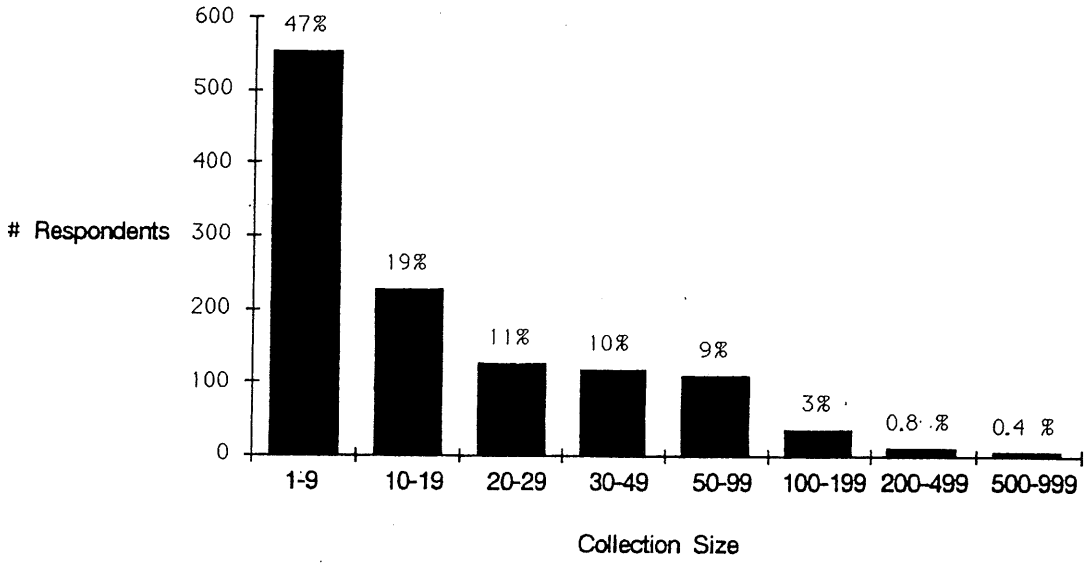
22. Four most common causes of death of adult psittacines as perceived by the respondents: (Total number of responses = 970)

	# Responses (%)
1. Undetermined causes	390 (40%)
2. Infectious diseases	318 (33%)
3. Trauma	195 (20%)
4. Improper nutrition	70 (7%)

RESPONDENT BACKGROUND INFORMATION

Question	Year	Number of Respondents (%)
23. Average year respondents acquired their first bird.....	1973	1,174 (96%)
24. Average year respondents acquired their first psittacine.	1980	1,161 (95%)
25. Average year respondents set up their first pair of psittacines for breeding.....	1983	918 (75%)
26. Average year respondents first produced psittacine chick that survived past weaning.....	1984	718 (59%)
27. Number of respondents whose earnings from selling birds/ and or bird supplies exceeded their expenses in 1989...		183 (15%)
28. Total number of respondents willing to participate in another captive breeding survey.....		1,034 (85%)
29. Total number of respondents who identified themselves by giving their name and or address.....		279 (23%)

Figure 1
COLLECTION SIZE DISTRIBUTION



Psittacine collection sizes ranged from 1 to 951 birds (Figure 1). Forty-seven percent of the collections held 1 to 9 birds, while 53% contained 10 or more birds. Nineteen percent (228) of collections were in the 10 to 19 bird category, 11% (125 collections) in the 20 to 29 category and 10% (118 collections) in the 30 to 49 category. Only 9% (109 collections) contained 50 to 99 birds, and only 4% (50 collections) contained 100 or more birds. Not surprisingly, 75% of the respondents with fewer than 10 birds described themselves as pet owners. Respondents with larger collections described themselves primarily as breeders or commercial breeders.

Respondents indicated that 4,689 psittacines were removed from collections in 1989 (excluding young hatched in 1989), an average of approximately 8 birds per collection. Some respondents objected to the wording of this question because they could not indicate exactly how the birds were removed (although the question did list potential means of removal, such as death and trade, etc.). They were concerned that people might improperly conclude that birds were removed from collections due to mortality, when, in fact, that might not have been the case.

Respondents indicated that 6,726 psittacines were added to collections in 1989. Breeders were the source of over 48% (3,202) of those birds, and more than one-half (1,987) of the birds coming from breeders were known to be captive-bred. Pet owners provided 22% (1,492) of the psittacines added in 1989, wholesale dealers provided 14% (916), 10% (654) came directly from quarantine following import and 7% (462) came from retail stores. Over 50% of the respondents adding parrots to their collection in 1989 described themselves as breeders or commercial breeders.

The above figures indicate that many aviculturists obtain their birds, whether wild-caught or captive-bred, from other breeders. Several aviculturists contacted in the course of this study noted that they preferred to acquire birds from other breeders because they were more likely to know the birds' origin and medical history. These data suggest that there is a "breeder trade" in U.S. aviculture -- breeders producing birds for other breeders.

Budgerigars and cockatiels are often the first psittacine species that many people own. They often provide a steady income for breeders because they breed readily and are in constant demand. Recognizing the prevalence of these two species in aviculture and the pet trade, two questions specific to them were asked: (1) total number of birds held and (2) total number of offspring raised in 1989.

Respondents listed 15,157 budgerigars in 358 collections (average of 42 birds per collection) and 10,718 cockatiels in 586 collections (an average of 17 birds per collection). In 1989, 26,584 budgerigars were produced in 167 collections (an average of 159), and 16,379 cockatiels were produced in 337 collections (an average of 49). A closer look at these data indicates that respondents identifying themselves as commercial breeders produced more budgerigars and cockatiels than did respondents identifying themselves as breeders. Nineteen commercial breeders produced 18,566 budgerigars (an average of 1,857 budgerigars) and 6,377 cockatiels (an average of 336 cockatiels), while 213 breeders produced 6,910 budgerigars (an average of 66 budgerigars) and 8,421 cockatiels (an average of 40 cockatiels).

2. Avicultural Information

Questions regarding use of modern avicultural techniques were asked in order to assess how widely these techniques are being used today. Identification systems such as closed-ring bands, open-ring bands, microchip (transponder) implants and tattoos are becoming an important method for protecting birds from theft and for managing breeding programs. Over 36% (445) of all respondents said they use at least one of these identification systems on their birds. Of that group, over 73% (327) use closed-ring bands, 21% (95) use open-ring bands, 4% (17) use tattoos and 1% (6) use microchips. The 1% of respondents who use microchips generally classified themselves as breeders. Census data from those respondents show that most have larger collections that include rare and often expensive psittacines such as hyacinth macaws (Anodorhynchus hyacinthinus).

Since many psittacine species are sexually monomorphic, a critical step in establishing viable breeding pairs is to determine the sex of birds by one of several sexing techniques. Forty-two percent (547) of survey respondents had at least one bird sexed by feather sexing, surgical sexing, or fecal steroid sexing in 1989. Surgical sexing was the most common method, used by 76% (415) of the respondents who had birds sexed in 1989.

Artificial incubation of eggs and checking egg fertility are two methods used by aviculturists to increase captive breeding success. Twenty-three percent (279) of the respondents artificially incubate their psittacines' eggs, and over 49% (603) of the respondents regularly candle eggs to check fertility.

Maintaining accurate breeding and pediatric records can be crucial to the success of a captive breeding program. Over one-half (52%) of the respondents keep breeding and pediatric records either by hand or with a computer. Of those respondents maintaining records, the great majority record number of eggs laid (98%), number of fertile eggs (83%), number of young hatched (100%), and number of young fledged (94%). Fewer respondents keep data on number of young that died in egg (67%) and number of young reared (53%). Only 10% said they keep records on weight loss of eggs. Many respondents commented on the importance of maintaining breeding and pediatric records. Furthermore, several respondents commented that this survey encouraged them to begin keeping breeding records, while others said it encouraged them to keep better records.

3. Selling and Trading Information

Of the 16,734 offspring produced in 1989 (excluding budgerigars and cockatiels), over 78% (13,057 birds) went to the pet and breeder trade. Thirteen percent (2,230) were retained in the respondents' collections, and 9% (1,447) had some "other" fate. Over 42% (5,538) of the offspring entering trade went directly to retailers, while almost equal numbers of offspring went directly to other breeders- 19% (2,519), wholesalers - 18% (2,378), and pet owners - 20% (2,622).

Fifteen percent (183) of the respondents indicated that their earnings from selling birds and/or bird supplies exceeded their expenses in 1989. However, only 3% (37) of respondents classified themselves as commercial breeders.

Eighteen percent (215) of respondents advertise only in newspapers, 7% (80) advertise only in trade magazines, and 6% (79) advertise in both. Several aviculturists noted that newspapers are often used by pet bird owners or small breeders to advertise pet birds or commonly bred species such as cockatiels and lovebirds.

Of the 527 breeders who indicated at what age they sell their psittacines' offspring, 49% (256) sell only weaned offspring, 10% (52) sell only unweaned offspring, and 42% (219) sell offspring both weaned and unweaned. Some aviculturists disagree regarding the age at which a young psittacine should leave their care.

4. Health Care Information

Sick birds were reported from 497 of 1,183 collections (42%) in 1989. Over 1,310 adult psittacines were sick one or more times, an average of 2.6 birds per collection. Mortality was reported from 351 collections in 1989. Over 820 adult psittacines died, an average of 2.3 birds per collection.

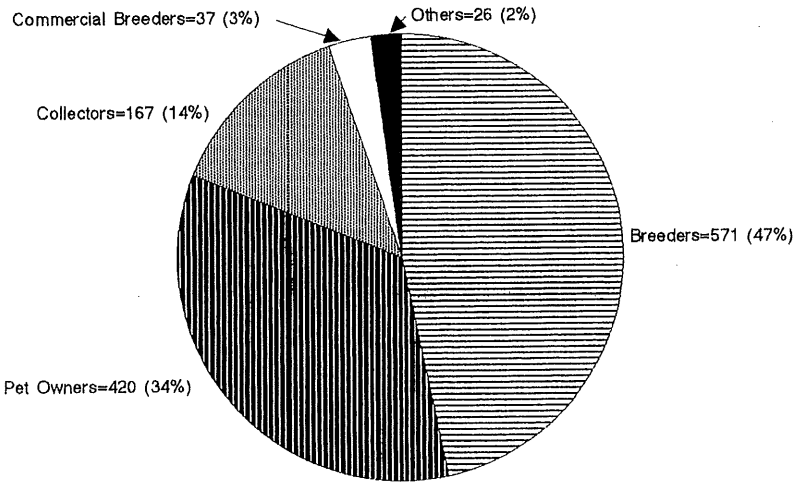
In an effort to help identify research needs related to psittacine diseases and treatment, respondents were asked to list what they believed to be the three most common causes of death of adult psittacines in their collection. The three most common causes listed were: (1) infectious diseases (listed 318 times); (2) trauma, including accidents, fighting, attacks by dogs, etc. (listed 195 times); (3) improper nutrition (listed 70 times). Other causes, including death from undetermined causes, amounted to 40% of all responses (listed 390 times). Under infectious diseases, death due to viral diseases was listed 110 times, bacterial infections 161 times, parasitic infections 23 times, and fungal infections 24 times.

Several veterinarians who specialize in exotic avian medicine note that diseases of exotic birds are often difficult to diagnose by nonspecialists and, therefore, are often misdiagnosed by regular veterinarians and bird owners. Survey data suggest that bird owners often do not know the cause of their bird's death. More accurate information on cause of death may assist aviculturists change or improve their management practices.

Sixty-four percent (780) of the respondents took one or more of their adult psittacines to a veterinarian in 1989. In contrast, only 9% (108) of the respondents had a veterinarian visit their collection in response to a health problem. Of the respondents that had a veterinarian visit their collection, several commented that the visit was not in response to a health problem but, rather, to consult on preventive measures to maintain a healthy flock. Respondents suggested that future captive breeding surveys should ask whether birds were taken to the vet or the vet visited the collection for reasons other than illness.

Figure 2

HOW DID CAPTIVE BREEDING SURVEY RESPONDENTS IDENTIFY THEMSELVES?
Respondents=1221



5. Background Information on the Respondents

Although the 1990 Survey was intended for aviculturists who are actively breeding psittacines, it was important to determine how respondents viewed themselves (Figure 2). Forty-seven percent (571) of all respondents classified themselves as "breeders" and 3% (37) classified themselves as "commercial breeders." Thirty-four percent (420) of respondents identified themselves as "pet owners," while 14% (167) identified themselves as "collectors." Among the 26 respondents in the "other" category were 13 zoos. Avian researchers, veterinarians, and retail pet store owners comprised the remainder of the "other" category.

The average year most respondents acquired their first pet bird was 1973, while acquiring their first psittacine in 1980. The average year respondents set up their first pair of psittacines for breeding was 1983, and the average year for producing the first chick to survive past weaning was 1984.

Responses to the survey came from all 50 states, Puerto Rico, the U.S. Virgin Islands, and 2 foreign countries. (Note: information from the 2 foreign countries was not included in the results presented here.) State totals ranged from 1 to 254 respondents. California and Florida had the most respondents with 254 and 132, respectively. Arizona and New York had 64 respondents each, while Texas and Pennsylvania had 47 and 46, respectively. In the Northwest, Washington had 54 respondents, and Illinois led the Midwest with 39 respondents.

D. Census

1. General Results

In terms of both the total number of species and the total number of birds recorded, the 1990 Psittacine Captive Breeding Survey is the most comprehensive set of data gathered on captive breeding of psittacines by private aviculturists in the United States. The 1990 Survey documented 31,008 birds of 183 species in 1,183 collections (Appendix 2). Table 2 summarizes census data.

Table 2. Census Totals

Census category	Total
Species	183
Taxa (species & subspecies)	192
Birds	31,008
Wild-caught birds	15,196
Captive-bred birds	12,595
Unknown origin birds	3,191
Set-up breeding pairs	11,259
Eggs hatched in 1989	17,277
Chicks weaned in 1989	14,887

The number of weaned chicks is 2,400 lower than the number of eggs hatched. This does not necessarily mean that 2,400 birds died before weaning, however. Aviculturists could have sold or otherwise removed birds from their collections prior to weaning. Rewording this question in future surveys to ask for the number of weaned and unweaned birds that left the collection for the pet or breeder trade would give a more accurate picture of the numbers of captive-bred psittacines entering the U.S. market.

Six of the nine species groups in the census were fairly evenly represented, the exceptions being lories, pionus, and parrotlets (Table 3). It is not clear why these groups were less well represented.

Table 3. Numbers of Birds in the Census, by Taxonomic Group.

Group	# Species	Total birds
Amazons	23	3,924
Macaws	14	4,144
Conures	27	4,364
Parrotlets	3	391
Pionus	7	702
Cockatoos	16	4,144
Lories	21	788
Lovebirds	7	3,538
Parrots	65	8,936

2. The 25 Most Abundant Census Taxa

Table 4 lists the 25 most abundant taxa in the census, the number of respondents holding each taxon, the source of the birds (wild-caught, captive-bred, unknown), and each taxon's 1989 reproductive data (number of breeding pairs, number hatched, number weaned). Data on total U.S. imports of these taxa from 1984 to 1988 are included in the table for comparison. The only subspecies in the table is the double yellow-headed amazon (Amazona ochrocephala oratrix). This subspecies was included separately in the census list because of its perceived prominence in captive breeding and high demand in the pet trade.

a. Relationships Between Census Abundance and Imports.

Twelve of the 25 most abundant census taxa were among the top 20 imported species for 1984-1988 (Table 4). For all of these species, imports consist primarily of wild-caught birds. By comparing census totals with the actual numbers of birds imported, it is clear that there are many more wild-caught birds of these taxa in the United States than are represented in the census, even after considering post-import mortality. Although most of these wild-caught birds are probably owned as pets, they could nevertheless be considered part of a large gene-pool of wild-caught birds available to aviculturists interested in breeding these species.

An additional 5 of the 25 most abundant census taxa were among the second 20 imported species (Table 4): two large macaw species (Ara ararauna and Ara chloroptera), two cockatoo species (Cacatua sulphurea and Cacatua galerita), and peach-faced lovebird (Agapornis roseicollis). The macaws and cockatoos are large, valuable species that are subject to export quotas in countries of export. Peach-faced lovebirds have not been available from the wild for a number of years, and imported birds are predominantly captive-bred specimens from Europe.

The remaining 8 of the 25 most abundant census taxa ranked far down the list of imported species (Table 4): sun conure (Aratinga solstitialis), scarlet macaw (Ara macao), masked lovebird (Agapornis personata), eclectus parrot (Eclectus roratus), Bourke's parakeet (Neophema bourkii), green-cheeked conure (Pyrrhua molinae), scarlet-chested parakeet (Neophema splendida), and green-cheeked amazon (Amazona viridigenalis). These species have not been available from the wild for a number of years but were previously available in relatively large numbers. For 6 of these 8 species, the number of captive-bred birds in the census far exceeds the number of wild-caught birds, indicating that captive breeding fulfills the majority of the demand for these species. The exceptions are scarlet macaw and green-cheeked amazon.

Eight species among the top 20 imported species (Mulliken and Thomsen 1990) are not represented among the 25 most abundant census taxa: mitred conure (Aratinga mitrata), blue-crowned conure (Aratinga acuticaudata), grey-cheeked parakeet (Brotogeris pyrrhopterus), red-masked conure (Aratinga erythrogenys), orange-winged amazon (Amazona amazonica), canary-winged parakeet (Brotogeris versicolurus), peach-fronted conure (Aratinga aurea), and red-lored amazon (Amazona autumnalis). These are all relatively inexpensive, South American psittacines that appear to be popular as pets but not as avicultural species (that is, if census totals are an accurate reflection of U.S. aviculture). It is unclear why these species are not being captive-bred by aviculturists to the extent that other species are, but the low value and availability of cheap, wild-caught birds in the pet market has probably inhibited the interest of aviculturists in captive breeding these species for the commercial market.

b. The Six Most Abundant Taxa in the Census.

The six most abundant taxa in the census were: 1) peach-faced lovebird, 2) grey parrot (Psittacus erithacus), 3) blue and yellow macaw, 4) salmon-crested cockatoo (Cacatua moluccensis), 5) white cockatoo (Cacatua alba), and 6) double yellow-headed amazon. These taxa represent a spectrum of psittacine taxonomic groups (lovebird, macaw, cockatoo, amazon), geographic origin (Africa, Asia, South America), size (medium to large), color (white, grey, blue and yellow, grey, etc.), vocalization ability (none to very

Table 4. The 25 Most Abundant Taxa in the Captive Breeding Census

	Total Birds In Census	Number of Respondents With Taxon	Source of Birds: Wild-Caught	Source of Birds: Captive Bred	Source of Birds: Unknown	1989 Breeding Information: Breeding Pairs	1989 Breeding Information: Hatched	1989 Breeding Information: Weaned	Imports*	Rank Among Imports
Agapornis roseicollis Peach-faced lovebird	2,454	246	47	2,221	186	836	4,049	3,746	13,042	24
Psittacus erithacus Grey parrot	1,976	448	1,880	300	174	741	810	683	85,441**	3
Ara ararauna Blue and yellow macaw	1,217	355	731	365	121	397	630	581	8,167	30
Cacatua moluccensis Salmon-crested cockatoo	820	239	645	93	81	317	158	120	30,270	16
Cacatua alba White cockatoo	798	217	604	136	59	318	441	380	30,440	15
Amazona ochrocephala oratrix Double yellow-headed amazon	779	233	439	187	152	290	218	196	***	
Poicephalus senegalus Senegal parrot	746	183	559	135	52	290	338	303	40,323	11
Cacatua goffini Goffin's cockatoo	711	215	602	42	67	297	77	66	29,068	17
Myiopsitta monachus Monk parakeet	710	91	508	156	45	256	634	521	84,083	4
Amazona aestiva Blue-fronted amazon	692	261	554	98	41	229	127	98	82,048	5
Psittacula krameri Rose-ringed parakeet	677	127	102	507	68	223	443	387	49,808	9
Aratinga solstitialis Sun conure	630	142	68	493	69	215	491	411	339	103
Amazona ochrocephala Yellow-crowned amazon	605	215	398	124	83	153	111	80	39,576**	12
Ara macao Scarlet macaw	592	154	309	186	99	176	147	113	802	91
Ara chloroptera Green-winged macaw	583	200	430	91	62	195	119	99	5,228	39
Agapornis personata Masked lovebird	579	96	19	463	97	202	510	508	143	134
Cacatua sulphurea L. Sulphur-crested cockatoo	524	173	381	88	55	198	102	91	13,228**	31
Eclectus roratus Eclectus parrot	512	126	70	374	63	209	305	227	446**	94
Cacatua galerita Sulphur-crested cockatoo	509	159	306	107	96	169	149	128	5,153**	40
Nandayus nenday Nanday conure	482	78	268	148	66	180	394	309	60,670	7
Agapornis fischeri Fischer's lovebird	416	74	44	313	59	132	315	274	99,893	2
Neophema bourki Bourke's parakeet	397	68	1	367	23	131	309	291	1,624	61
Pyrrhura molinae Green-cheeked conure	391	78	84	289	18	148	490	441	144	133
Neophema splendida Scarlet-chested parakeet	353	57	1	348	4	134	281	239	63	156
Amazona viridigenalis Green-cheeked amazon	345	128	239	47	59	114	57	47	8	178

* Total U.S. imports, 1984–1988 (U.S. Fish and Wildlife Service computerized data compiled by TRAFFIC USA).
** This figure includes all subspecies.
*** Import figures for *Amazona o. oratrix* are included in *Amazona ochrocephala*.

good), and price (retail price from $25 to $2,400). However, they share the common trait of being popular as pets. The relationships among these species' rank in the census, the number of wild-caught versus captive-bred birds, 1989 breeding information, and 1984-1988 import levels provide some insight into the current status of these species in U.S. aviculture.

1. Peach-faced lovebird. The most abundant species in the census was the peach-faced lovebird, with 2,454 birds held by 246 survey respondents (hereafter referred to as holding respondents). Very popular as a pet, virtually all peach-faced lovebirds on the commercial market are captive-bred. The vast majority of peach-faced lovebirds imported into the United States are captive-bred in Europe (T. Mulliken, pers. comm.). Most of the U.S. breeding stock of peach-faced lovebirds is also captive-bred. Census data appear to confirm the above points, because 91% of the peach-faced lovebirds documented by the census are captive-bred.

Over 68% of the peach-faced lovebirds in the census were in breeding pairs (836 pairs, or 1,672 of 2,454 birds). Holding respondents had an average of 3.4 breeding pairs each, the highest number of breeding pairs per respondent among the 25 most abundant census taxa. In 1989, 4,049 young were hatched, an average of 4.8 young per breeding pair (the highest number of young per breeding pair among the 25 most abundant census taxa). Thus, 1989 breeding production was 16.3 young hatched per holding respondent. This supports the conclusion that many private aviculturists in the United States are breeding peach-faced lovebirds and that they are producing relatively large numbers of birds.

The peach-faced lovebird was ranked 24th among imports for 1984-1988, with 13,042 birds imported (a yearly average of only 2,608 birds). This does not indicate that there is low demand for the species. Instead, the relatively low number of imports appears to support the belief that successful captive breeding efforts in the United States are satisfying much of the pet market's demand for peach-faced lovebirds.

2. Grey parrot. The second most abundant species in the census was the grey parrot, with 1,976 birds held by 448 survey respondents. This species is also an extremely popular pet, but a large portion of the commercial demand is fulfilled by imported, wild-caught birds. The grey parrot was ranked third among imported species for 1984-1988 with total imports of 85,441 primarily wild-caught birds (a yearly average of 17,088 birds). Most of the grey parrots in the census originated from the wild (76%).

Seventy-five percent of the grey parrots in the census were in breeding pairs (741 pairs, or 1,482 of 1,976 birds). Holding respondents had an average of 1.7 breeding pairs each. In 1989, 779 young were hatched, an average of 1.1 young per breeding pair. Thus, 1989 breeding production averaged 1.9 young hatched per holding respondent.

When combined with import data, the census data appear to indicate that U.S. captive breeding efforts are not fulfilling the majority of the pet market's demand for the grey parrot. Although the grey parrot has been bred in captivity since the 1800s (Low 1986), only in the last few years has captive breeding provided an increasing segment of the pet trade's demand for this species. Low (1986) probably accurately summarized the current status of the grey parrot in U.S. aviculture: "The number of young bred increases annually but remains comparatively small."

3. Blue and yellow macaw. The third most abundant species in the census was blue and yellow macaw with 1,217 birds held by 355 survey respondents. This species was not among the top 20 imports for 1984-1988; 8,167 birds were imported (a yearly average of 1,633). About 60% of the birds documented by the census were wild-caught.

Over 65% of blue and yellow macaws in the census were in breeding pairs (397 pairs, or 794 of 1,217 birds). Holding respondents had an average of 1.1 breeding pairs each. In 1989, 630 young were hatched, an average of 1.6 young per breeding pair. Thus, 1989 breeding production averaged 1.8 young hatched per holding respondent.

It appears that pet market demand for blue and yellow macaws is being fulfilled by both imported, wild-caught birds and birds captive-bred in the United States. Captive breeding may provide an important and perhaps increasing segment of the pet trade's demand for this species.

4. Salmon-crested cockatoo. The fourth most abundant species in the census was the salmon-crested cockatoo, with 820 birds held by 239 survey respondents. Commercial demand for this species was largely fulfilled by wild-caught birds until 1990, when the species was listed on Appendix I of the Convention on International Trade in Endangered Species (CITES). This species was ranked 16th among 1984-1988 imports, with 30,270 birds imported (a yearly average of 6,054). Over 79% of the birds in the census were of wild origin.

Over 77% of the salmon-crested cockatoos in the census were in breeding pairs (317 pairs, or 634 of 820 birds). Holding respondents had an average of 1.3 pairs each. In 1989, 158 young hatched, an average of 0.5 young per breeding pair. Production for 1989 averaged 0.65 young hatched per holding respondent.

Several factors may have been responsible for the relatively low reproductive rates for the salmon-crested cockatoo recorded in the census. Small sample size or nonrandom sampling could have caused the results to be biased on the low side. However, breeders and retailers report that there is high demand for captive-bred salmon-crested cockatoos, which suggests that low reproduction may not be due to lack of breeding effort. An alternative explanation may be that the reproductive needs of this species are not widely understood by aviculturists (D.R. Thompson, pers. comm.), resulting in greater breeding failure among the pairs that are set up for breeding. Aggression between mates and difficulty in rearing young are problems in successfully breeding this species. The ready availability and lower cost of imported salmon-crested cockatoos prior to 1990 may have discouraged aviculturists from working with this species until recently.

5. White cockatoo. The fifth most abundant species in the census was the white cockatoo, with 798 birds held by 217 survey respondents. This species was imported in similar numbers to the salmon-crested cockatoo during 1984-1988; total imports were 30,440 birds, a yearly average of 6,088. The white cockatoo is still imported for the pet trade.

Eighty percent of white cockatoos in the census were in breeding pairs (318 pairs, or 636 of 798 birds). Holding respondents had an average of 1.5 breeding pairs each. In 1989, 441 young were hatched, an average of 1.4 young per breeding pair. Breeding production for 1989 was 2.1 young hatched per holding respondent.

The above data, combined with the import data, suggest that private aviculture provides an important segment of the pet market's demand for this species, although wild-caught birds are still available in significant numbers. Personal communication with several aviculturists substantiates that many pairs are being bred in response to the strong demand for this species in the pet market.

It is interesting to compare 1989 breeding data for the white cockatoo and the salmon-crested cockatoo. Although almost identical numbers of breeding pairs were recorded for both species, white cockatoos produced almost three times as many young hatched per breeding pair as salmon-crested cockatoos. Because both species produce similar-sized clutches and both are in high demand, the data suggest that the white cockatoo is bred more readily in captivity than the salmon-crested cockatoo. This could be due to basic behavioral differences between the species. Aviculturists note that the white cockatoo consistently produces young in captivity. These data appear to confirm their experience. An alternative explanation is that the reproductive husbandry of the white cockatoos is understood better than that of the salmon-crested cockatoo.

6. Double yellow-headed amazon. The sixth most abundant taxon in the census was the double yellow-headed amazon, with 779 birds held by 233 survey respondents. It has been illegal to export the double yellow-headed amazon from Mexico (the only country in which it occurs) since 1982, yet 56% of the birds in the census were of wild origin. This suggests one of two things: that the majority of double yellow-headed amazons in the census were acquired prior to 1982 or that double yellow-headed amazons have been entering the United States illegally in recent years.

Seventy-five percent of the double yellow-headed amazons in the census were set up in breeding pairs (290 pairs, or 580 of 779 birds). Holding respondents had an average of 1.2 pairs each. In 1989, only 218 young were hatched, an average of 0.75 young hatched per breeding pair. Thus, 1989 breeding production averaged 0.9 young hatched per holding respondent.

It appears that private aviculture is not fulfilling the pet market's demand for this species. Poorly understood reproductive needs (D.R. Thompson, pers. comm.) coupled with wide availability of wild-caught birds (legal and illegal) may have discouraged aviculturists from working with this species until recently.

3. Protected Species in the Census

The census documented 21 psittacine species listed on Appendix I of CITES, 7 of which are also listed as either threatened or endangered under the U.S. Endangered Species Act (ESA) (Table 5). The protected species with the greatest number of adult birds and the highest overall 1989 production of young hatched are those species considered popular both among aviculturists and pet owners: scarlet macaw, military macaw (Ara militaris), hyacinth macaw, scarlet-chested parakeet, and salmon-crested cockatoo.

The scarlet-chested parakeet and turquoise parakeet (Neophema pulchella), both listed as endangered under the ESA, are relatively well-represented in the census with 353 and 112 birds, respectively. Both species are native to Australia, which has prohibited the export of its live native fauna since 1960. The census includes only one wild-caught individual from each species, the remainder being captive-bred. Breeding results for 1989 are consistent with

Table 5. CITES Appendix I and ESA-Listed Species in the Captive Breeding Census

	Total Birds in Census	Number of Respondents with Taxon	Source of Birds: Wild-Caught	Source of Birds: Captive-Bred	Source of Birds: Unknown	1989 Breeding Information: Breeding Pairs	1989 Breeding Information: Hatched	1989 Breeding Information: Weaned
Amazons								
Amazona barbadensis Yellow-shouldered amazon	15	5	3	8	4	4	2	2
*Amazona brasiliensis** Red-tailed amazon	2	1	0	0	2	1	0	0
*Amazona leucocephala** Cuban amazon	10	5	5	4	1	2	4	4
Amazona petrei Red-spectacled amazon*	1	1	0	0	1	0	0	0
Amazona tucumana Tucuman amazon	134	36	116	5	14	46	16	13
*Amazona vinacea** Vinaceous amazon	20	7	3	15	2	9	6	0
Macaws								
Anodorhynchus hyacinthinus Hyacinth macaw	236	64	139	72	23	93	41	39
Ara ambigua Buffon's macaw	64	11	42	21	1	19	16	8
Ara glaucogularis Blue-throated macaw	84	7	57	27	0	35	10	11
Ara macao Scarlet macaw	592	154	309	186	99	176	147	113
Ara maracana Illiger's macaw	24	14	9	14	1	8	7	0
Ara militaris Military macaw	302	112	199	65	38	105	75	62
Ara rubrogenys Red-fronted macaw	163	35	80	66	10	60	54	45
Conures								
*Aratinga guarouba** Golden conure	43	10	0	37	6	12	19	18
Parrot/parrotlets								
Cyanoramphus novaezelandiae Red-fronted parakeet	37	14	2	33	2	14	61	52
*Neophema pulchella** Turquoise parakeet	112	31	1	99	12	39	59	51
*Neophema splendida*** Scarlet-chested parakeet	353	57	1	348	4	134	281	239
*Pionopsitta pileata** Pileated parrot	15	6	0	15	0	7	7	7
*Rhynchopsitta pachrhyncha** Thick-billed parrot	23	3	0	7	16	10	6	6
Cockatoos								
Cacatua moluccensis Salmon-crested cockatoo	820	239	645	93	81	317	158	120
Probosciger aterrimus Palm cockatoo	109	11	89	15	5	42	17	10

* Species is listed on the U.S. List of Endangered and Threatened Wildlife and on CITES Appendix I.
** Species is listed only on the U.S. List of Endangered and Threatened Wildlife.

many reports that these two species are commonly bred in captivity. Although their survival in the wild may not be certain, it seems possible that continued breeding of these species both in the United States and in Europe will ensure their survival in captivity if inbreeding problems can be minimized.

Many of the other ESA and CITES Appendix I species in the census, such as vinaceous amazon (Amazona vinacea), yellow-shouldered amazon (Amazona barbadensis), blue-throated macaw (Ara glaucogularis), and Buffon's macaw (Ara ambigua) are primarily held by respondents identifying themselves as breeders. Census data suggest that these respondents breed more common species for the commercial trade. The respondents themselves say that they work with ESA and/or Appendix I species out of interest and concern for the species' survival.

The relatively few ESA and Appendix I species (21 of a potential 52 species) in the census suggests at least two possibilities. First, some respondents may not have provided information on their ESA and Appendix I species. Second, some ESA and/or Appendix I species may be poorly represented in captivity or may be held by a limited number of individuals. Census data suggest that demand from the pet or breeder market plays a role in determining which ESA and Appendix I species are captive-bred in relatively large numbers.

IV. CONCLUSIONS

The 1,221 completed survey forms received by TRAFFIC USA represent what can only be described as an unprecedented response to the first Psittacine Captive Breeding Survey. In terms of both total number of species (183) and total number of birds recorded (31,008), the 1990 Psittacine Captive Breeding Survey represents the most comprehensive data set ever gathered on captive breeding of psittacines by private aviculturists in the United States.

Results of the questionnaire indicate that many private aviculturists in the United States use modern avicultural techniques such as permanent marking systems, surgical sexing, computerized breeding and pediatric records, and artificial incubation of eggs. Aviculture will continue to advance as more and more aviculturists adopt these and other modern techniques.

Results of the census confirm that U.S. aviculturists maintain a wide variety of psittacine species in their collections, from very common to very rare, and that they are breeding many species successfully.

Popularity as a pet, the value of individual birds, and availability from the wild appear to play an interrelated role in determining what species are emphasized in captive breeding:

a. Eleven of the 25 most abundant census taxa are species for which there is great commercial demand, but which are no longer available from the wild. Seven of these species were among the top 10 in the category of young hatched per breeding pair, indicating a strong emphasis on captive breeding of these species.

b. Of those species still imported from the wild in relatively large numbers, census representation is directly related to the value of individual birds. Larger, more valuable birds such as macaws and cockatoos are represented in relatively large

numbers (compared to the number imported), while inexpensive, readily available birds are not, as reflected by the low numbers of commonly imported conures and smaller parrots.

c. Uncommon or rare species in captivity are generally held by breeders and collectors who often have an interest in the genus as a whole. These species might be more accurately referred to as avicultural birds because they are most common among aviculturists and not pet owners.

A comparison of how respondents describe themselves with census information from those same respondents gives a picture of which species are being held and/or bred by what type of aviculturist. What emerges is a spectrum of people calling themselves "breeder," ranging from a novice breeder attempting to breed pet birds, to the more experienced breeders who breed popular species to supply the pet trade, to specialty breeders who emphasize only certain taxa or rare taxa. Breeders of common species may also breed less common or rare species. In fact, some breeders say they breed popular species for the pet trade to support their work with species that are rare in aviculture or are considered endangered.

Census data suggest that at least eight species that are popular pets are not being bred in large numbers in captivity because they are of limited value and are readily available from the wild. If wild-caught imports for the pet trade are gradually phased out it will be important for aviculture to increase production of these species if they are to remain available as pets.

The future of unpopular or uncommon species in aviculture is uncertain. Will there continue to be enough interest in breeding uncommon species to provide viable captive populations? If the variety of psittacine species present in this census is to be maintained in captivity, aviculturists will have to become better coordinated to share the limited genetic material available for rare species. Breeding rare or endangered species has little value for the survival or viability of captive populations unless that breeding is part of a well-managed, coordinated captive breeding program.

Illegal collection and smuggling continue to be serious threats to some taxa in the wild, such as the double yellow-headed amazon and the green-cheeked amazon. Smuggling also threatens aviculturists, whose captive breeding efforts with these species may be threatened by the lower cost and uncertain health and legal status of smuggled birds. One important way to help end illegal trade in exotic birds is by captive breeding. Where the demand for certain species can be met by competitively priced captive-bred birds, there is less incentive to smuggle.

V. RECOMMENDATIONS

The fate of many psittacine species in the wild, such as the hyacinth macaw and the green-cheeked amazon, will be decided in the coming decade. Aviculturists will play a critical role in that fate, be it survival or demise. There are four areas where individual aviculturists can contribute to reducing the demand for wild-caught birds:

1) Continued captive breeding of birds to supply the demands of both the pet bird trade and the breeder trade. Threats to many wild bird populations could be reduced by providing captive-bred alternatives to international demand for wild-caught birds.

2) Maintaining good collection and breeding records and participating in regular captive breeding censuses. These actions would provide aviculturists with the necessary genealogy and captive breeding information to more effectively assess the breeding success in their own collections and in aviculture as a whole, and will help maintain the genetic diversity of captive populations.

3) Increased participation in coordinated captive breeding programs for threatened and endangered species, especially those species which are not particularly popular as pets. This action would contribute to maintaining captive populations and genetic variability of these species.

4) Reduce the economic incentive for smuggling by increasing production (thereby reducing the cost) of captive-bred birds. Better cooperation between aviculturists and law enforcement officials would also help in the fight against bird smuggling. In addition, antismuggling campaigns to educate the consumer about the negative effects of smuggling are a positive action toward ending this threat to wild bird populations.

* * *

TRAFFIC USA wishes to thank all those who participated in this precedent-setting 1990 Psittacine Captive Breeding Survey. While this 1990 Survey has provided important new information for the avicultural and conservation communities alike, it represents just one year of captive breeding results and therefore has limited usefulness in assessing trends in aviculture and the pet bird industry. Additional captive breeding surveys are needed to better understand the status of captive breeding by U.S. aviculturists.

VI. REFERENCES

Allen, C., T. Mulliken, and J.B. Thomsen. 1989. AFA Members Respond Well to Captive Breeding Questionnaire. AFA Watchbird 17(1): 37-38.

Cooperative Working Group on Bird Trade. 1990. Findings and Recommendations. World Wildlife Fund, Washington, D.C. 47 pp.

Forshaw, J. 1989. Parrots Of The World. Third (Revised) Edition. Landsdowne Press. Melbourne, Australia.

Low, R. 1986. Parrots, Their Care and Breeding. Second Edition, Blandford, Poole.

Morony, J., W. Bock, and J. Farrand. 1975. Reference List of the Birds of the World, New York, New York.

Mulliken, T., and J.B. Thomsen. 1990. U.S. Bird Trade: The Controversy Continues Although Imports Decline. TRAFFIC USA Newsletter 10(3): 1-13.

APPENDIX I

1990 Psittacine Captive Breeding Survey Form

TRAFFIC USA

WWF

1250 Twenty-Fourth Street, NW, Washington, DC 20037 USA
202/293-4800 Telex: 64505 PANDA Fax: 202/293-9211

May 1990

Dear Aviculturist:

As you may be well aware, captive breeding of psittacines by private aviculture is playing an increasingly important role in the conservation of these beautiful birds. Until now, however, that role has remained undocumented and, thus, largely ignored by the scientific and conservation communities. Private aviculture will become even more important in the near future because of a recommendation by the Cooperative Working Group on Bird Trade that captive breeding eventually replace wild-caught bird imports as a source of birds for the commercial trade. Thus it is critically important to document quantitatively the role of private aviculture.

To provide that documentation, TRAFFIC(USA) is launching a nationwide "Psittacine Captive Breeding Survey," which will result in a computerized database of information on captive breeding of psittacines in the U.S. The survey will gather and analyze data in order to assess: (1) what segments and percentages of the domestic cage bird market are currently met by captive breeding, and by what types of breeders; (2) whether certain factors are inhibiting or, alternatively, are contributing to the growth of private aviculture; and (3) whether aviculture is capable of fulfilling the demand of the pet bird industry currently met by imported, wild-caught birds. A summary of survey results will be available to all respondents and will be published in avicultural and conservation publications.

Before completing the survey, we would like to emphasize a few points: 1. If you receive more than one questionnaire, please fill out only <u>one (1)</u> questionnaire per collection. 2. Please return the survey directly to the TRAFFIC(USA) address on the first page of the questionnaire before August 31, 1990, 3. **We will treat all individual responses and information on individual collections as <u>confidential</u>.**

For many of you this survey will be a new and perhaps challenging experience. We hope, however, that you will view the survey as an opportunity to learn more about your own psittacine captive breeding efforts and to contribute to a database that will clearly document the contributions of private aviculture to psittacine captive breeding and conservation efforts.

Sincerely,

Ginette Hemley
Director, TRAFFIC(USA)

Catherine Allen
Survey Coordinator

TRAFFIC(USA) is a program of World Wildlife Fund and part of the international TRAFFIC network sponsored by WWF and IUCN to monitor international trade in wild plants and animals in cooperation with the CITES Secretariat.

TRAFFIC(USA)
World Wildlife Fund
Psittacine Captive Breeding Survey
1990

Please read this before filling out the questionnaire.

For all "fill-in-the-blank" questions write your answer(s) in the blank provided below each question. For all "Yes/No" questions circle your answer.

The term "parrot" includes all species of psittacine, except budgerigars and cockatiels unless otherwise stated. Budgerigars and cockatiels are not included because they are well-established in captivity and their husbandry is well-known.

We want information only from the 1989 breeding season. If eggs laid in 1988 hatched in 1989, include them in your 1989 breeding numbers. If eggs laid in 1989 hatched in 1990, do not include them in your 1989 breeding numbers.

The term "your collection" refers only to the parrots that were physically present in your aviary, including birds on loan to you, as of December 31, 1989.

The information you provide in this questionnaire will be treated as confidential.

IMPORTANT! Please return the questionnaire before August 31, 1990 to the following address:

TRAFFIC (USA)
World Wildlife Fund
1250 24th Street, NW
Washington, D.C. 20037
Attention: Catherine Allen
Phone: (202) 778-9675

Today's date (month-day-year):_____

Inventory Information About Your Collection (Exclude budgerigars and cockatiels).

1. As of December 31, 1989, how many parrots were in your collection? (Exclude all young hatched in 1989.)
   Answer #1 _____

2. As of December 31, 1989, what percentage of the parrots in your collection were hatched in the wild? (Please give your best estimate.)
   Answer #2 _____

3. As of December 31, 1989, how many birds other than parrots were in your collection?
   Answer #3 _____

4. How many parrots were removed from your collection in 1989 by any of the following means: death, sale, trade, loan, loss, theft, etc.? (Exclude offspring hatched in 1989.)
   Answer #4 _____

5. How many parrots did you add to your collection in 1989, including birds that were acquired by trade and/or loan? (Exclude offspring hatched in 1989.)
Answer #5 _____

6. Of the parrots you added to your collection in 1989, how many did you add directly from the following sources? (Record the actual number of parrots from each source and leave blank all those that do not apply.)

Breeder (parrot known to be captive-bred)_____
Breeder (parrot known not to be captive-bred)_____
Private pet owner or collector_____
Retail outlet (including pet stores)_____
Direct from quarantine (Importer)_____
Wholesale dealer _____

The following two questions apply only to your budgerigars and cockatiels.

7. As of December 31, 1989, how many budgerigars and cockatiels were in your collection (Please use an approximate number if necessary.)
Answer #7 Budgerigars _____ **Cockatiels** _____

8. How many young budgerigars and cockatiels did you raise in 1989? (Please use an approximate number if necessary.)
Answer #8 Budgerigars _____ **Cockatiels** _____

Aviculture Information About Your Collection (Exclude budgerigars and cockatiels).

9. Do you use any of the following identification systems on your parrots?

Closed band	Yes	No
Chip (transponder)	Yes	No
Tattoo (not for sexing, but for ID#)	Yes	No
Open band	Yes	No

10. Did you have your parrots sexed in 1989 by the following methods?

Feather sexing	Yes	No
Surgical sexing	Yes	No
Fecal steroid sexing	Yes	No

11. How many parrots did you pay to have sexed in 1989?
Answer #11 _____

12. From what percentage of your breeding pairs of parrots did you remove eggs so as to increase the number of eggs produced and hatched in 1989?
Answer #12 _____

13. Do you ever artificially incubate your parrots' eggs?

Yes No

14. Do you regularly candle eggs to check fertility?

Yes No

15. In 1989, did you keep any of the following breeding/pediatric records either by hand or with a computer?

Number of eggs laid	Yes	No
Number of fertile eggs	Yes	No
Number of young that died in egg	Yes	No
Weight loss of eggs	Yes	No
Number of young hatched	Yes	No
Weight gain of young (if you hand rear)	Yes	No
Number of young fledged	Yes	No

Selling/Trading Information (Exclude budgerigars and cockatiels).

16. What did you do with your offspring hatched in 1989? (Please use actual numbers or an approximate number if necessary, and leave blank those that do not apply.)

Kept in your collection_____
Sold/traded directly to another breeder_____
Sold/traded directly to retailer (including pet stores)_____
Sold/traded directly to wholesaler_____
Sold to pet owner_____
Other_____

17. Do you ever advertise your birds in the following publications?

Newspaper	Yes	No
Bird trade magazine	Yes	No

18. Did you sell any of your parrots' 1989 offspring at either of the following ages?

Weaned (young able to completely feed itself)	Yes	No
Unweaned (young unable to completely feed itself)	Yes	No

Health Care Information (Exclude budgerigars and cockatiels).

19. In 1989, how many adult parrots (i.e., older than 1 year) in your collection were sick one or more times?
Answer #19 _____

20. In 1989, how many adult parrots (i.e., older than 1 year) in your collection died?
Answer #20 _____

21. In 1989, did you take one or more of your parrots to see a veterinarian at a clinic?

Yes No

22. In 1989, did you have a veterinarian visit your collection in response to a health problem?

Yes No

23. In 1989, what were your veterinary expenses (i.e., services/supplies directly obtained from a veterinarian) for your parrots? (Give your best estimate.)
Answer #23_____

24. To help determine research needs related to psittacine diseases and medicine, please tell us what you suspect to be the three most common causes of death of adult parrots in your collection. (Please list the most common cause first.)

1._____

2._____

3._____

Background Information About You

25. What year did you acquire your first pet bird?
Answer #25 _____

26. What year did you acquire your first parrot?
Answer #26 _____

27. What year did you set up your first pair of parrots for breeding?
Answer #27 _____

28. What year did you first produce a parrot chick that survived past weaning?
Answer #28 _____

29. Please place a checkmark next to the one category below best describes you.

Pet owner_____
Collector (breeding not primary interest)_____
Breeder (breeding is primary interest)_____
Commercial breeder_____
Other_____ (explain)_____

30. In 1989, did your earnings from selling birds and/or bird supplies exceed your expenses?

Yes No

31. What state do you live in? (Please use your state's two letter postal code.)
Answer #31 _____

32. Where did you get this survey?

Bird World magazine _____
In the mail from AFA _____
From a bird club (meeting or newsletter) _____
From a friend _____
Other _____(explain)_____

DON'T STOP NOW - IMPORTANT - PLEASE CONTINUE!

Parrot Census

The following census chart is a list of species arranged into groups (e.g., amazons, macaws, parrots, etc.). Please fill in the information requested in each column for each species held in your collection as of December 31, 1989.

Please use a zero ("0") only to tell us that the answer is zero (e.g., number of wild-caught _0_). If you don't know the answer please leave the blank empty.

If you have a species in your collection that is not listed on the census chart, and you would like to provide information on this species, please list the species in the "Other" category located at the end of the census chart.

If you have any sub-species (e.g., Amazona o. tresmarie), please list them under their primary species listing (e.g., Amazona ochrocephala).

Hybrids and Mixed Pairs:

(a) If you have individuals from two different "pure" parrot species paired to produce hybrid offspring (e.g., Green-winged macaw x Blue and Gold macaw), please list the individuals in their respective species categories on the census, but do not fill in the pair's breeding information there. Then list the mixed pair in the category "Mixed Pairs" and fill in the pair's breeding information there.

(b) If you have a "pure" parrot species (e.g., Green-wing macaw) paired with a hybrid (e.g., Harlequin macaw), please list the "pure" bird in its species category, list the hybrid in the "Other" category, and list them as a pair in the "Mixed Pairs" category. Fill in their breeding information under "Mixed Pairs."

(c) If you have hybrids, list them in the "Other" category and fill in their breeding information there.

Please use the example below as a guide for filling out the census chart.

1989 PSITTACINE BREEDING DATA		How many individual birds do you have?	How many were wild-caught?	How many were captive-bred?	How many do you not know if they were wild-caught or captive-bred?	How many pairs are set up for breeding?	How many young hatched in 1989?	How many young were weaned in 1989?
GROUP COMMON NAME	SCIENTIFIC NAME							
LOVEBIRDS								
125. Black-cheeked	Agapornis nigrigenis							
126. Fischer's	A. fischeri	14	5	2	1	4	8	6
127. Grey-headed	A. cana							
128. Masked	A. personata	12	4	8	0	4	2	2
129. Nyasa	A. lilianae							
130. Peach-faced	A. roseicollis							
OTHER								
131. Scarlet-Chested Parakeet		8	0	8	0	2	2	1
132. Harlequin Macaw		3	0	3	0	0	0	0
133.								
134.								
MIXED PAIRS								
135. Green-Wing x Blue + Gold						1	1	1
136.								
137.								

BREEDING DATA

GROUP	COMMON NAME	SCIENTIFIC NAME	How many individual birds do you have?	How many were wild-caught?	How many were captive-bred?	How many do you not know if they were wild-caught or captive-bred?	How many pairs are set up for breeding?	How many young hatched in 1989?	How many young were weaned in 1989?
AMAZONS									
	1. Black-billed	Amazona agilis							
	2. Blue-cheeked	A. dufresniana							
	3. Blue-fronted	A. aestiva							
	4. Cuban	A. leucocephala							
	5. Festive	A. festiva							
	6. Green-cheeked(Red-head)	A. viridigenalis							
	7. Hispaniolan	A. ventralis							
	8. Lilac-crowned	A. finschi							
	9. Mealy	A. farinosa							
	10. Orange-winged	A. amazonica							
	11. Pretre's	A. pretrei							
	12. Red-lored	A. autumnalis							
	13. Red-tailed	A. brasiliensis							
	14. Scaly-naped	A. mercenaria							
	15. St. Vincent's	A. guildingii							
	16. Tucuman	A. tucumana							
	17. Yellow-crowned	A. ochrocephala							
	18. Double Yellow Head	A. o. oratrix							
	19. Yellow-faced	A. xanthops							
	20. Yellow-lored	A. xantholora							
	21. Vinacous	A. vinacea							
	22. White-fronted(Spectacld)	A. albifrons							
COCKATOOS									
	23. Bare-eyed (l. corrella)	Cacatua sanguinea							

1989 PSITTACINE BREEDING DATA

GROUP	COMMON NAME	SCIENTIFIC NAME	How many individual birds do you have?	How many were wild-caught?	How many were captive-bred?	How many do you not know if they were wild-caught or captive-bred?	How many pairs are set up for breeding?	How many young hatched in 1989?	How many young were weaned in 1989?
24.	Blue-eyed	C. ophthalmica							
25.	Goffin's	C. goffini							
26.	Slender-billed	C. tenuirostris							
27.	Major Mitchell's	C. leadbeateri							
28.	Moluccan	C. moluccensis							
29.	Sulphur-crested	C. galerita							
30.	Eleonora	C. g. eleonora							
31.	L. Sulphur-crested	C. sulphurea							
32.	Red-vented	C. haematuropygia							
33.	Umbrella (White)	C. alba							
34.	Black	Calyptorhynchus funereus							
35.	Red-tailed	C. magnificus							
36.	Gang Gang	Callocephalon fimbriatum							
37.	Galah	Eolophus roseicapillus							
38.	Palm	Probosciger aterrimus							
MACAWS									
39.	Blue & Gold	Ara ararauna							
40.	Buffon's	A. ambigua							
41.	Caninde	A. glaucogularis							
42.	Green-winged	A. chloroptera							
43.	Hahn's	A. n. cumanensis							
44.	Illiger's	A. maracana							
45.	Military	A. militaris							
46.	Noble	A. noblis noblis							
47.	Red-bellied	A. manilata							
48.	Red-fronted	A. rubrogenys							

GROUP	COMMON NAME	SCIENTIFIC NAME	How many individual birds do you have?	How many were wild-caught?	How many were captive-bred?	How many do you not know if they were wild-caught or captive-bred?	How many pairs are set up for breeding?	How many young hatched in 1989?	How many young were weaned in 1989?
	49. Scarlet	A. macao							
	50. Severe	A. severa							
	51. Yellow-collared	A. auricollis							
	52. Hyacinth	Anodor hyacinthinus							
PARROTS									
	53. Eclectus	Eclectus roratus							
	54. African grey	Psittacus erithacus							
	55. Brown-headed	Poicephalus cryptoxanthus							
	56. Jardine's	P. gulielmi							
	57. Meyer's	P. meyeri							
	58. Red-bellied	P. rufiventris							
	59. Senegal	P. senegalus							
	60. Princess	Polytelis alexandrae							
	61. Red-rumped	Psephotus haematonotus							
	62. Crimson Rosella	Platycercus elegans							
	63. Eastern Rosella	P. eximius							
	64. Blue-headed Rosella	P. adscitus							
	65. Amboina King	Alisterus amboinensis							
	66. Australian King	A. scapularis							
	67. Green-winged King	A. chloropterus							
	68. Crimson-winged	Aprosmictu erythropterus							
	69. Timor Crimson-wingd	A. jonquillaceus							
	70. Barnard Parakeet	Barnardius barnardi							
	71. Port Lincoln	B. zonarius							
	72. Great-billed	Tanygnathu megalorhychos							
	73. Hawk-headed	Deroptyus accipitrinus							

1989 PSITTACINE BREEDING DATA

GROUP	COMMON NAME	SCIENTIFIC NAME	How many individual birds do you have?	How many were wild-caught?	How many were captive-bred?	How many do you not know if they were wild-caught or captive-bred?	How many pairs are set up for breeding?	How many young hatched in 1989?	How many young were weaned in 1989?
	74. Quaker Parakeet	Myiopsitta monachus							
	75. Blue-crowned Hangin	Loriculus galugulus							
	76. Edward's Fig	Psittaculirost edwardsii							
	77. Black-headed Caique	Pionites melanocephala							
	78. Piliated Parrot	Pionopsitta caica							
	79. White-bellied Caique	P. leucogaster							
CONURES									
	80. Blue-crowned	Aratinga acuticaudata							
	81. Brown-throated	A. pertinax							
	82. Dusky-headed	A. weddellii							
	83. Golden (Bavaria)	A. guarouba							
	84. Golden-capped	A. auricapilla							
	85. Green	A. holochlora							
	86. Jenday	A. jandaya							
	87. Mitred	A. mitrata							
	88. Olive-throated	A. nana							
	89. Half-moon(Orange-front)	A. canicularis							
	90. Peach-fronted	A. aurea							
	91. Red-masked	A. erythrogenys							
	92. Scarlet-fronted	A. wagleri							
	93. Sun	A. solstitialis							
	94. White-eyed	A. leucophthalmus							
	95. Austral	Enicognathus perrugineas							
	96. Slender-billed	E. leptorhynchus							
	97. Nanday	Nandayus nenday							
	98. Green-cheeked	Pyrrhura molinae							

1989 PSITTACINE BREEDING DATA

GROUP	COMMON NAME	SCIENTIFIC NAME	How many individual birds do you have?	How many were wild-caught?	How many were captive-bred?	How many do you not know if they were wild-caught or captive-bred?	How many pairs are set up for breeding?	How many young hatched in 1989?	How many young were weaned in 1989?
	99. Maroon-bellied	P. frontalis							
	100. Maroon-tailed	P. melanura							
	101. Painted	P. picta							
	102. Pearly	P. perlata							
	103. Patagonian	Cyanoliseus patagonus							
LORIES									
	104. Black	Chalcopsitta atra							
	105. Duyvebode'si	C. duivenbodei							
	106. Yellow-streaked	C. sintillata							
	107. Josephine's	Charmosyna josefinae							
	108. Papuan	C. papou							
	109. Black-capped	Lorius lory							
	110. Chattering	L. garrulus							
	111. Purple-napped	L. domicellus							
	112. Red	Eos bornea							
	113. Violet-necked	E. squamata							
	114. Dusky	Pseudeos fuscata							
	115. Goldie's	Trichoglossus goldiei							
	116. Rainbow	T. haematodus							
	117. Yellow & Green	T. flavoviridis							
PARROTLETS									
	118. Green-rumped	Forpus passerinus							
	119. Pacific	F. coelestis							
	120. Yellow-faced	F. xanthops							
PIONUS									
	121. Blue-headed	Pionus menstruus							

1989 PSITTACINE BREEDING DATA

GROUP	COMMON NAME	SCIENTIFIC NAME	How many individual birds do you have?	How many were wild-caught?	How many were captive-bred?	How many do you not know if they were wild-caught or captive-bred?	How many pairs are set up for breeding?	How many young hatched in 1989?	How many young were weaned in 1989?
LOVEBIRDS									
	122. Bronze-winged	P. chalcopterus							
	123. Scaly-headed	P. maximiliani							
	124. White-capped	P. senilis							
	125. Black-cheeked	Agapornis nigrigenis							
	126. Fischer's	A. fischeri							
	127. Grey-headed	A. cana							
	128. Masked	A. personata							
	129. Nyasa	A. lilianae							
	130. Peach-faced	A. roseicollis							
OTHER									
	131.								
	132.								
	133.								
	134.								
	135.								
	136.								
	137.								
	138.								
MIXED PAIRS									
	139.								
	140.								
	141.								
	142.								

----------Don't Stop!!----------Please Continue!!----------Very Important!!----------

Follow Up and Your Comments

32. Would you be interested in participating in future surveys about captive breeding?

Yes No

If you would like to receive a copy of the completed survey analysis, please contact Catherine Allen at the address located on the front of this questionnaire, or you can write your name, address, and phone in the spaces provided below.

OPTIONAL! **OPTIONAL!** **OPTIONAL!**

Your completion of this section is **OPTIONAL**. However, we may want to contact you again to ask some follow-up questions, or to ask you if you would participate in future captive breeding surveys. We would appreciate your reply to this request. We will treat the information on this survey and any future survey as CONFIDENTIAL.

Name:_____

Address or P.O. Box:_____

City, State, Zipcode:_____

Phone:_____

Yes____, I would like to receive a copy of the completed survey analysis.

COMMENTS

We would like to know what you think of this questionnaire and if you have any comments on its design or how we could make it better. Please use another sheet of paper if you need more space.

THANK YOU FOR YOUR TIME!

APPENDIX II

1990 Psittacine Captive Breeding Survey Census Totals

1990 Psittacine Captive Breeding Survey -- Census Totals

Species	Number of Birds in Census	Rank in Census	Number of Respondents With Taxon	Source of Birds: Wild-Caught	Source of Birds: Captive-Bred	Source of Birds: Unknown	1989 Breeding Information: Breeding Pairs	1989 Breeding Information: Hatched	1989 Breeding Information: Weaned
Amazons									
Census:									
Amazona aestiva Blue-fronted Amazon	692	10	261	554	98	41	229	127	98
Amazona agilis Black-billed Amazon	2	182*	2	0	1	1	0	0	0
Amazona albifrons White-fronted Amazon	234	44	104	174	35	25	78	43	38
Amazona amazonica Orange-winged Amazon	294	30	118	253	15	26	94	14	12
Amazona autumnalis Red-lored Amazon	257	38	112	169	37	49	82	56	21
Amazona brasiliensis Red-tailed Amazon	2	182*	1	0	0	2	1	0	0
Amazona dufresniana Blue-cheeked Amazon	11	153*	3	11	0	0	5	0	0
Amazona farinosa Mealy Amazon	130	63	65	106	14	10	40	13	12
Amazona festiva Festive Amazon	31	120	10	29	1	1	11	0	0
Amazona finschi Lilac-crowned Amazon	224	44	90	149	46	29	86	56	47
Amazona guildingii St. Vincent's Amazon	0	0	0	0	0	0	0	0	0
Amazona leucocephala Cuban Amazon	10	157*	5	5	4	1	2	4	4
Amazona mercenaria Scaly-naped Amazon	4	174*	2	4	0	0	2	0	0
Amazona ochrocephala Yellow-crowned Amazon	331	24	112	213	57	61	106	62	58
Amazona ochrocephala oratrix Double Yellow-head Amazon	779	6	233	439	187	152	290	218	196
Amazona pretrei Red-spectacled Amazon	1	192*	1	0	0	1	0	0	0
Amazona tucumana Tucuman Amazon	134	60*	37	116	5	14	46	16	13
Amazona ventralis Hispaniolan Amazon	62	92*	15	28	8	26	23	8	8
Amazona vinacea Vinaceous Amazon	20	136*	7	3	15	2	9	6	0
Amazona viridigenalis Green-cheeked Amazon	345	23	130	239	47	59	114	57	47
Amazona xantholora Yellow-lored Amazon	7	165*	4	4	0	3	2	2	0
Amazona xanthops Yellow-faced Amazon	49	100	13	33	3	13	20	11	0
Other: +									
Amazona barbadensis Yellow-shouldered Amazon	15	141*	5	3	8	4	4	2	2
Amazona collaria Yellow-billed Amazon	10	157*	3	5	5	0	3	0	0
Amazona farinosa guatamalae Blue-crowned Amazon	6	168*	6	4	1	1	0	0	0
Amazona ochrocephala panamensis Panama Amazon	15	141*	5	10	3	2	2	4	0

Species	Number of Birds in Census	Rank in Census	Number of Respondents With Taxon	Source of Birds: Wild-Caught	Source of Birds: Captive-Bred	Source of Birds: Unknown	1989 Breeding Information: Breeding Pairs	1989 Breeding Information: Hatched	1989 Breeding Information: Weaned
Amazona ochrocephala auropalliata Yellow-naped Amazon	259	37	98	175	64	20	45	45	22
Subtotal for Amazons:	3,924		660	2,726	654	543	1,294	744	578
Cockatoos									
Census:									
Cacatua alba White Cockatoo	797	5	217	603	136	59	318	441	380
Cacatua galerita Sulphur-crested Cockatoo	196	50*	70	99	50	47	60	39	35
Cacatua galerita eleonora M. Sulpur-crested Cockatoo	267	35	75	192	47	28	91	79	71
Cacatua goffini Goffin's Cockatoo	711	8	215	602	42	67	297	77	66
Cacatua haematuropygia Red-vented Cockatoo	62	92*	22	53	3	6	22	5	3
Cacatua leadbeateri Major Mitchell's Cockatoo	85	77*	18	8	45	32	33	12	13
Cacatua moluccensis Salmon-crested Cockatoo	820	4	239	645	93	81	317	158	120
Cacatua ophthalmica Blue-eyed Cockatoo	14	146*	6	2	10	2	5	3	2
Cacatua sanguinea Bare-eyed Cockatoo	152	59	42	67	76	1	45	75	68
Cacatua sulphurea L. Sulphur-crested Cockatoo	410	19	133	305	69	36	151	78	69
Cacatua tenuirostris Slender-billed Cockatoo	24	130*	5	2	14	8	4	2	2
Callocephalon fimbriatum Gang Gang Cockatoo	14	146*	3	0	2	12	8	0	0
Calyptorhynchus funereus Black Cockatoo	5	171*	1	0	2	3	1	0	0
Calyptorhynchus magnificus Red-tailed Cockatoo	12	149*	1	0	3	9	3	1	0
Eolophus roseicapillus Galah	248	39*	67	28	160	60	98	101	82
Probosciger aterrimus Palm Cockatoo	109	68	11	89	15	5	42	17	10
Other: +									
Cacatua galerita triton Triton Cockatoo	44	105*	13	13	10	21	17	31	18
Cacatua galerita fitzroyi Fitzroyi Cockatoo	2	182*	1	2	0	0	1	0	0
Cacatua sulphurea citrinocristata Citron-crested Cockatoo	114	66	40	76	19	19	47	24	22
Calyptorhynchus funereus baudinii Black Cockatoo	3	180*	1	0	3	0	0	0	0
Subtotal for Cockatoos:	4,089		556	2,786	799	496	1,560	1,143	961
Macaws									
Census:									
Anodorhynchus hyacinthinus Hyacinth Macaw	236	42	64	139	72	23	93	41	39
Ara ambigua Buffon's Macaw	64	90	11	42	21	1	19	16	8
Ara ararauna Blue & yellow Macaw	1,217	3	355	731	365	121	397	630	581

Species	Number of Birds in Census	Rank in Census	Number of Respondents With Taxon	Source of Birds: Wild-Caught	Source of Birds: Captive-Bred	Source of Birds: Unknown	1989 Breeding Information: Breeding Pairs	1989 Breeding Information: Hatched	1989 Breeding Information: Weaned
Ara auricollis Yellow-collared Macaw	316	27	95	165	125	26	116	123	94
Ara chloroptera Green-winged Macaw	583	14	200	430	91	62	195	119	99
Ara glaucogularis Blue-throated Macaw	84	80	7	57	27	0	35	10	11
Ara macao Scarlet Macaw	592	13	154	309	186	99	176	147	113
Ara manilata Red-bellied Macaw	85	77*	33	74	6	5	35	1	0
Ara maracana Illiger's Macaw	24	130*	14	9	14	1	8	7	0
Ara militaris Military Macaw	302	28	112	199	65	38	105	75	62
Ara nobilis Red-shouldered Macaw	78	84*	33	35	35	8	31	26	25
Ara nobilis cumanensis Hahn's Macaw	134	60*	48	69	55	10	46	84	59
Ara rubrogenys Red-fronted Macaw	163	57*	35	80	66	10	60	54	45
Ara severa Severe Macaw	266	36	87	150	77	39	99	125	92
Subtotal for Macaws:	4,144		505	2,489	1,205	443	1,415	1,458	1,228
Parrots/Parakeets									
Census:									
Alisterus amboinensis Amboina King Parrot	53	97*	19	24	23	6	16	39	28
Alisterus chloropterus Green-winged King Parrot	11	153*	5	5	4	2	4	5	5
Alisterus scapularis Australian King Parrot	26	124*	7	1	17	8	8	9	7
Aprosmictus erythropterus Crimson-winged Parrot	82	82	31	24	53	5	35	39	38
Aprosmictus jonquillaceus Timor Crimson-winged Parrot	2	182*	1	1	0	1	1	0	0
Barnardius barnardi Mallee Ring-necked Parrot	16	140*	5	0	16	0	8	19	18
Barnardius zonarius Port Lincoln Parrot	44	105*	8	0	42	2	21	19	16
Deroptyus accipitrinus Hawk-headed Parrot	126	65	44	107	12	7	55	20	8
Eclectus roratus Grand Eclectus Parrot	487	16	121	67	357	63	198	300	223
Loriculus galgulus Blue-crowned Hanging Parrot	61	94*	16	54	7	0	19	21	11
Myiopsitta monachus Monk Parakeet	710	9	91	508	156	45	256	431	521
Pionites leucogaster White-bellied Caique	63	91*	18	24	37	2	25	20	17
Pionites melanocephala Black-headed Caique	196	50*	49	132	57	7	80	53	35
Pionopsitta pileata Piliated Parrot	15	141*	6	0	15	0	7	7	7
Platycercus adscitus Pale-headed Rosella	66	89	23	5	54	7	26	51	40

Species	Number of Birds in Census	Rank in Census	Number of Respondents With Taxon	Source of Birds: Wild-Caught	Source of Birds: Captive-Bred	Source of Birds: Unknown	1989 Breeding Information: Breeding Pairs	1989 Breeding Information: Hatched	1989 Breeding Information: Weane
Platycercus elegans Crimson Rosella	104	71	36	6	82	16	38	33	28
Platycercus eximius Eastern Rosella	209	47	80	26	148	35	84	93	77
Poicephalus cryptoxanthus Brown-headed Parrot	48	101*	13	40	8	0	19	12	11
Poicephalus gulielmi Jardine's Parrot	78	84*	22	62	9	7	32	14	12
Poicephalus meyeri Meyer's Parrot	295	29	86	236	46	13	119	125	116
Poicephalus rufiventris Red-bellied Parrot	140	58	39	111	25	6	54	58	52
Poicephalus senegalus Senegal Parrot	746	7	183	559	135	52	290	338	303
Polytelis alexandrae Princess Parrot	180	53	54	5	166	9	74	139	110
Psephotus haematonotus Red-rumped Parrot	324	25	90	19	269	35	122	208	187
Psittaculirostris edwardsii Edward's Fig Parrot	40	110*	11	31	5	4	18	21	2
Psittacus erithacus Grey Parrot	1,923	2	428	1,460	295	168	725	799	676
Tanygnathus megalorhynchos Great-billed Parrot	20	136*	12	20	0	0	7	0	0
Other: +									
Bolborhynchus lineola Barred Parakeet	11	153*	3	4	7	0	5	27	19
Brotogeris chrysopterus Golden-winged Parakeet	23	132*	5	23	0	0	8	0	0
Brotogeris jugularis Orange-chinned Parakeet	26	124*	4	15	11	0	8	15	0
Brotogeris pyrrhopterus Grey-cheeked Parakeet	202	49*	47	161	19	22	66	26	14
Brotogeris versicolurus Canary-winged Parakeet	101	72*	34	79	14	8	34	12	11
Coracopsis vasa Vasa Parrot	46	103*	10	46	0	0	20	6	0
Cyanoramphus auriceps Yellow-fronted Parrot	15	141*	7	4	11	0	6	24	20
Cyanoramphus novaezelandiae Red-fronted Parrot	37	113	14	2	33	2	14	61	52
Eclectus roratus solomonensis Solomon Eclectus Parrot	4	174*	2	0	4	0	2	0	0
Eclectus roratus polychloros Red-sided Eclectus Parrot	2	182*	1	1	1	0	1	0	0
Eclectus roratus vosmaeri Vosmaeri Eclectus Parrot	18	139	2	2	16	0	8	5	4
Loriculus vernalis Vernal Hanging Parrot	2	182*	1	2	0	0	0	0	0
Neophema bourkii Bourke's Parrot	397	20	68	1	367	23	131	309	291
Neophema elegans Elegant Parrot	26	124*	6	0	26	0	8	8	8
Neophema pulchella Turquoise Parrot	112	67	31	1	99	12	39	59	51
Neophema splendida Scarlet-chested Parrot	353	22	57	1	348	4	134	281	239

Species	Number of Birds in Census	Rank in Census	Number of Respondents With Taxon	Source of Birds: Wild-Caught	Source of Birds: Captive-Bred	Source of Birds: Unknown	1989 Breeding Information: Breeding Pairs	1989 Breeding Information: Hatched	1989 Breeding Information: Weaned
Pionopsitta barrabandi Barraband's Parrot	38	112*	15	0	32	6	16	10	10
Platycercus adelaidae Adelaide Rosella	4	174*	2	0	4	0	2	4	3
Platycercus flaveolus Yellow Rosella	7	165*	4	0	7	0	1	0	0
Platycercus icterotis Western Rosella	48	101*	16	2	40	6	15	21	20
Poicephalus robustus Cape Parrot	35	116	7	21	14	0	13	8	6
Polytelis anthopeplus Regent Parrot	53	97*	14	1	50	2	18	29	26
Prosopeia tabuensis Red Shinning Parrot	3	180*	1	0	2	1	1	1	0
Psittacula alexandri Moustached Parakeet	171	54	55	63	70	38	66	122	98
Psittacula cyanocephala Plum headed Parakeet	129	64	38	22	70	37	45	59	47
Psittacula derbiana Derbyan Parakeet	29	122	11	10	14	5	11	22	20
Psittacula eupatria Alexandrine Parakeet	91	74	31	39	46	6	33	55	53
Psittacula himalayana Slaty-headed Parakeet	26	124*	9	9	14	3	8	23	22
Psittacula krameri Rose-ringed Parakeet	677	11	127	102	507	68	223	443	387
Psittacula longicauda Long-tailed Parakeet	20	136*	3	7	1	12	8	0	0
Psittacula roseata Blossom-headed Parakeet	10	157*	3	3	7	0	3	5	4
Psittaculirostris desmarestii Desmarest's Fig Parrot	27	123*	5	18	8	1	7	10	8
Psittaculirostris salvadorii Salvadori's Fig Parrot	12	149*	3	11	0	1	4	2	0
Psittacus erithacus timneh Timneh Grey Parrot	53	97*	20	42	5	6	16	11	7
Purpureicephalus spurius Red-capped Parrot	32	119	1	0	32	0	6	28	26
Rhynchopsitta pachyrhyncha Thick-billed Parrot	23	132*	3	0	7	16	10	6	6
Tanygnathus lucionensis Blue-naped Parrot	6	168*	3	2	2	2	2	1	0
Tanygnathus sumatranus Muller's Parrot	2	182*	1	1	1	0	0	0	0
Subtotal for Parrots/Parakeets:	8,936		821	4,222	3,927	781	3,333	4,566	4,000
Conures									
Census:									
Aratinga acuticaudata Blue-crowned Conure	320	26	98	231	56	33	115	109	87
Aratinga aurea Peach-fronted Conure	284	32	88	198	62	23	117	204	175
Aratinga auricapilla Golden-capped Conure	170	55*	40	50	114	6	67	150	81
Aratinga canicularis Orange-fronted Conure	181	52	61	95	54	32	65	114	78

Species	Number of Birds in Census	Rank in Census	Number of Respondents With Taxon	Source of Birds: Wild-Caught	Source of Birds: Captive-Bred	Source of Birds: Unknown	1989 Breeding Information: Breeding Pairs	1989 Breeding Information: Hatched	1989 Breeding Information: Weaned
Aratinga erythrogenys Red-masked Conure	208	48	52	122	67	19	64	42	31
Aratinga guarouba Golden Conure	43	107*	10	0	37	6	12	9	18
Aratinga holochlora Green Conure	68	88	18	38	23	7	21	27	10
Aratinga jandaya Jandaya Conure	290	31	68	44	206	39	93	328	292
Aratinga leucophthalmus White-eyed Conure	43	107*	20	28	9	6	15	22	20
Aratinga mitrata Mitred Conure	244	41	76	209	19	16	94	71	62
Aratinga nana Olive-throated Conure	10	157*	4	6	2	0	5	6	0
Aratinga pertinax Brown-throated Conure	80	83	22	56	23	1	33	56	50
Aratinga solstitialis Sun Conure	630	12	142	68	493	69	215	491	411
Aratinga wagleri Red-fronted Conure	11	153*	4	7	4	0	5	8	6
Aratinga weddellii Dusky-headed Conure	108	69	32	53	48	7	41	132	118
Cyanoliseus patagonus Patagonian Conure	217	46	68	145	49	23	81	58	54
Enicognathus leptorhynchus Slender-billed Conure	83	81	19	41	38	4	34	25	29
Enicognathus ferrugineus Austral Conure	14	146*	5	6	6	2	5	1	1
Nandayus nenday Nanday Conure	482	17	122	268	148	66	180	394	309
Pyrrhura frontalis Maroon-bellied Conure	280	33*	66	103	137	40	116	292	192
Pyrrhura melanura Maroon-tailed Conure	25	129	5	9	15	1	14	33	25
Pyrrhura molinae Green-cheeked Conure	391	21	78	84	289	18	148	490	441
Pyrrhura perlata Pearly Conure	69	87	6	2	67	0	18	41	9
Pyrrhura picta Painted Conure	61	94*	17	29	24	8	26	13	12
Other: +									
Aratinga finschi Finsch's Conure	6	168*	1	6	0	0	3	0	5
Pyrrhura hoffmanni Hoffman's Conure	10	157*	1	3	7	0	4	5	3
Pyrrhura rupicola Black-capped Conure	36	115*	6	7	29	0	15	22	0
Subtotal for Conures:	4,364		437	1,908	2,026	426	1,606	3,143	2,519
Lories									
Census:									
Chalcopsitta atra Black Lory	22	134*	9	19	3	0	8	3	3
Chalcopsitta duivenbodei Duyvenbode's Lory	30	121	9	24	6	0	14	17	10
Chalcopsitta sintillata Yellow-streaked Lory	22	134*	7	18	2	2	11	12	1

Species	Number of Birds in Census	Rank in Census	Number of Respondents With Taxon	Source of Birds: Wild-Caught	Source of Birds: Captive-Bred	Source of Birds: Unknown	1989 Breeding Information: Breeding Pairs	1989 Breeding Information: Hatched	1989 Breeding Information: Weaned
Charmosyna josefinae Josephine's Lory	5	171*	2	5	0	0	1	0	0
Charmosyna papou Papuan Lory	34	117*	8	24	7	3	16	25	4
Eos bornea Red Lory	101	72*	39	60	29	12	37	59	42
Eos squamata Violet-necked Lory	26	124*	8	20	4	2	11	19	9
Lorius domicellus Purple-napped Lory	12	149*	2	5	7	0	4	3	3
Lorius garrulus Chattering Lory	89	96*	31	63	19	7	36	42	28
Lorius lory Black-capped Lory	57	84	13	25	29	3	23	26	21
Pseudeos fuscata Dusky Lory	46	103*	16	29	15	2	19	44	27
Trichoglossus flavoviridis Yellow and Green Lorikeet	12	149*	3	9	1	2	5	15	7
Trichoglossus goldiei Goldie's Lorikeet	77	86	20	35	40	2	33	79	51
Trichoglossus haematodus Rainbow Lory	170	55*	51	100	46	24	67	113	63
Other: +									
Charmosyna multistriata Striated Lorikeet	1	192*	1	1	0	0	0	0	0
Charmosyna placentis Red-flanked Lorikeet	15	141*	4	12	2	1	7	8	0
Eos cyanogenia Black-winged Lory	8	164	3	7	0	1	4	5	1
Eos reticulata Blue-streaked Lory	40	110*	18	28	6	6	17	22	4
Glossopsitta concinna Musk Lorikeet	2	182*	1	0	2	0	1	1	0
Neopsittacus musschenbroekii Musschenbroek's Lorikeet	4	174*	1	4	0	0	2	2	0
Trichoglossus iris Iris Lorikeet	4	174*	1	2	2	0	2	1	1
Trichoglossus ornatus Ornate Lorikeet	10	157*	3	8	2	0	4	6	4
Vini kuhlii Kuhl's Lory	1	192*	1	0	0	1	0	0	0
Subtotal for Lories:	788		105	498	222	68	322	502	279
Parrotlets									
Census:									
Forpus coelestis Pacific Parrotlet	280	33*	64	33	227	20	100	236	218
Forpus passerinus Green-rumped Parrotlet	104	89	32	48	50	6	43	71	62
Forpus xanthops Yellow-faced Parrotlet	7	165*	1	3	4	0	3	5	5
Subtotal for Parrotlets:	391		77	84	281	26	146	312	285
Pionus									
Census:									
Pionus chalcopterus Bronze-winged Parrot	89	75*	25	36	51	2	32	55	56

Species	Number of Birds in Census	Rank in Census	Number of Respondents With Taxon	Source of Birds: Wild-Caught	Source of Birds: Captive-Bred	Source of Birds: Unknown	1989 Breeding Information: Breeding Pairs	1989 Breeding Information: Hatched	1989 Breeding Information: Weaned
Pionus maximiliani Scaly-headed Parrot	85	77*	37	47	36	2	26	36	35
Pionus menstruus Blue-headed Parrot	248	39*	79	133	90	25	87	90	86
Pionus senilis White-capped Parrot	235	43	76	115	101	19	79	104	88
Other: +									
Pionus fuscus Dusky Parrot	34	117*	12	14	18	2	13	11	4
Pionus sordidus Red-billed Parrot	2	182*	1	1	0	1	1	0	0
Pionus tumultuosus Plum-crowned Parrot	9	163	2	1	0	8	1	0	0
Subtotal for Pionus:	702		146	347	296	59	239	296	269
Lovebirds									
Census:									
Agapornis cana Grey-cheeked Lovebird	43	107*	8	7	32	4	18	32	28
Agapornis fischeri Fischer's Lovebird	416	18	74	44	313	59	132	315	274
Agapornis lilianae Nyasa Lovebird	4	174*	1	0	4	0	2	0	0
Agapornis nigrigenis Black-cheeked Lovebird	37	113*	7	8	27	2	19	0	0
Agapornis personata Masked Lovebird	579	15	96	19	463	97	202	485	508
Agapornis roseicollis Peach-faced Lovebird	2,454	1	246	47	2,221	186	836	4,049	3,746
Other: +									
Agapornis pullaria Red-faced Lovebird	5	171*	2	5	0	0	2	1	0
Subtotal for Lovebirds:	3,538		298	130	3,060	348	1,211	4,882	4,556
Subtotal for Hybrids:	132	62	73	6	125	1	23	63	45
Subtotal for Mixed Pairs:	0	0	79	0	0	0	110	168	167
Grand Totals:	31,008		1,183	15,196	12,595	3,191	11,259	17,277	14,887

*** Indicates more than one species with the same rank.**
+ Indicates taxon added to the census form by respondents.