

# A study of the parrot trade in Peru and the potential importance of internal trade for threatened species

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## Summary

During a period of 12 months in 2007 and 2008, a study of the parrot trade within Peru was carried out. In this study, 20 main wildlife markets were visited in eight cities in order to estimate the number of parrot species and individuals traded legally and illegally within a year. The study also gathered extra information from vendors and customers through informal interviews about the trade process. Additionally we contracted one person in two markets between February and May 2008 to monitor how many species and individuals entered the trade. During the study, four threatened species (the 'Endangered' Gray-cheeked Parakeet *Brotogeris pyrrhoptera*, the 'Vulnerable' Military Macaw *Ara militaris*, the 'Vulnerable' Yellow-faced Parrotlet *Forpus xanthops* and the 'Near Threatened' Red-masked Parakeet *Aratinga erythrogenys*) and one additional species listed in CITES Appendix 1 (Scarlet Macaw *Ara macao*) were found being traded. Thirty-four species were recorded in total, 33 of which are native to Peru (representing 63% of the 52 known Peruvian parrot species) and one of which (Monk Parakeet *Myiopsitta monachus*) is native to Bolivia and Argentina. Our results show that even for the seven species which can be legally traded in Peru, the number of individuals being traded can greatly exceed the numbers that can officially be traded legally. We directly counted 4,722 parrots for sale and using a measured detection rate of 3% we estimate a total market size in the cities surveyed of between 80,000 and 90,000 individuals. As our surveys sampled only 8 out of Peru's 24 departmental capitals and there are also other large cities, these numbers are likely to represent only a part of the total trade in Peru. To the best of our knowledge this is one of the first detailed studies of the internal trade in a source country for the international parrot trade. Our results suggest that such internal trade is likely to be a significant conservation issue that has previously been largely overlooked.

## Introduction

Globally, illegal or black markets supply a large part of the pet parrot trade both nationally and internationally (CCAAN 2005). These illegal markets trade in many types of wildlife and from many parts of the world. Live animals are captured in native habitats and sold as pets or for research, or are killed and their parts sold for medicines, food, clothing, and accessories (Wagener 2001). This illegal worldwide wildlife trade is estimated by Interpol to be valued at US\$10 billion every year and is the third biggest illegal trade in the world only surpassed by guns and drug trafficking (CCAAN 2005) and parrots are often a significant part of this illegal traffic (e.g. Wagener 2001, Herrera and Hennessey 2007). Illegal trade is thought to contribute to the threatened status of 66 parrot species worldwide including 27 in South America, where it is

believed to have caused the probable extinction in the wild of Spix's Macaw *Cyanospitta spixii* (Birdlife 2008, IUCN 2008).

In Peru in the 1960s and early 1970s there was a large international and national demand for wildlife and no legal controls (Rosales *et al.* 2007). Despite passage in the mid-1970s of some local laws restricting wildlife trade, parrot traffic flourished in the 1980s due to huge demand from developed countries (Rosales *et al.* 2007). As a result, the Peruvian government created new laws to improve control of the wildlife trade. Principally the Ley Forestal y de Fauna Silvestre No 27308 from the Instituto Nacional de Recursos Naturales - INRENA (the Peruvian government organization in charge of the protection of flora and fauna in the country). This law includes in its articles, regulations for the commercialisation of legal wild species, minimum requirements for their harvest, collection and transportation, and establishes a maximum collection quota for each species from their natural environment. This quota is set by INRENA and published each year in the government newspaper. In 2007 and 2008 there were seven parrot species listed for legal wildlife trade: Mitred Parakeet *Aratinga mitrata*, Scarlet-fronted Parakeet *A. wagleri*, Dusky-headed Parakeet *A. weddellii*, Cobalt-winged Parakeet *Brotogeris cyanoptera*, Tui Parakeet *B. santichthomae*, Canary-winged Parakeet *B. versicolorus* and Pacific Parrotlet *Forpus coelestis* (El Peruano 2007); trade in all other parrot species is illegal. Most of the parrots in the illegal trade come from the wild where they have been harvested by small local communities and traded to other people who transport them to wildlife markets in major cities (Gonzales 2003, Rosales *et al.* 2007).

In 2004 and 2005, the Armonía/Loro Parque Fundacion Blue-throated Macaw *Ara glaucogularis* conservation programme and the Armonía Red-fronted Macaw *Ara rubrogenys* conservation programme began monitoring illegal parrot trade in the city of Santa Cruz in Bolivia (Herrera and Hennessey 2007). Several large, threatened macaw species were found being purchased by middlemen traders for transport to Lima, Peru (Herrera and Hennessey 2007). This suggested that an understanding of the level of the parrot trade in Peru could be important in helping to understand the illegal trade in the whole of the central region of South America. There is also very little known about the volume of internal parrot trade within source countries for the international parrot trade (Beissinger 2001). This study therefore aimed to assess the status of legal and illegal parrot trade in Peru and its potential effects on species of conservation concern, especially globally threatened species. The key objectives were firstly to identify markets where parrots were being traded, to identify the species being traded, to count the numbers of parrots on sale at any one time and to monitor the total numbers of parrots entering selected markets over time. Then secondly to use this data to infer source areas for each market, calculate detection rates for market surveys and make a preliminary estimate of the total size of the parrot trade in Peru.

## Study Area

Politically, Peru is divided into 24 departments and geographically the country can be broadly characterised by three natural regions; the western coastal lowlands, the Andes mountains and the Amazonian lowlands to the east. We had sufficient resources to study the parrot trade in eight cities; as departmental capitals are normally the focus of transport links and therefore trade in Peru (both within the department and between departments) we chose to focus our survey effort on these cities. We chose departmental capitals based on their geographic locations. We studied the trade in the coastal lowlands in the cities of Lima and Chiclayo; in the Andes in Arequipa, Cusco and Puno; and in the Amazonian lowlands in Pucallpa, Puerto Maldonado and Iquitos (Figure 1). These gave us a good geographic spread from north to south.

## Methods

From July 2007 to July 2008 we surveyed the 20 main wildlife markets in eight Peruvian cities (Figure 1). Wildlife market locations are well known to local populations, and were identified by



Figure 1. Map of Peru showing the eight cities in which parrot trade surveys were carried out. Natural regions: Coast (white), Mountains (dark grey) and Lowlands (light grey).

the team members living in each city using local knowledge. This was supplemented by questioning stall holders in markets about where else parrots or wildlife in general might be sold. We believe this process allowed us to identify all the wildlife markets in seven out of the eight cities. The exception was in Lima, where we were able to identify the markets in the centre but the large size of the city meant we were unable to exclude the possibility of other markets existing around the outskirts.

Each individual market survey counted the number of individuals of each species for sale and lasted less than a day. Standard field guides covering species from throughout South America were used to identify the parrot species. In order to observe seasonality in the parrot trade, markets were surveyed in each of four quarterly periods: July–September 2007, October–December 2007, January–March 2008 and April–July 2008. We gathered extra information from vendors and customers through informal interviews about the processes of the trade. According to vendors, only one species, Monk Parakeet *Myiopsitta monachus*, was bred in captivity; all other species came from wild populations and vendors normally only held individual birds for days or a week or two. Thus in carrying out surveys at quarterly intervals we were unlikely to detect the same individuals. Vendors were open about the species they were selling, with both legal and illegal species on display and were forthcoming in sharing information about their trade. We also collected information on illegally traded parrots that had been confiscated by

INRENA and the Ecological Police (Policía Ecológica, the police force responsible for enforcing environmental laws).

Between February and May 2008, we contracted one person working in each of two of the largest parrot markets (Pucallpa and Arequipa) to record how many species and individuals entered the trade during these months. Working in the trade, these people were able to identify all the species and we selected people known and trusted by our local team members. We would also have liked to contract a person in the other large market (Chiclayo) but could not find anyone suitable. This monitoring was done so that we could compare the number of individuals and species detected by the team in each survey visit and the true numbers being brought into the markets each month. Counts of parrots entering these individual stalls were used to estimate the total percentage of parrot trade detected by the market surveys and how many individuals might be entering markets between the quarterly surveys. This allowed an estimation of the total volume of trade within the markets.

## Results

Each of the twenty wildlife markets surveyed had from 0 to 10 stalls offering parrots for sale and on average (over the four quarterly surveys) these markets held a total of 42 stalls (Table 1). For the one year period, a total of 2,578 individual parrots were found for sale during the market surveys (see Appendix 1 for counts of species). These individuals belonged to 32 species, 31 of which are native to Peru and one of which (Monk Parakeet) is native to Bolivia and Argentina. During the four month period from February to May 2008 a total of 2,329 individuals of 27 species were recorded in more detailed counts of parrots entering one stall in the Pucallpa market and one stall in the Arequipa market (Appendix 1). Taking account of slight overlap in the two parts of the study, a total of 4,722 individuals of 34 species were found in the markets. Of these, 33 species are native to Peru, representing 63% of the 52 known Peruvian parrot species (Schulenberg *et al.* 2007).

Peruvian law allows seven native parrot species to be traded; the trade in the other 26 species (see Appendix 1) is illegal when the birds are taken from the wild. Four species of global conservation concern because they are threatened or near-threatened were found being illegally traded. These were the Gray-cheeked Parakeet *Brotoyeris pyrrhoptera* (385 individuals) which is classified as 'Endangered', the Military Macaw *Ara militaris* (eight individuals) and the Yellow-faced Parrotlet *Forpus xanthops* (16 individuals) both classified as 'Vulnerable' and the Red-masked Parakeet *Aratinga erythrogenys* (162 individuals) which is 'Near Threatened' (Table 2).

Table 1. Summary of results of parrot trade market surveys carried out in four quarters between July 2007 and July 2008.

City	Markets Surveyed	Trading Stalls	Parrot Species	Individuals for Sale	Potential Annual Market
Pucallpa	1	7	20	1,078	35,574
Chiclayo	4	6	21	547	18,233
Arequipa	1	7	8	329	13,335
Lima	4	12	12	317	10,567
Puno	2	4	12	201	6,700
Iquitos	2	6	6	102	3,400
Cusco	2	0	1	4	0
Puerto Maldonado	4	0	0	0	0
<b>Totals</b>	<b>20</b>	<b>42</b>	<b>32</b>	<b>2,578</b>	<b>87,909</b>

The number of trading stalls is the average number per city over the four quarterly surveys. The estimate of the potential annual market is based on the market surveys detecting 3% of the actual trade (see results text for details).

Table 2. Numbers of threatened and near-threatened parrot species detected during market surveys and market counts.

Species	IUCN Status	Lima Surveys	Arequipa Surveys	Arequipa Counts	Chiclayo Surveys	Pucallpa Surveys	Pucallpa Counts	Totals
<i>Ara militaris</i>	VU	0	0	0	1	0	7	8
<i>Aratinga erythrogenys</i>	NT	36	19	55	52	0	0	162
<i>Forpus xanthops</i>	VU	0	0	0	16	0	0	16
<i>Brotogeris pyrrhoptera</i>	EN	3	178	50	29	125	0	385

EN = Endangered, VU = Vulnerable, NT = Near Threatened, according to IUCN criteria (BirdLife International 2008).

Two species listed in CITES Appendix 1 (Military Macaw and Scarlet Macaw *Ara macao*) and 32 species listed in CITES Appendix 2 were found being traded (Appendix 1).

In terms of the number of individuals and number of species available for sale during the quarterly surveys, the cities with the largest trade were Pucallpa and Chiclayo with significant numbers of parrots also identified for sale in Arequipa, Iquitos, Lima and Puno (Table 1). Despite extensive searching by the survey team and volunteer helpers, no parrot trade was found in the markets of Cusco or Puerto Maldonado. On only one occasion were parrots found for sale in these cities and this was from a wandering street seller at a main bus station in Cusco rather than from a permanent market stall.

The detailed counts of parrots entering sample stalls identified 1,694 parrots of 27 species entering one stall in Pucallpa and 635 parrots of 21 species entering one stall in Arequipa, each over a four month period (Appendix 1). If trade is spread evenly throughout the year from the seven stalls of similar size that occur in each city the annual trade in Pucallpa would be about 35,000 individual parrots and in Arequipa about 13,000 individuals. These estimates suggest that the quarterly market surveys measured approximately 2.5% of annual parrot trade in Arequipa and 3% in Pucallpa. Based on the more conservative detection rate of 3% we estimated potential annual market sizes in the cities surveyed (Table 1).

The 3% detection rate would suggest a total market size in the eight cities surveyed of between 80,000 and 90,000 individuals. Moreover, this estimate is likely to be conservative because our detailed market counts took place outside the peak trading season. The market surveys found 707 individuals for sale in surveys during the third quarter of 2007, 1,116 individuals in the fourth quarter of 2007, 371 individuals in the first quarter of 2008 and 384 individuals in the second quarter of 2008. Thus approximately 70% of the birds for sale were found in the second half of the calendar year and only 30% in the first half, which was the period during which the market counts were carried out.

As well as differing in the number of species traded, the species composition and the likely source of species for sale differed in each city (see Table 3). In Iquitos and Pucallpa in the Amazonian lowlands, traded species were mainly those available locally (in the same political department as the city). In contrast, in Arequipa and Chiclayo, the trade was dominated by species that were not available locally, suggesting the presence of regular traffic in parrots between different parts of Peru.

## Discussion

There is a large parrot trade in and between several of Peru's major cities. The vast majority of this trade is illegal and includes at least four species of global conservation importance and two species listed by CITES in Appendix 1. The trade in the most threatened of these species, the 'Endangered' Gray-cheeked Parakeet, is particularly prominent with 385 individuals detected.

Originally one of the main aims of this study was to assess the level of trade in the 'Endangered' Blue-headed Macaw *Primolius couloni*, but in our surveys and market counts we could not find

Table 3. Nearest sources of parrot species to city markets.

City	Local Department	Local Geographic Region	Local Natural Region	National	International
Lima	16.7%	58.3%	33.3%	16.7%	0.0%
Arequipa	0.0%	25.0%	37.5%	50.0%	12.5%
Chiclayo	14.3%	38.1%	19.0%	61.9%	0.0%
Iquitos	100.0%	100.0%	100.0%	0.0%	0.0%
Pucallpa	75.0%	85.0%	75.0%	10.0%	0.0%
Puno	66.7%	33.3%	75.0%	8.3%	0.0%

Species are classified as: occurring in the local department (the same department as the market), occurring in the same geographic regions (five geographic regions were used – south-east, south-west, central, north-east and north-west Peru), occurring in the same natural region (three regions were used: coast, Andes, Amazon). Species not native to the same region as the market where classified as coming from national sources, species not native to Peru where classified as coming from international sources.

any evidence of this species being traded. There were however 22 individuals of this species in Huachipa Zoo in Lima that had been confiscated by INRENA in 2000 from a wildlife market in the city. This indicates that the species used to be traded in wildlife markets but, if the trade continues in such locations, it is well hidden.

Our results show that even for the seven species which can be legally traded, much of the trade is illegal because the number of individuals for sale greatly exceeds the numbers that can officially be legally sold. For example, in our quarterly market surveys in eight departmental capitals, 946 individuals of Canary-winged Parakeet were counted. Peruvian law sets the number of this species that can be traded at 1,250 individuals, meaning that 76 % of the legal quota was counted by the team. As we estimate our surveys only detected 3 % of the trade in the cities surveyed, this would suggest more than 31,000 individuals could be traded annually. In addition, 361 individuals of Pacific Parrotlet were counted, 241 % of the permitted legal trade of 150 individuals and the total annual market size could potentially be about 12,000 individuals. Despite these estimates, no individual trader is likely to be holding more individuals than the legal limit at any one time, so proving when the law has been broken would be extremely difficult. Additionally, without training, few police officers or market inspectors are likely to be able to differentiate between species that can be legally be traded and those that can not. Therefore the small, legally authorised Peruvian parrot trade seems to facilitate a much larger illegal parrot trade. As our surveys sampled eight out of Peru's 24 departmental capitals and there are also other large cities, our estimates are likely to be conservative because they represent only a part of the total trade in Peru. It is therefore probable that hundreds of thousands of parrots are traded illegally in Peru each year.

According to Bessinger (2001) between 1991 and 1996, the global CITES-registered trade in parrots was 1.2 million, equivalent to 240,000 individuals a year. WWF estimate international parrot trade to have been approximately 1 million from 1998 to 2000, equivalent to 333,000 individuals a year (WWF 2010). There is very little information available on the size of the internal parrot trade in source countries (Beissinger 2001). However, the volume of the internal trade in Peru is sizeable when compared to these estimates of global international trade. This suggests that internal trade in source countries is likely to be a significant conservation issue that has previously largely been overlooked. We therefore suggest that there is an urgent need for field studies to establish the impact of these levels of trade on populations of individual parrot species, especially for the most traded of the threatened species, Gray-cheeked Parakeet.

The results of Herrera and Hennessey (2007) suggest that Peru is a regional centre for a high value international trade that includes significant numbers of several threatened macaw species (Herrera and Hennessey 2007). We found no evidence of this illegal international trade in our market surveys or counts and the one threatened macaw species we found was the Military

Macaw, which is a species native to Peru. From testimonies of local people and the Ecological Police, the additional illegal trade in high value species exists but, unlike in the market studied in Santa Cruz de la Sierra in Bolivia (Herrera and Hennessey 2007), it is carried out away from the local wildlife markets. Our interviews and results suggest that while threatened species can be easily bought by middlemen in Peru's wildlife markets, once purchased, those that are destined for the international trade are well hidden and kept separate from the national trade. Instead, these species are transported to private facilities, reportedly mostly in and around Lima. These species are then transported abroad to destinations in North America, Europe, Asia or other developed countries (Wagener 2001) and also probably to rich individuals in other developing countries.

Despite the large size of the illegal parrot trade identified in this study, we also identified some positive aspects to the state of the trade in Peru. It was encouraging to note that parrot trade in two departmental capitals, Cusco and Puerto Maldonado, appeared to be negligible. This is despite personal observations that in the past, both cities had active parrot trade markets. In Cusco there was an active market approximately five years before our surveys. From our observations we believe the reduction in trade in Cusco in particular is the result of a combination of three factors. First, the local authorities have been keen to ensure that market trade in general is only carried out by licensed vendors, which makes it difficult for sellers involved in the illegal parrot trade to function. Second, INRENA and the ecological police actively work to suppress the trade. Third, many local people are against wildlife trade in general, believing that it creates a poor impression for the tourist trade which is very important to the city and because illegally traded animals are seen as a potential cause of disease.

In other cities, even though INRENA and the Ecological Police are carrying out activities aimed at controlling the illegal traffic, large wildlife markets work openly. In these cities, individuals within INRENA have commented to us that they do not have a budget or enough people working for them to make frequent market inspections. We suggest that if the combination of circumstances found in Cusco could be replicated through national awareness campaigns and if support is provided for the police in enforcing wildlife and trading laws, much of the illegal parrot trade in Peru's other cities might also be controlled. We have observed that in most cities there are many people who care about wildlife, especially parrots and believe they would be willing to volunteer in order to help INRENA.

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Appendix 1. Numbers of parrot species identified by market surveys and market counts in eight Peruvian cities. Illegally traded species are mark with \*

English Name	Scientific Name	Status		Market Surveys									Market Counts	
		IUCN	CITES	Lima	Arequipa	Chiclayo	Iquitos	Pucallpa	Puno	Cusco	Puerto M	Total	Arequipa	Pucallpa
Blue-and-yellow Macaw*	<i>Ara ararauna</i>	LC	2	0	0	6	0	4	3	0	0	13	6	68
Military Macaw*	<i>Ara militaris</i>	VU	1	0	0	1	0	0	0	0	0	1	1	7
Scarlet Macaw*	<i>Ara macao</i>	LC	1	0	0	3	0	1	0	0	0	4	4	34
Red-and-green Macaw*	<i>Ara chloropterus</i>	LC	2	0	0	3	0	4	0	0	0	7	0	58
Chestnut-fronted Macaw*	<i>Ara severus</i>	LC	2	0	0	0	0	2	0	0	0	2	8	1
Red-bellied Macaw*	<i>Orthopsittaca manilata</i>	LC	2	0	0	0	0	1	0	0	0	1	0	0
Scarlet-fronted Parakeet	<i>Aratinga wagleri</i>	LC	2	2	0	27	0	0	0	0	0	29	24	0
Mitred Parakeet	<i>Aratinga mitrata</i>	LC	2	2	0	24	0	13	51	0	0	90	16	0
Red-masked Parakeet*	<i>Aratinga erythrogenys</i>	NT	2	36	19	52	0	0	0	0	0	107	67	0
White-eyed Parakeet*	<i>Aratinga leucophthalma</i>	LC	2	4	0	3	1	4	2	0	0	14	10	48
Dusky-headed Parakeet	<i>Aratinga weddellii</i>	LC	2	4	2	10	0	14	0	0	0	30	0	59
Painted Parakeet*	<i>Pyrhura picta</i>	LC	2	2	0	0	0	5	4	0	0	11	0	12
Andean Parakeet*	<i>Bolborhynchus orbynesius</i>	LC	2	0	0	0	0	0	0	0	0	0	15	0
Mountain Parakeet*	<i>Psilopsiagon aurifrons</i>	LC	2	26	0	0	0	0	0	0	0	26	30	0
Blue-winged Parrotlet*	<i>Forpus xanthopterygius</i>	LC	2	0	4	0	0	0	0	0	0	4	0	0
Dusky-billed Parrotlet*	<i>Forpus sclateri</i>	LC	2	0	0	0	0	0	17	0	0	17	90	0
Pacific Parrotlet	<i>Forpus coelestis</i>	LC	2	91	16	254	0	0	0	0	0	361	0	0
Yellow-faced Parrotlet*	<i>Forpus xanthops</i>	VU	2	0	0	16	0	0	0	0	0	16	0	0
Canary-winged Parakeet	<i>Brotogeris versicolurus</i>	LC	2	129	103	56	64	537	57	0	0	946	135	580
Gray-cheeked Parakeet*	<i>Brotogeris pyrrhoptera</i>	EN	2	3	178	29	0	125	0	0	0	335	50	0
Cobalt-winged Parakeet	<i>Brotogeris cyanoptera</i>	LC	2	0	0	30	17	175	29	0	0	251	0	421

Tui Parakeet	<i>Brotogeris sanctithomae</i>	LC	2	0	0	0	7	99	16	0	0	122	12	112
Black-headed Parrot*	<i>Pionites melanocephalus</i>	LC	2	0	0	0	0	3	0	0	0	3	2	31
White-bellied Parrot*	<i>Pionites leucogaster</i>	LC	2	0	0	8	0	0	0	0	0	8	4	12
Orange-cheeked Parrot*	<i>Pionopsitta barrabandi</i>	LC	2	0	0	0	0	0	0	0	0	0	0	3
Short-tailed Parrot*	<i>Graydidascalus brachyurus</i>	LC	2	0	0	0	7	0	4	0	0	13	0	0
Blue-headed Parrot*	<i>Pionus menstruus</i>	LC	2	17	0	6	0	7	14	4	0	48	20	47
Red-billed Parrot*	<i>Pionus sordidus</i>	LC	2	0	0	0	0	3	0	0	0	3	0	0
Festive Parrot*	<i>Amazona festiva</i>	LC	2	1	0	1	0	18	0	0	0	20	15	66
Yellow-crowned Parrot*	<i>Amazona ochrocephala</i>	LC	2	0	0	1	0	11	1	0	0	13	20	2
Orange-winged Parrot*	<i>Amazona amazonica</i>	LC	2	0	0	13	6	29	0	0	0	48	0	62
Scaly-naped Parrot*	<i>Amazona mercenaria</i>	LC	2	0	0	1	0	0	3	0	0	2	0	0
Mealy Parrot*	<i>Amazona farinosa</i>	LC	2	0	1	3	0	23	0	0	0	27	8	71
Monk Parakeet	<i>Myiopsitta monachus</i>	LC	2	0	6	0	0	0	0	0	0	6	98	0
<b>Total Individuals</b>				<b>317</b>	<b>329</b>	<b>547</b>	<b>102</b>	<b>1,078</b>	<b>201</b>	<b>4</b>	<b>0</b>	<b>2,578</b>	<b>635</b>	<b>1,694</b>
<b>Total Species</b>				<b>12</b>	<b>8</b>	<b>21</b>	<b>6</b>	<b>20</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>32</b>	<b>21</b>	<b>27</b>