

PARROT ILLEGAL TRADE DECREASES

IN MEXICO

2022

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UNIVERSIDAD AUTÓNOMA
DE BAJA CALIFORNIA SUR

"Sabiduría como meta-patria como destino"

Cite: Cantú, J.C., M. E. Sánchez, García De la Puente, E. y Ontiveros, P. J.M. 2022. PARROT ILLEGAL TRADE DECREASES IN MEXICO. Defenders of Wildlife, Teyeliz A.C. and UABCS. June 2022. pp 57

Photo cover:

Lilac-crowned parrot
PROFEPA

Design. Raziel Levi Méndez Moreno

ACKNOWLEDGMENTS

We would like to acknowledge all the people and institutions that provided crucial data or input for this report:

Patricia Escalante;
Cynthia Ruiz;
Carlos Bonilla;
Claudia Macias;
Diego Cobo;
Juan Carlos Orraca;
Vanessa Martínez,
Edith Jiménez;
Gladys Reyes;
Manuel Grosselet;
Patricia Oropeza;
José Antonio Hernández Velasco;
Anna Backstrom;
Victor Busteros;
PROFEPA

LIST OF ACRONYMS

CITES

« Convention on International Trade in Endangered Species of Wild Fauna and Flora »

CONANP

« National Commission for Protected Areas »

DGVS

« General Office of Wildlife of the Environment Ministry »

DOF

« Official Register of the Federation »

LGEEPA

« General Law of Ecological Equilibrium and the Protection of the Environment »

NGO

« Non-Governmental Organization »

NOM-059

« Mexican Norm 059 determines species as endangered, threatened, or under special protection »

PROFEPA

« Federal Attorney Office for the Protection of the Environment »

SEMARNAT

« Ministry of Environment and Natural Resources »

UMA

« Units of Management and Conservation in the General Law of Wildlife »

	TABLE OF CONTENTS	(pag) 3
2.	EXECUTIVE SUMMARY	4
3.	INTRODUCTION	5
4.	THE 2008 TRADE BAN AND ENVIRONMENTAL LAW	8
5.	PARROT ILLEGAL TRADE DECREASED AFTER THE 2008 BAN	16
6.	ILLEGAL TRADE BY SPECIES AFTER THE 2008 BAN	26
7.	REASONS FOR THE DECREASE IN THE ILLEGAL TRADE OF PARROTS	38
8.	CONCLUSIONS	44
9.	BIBLIOGRAPHY	46
10.	ANNEX	52



EXECUTIVE SUMMARY

Mexico has 22 species of parrots and macaws. In 2019, all species were classified in some risk category, with 11 species classified as endangered, seven as threatened, and four under special protection. Illegal trafficking of Mexican parrots for the pet trade is a threat to most species. In 2007, the illicit annual take was estimated at 65,000 to 78,500 parrots. In 2008, a total ban prohibited the capture of native psittacines for commercial and subsistence use, imports, exports of native parrots, and captive breeding for

commercial use. Before and after the ban, doubts were expressed about its usefulness. Some believed that the ban would increase the illegal trade in parrots. Since 2010, the Federal Attorney for Environmental Protection (PROFEPA) publicly stated that the illicit trade in parrots had decreased thanks to the ban. In 2017, PROFEPA announced that the illicit trade in parrots decreased by 24%. The total seizures of psittacines by PROFEPA after the ban from 2009 to 2021 decreased by 42% compared to the previous period from 1995 to 2008. In the United States, the seizure of Mexican parrots after



Photo: Yellow-headed parrot,
(*Amazona oratrix*).
PROFEPA

Photo: Orange-fronted parakeet,
(*Eupsittula canicularis*).
PROFEPA

the ban, from 2009 to 2020, decreased by 88% compared to the period before the ban, from 1997 to 2008. **Our recent estimate is that from 2009 to 2021, the illegal trade has decreased by 47.14% and that the illicit annual capture of parrots is now in the range from 34,000 to 41,500 parrots. Thanks to the 2008 ban, it is estimated that between 31,000 and 37,000 psittacines have ceased to be captured annually.** Several reasons explain the decline in illegal parrot trafficking in Mexico, for example, the 2008 ban itself, which put an end

to the issuance of capture permits, which in turn made it more difficult for traffickers to cheat and deceive the authorities; a permanent communication campaign throughout the country which informed about the ban, threats to parrots and ways to denounce illegal sales; the development of many parrot recovery programs, increased funding for conservation, environmental education programs, and alternative uses of parrots such as birdwatching; and to a lesser extent, the massive importation of exotic parrot species.

I INTRODUCTION

Mexico has 22 species of parrots and macaws, and all are in some category of risk; half of the species are classified as endangered (DOF, 2019). The biggest threats Mexican parrots face are habitat destruction (Macías *et al.*, 2000) and illegal trade for the pet trade (Cantú *et al.*, 2007). Since the 1970s, legal and illicit overexploitation of wild parrots forced government authorities to restrict the trapping of more and more species until 2008, when a total ban on the commercial and subsistence use of all species of Mexican parrots was decreed (DOF, 2008). In 2007, it was estimated that the annual illegal capture was 65,000 to 78,500 parrots (Cantú *et al.*, 2007).



▲ Photo: Yucatán parrot, (*Amazona xantholora*).
PROFEPA



There were many misgivings about the consequences of a total ban on the capture, import, export, and breeding of parrots before and after the 2008 parrot trade ban. Many of these misgivings were voiced by environmental authorities and others who said: a ban will increase illegal trade; bans don't work; parrots will lose value; illegal parrots will increase in value; exotic invasive species were imported because of the ban; habitat and parrots will

◀ Photo: Yellow-cheeked parrot, (*Amazona autumnalis*).
PROFEPA



◀ Photo: Yellow-headed parrot (*Amazona oratrix*),
PROFEPA

be destroyed because UMA owners will find no economic value if they can't trap parrots; thousands of "pajareros" or bird trappers will be affected because they would lose access to parrots and macaws, etc. (Senado, 2007; 2017; CEC, 2017; Roldan *et al.*, 2017; Universal, 2010; TRAFFIC, 2010).

The reality is that all these misgivings were false or turned out to be false alarms. Absolutely none of it happened, and most importantly, illegal trade didn't increase because it couldn't increase. Poachers work like fishers and the tragedy of the commons applies;

if they didn't take down a nest, they risked someone else taking it down. Poachers take all the parrots they catch in their nets and traps; they never release any if they are too young; on the contrary, they prefer them young. They also take all the chicks from a nest; they never leave any to grow up and eventually breed to produce more chicks. If they get to a nest and find the chicks too young to survive handling, they take the older chicks and return some weeks later to take the rest. Wherever they were working, they worked at their 100% capacity. Proof of this is the hundreds of sites in Mexico where one

Photo: Yellow-headed parrot,
Lilac-crowned parrot,
PROFEPA



parrot species or another has been wholly extirpated (Macías *et al.*, 2000). Furthermore, deforestation and the destruction of nesting, feeding, and resting habitats for parrots are ongoing (Monterrubio *et al.*, 2016). Parrot populations are generally decreasing all over Mexico and none enjoy having their original area of distribution or historical populations intact. So, how could poachers increase their activity to increase illegal take after the ban? How could their illegal activity benefit from a total ban if they were already taking everything they could illegally?

If one supposes legal trapping was more extensive or the same amount as illegal trapping, one could possibly say that the illegal activity could be fostered by banning a legal activity. But the reality is that it wasn't, legal trapping was insignificant. For every parrot trapped legally, 20 to 25 parrots were

captured illegally (*see below*). Legal capture only represented 3.6% to 4.6% of the annual capture, so illegal trade could only increase by that much after the ban, if at all.

The rest of the misgivings turned out to be red herrings, but except for a few, we will not be addressing them in this report. We will focus on the legal effects the 2008 ban had and document the general decrease in the illegal trade of parrots.



◀ Photo: Military macaw (*Ara militaris*).
PROFEPA

Photo: Yellow-cheeked parrot, (*Amazona autumnalis*).
PROFEPA
▶



THE 2008 TRADE BAN AND THE LAW



Photo: Yellow-naped parrot, (*Amazona auropalliata*), seizure. PROFEPA

The General Law of Ecological Equilibrium and Environmental Protection (LGEEPA) established in 1988 that threatened or endangered species could not be used: "The use of natural populations of endemic, threatened or endangered species will not be authorized except in cases of scientific research"(DOF, 1988). There was no official list of endangered or threatened species at that time. Still, scientists and environmental authorities acknowledged that the Scarlet and Military macaws and the Thick-billed and Maroon-fronted parrots were endangered.

Official lists that classified the conservation risk of species were created in 1991, and by 1994, 13 species of parrots were classified as threatened or endangered. In 1996 the LGEEPA was modified and allowed the use of threatened and endangered species for captive breeding, but could not be trapped for commercialization:

"The exploitation of natural populations of endangered or threatened species will not be authorized, except in cases where

their controlled reproduction is guaranteed ..." (DOF, 1996).

Thus, endangered or threatened species could not be trapped for the pet trade. In 2000, the Wildlife Law was created. It established:

"Article 85. The use of specimens of species at risk may only be authorized when priority is given to the collection and trapping for restoration, repopulation and reintroduction activities" (DOF, 2000).

Environmental authorities interpreted the law in their way, and their decisions to allow trapping or not didn't comply precisely with the law. In some years, they let trapping of threatened species like the Yucatan parrot or the Northern Mealy parrot, which would have been illegal under the Wildlife Law because they were not used for restoration, repopulation, or reintroduction purposes (Cantú et al., 2007). By 2001, there were 16 species classified as endangered or threatened (DOF, 2001). The status of parrots was reviewed before the 2008 ban, and eleven species were classified as endangered, but the list was not published until 2010 (DOF, 2010). By 2019 all 22 species of parrots and macaws were at risk,

Figure 1.
Classification of the 22 species of Mexican Parrots (1991-2019).

Clasificación	Ecological Criterium (1991)	Norm NOM-059 (1994)	Norm NOM-059 (2001)	Norm NOM-059 (2010)	Norm NOM-059 (2019)
Endangered	6	6	6	11	11
Threatened	4	7	10	6	7
Special Protection	2	0	4	4	4
TOTAL SPECIES	12	13	20	21	22

Source:
DOF, 1991, 1994,
2001, 2010, 2019

with 18 species classified as Endangered or Threatened (DOF, 2019) (figure 1).

In October 2008, the General Wildlife Law was amended to include the parrot trade ban (DOF, 2008). The ban established that no commercial or subsistence use would be allowed for any Mexican native species of parrot, including all trapping, export, import, and captive breeding (DOF, 2008). Although the 2008 parrot trade ban officially stopped

all legal trapping of wild parrots in Mexico, the reality is that before the ban, most parrots and macaws were not allowed to be trapped legally. Several of the most sought-after species like the Scarlet macaw, Military macaw, Yellow-headed parrot, or the Yellow-naped parrot had not been allowed to be trapped for over 26-30 years before the ban, and only five species were authorized to be trapped the year before the 2008 ban (figure 2).

Figure 2.
Trapping bans for Mexican parrots before the 2008 ban.

Species	Number of years that trapping was not allowed before the 2008 ban
Socorro parakeet (<i>Psittacara brevipes</i>)	Trapping was never allowed.
Military macaw (<i>Ara militaris</i>)	More than 30 years
Scarlet macaw (<i>Ara macao</i>)	More than 30 years
Thick-billed parrot (<i>Rhynchopsitta pachyrhyncha</i>)	More than 30 years
Maroon-fronted parrot (<i>Rhynchopsitta terrisi</i>)	More than 30 years
Yellow-headed parrot (<i>Amazona oratrix</i>)	26 years
Red-crowned parrot (<i>Amazona viridigenalis</i>)	26 years
Yellow-naped parrot (<i>Amazona auropalliata</i>)	26 years
Brown-hooded parrot (<i>Pyrillia haematotis</i>)	26 years
Mexican parrotlet (<i>Forpus cyanopygius</i>)	25 years
Pacific parakeet (<i>Psittacara strenuus</i>)	19 years



Green parakeet (<i>Psittacara holochlorus</i>)	14 years
Orange-chinned parakeet (<i>Brotogeris jugularis</i>)	11 years
Barred parakeet (<i>Bolborhynchus lineola</i>)	11 years
Lilac-crowned parrot (<i>Amazona finschi</i>)	9 years
White-crowned parrot (<i>Pionus senilis</i>)	7 years
Northern Mealy parrot (<i>Amazona guatemalae</i>)	7 years
Yucatan parrot (<i>Amazona xantholora</i>)	0 years
Yellow-cheeked parrot (<i>Amazona autumnalis</i>)	0 years
White-fronted parrot (<i>Amazona albifrons</i>)	0 years
Aztec parakeet (<i>Eupsittula nana</i>)	0 years
Orange-fronted parakeet (<i>Eupsittula canicularis</i>)	0 years

Source:
Cantú et al., 2007; 2021;
Cantú, 2020;
SEMARNAT, 2008

A misconception exists about which actors were affected by the parrot ban. Since the creation of the Units of Management and Conservation of Wildlife (UMA) system in 1998 (DOF, 1998), the wildlife authority, through negotiated agreements, prohibited bird trappers' unions from trapping parrots unless it was through a UMA (SEMARNAP, 2000). So, bird trappers could only trap parrots if they owned land registered as a UMA, and thus, since they did not own land, they didn't trap parrots legally for over a decade before the 2008 ban. The 2008 ban did not affect bird trappers because their legal status didn't change; it only applied to UMA owners.

From 1998 to 2008, owners of 34 UMAs received trapping permits for only eight species of parrots (Cantú et al., 2017; SEMARNAT, 2005, DGVS, 2009). In 11 years, 55.5% of the UMAs obtained trapping permits for one year, followed by 22.2% who received trapping permits for two years, 16.6% for three years, one UMA was authorized to trap for four years, and another one for five years (SEMARNAT, 2005, DGVS, 2009) (figure 3). Thus, only six UMAs trapped parrots for three years, while only two UMAs trapped parrots for 4-5 years. From 2003 to 2005, no UMA received a permit to trap parrots because they didn't comply with the law requisites (Cantú et al., 2007). 32,724 parrots were trapped legally from 1998 to 2008, with an annual average of 2,974 parrots (Cantú et al., 2017).

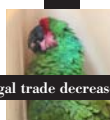
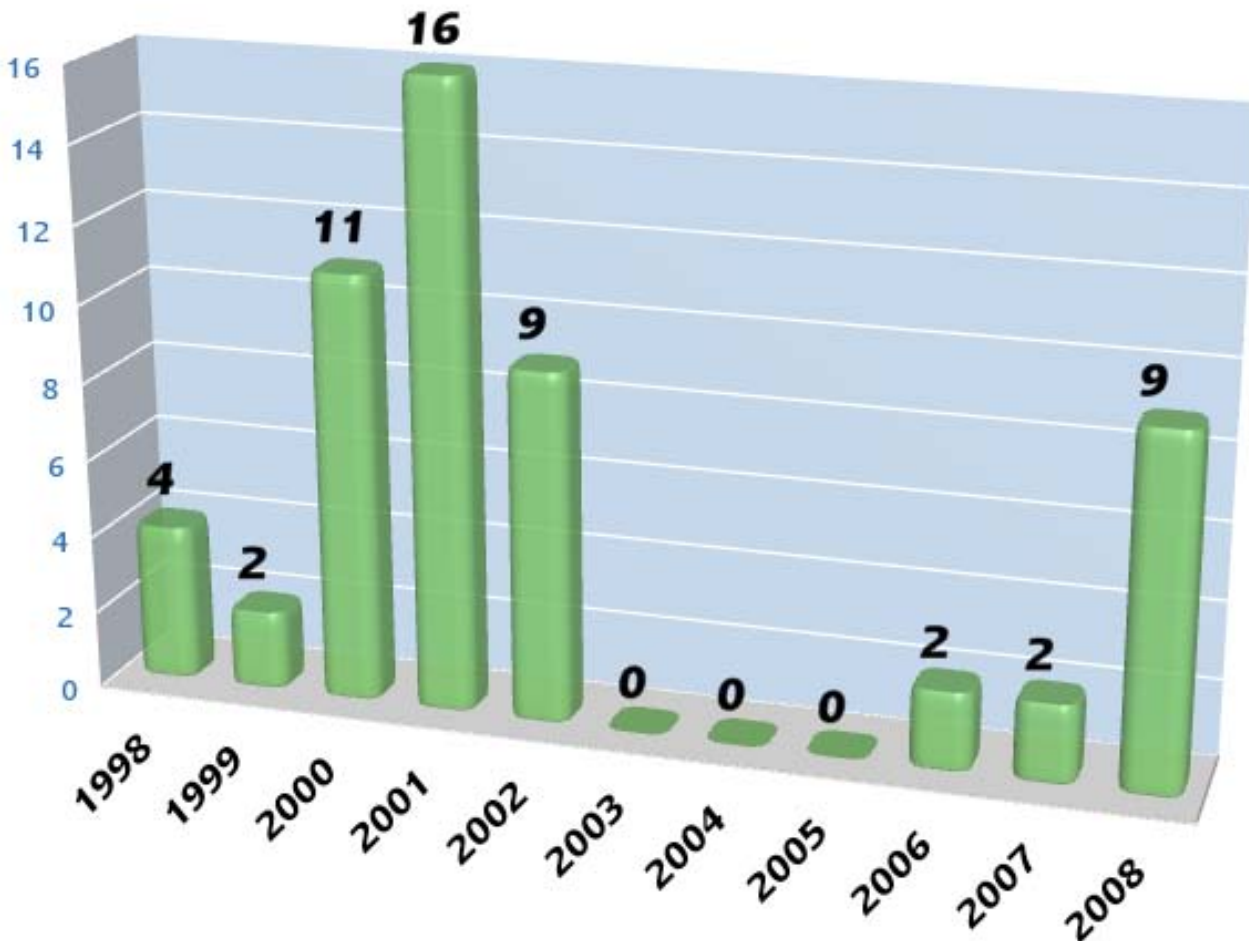


Figure 3.
UMAs with parrot trapping permits 1998-2008.

UMAs (years with trapping permits)	Percentage
20 (1)	55.5%
8 (2)	22.2%
6 (3)	16.6%
1 (4)	2.9%
1 (5)	2.9%

UMAs with trapping permits per year 1998-2008.

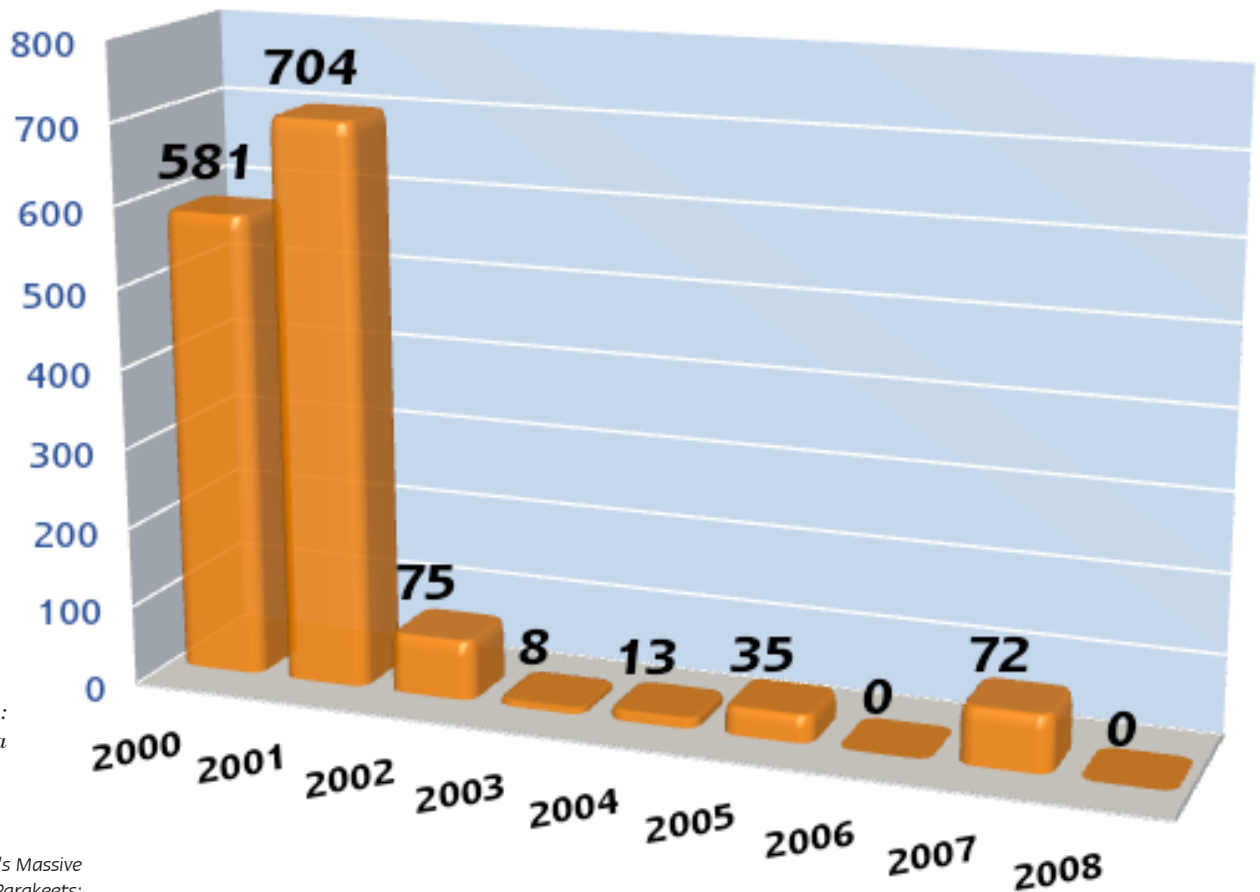
Source:
SEMARNAT, 2005,
DGVS, 2009



The 2008 ban stopped all trapping and trade of Mexican parrots and banned all imports and exports except for conservation purposes (DOF, 2008). In 1982 all exports of Mexican wildlife were forbidden, including parrots (Iñigo *et al.*, 1991; Gobbi *et al.*, 1996). Thus, exports of Mexican parrots had been minimal

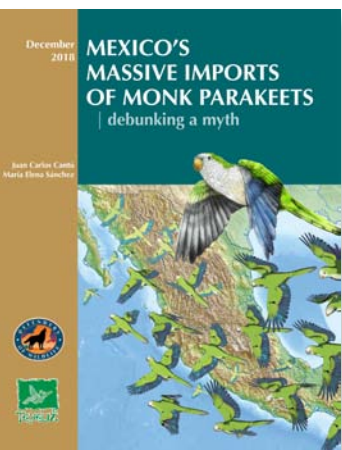
since the 1990s, but the Wildlife Law of 2000 allowed exports voiding the 1982 export ban. Nevertheless, there wasn't much interest in it, which resulted in a decreasing trend of exports after the early 2000s up to the 2008 ban (CITES, 2018a; Cantú *et al.*, 2007) (figure 4).

Figure 4.
Mexican parrot exports 2000-2008.



Source:
CITES, 2018a

Cover: Mexico's Massive
Imports of Monk Parakeets:
Debunking a Myth

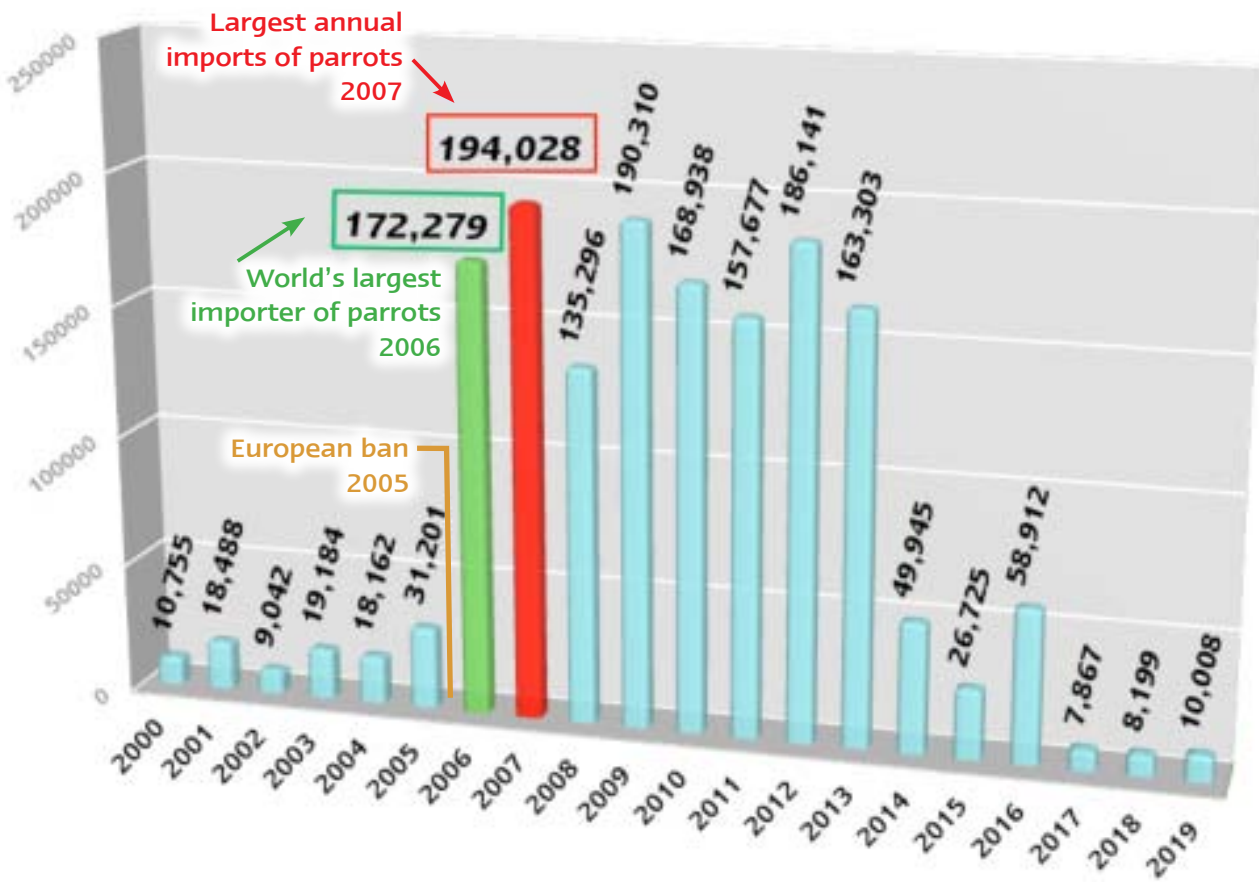


Before the 2008 ban, Mexico had changed from a massive exporter of parrots in the 1970s-1980s to an importer of exotic parrot species (Cantú *et al.*, 2007). Mexico became the foremost worldwide importer of parrots in 2006 (figure 5) (Sánchez and Cantú, 2013, 2017; Cantú *et al.*, 2018). Some environmental authorities blamed the 2008 ban for the dramatic increase in parrot imports, arguing that the ban created a void in parrots for the pet trade in Mexico that needed to be filled (Universal 2010). This was a lie, given

that the massive increase in imports began two years before the ban and the primary reasons for these imports was an abrupt change in markets following the closure of the European Union wild bird imports and the Mexican ban on the import of invasive alien species (Cantú *et al.*, 2018). (For more detail, see *Mexico's Massive Imports of Monk Parakeets: Debunking a Myth* https://www.pericosmexico.org/pdf/Reporte_eng2019.pdf).

Figure 5.
Imports of parrots by Mexico from 2000 to 2016.

Source:
Cantú et al., 2018;
CITES, 2021



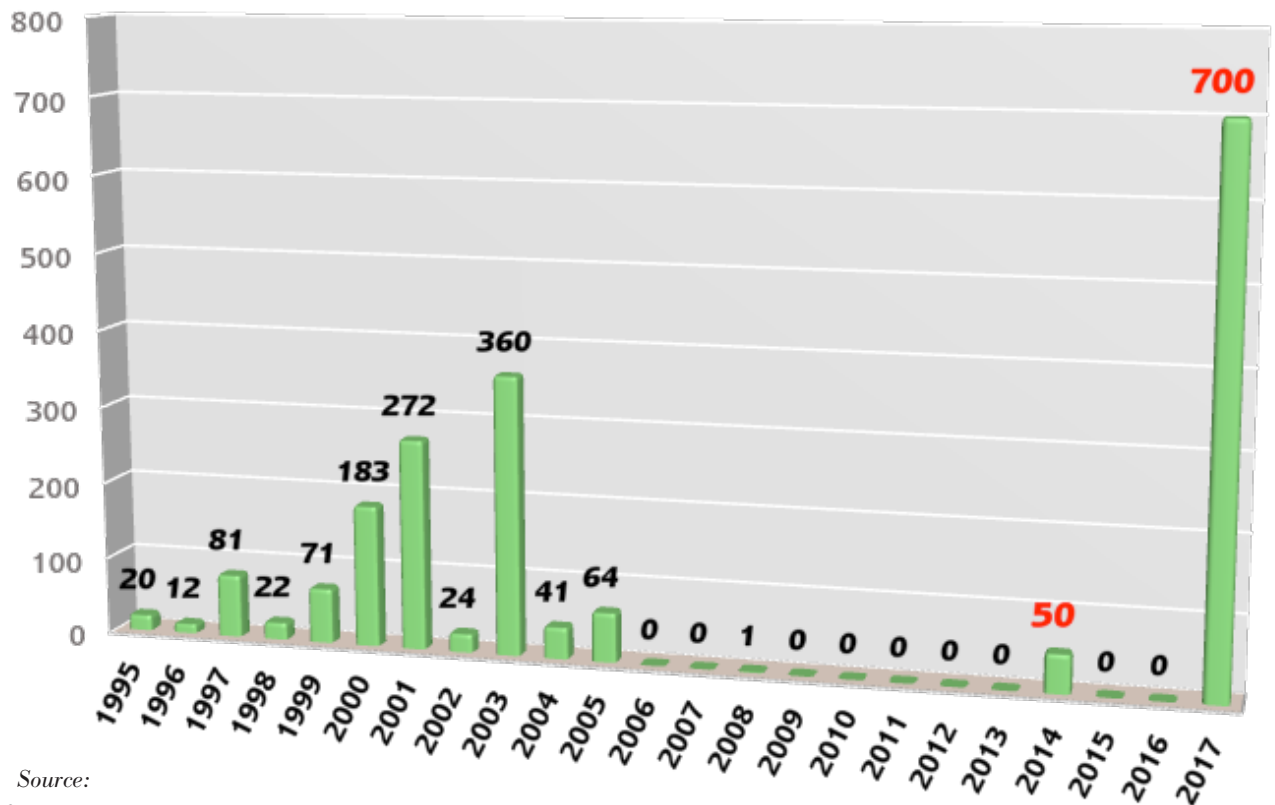
In the 2008 ban, Mexican legislators decided to ban all imports of parrot species native to Mexico because many species have distributions that reach Central and South America (ex-congressman Diego Cobo pers. comm.). They wanted to stop a possible loophole where imports of these species could increase after the ban and would make it very difficult for enforcement authorities to control and for the Mexican public to know which specimens were legal and which were not (ex-congressman Diego Cobo pers. comm.). Before the ban, 14 species of native Mexican parrots were imported, led by the White-fronted parrot and Mealy parrot, and an average of 82 specimens from all native parrots imported yearly (CITES, 2018b) (Figure 6). There should not be any imports after 2008. Still, 750 specimens of Barred parakeets were reported as exported by Cuba to Mexico in 2014 and

2017 for trade purposes (CITES, 2018b), which would be illegal under the 2008 ban.

Captive breeding of Mexican parrots was also banned except for conservation purposes (DOF, 2008). This last measure was an afterthought because the original bill didn't ban captive breeding (Gaceta Parlamentaria, 24 April 2007). Still, the members of Congress included it afterward because they didn't want loopholes in the law that would foster laundering specimens from the wild (ex-congressman Diego Cobo pers. comm.) It had been documented that some breeding facilities laundered species; they were also selling specimens illegally because they did not have the official documentation or used falsified documentation (Cantú et al., 2020b; PROFEPA, 2002).



Figure 6.
Imports of Mexican native parrots 1995-2017.



Source:
CITES, 2018b

Environmental authorities have had the long-standing view that captive breeding is useful against illegal trade:

"... the legal establishment of captive breeding facilities and nurseries is the only long-term alternative to combat illegal trapping and commercialization practices...".

(SEMARNAP, 1995).

They even thought so for parrots:

"... establish captive breeding facilities for reproduction and reintroduction of military macaws" (SEMARNAP, 1997).

So, the ban on breeding parrots in captivity for commercial purposes was not well received.

In 2005, the Ministry of Environment and Natural Resources (SEMARNAT) had 144 parrot facilities registered (Cantú et al.

2020b; 2007), of which 65% managed exotic and Mexican species, and only 34% only handled Mexican parrots (Cantú et al., 2020; 2007). The reality was that Mexican parrot breeders were not interested in most Mexican species. SEMARNAT confirmed this:

"The commercial reproduction of these birds is restricted to a few species; all of these species are exotic with minimal or no effort in reproducing national species. The main species reproduced intensively are: Melopsittacus undulatus (Australian parakeet), Nymphicus hollandicus (cockatiel), Serinus canaria (canaries), Cactua spp. (cockatoos) and Agapornis spp. (lovebirds)"

(SEMARNAT, 2009).

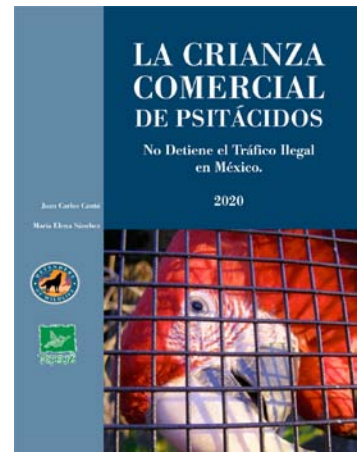
Parrot breeders focused on the three most expensive Mexican species, the Scarlet macaw, Military macaw, and Yellow-headed parrot (Cantú et al., 2020b; 2017; 2007).

Price is one of the main factors that impede captive breeding from being useful against illegal trade. Most Mexicans couldn't afford the costs of captive-bred specimens and preferred to buy them cheaply on the black market. Before the 2008 ban, the prices of 15 species of Mexican parrots bred in captivity were between 1.8 and 18.5 times more expensive than illegal parrots, and on average, they were 6.2 times more expensive (Cantú *et al.*, 2020b; 2007).



Parrot breeders preferred to work with expensive Mexican species like macaws or Yellow-headed parrots because they couldn't compete with the low prices of the illegal trade. Thus, the smaller and the least costly species were rarely bred, including the most trafficked Orange-fronted parakeet, White-fronted parrot, and the Yellow-cheeked parrot (Cantú *et al.*, 2020b; 2007).

Captive breeding cannot help stop the illegal trade of parrots because it can't supply the demand for each of the 22 species of Mexican parrots; produce the annual volumes of parrots in illegal traffic; provide the volume of parrots demanded in each region or population of Mexico; provide specimens at the same or lower price than the illegal traffic; provide an economic benefit to traffickers to deter them; produce specimens that can be differentiated from wild specimens, etc. (Cantú *et al.*, 2020b). (For more detail, see https://www.pericosmexico.org/pdf/CAUTIVERIO_PSITACIDOS.pdf)



▲ Crianza comercial de psitácidos, Defenders of wildlife.

◀ Photo: Military macaw, (*Ara militaris*). PROFEPA

Photo: Yellow-cheeked parrot, (*Amazona autumnalis*). PROFEPA
▼



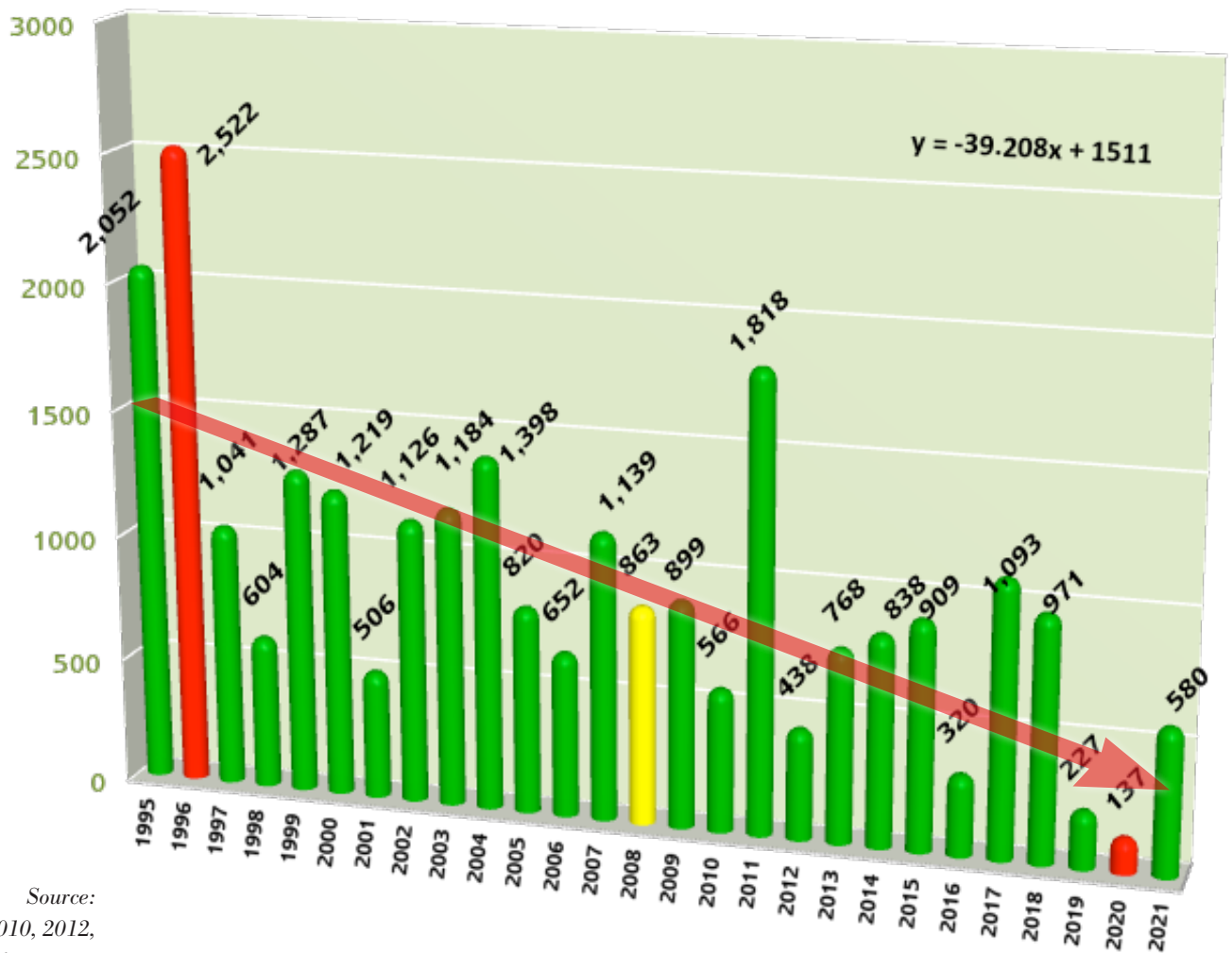
PARROT ILLEGAL TRADE DECREASED AFTER THE 2008 BAN

The annual seizures of Mexican parrots show a decreasing trend from 1995 to 2021, from the highest quantity of 2,522 parrots seized in 1996 to the lowest number of 137 parrots seized in 2020 (figure 7).

Photo: Military macaw, (*Ara militaris*), seizure PROFEPA



Figure 7. Mexican parrot seizures by PROFEPA from 1995 to 2021.

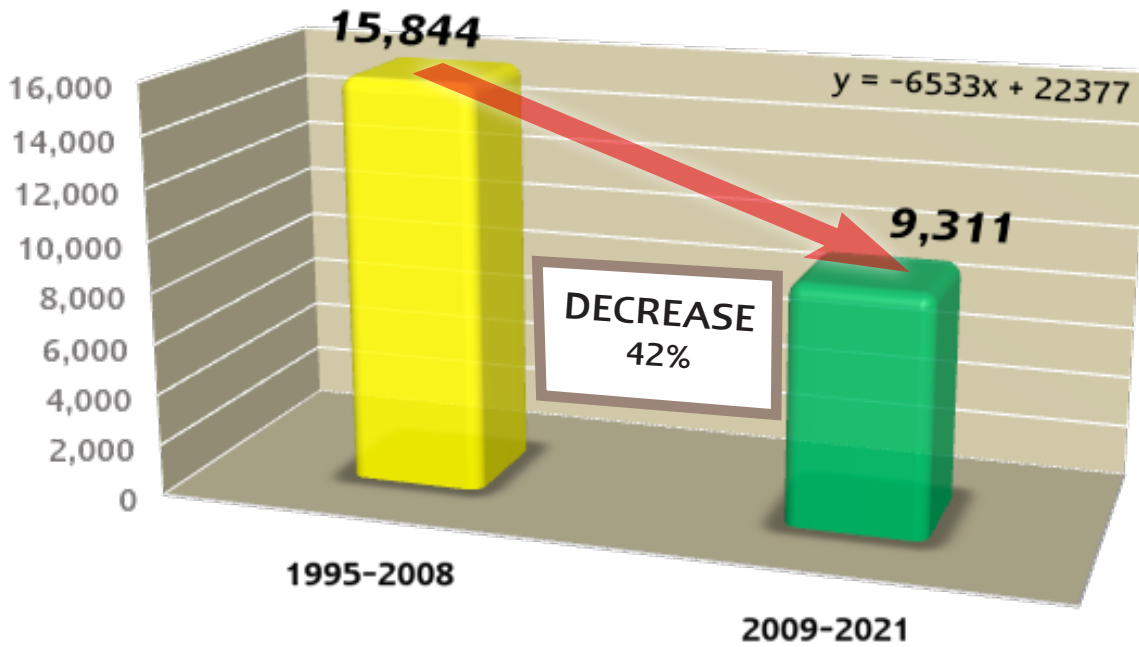


Source: PROFEPA, 2010, 2012, 2013, 2015, 2016a, 2020 y 2022a; Cantú et al., 2007

There is a 42% reduction between the total number of seizures per species before the ban from 1995 to 2008 (15,844 specimens) and the period after the ban from 2009 to

2021 (9,311 specimens) (Figure 8). Only specimens identified at the species level were considered.

Figure 8.
Comparison of total seizures of parrots by PROFEPA 1995-2021.

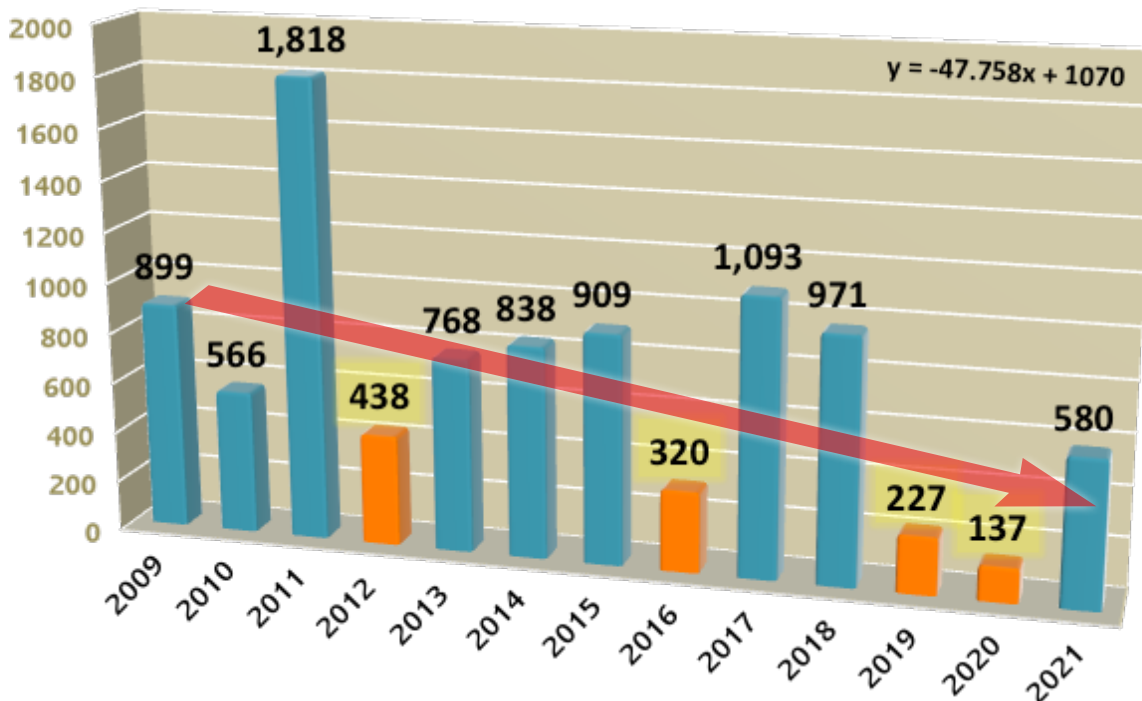


Source:
PROFEPA, 2010, 2012,
2013, 2015, 2016a, 2020 y
2022a; Cantú et al., 2007

After the ban in 2008, the trend of decreasing seizures is also evident (Figure 9), and since 1995, PROFEPA's lowest annual seizures oc-

curred after the ban in 2012 (438 parrots), 2016 (320 parrots), 2019 (227 parrots) and 2020 (137 parrots) (figure 9).

Figure 9.
Seizures of Mexican parrots by PROFEPA after the 2008 ban.



Source:
PROFEPA, 2010, 2012,
2013, 2015, 2016a,
2020 y 2022a





Photo: Aztec parakeet (*Eupsittula nana*), seizure. PROFEPA

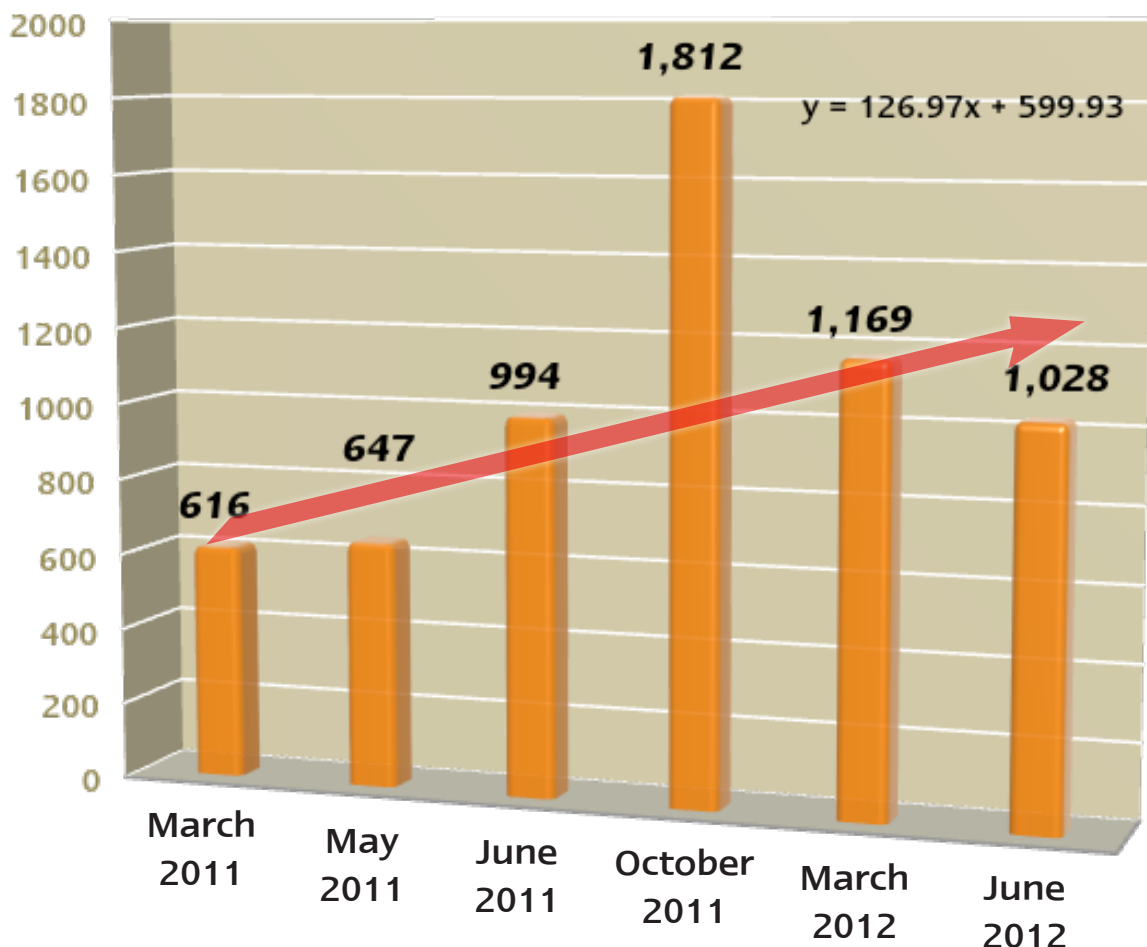
In 2010 history was made because an environmental authority said that the illegal trade of parrots had decreased in Mexico for the first time. The PROFEPA authorities noticed a substantial decrease in the seizures of parrots and believed it to be a consequence of the recently declared ban. The head of PROFEPA, Patricio Patron Laviada, said:

"... the seizures of wild parrots have diminished thanks to the ban of October 2008..." (Supervivencia, 2010).

In 2011, PROFEPA began a new program of special operations. Every three months, a huge special operation was carried out at the national level. Stores, markets, and street markets were inspected all over the country, and surveillance tours and transport review

filters were carried out. PROFEPA inspectors, authorities from the Army, Navy, the Federal Ministerial Police, the State, Municipal Police, agents from the Public Ministry of the Federation, and personnel from the National Commission for Protected Areas (CONANP) participated. The number of PROFEPA inspectors, together with agents from other institutions, grew until reaching 1,812 inspectors and agents during the October 2011 operation (figure 10) (PROFEPA, 2012 a and b). In 2011 the highest number of parrots were seized after the 2008 ban, however, by the end of 2012, this strategy was worn out and lost its surprise among the traffickers, and the number of parrots seized decreased dramatically to one of the lowest numbers since 1995 (see figure 9).

Figure 10.
Inspectors and agents participating in the national operations of PROFEPA 2011-2012.



Source:
Cantú et al., 2012

In 2017, PROFEPA analyzed the illegal trade of parrots and announced:

"The Federal Environmental Protection Agency (PROFEPA) reports that the ban imposed for the extraction of parakeets, parrots, and macaws decreed in 2008 by the Ministry of the Environment and Natural Resources (SEMARNAT), decreased illegal trafficking of psittacines by 24%" (PROFEPA, 2017).

They also declared that:

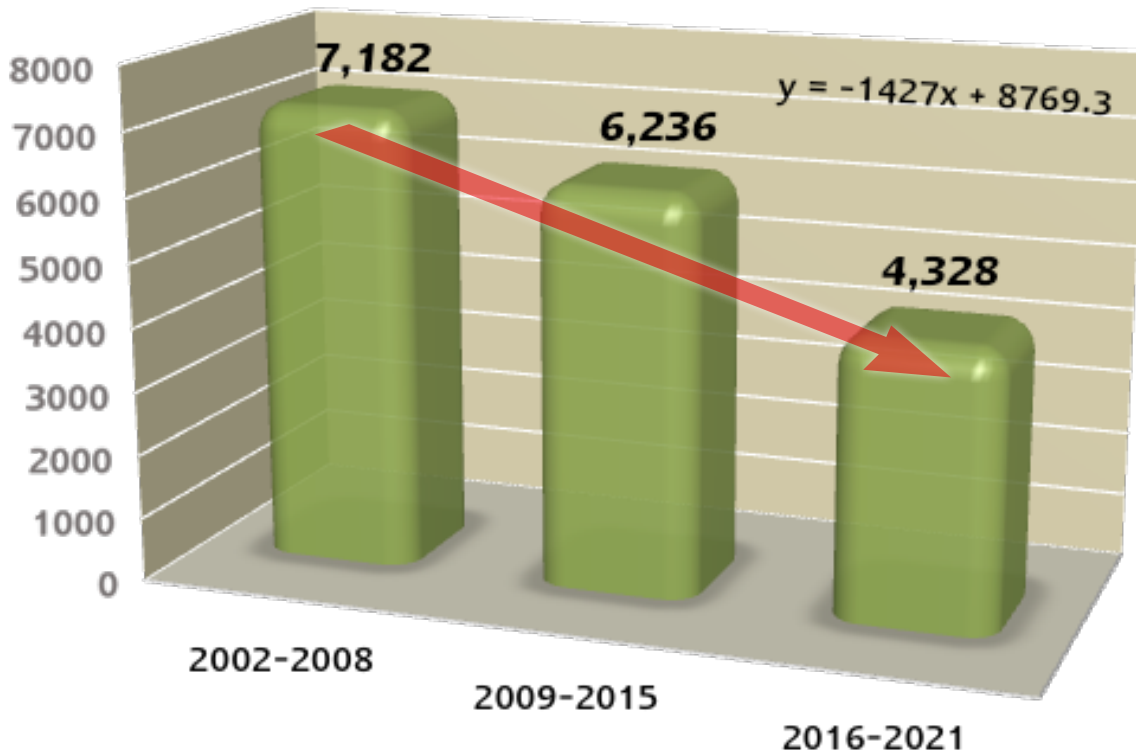
"In the same period, the number of inspections and operations increased by 25%, which allowed the seizure of those species listed in a category of risk in the Mexican Official Norm NOM-059-SEMARNAT-2010, to avoid, in some cases, their disappearance through the illegal plunder that they faced in the last decade" (PROFEPA, 2017).

PROFEPA carries out its inspection work through two main activities: first, by res-

ponding to all public complaints of illegal traffic received from citizens and through the permanent inspection program of programmed inspections to establishments or premises where wildlife is handled or traded (inspection acts), and second, through multiple and simultaneous inspection acts planned for many establishments in a city, region or at a national level during a determined period (operations).

In 2022, we analyzed parrot seizures after the ban and compared them to the period from 2002 to 2008 before the ban. Mexican parrot seizures from 2016 to 2021 were 4328, which represents a 33% decrease compared to seizures from 2009 to 2015 (6,236) and a 40% decrease compared to seizures from 2002 to 2008 (7,182) before the ban (Figure 11). The reduction by itself does not mean a decrease in illegal parrot trafficking. There may be many factors that explain it, such as a severe decline in parrot populations or simply that PROFEPA inspectors were not doing their job.

Figure 11.
Mexican parrot seizures by PROFEPA from 2002 to 2021.



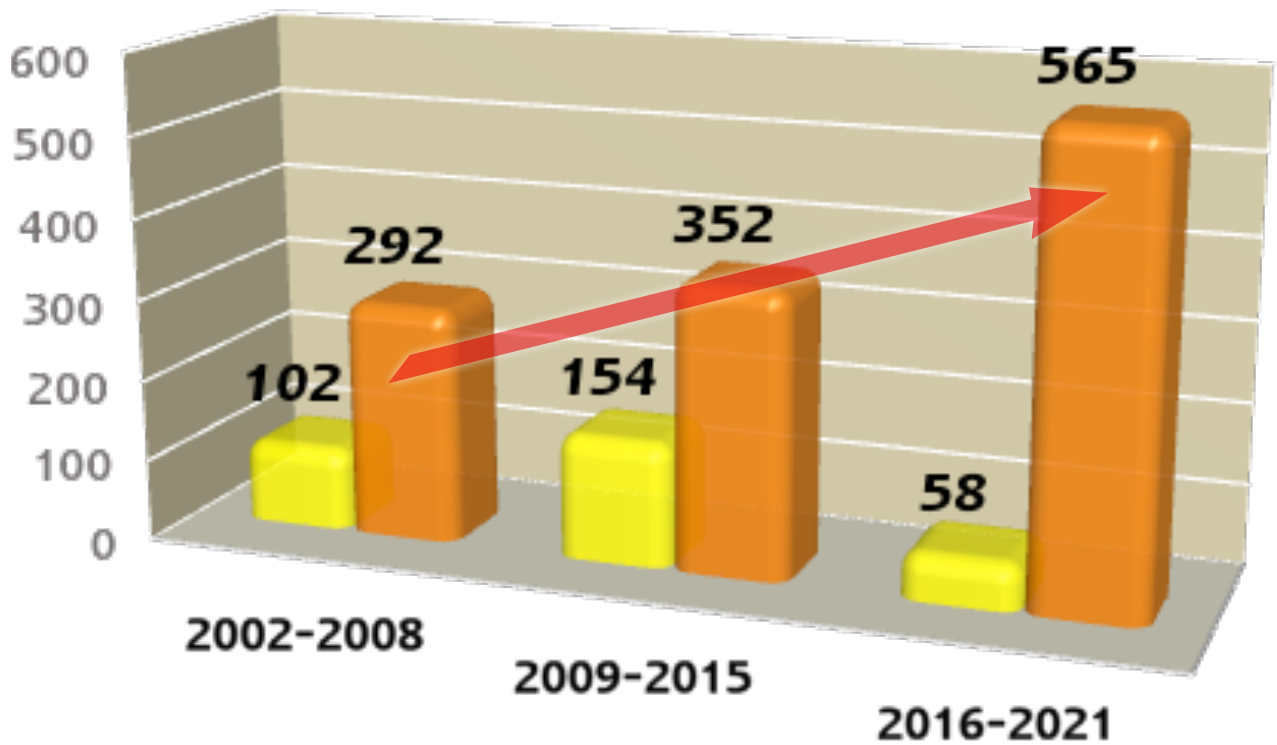
Source:
PROFEPA, 2016 b,
2020 y 2022a

The number of PROFEPA inspections and operations that resulted in the seizure of a Mexican psittacine was analyzed and compared to the period from 2002 to 2008 before the ban. The number of inspections increased to 565 between 2016 and 2021, an increase of 38% compared from 2009 to 2015 and 49% compared to the period from 2002 to 2008

before the ban. On the other hand, the number of operations decreased to 58 due to the pandemic in 2020 and 2021. However, combined inspection/operational acts totaled 623 acts, an increase of 18% over inspection/operational acts during the 2009 to 2015 period and 37% over the 2002 to 2008 period before the ban (figure 12).

Figure 12.

Inspection and operation acts by PROFEPA 2002-2021.



Source:

PROFEPA, 2022b, 2016b

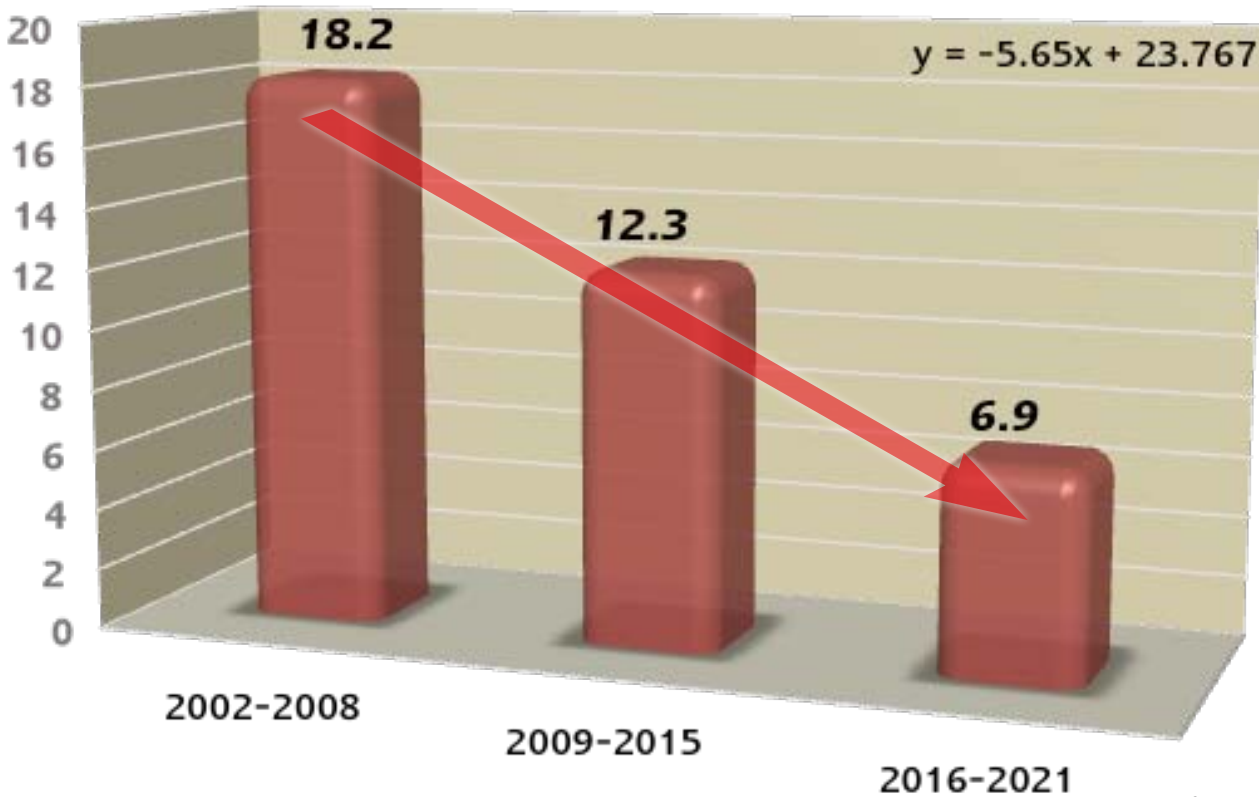


The increase in inspection/operation acts and the decrease in seizures again resulted in fewer parrots seized per inspection/operation to just 6.9 parrots per act (figure 13). So, fewer parrots were seized by an increased number of inspection/operation acts because there were fewer parrots in the illegal trade to be seized.

With the above information, percentage differences were obtained concerning the period before the ban, with a 32.39% decrease for the first years after the ban (2009-2015) and a more marked reduction of 61.89% for the last five years (2016-2021). From these previous two percentages **the average decrease after the ban was 47.14% of the traffic of Mexican psittacines.** (figure 14 and 15) (Annex 1).

Figure 13.

The average number of parrots seized per act of inspection/operation by PROFEPA 2002-2021.



Source:
PROFEPA, 2016 b,
2020 y 2022a

Figure 14.

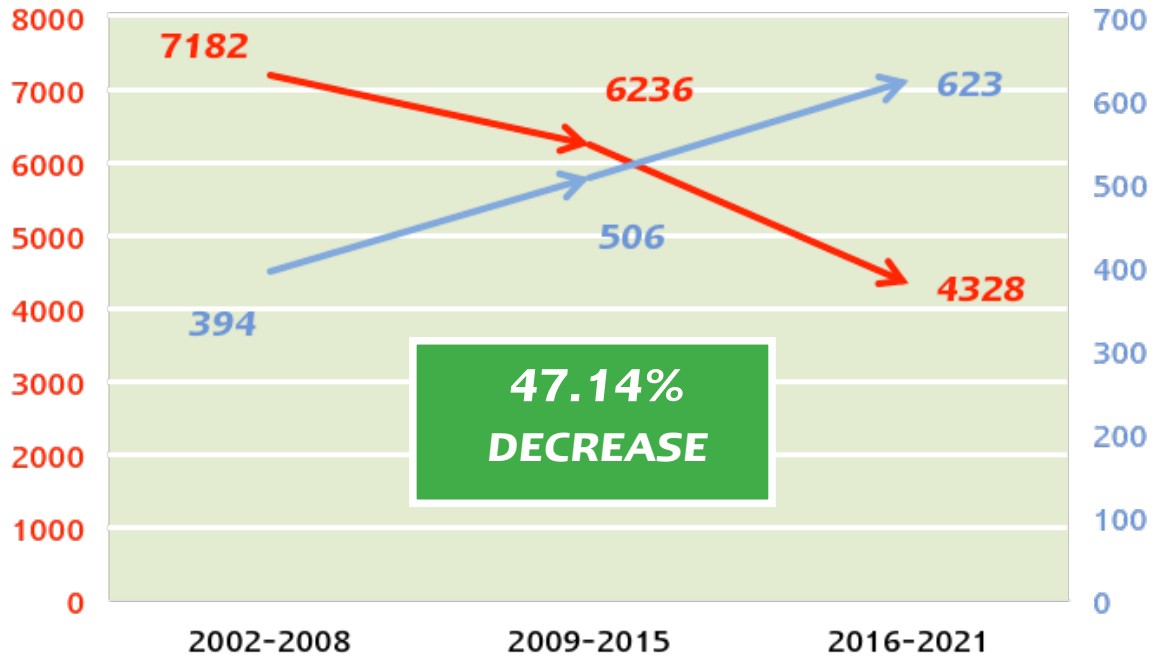
Percentage comparison of seizures with inspection / operations 2002-2021.

Year	Seizures	Inspection/operation	Number of parrots seized per act of inspection/operation	Percentage representation of the number of parrots per operation concerning 2002 -2008	Percentage difference from 2002-2008
2016-2021	4,328	623	6.9	38.11%	61.89%
2009-2015	6,236	506	12.3	67.61%	32.39%
2002-2008	7,182	394	18.2		

Source:
PROFEPA, 2016 b,
2020 y 2022a y b



Figure 15.
Comparison of inspection/operation acts to seizures by
PROFEPA 2002-2021.



Source:
PROFEPA, 2022b, 2016b



In 2007 we estimated that the annual illegal capture of parrots was 65,000 to 78,500 parrots (Cantú *et al.*, 2007). From the estimated 47.14% decrease in illegal trade from 2009 to 2021 compared to the estimated annual catch before the ban,

we obtain a range of 34,000 to 41,500 parrots illegally captured per year (Figure 16). Therefore, it is estimated that 31,000 to 37,000 parrots have ceased to be captured annually.

Figure 16.
Estimated illegal annual trapping of parrots for the
period 2016-2021.

Estimated illegal annual trapping anual 2007	Estimated decrease 47.14% 2016-2021	Estimated number of parrots not-captured illegally per year
65,000	34,000	31,000
78,500	41,500	37,000

Seizures in the U.S.A.

The USA was the primary international market of legal Mexican parrots for decades, with an average of 10 thousand parrots a year from 1970 to 1982 (Iñigo *et al.*, 1991). The illegal contraband of parrots to the USA was much higher, and it was estimated to be in the range of 20,000-150,000 parrots annually, including Mexican parrots (Thomsen, 1987; James, 1992; Gobbi *et al.*, 1996). In 2007, the illegal trade of parrots to the USA was estimated to be 3,133-9,400 parrots annually (Cantú *et al.*, 2007).

The seizure data of Mexican parrots in the USA from 1997 to 2020 show a decreasing trend, with a high of 207 parrots seized in 2004 and a low of 0 parrots in 2019 and 2020 (CITES, 2022) (figure 17). 70% of all seizures were imported into the USA for commercial purposes, while 26.4% were imported for personal purposes, such as pets (CITES, 2022). The most seized species was the Orange-fronted parakeet with 308 specimens, followed by the Lilac-crowned parrot with 91, the Yellow-cheeked parrot with 82, the Yellow-headed parrot with 59, and the Red-crowned parrot with 38 (figure 18) (CITES, 2022).

Figure 17.
Seizures of Mexican parrots in the USA 1997-2020.

Source:
CITES, 2022

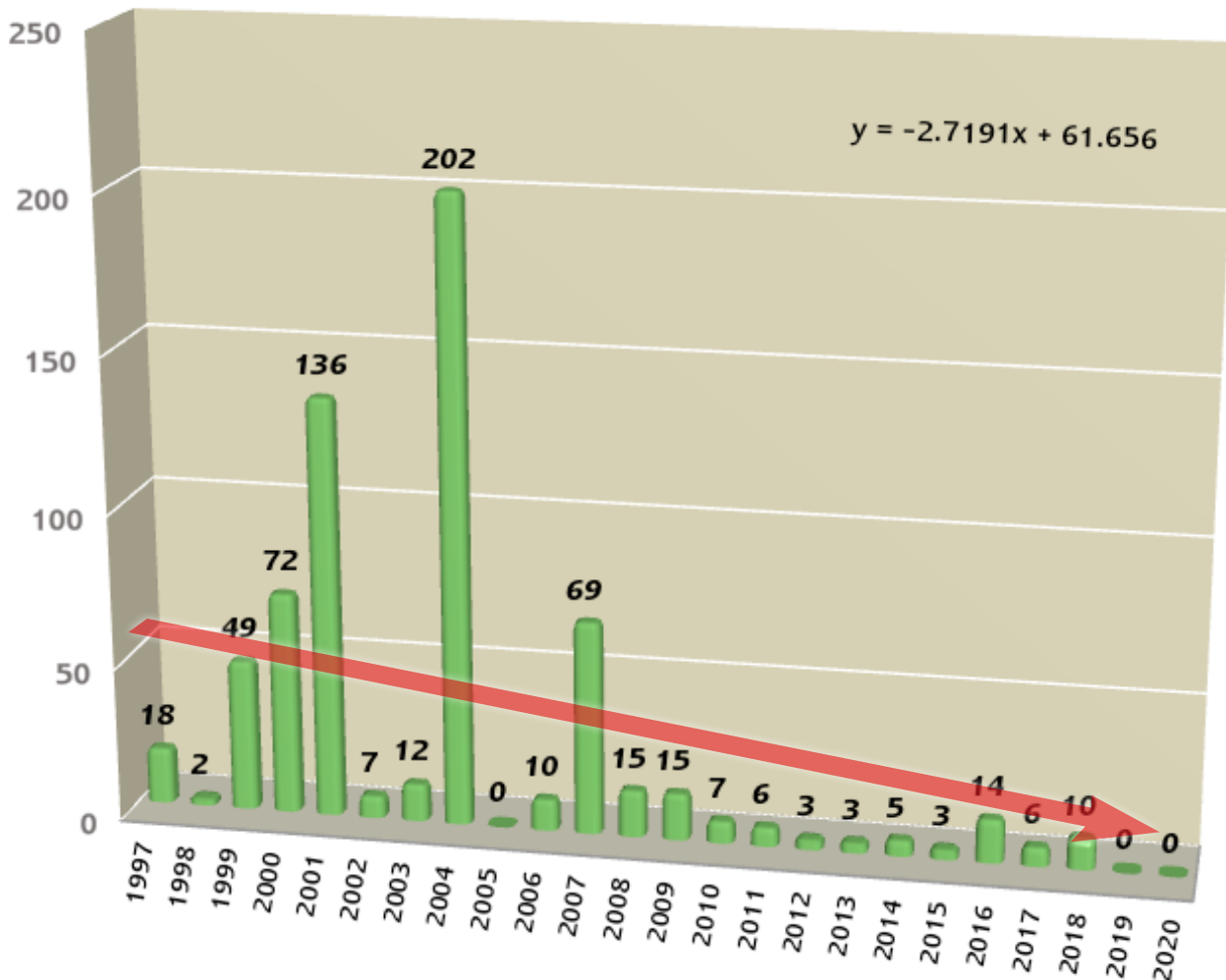


Figure 18.
 Mexican parrot species seized in the USA 1997-2020.

Species	Quantity
<i>Eupsittula canicularis</i> = <i>Aratinga canicularis</i>	308
<i>Amazona finschi</i>	91
<i>Amazona autumnalis</i>	82
<i>Amazona oratrix</i> = <i>Amazona ochrocephala</i>	59
<i>Amazona viridigenalis</i>	38
<i>Amazona auropalliata</i>	35
<i>Amazona albifrons</i>	23
<i>Ara militaris</i>	4
<i>Amazona guatemalae</i> = <i>Amazona farinosa</i>	2
<i>Psittacara holochlorus</i> = <i>Aratinga holochlora</i>	2
Amazona spp.	30
Aratinga spp.	24
Psittaciformes spp.	8
Psittacidae spp.	3
Forpus spp.	1
Ara spp.	1

Source:
 CITES 2022

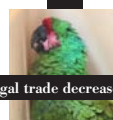


Figure 19.

Comparison of seizures of Mexican parrots in the USA 12 years before and 12 years after the 2008 ban.

Source:
CITES, 2022

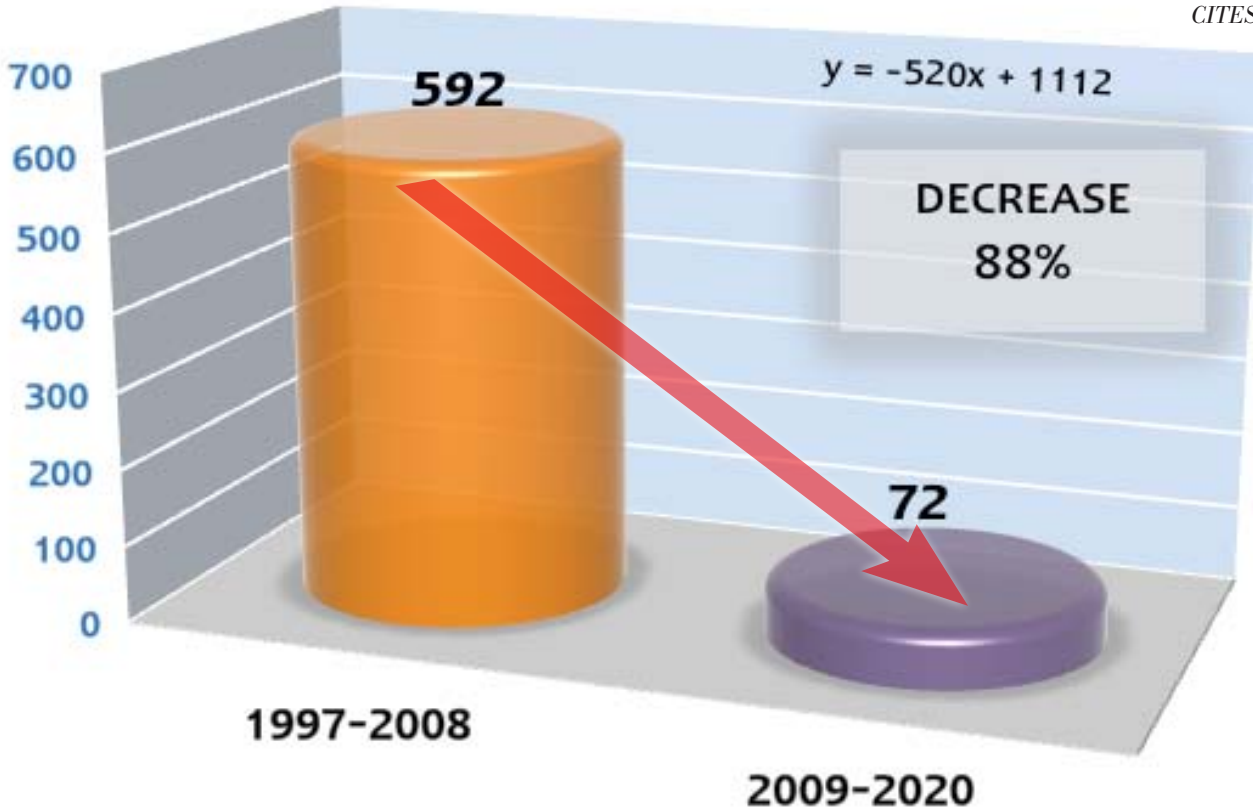


Photo: Yellow-cheeked parrot (*Amazona autumnalis*).
PROFEPA

We compared the USA seizures of Mexican parrots before and after the 2008 ban, considering twelve years before the ban (1997-2008) and twelve years after the ban (2009-2020), and there was a dramatic 88% decrease in the seizures after the 2008 ban (Figure 19). The 88% decrease in seizures after the 2008 ban represents double the decrease in total insurances in Mexico (42%) after the ban (see Figure 8). It demonstrates the unavailability of documentation to validate a legal import, given there were no permits for legal trapping or captive breeding. This is very important given that it has been documented that permits to trap or breed parrots were being used illegally to launder illegal parrots (PROFEPA, 2002; Cantú *et al.*, 2007, 2013; Cantú y Sánchez, 2012; Jiménez *et al.*, 2017) (see below).



ILLEGAL TRADE BY SPECIES AFTER THE 2008 BAN

The analysis we have done so far has been a general one on seizure trends for all species, but the trends can be different when done species by species. Most of the species do show a decreasing trend in

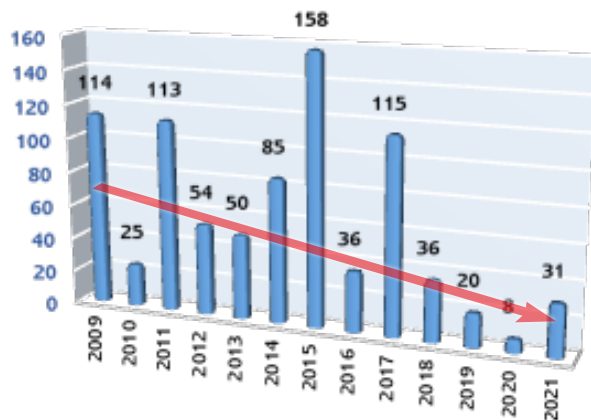
seizures. Still, there are some species like the Orange-fronted parakeet (*Eupsittula canicularis*), whose decrease is very slight, or the Barred parakeet (*Bolborhynchus lineola*), which doesn't show a decrease (figure 20). Nevertheless, it is undeniable that seizures after the 2008 ban have decreased for most species, and not one species shows an increasing trend.

Figure 20.

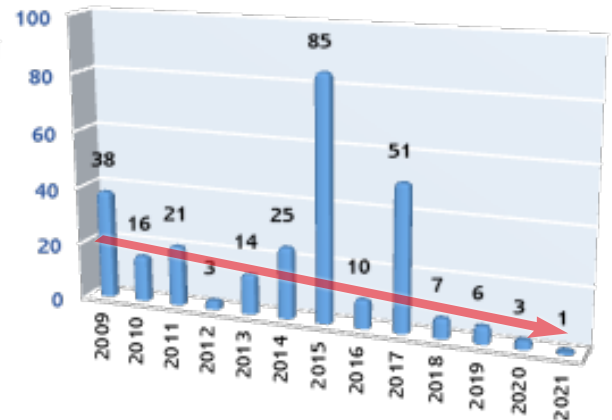
Seizure trends by species 2009-2021.

(Some species are not shown because there were no seizures, or their seizures were less than five specimens during the period see figure 21).

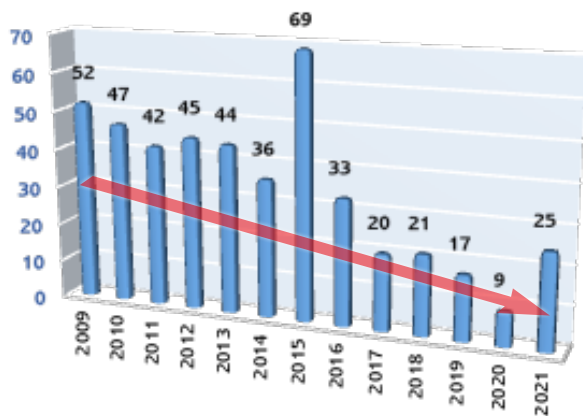
Ara militaris
 $y = -5.0989x + 100.69$



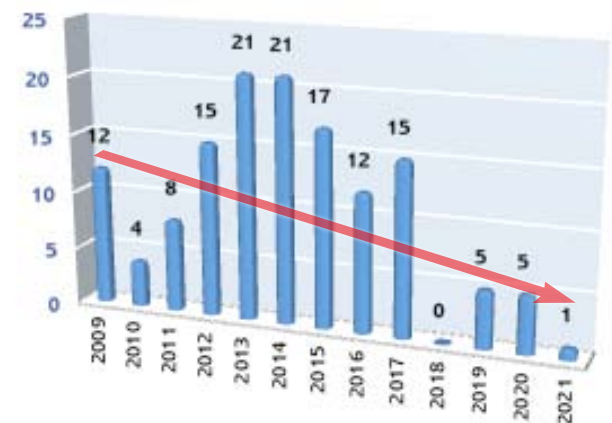
Ara macao
 $y = -1.5165x + 32.154$



Amazona oratrix
 $y = -3.1593x + 57.5$



Amazona auropalliata
 $y = -0.7637x + 15.808$



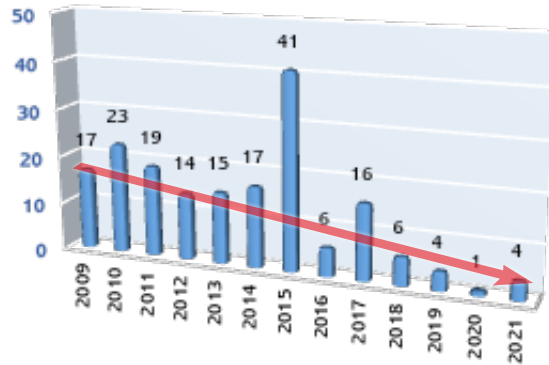
Amazona autumnalis

$y = -8.7637x + 160.73$



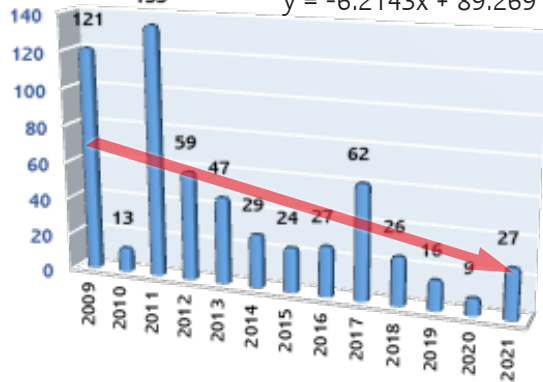
Amazona guatemalae

$y = -1.544x + 24.885$



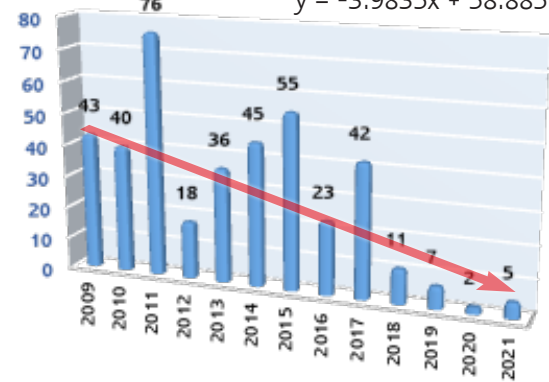
Amazona albifrons

$y = -6.2143x + 89.269$



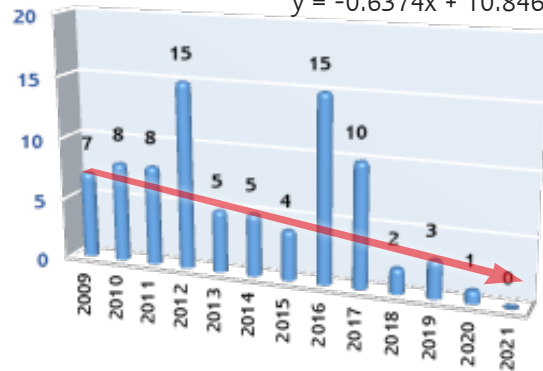
Amazona finschi

$y = -3.9835x + 58.885$



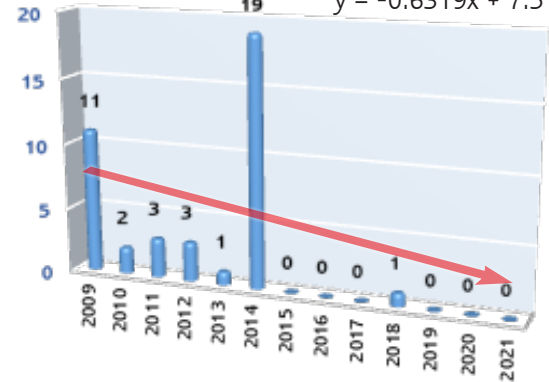
Amazona viridigenalis

$y = -0.6374x + 10.846$



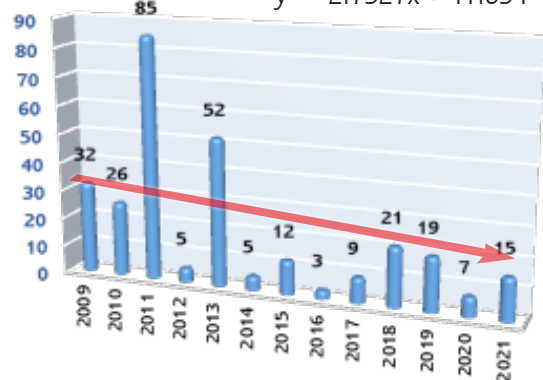
Amazona xantholora

$y = -0.6319x + 7.5$



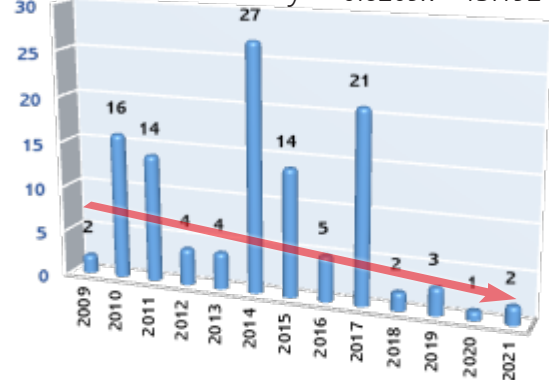
Eupsittula nana

$y = -2.7527x + 41.654$



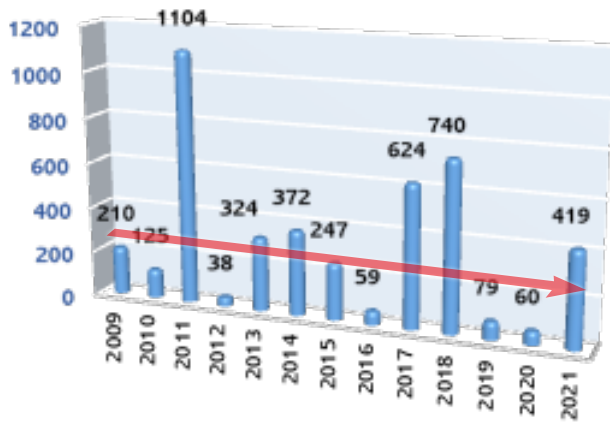
Psittacara holochlorus

$y = -0.6209x + 13.192$



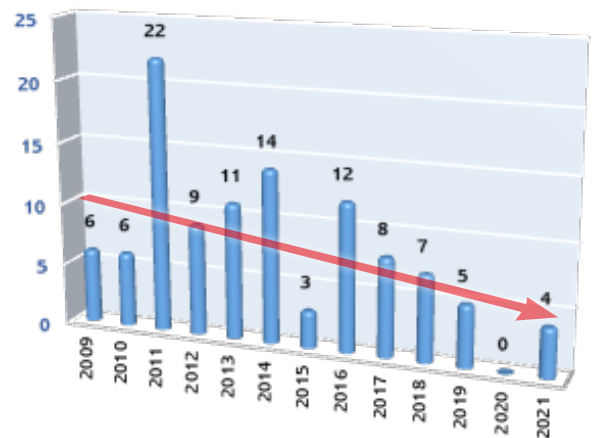
Eupsittula canicularis

$y = -4.2747x + 368.46$



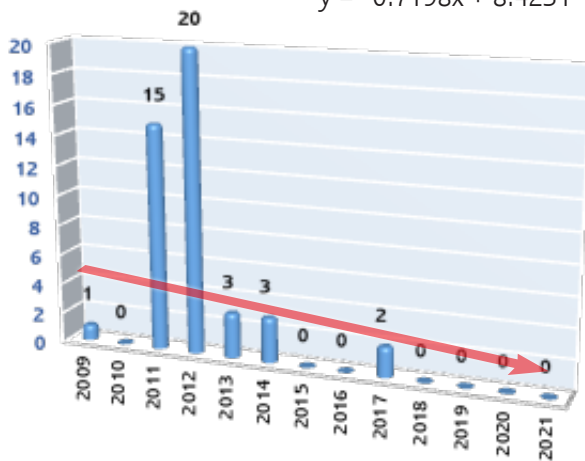
Pionus senilis

$y = -0.6813x + 13$



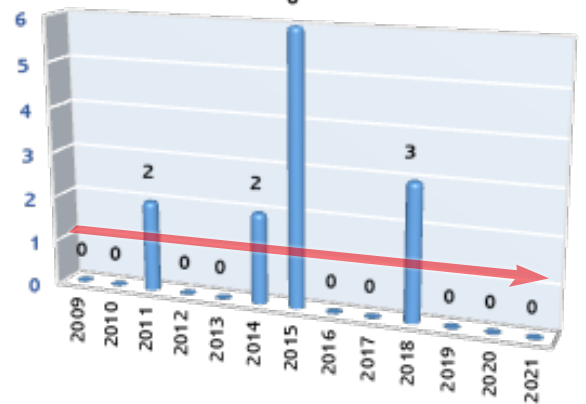
Forpus cyanopygius

$y = -0.7198x + 8.4231$



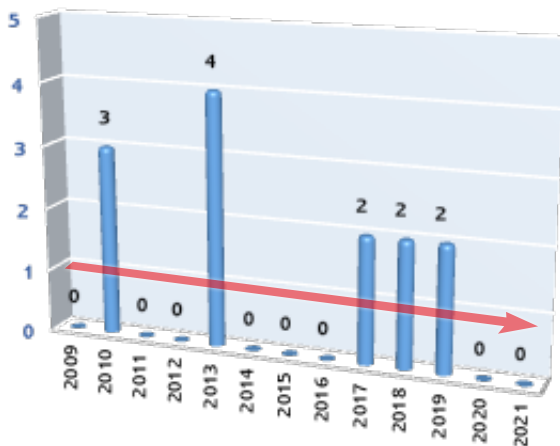
Bolborhynchus lineola

$y = -0.0055x + 1.0385$



Brotogeris jugularis

$y = -0.0275x + 1.1923$



Some species are more heavily trafficked than others, and some are not trafficked like the Socorro parakeet (*Psittacara brevipes*) because it inhabits a faraway island in the Pacific where no poacher can reach or the Brown-hooded parrot (*Pyrillia haematotis*) that is very rare in Mexico. The Orange-fronted parakeet (*Eupsittula canicularis*) is the most seized species of all 22 species of parrots in Mexico, with 47.2% of the total seizures (Figure 21). In a far-off second place is the Yellow-cheeked parrot (*Amazona autumnalis*), with 13.8% of the total. In third place is the Military macaw (*Ara militaris*), with 9.0% of the total. These three species represent 70% of all seizures for all species.

Figure 21.

Seizures of parrot species by PROFEPA before and after the 2008 ban 2009-2021.

SPECIES	1995-2008	1995-2008 Percentage %	2009-2021 (In order higher to lower)	2009-2021 Percentage %
Orange-fronted parakeet (<i>Eupsittula canicularis</i>)	7,480	47.2	4,401	47.2
Yellow-cheeked parrot (<i>Amazona autumnalis</i>)	1,106	6.98	1,292	13.8
Military macaw (<i>Ara militaris</i>)	543	3.4	845	9.0
White-fronted parrot (<i>Amazona albifrons</i>)	3,514	22.1	595	6.3
Yellow-headed parrot (<i>Amazona oratrix</i>)	311	1.96	460	4.9
Lilac-crowned parrot (<i>Amazona finschi</i>)	470	2.96	403	4.3
Aztec parakeet (<i>Eupsittula nana</i>)	730	4.6	291	3.1
Scarlet macaw (<i>Ara macao</i>)	145	0.9	280	3.0
Northern Mealy parrot (<i>Amazona guatemalae</i>)	141	0.8	183	1.9
Yellow-naped parrot (<i>Amazona auropalliata</i>)	112	0.7	136	1.4
Green parakeet (<i>Psittacara holochlorus</i>)	413	2.6	115	1.2
White-headed parrot (<i>Pionus senilis</i>)	107	0.6	107	1.1
Red-crowned parrot (<i>Amazona viridigenalis</i>)	149	0.9	83	0.8
Blue-rumped parrotlet (<i>Forpus cyanopygius</i>)	99	0.6	44	0.4
Yucatan parrot (<i>Amazona xantholora</i>)	89	0.5	40	0.4
Orange-chinned parakeet (<i>Brotogeris jugularis</i>)	207	1.3	13	0.1
Barred parakeet (<i>Bolborhynchus lineola</i>)	83	0.5	13	0.1
Marroon-fronted parrot (<i>Rhynchopsitta terrisi</i>)	1	.006	5	0.05
Thick-billed parrot (<i>Rhynchopsitta pachyrhyncha</i>)	84	0.5	4	0.04
Pacific parakeet (<i>Psittacara strenuus</i>)	2	0.01	1	0.01
TOTAL	15,844	100	9,311	100

Source: PROFEPA, 2010, 2012, 2013, 2015, 2016a, 2020 y 2022a; Cantú et al., 2007






















We compared the total seizures before and after the 2008 ban (14 years before and 13 years after the ban) from the 20 species most seized before the ban (Cantú et al., 2007). Of these, twelve species showed a decrease in total seizures after the ban *Eupsittula canicularis*, *Amazona albifrons*, *Eupsittula nana*, *Amazona finschi*, *Psittacara holochlorus*, *Brotogeris jugularis*, *Psittacara strenuus*, *Amazona viridigenalis*, *Forpus cyanopygius*, *Bolborhynchus lineola*,

Amazona xantholora, and *Rhynchopsitta pachyrhyncha*; seven species showed an increase in the total number of seizures after the ban *Amazona autumnalis*, *Ara militaris*, *Amazona oratrix*, *Ara macao*, *Amazona guatemalae*, *Amazona auropalliata*, and *R. terrisi*. One showed no change *Pionus senilis* (Figure 22). Species whose seizures decreased after the ban totaled 7,359 specimens (88.6%), while those whose seizures increased totaled 842 specimens (11.4%).

Figure 22.

Comparison of total seizures by species before and after the ban.

SPECIES	Place before the ban 1995-2008 (Quantity / percentage of total seizures)	Place after the ban 2009-2021 (Quantity / percentage of total seizures)	Increase / Decrease total seizures
<i>Eupsittula canicularis</i>	First 7480/47.2%	First 4401/47.2%	Decrease 41.2% 
<i>Amazona albifrons</i>	Second 3514/22.1%	Fourth 595/6.3%	Decrease 83.1% 
<i>Amazona autumnalis</i>	Third 1106/6.98%	Second 1292/13.8%	Increase 16.8% 
<i>Eupsittula nana</i>	Fourth 730/4.6%	Seventh 291/3.1%	Decrease 60.2% 
<i>Ara militaris</i>	Fifth 543/3.4%	Third 845/9.0%	Increase 55.6% 
<i>Amazona finschi</i>	Sixth 470/2.96%	Sixth 403/4.3%	Decrease 14.3% 
<i>Psittacara holochlorus</i>	Seventh 413/2.6%	Eleventh 115/1.2%	Decrease 72.2% 
<i>Amazona oratrix</i>	Eight 311/1.96%	Fifth 460/4.9%	Increase 47.9% 

SPECIES	Place before the ban 1995-2008 (Quantity / percentage of total seizures)	Place after the ban 2009-2021 (Quantity / percentage of total seizures)	Increase / Decrease total seizures
<i>Brotogeris jugularis</i>	Ninth 207/1.3%	Sixteenth 13/0.1%	Decrease 93.8% 
<i>Ara macao</i>	Tenth 145/0.9%	Eight 280/3.0%	Increase 93.1% 
<i>Amazona guatemalae</i>	Eleventh 141/0.8%	Ninth 183/1.9%	Increase 29.7% 
<i>Amazona auropalliata</i>	Twelfth 112/0.7%	Tenth 136/1.4%	Increase 21.4% 
<i>Pionus senilis</i>	Thirteenth 107/0.6%	Twelfth 107/1.1%	No movement 0%
<i>Amazona viridigenalis</i>	Fourteenth 149/0.9%	Thirteenth 83/0.8%	Decrease 44.3% 
<i>Forpus cyanopygius</i>	Fifteenth 207/1.3%	Fourteenth 44/0.4%	Decrease 78.8% 
<i>Amazona xantholora</i>	Sixteenth 89/0.5%	Fifteenth 40/0.4%	Decrease 55.1% 
<i>Rhynchopsitta pachyrhyncha</i>	Seventeenth 84/0.5%	Nineteenth 4/0.04%	Decrease 95.2% 
<i>Bolborhynchus lineola</i>	Eighteenth 83/0.5%	Seventeenth 13/0.1%	Decrease 84.4% 
<i>Psittacara strenuus</i>	Nineteenth 2/0.01%	Twentieth 1/0.1%	Decrease 50% 
<i>Rhynchopsitta terrisi</i>	Twentieth 1/0.006	Eighteenth 5/0.05%	Increase 400% 



Orange-fronted parakeet

The orange-fronted parakeet (*Eupsittula canicularis*) went from 7,480 specimens seized before the ban to 4,401 specimens after the ban, a decrease of 41.2%. This species is the main reason for the reduction in total seizures after the ban (see Figure 23 and its explanation). Nevertheless, its situation is dire since it has been the most seized and trafficked species per volume of Mexico for decades. Trafficking of this species is not limited to national consumption as it is also destined for international traffic. It was the most seized Mexican parrot species by the United States, with 308 specimens between 1997 and 2020 (CITES 2022).

Photo: Orange-fronted parakeet, with bleached head, (*Eupsittula canicularis*). José Antonio Hernández



Photo: Orange-fronted parakeet, (*Eupsittula canicularis*). PROFEPA

The extraction of Orange-fronted parakeet chicks has been eroding the species' genetic pool, and more genetic diversity was found in a seizure in the city of Guadalajara than in a study of wild parakeets (Padilla et al., 2021). The Orange-fronted parakeet is not only captured for itself, but traffickers also bleach its head yellow and masquerade it as the chick of the Yellow-headed parrot, which is the most sought-after species in Mexico



due to its ability to imitate sounds (Cantú and Sánchez, 1996; Backstrom, 2019). In 2020, the International Union for the Conservation of Nature increased the degree of threat of the Orange-fronted parakeet from Least Concern to Threatened based on population decline due to illegal trafficking (Birdlife International, 2020). In Mexico, a proposal was presented in 2021 to the Environment Ministry to increase its risk status from Special Protection to Threatened (Escalante et al., 2021a).

White-fronted parrot

One of the most dramatic decreases in total seizures occurred with the White-fronted parrot (*Amazona albifrons*), which went from 3514 specimens seized before the ban to 595 specimens after the ban, an 83.1% decrease. This is the main reason for the global reduction of seizures after the ban. It was the second most seized species before the ban representing 22.1% of the total seizures for all species, and it is now the fourth with only 6.3% of the total. Together with *Eupsittula canicularis*, it represents 64% of the decrease in the total number of parrot seizures after the ban (see Figure 23 and its explanation). The reason for the decline may lie in the fact that this species had the record for most years allowed to be captured, 25 years up to 2008 (Cantú et al.,



Photo: Orange-fronted parakeet, (*Eupsittula canicularis*).
PROFEPA

(2012) suggested that the extirpation of the species from most of its range is related to capture for trade. The extirpation and consequent decrease in populations make it difficult to capture them. Therefore, their lack of presence in the illegal trade would explain the low number of seizures. A proposal was presented in 2021 to the Environment Ministry to increase its risk status from Special Protection to Endangered (Escalante *et al.*, 2021b).

Photo: White-fronted parrot, (*Amazona albifrons*).
PROFEPA.

2007, DGVS, 2008, 2009), and that it was estimated that for every parrot trapped legally up to 25 parrots were being trapped illegally under the umbrella of permitted trapping (*see below*). Thus, after the ban, when all permits expired, there was no possibility of fooling the authorities and trafficking with this species became harder.

Blue-rumped parrotlet

The Blue-rumped parrotlet (*Forpus cyanopygius*) is an endemic species that had a 78.8% decrease in seizures after the ban, and although this seems like good news, it could very well be alarming. The species has suffered a 61.4% reduction in its distribution area in the Pacific coastland of Mexico (Marin-Togo *et al.*, 2012). Trappers estimated a decrease of up to 33% of the population by 2007 (Cantú *et al.*, 2007). Also, trappers from Nayarit stated that it was already challenging to find this species, and that is why they moved to other states to capture it (Juan Carlos Cantú pers. obs.). Marin-Togo *et al.*

Military macaw

There were five species whose number of seizures increased after the ban, and one of them is the Military macaw (*Ara militaris*) which had an increase of 55.6%. The Military macaw has a very fragmented distribution in Mexico, mainly on mountain ranges of the Pacific slope, with some scattered populations on the Gulf slope. On the Gulf slope, it nests in crevices in cliff walls in canyons and deep sink-holes (Gaucín, 2000; Rodriguez, 2022) where poachers cannot reach the nests, while on the Pacific slope, it mainly nests in trees where they are vulnerable to poachers (Bonilla *et al.*, 2014; Marín-Togo *et al.*, 2012; Monterrubio *et al.*, 2016). The immense majority of the Military macaw chicks in the illegal trade come from the Pacific populations from Sinaloa, Nayarit, and Jalisco. In contrast, another portion

Photo: Military macaw, (*Ara militaris*).
PROFEPA





Photo: Military macaw, (*Ara militaris*). PROFEPA

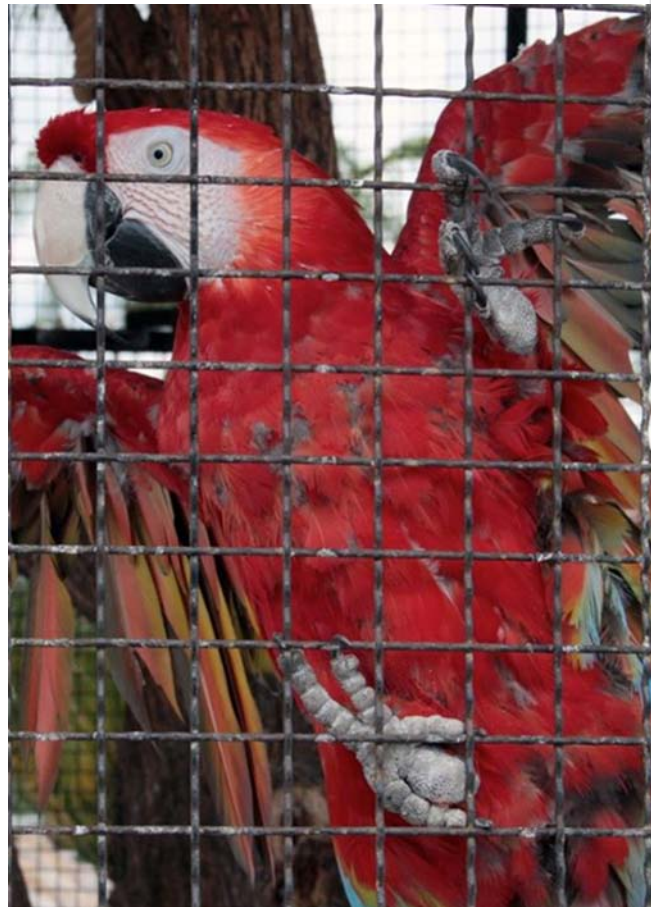


Photo: Scarlet macaw, (*Ara macao*). PROFEPA

came from illegal breeding facilities banned since 2008 and sold through internet sale platforms. The internet has facilitated the illegal sale of these large macaws in Mexico (SSN 2018). Some NGOs are protecting nesting sites from poachers (Bonilla and Cinta, 2021), but most of the nests are poached where there is no protection. Nevertheless, the seizure trend after the ban is decreasing (see figure 20).

Scarlet macaw

The Scarlet macaw also had an increase of 93.1% in total seizures, going from 145 seized birds before the ban to 280 seized macaws after the ban. This species has a very small wild population of around 200 pairs of macaws in the Reserva de la Biosfera Montes Azules, Chiapas, while a relict population of around 30-50 individuals is

found in the Chimalapas reserve in Chiapas and Oaxaca (CONANP 2009; Iñigo-Elias *et al.*, 2004, 2001, 1996). The wild population in Rio Lacantún, Chiapas is being monitored by an NGO which monitors 10-14 nests with the participation of rural communities. When they notice poacher activity, they take down the nestlings that are rehabilitated and released into the wild population, about 4-9 chicks annually (de la Maza *et al.*, 2015). But they can't monitor the whole breeding population, and poachers will take down any unprotected nest.

Two reintroduction projects were created after the 2008 ban, one in Palenque, Chiapas, and one in Los Tuxtlas, Veracruz, which doubled the wild populations in Mexico. In Los Tuxtlas, 189 macaws were released from 2014 to 2018 (Escalante *et al.*, 2019), and in Palenque 96 macaws were released from 2013 to 2014 (Amaya *et al.*,



most of the seized macaws after the 2008 ban come from illegal captive breeding sources and some from the wild populations in Río Lacantún and Chimalapas, Chiapas, and Central American populations. In 2008, at least 50 scarlet macaws were reported in transport in Oaxaca, most probably coming from Central America (M. Grosselet pers. comm.). Nevertheless, the seizure trend after the ban is decreasing (see figure 20).

Photo: Scarlet macaw, (*Ara macao*). PROFEPA

Yellow-cheeked parrot

The 16.8% increase in seizures of the yellow-cheeked parrot (*Amazona autumnalis*) puts it in second place as the most seized species, up from third place before the ban.



Photo: Yellow-cheeked parrot, (*Amazona autumnalis*). PROFEPA

2015). In Los Tuxtlas, poaching activity has not been recorded, given that most of the nesting is done on artificial nests that are constantly monitored (P. Escalante pers. comm.). In the Palenque region, only a few natural nests have been recorded (PROFEPA 2018). In Los Tuxtlas, thanks to the environmental education campaign, the community informs the authorities when released, macaws somehow end up in the hands of locals, which are then rehabilitated and released (P. Escalante pers. comm.).

Since the wild populations left in Mexico are so small, most trafficked animals come from other sources like illegal captive breeding facilities. The 2008 ban allowed breeders to sell their stock until their permits expired (one year) (DOF 2008), and since then, more and more scarlet macaws have appeared for sale illegally on the internet. We presume that

It is not surprising given that it was the only parrot species not included in the list of species at risk in 2010, which gave the public the impression that the species was not protected by law and thus it was not illegal to use or trade with it (Escalante *et al.*, 2018). This is a false argument given that all species were protected from any commercial use by the ban of 2008. Nevertheless, this





Photo: Lilac-crowned parrot (*Amazona finschi*) with yellow bleached head. José Antonio Hernández

false argument was used in 2014 by lawyers from an internet sales platform company (Segundamano) to use the species for a publicity campaign (JC Cantú, ME Sánchez pers. obs.). In response to the complaint from legislators and environmental organizations, PROFEPA demanded that Segundamano withdraw its campaign for violating the General Wildlife Law (PROFEPA, 2014a). Segundamano finally agreed to remove the campaign (PROFEPA, 2014b). However, the damage had been done. The result was that the campaign promoted and increased the offer of *A. autumnalis* on different internet portals (Escalante *et al.*, 2018).

The Yellow-cheeked parrot was not only the foremost Amazon species trafficked before and after the ban by volume, but it is also the foremost Amazon parrot used by traffickers to bleach their head and pass it off as a Yellow-headed parrot. Only 56.4% of its original distribution stands, mainly in the states of Campeche, eastern Chiapas, and Oaxaca, which along with the continuous illegal extraction, has decimated the populations everywhere. In 2019, the species was finally included in the list of species at risk as Threatened (DOF 2019). Nevertheless, the seizure trend after the ban is decreasing (*see figure 20*).

Photo: Orange-fronted parakeet, with yellow bleached head. José Antonio Hernández

Photo: Yellow-headed parrot, (*Amazona oratrix*). PROFEPA



Yellow-headed parrot

The Yellow-headed parrot (*Amazona oratrix*) had an increase in the total seizures of 47.9% and jumped from eighth to fifth place after the ban representing 4.9% of the total seizures. This species is the most sought-after parrot in Mexico, given it has been in the trade since pre-Columbian times because it is known to be the best talker (Sahagún, 1992). The species has lost up to 77.4% of its original distribution area because of deforestation and is even absent in areas where the habitat is still intact because of illegal poaching (Monterrubio *et al.*, 2016). Nevertheless, it can survive in degraded areas (agriculture plots or cattle ranches) where some trees can still support nesting (Monterrubio *et al.*, 2014). Unfortunately, when nesting in degraded areas poachers can easily access the trees, so the species is harassed anywhere and everywhere in Mexico, except for the Islas Marias in the Pacific, which used to be a penal colony (it recently became a natural protected area, and the parrot population will become accessible to would-be poachers).

The species was officially declared endangered in 1991 (DOF, 1991), and it has not been allowed to be captured for more than 26 years. It was allowed to be bred for com-



mercial purposes, but this was forbidden after the 2008 ban (Cantú and Sánchez, 2020b). Since it is the most sought-after species and its populations have been decimated by habitat destruction and intense poaching, traffickers will bleach the head yellow of any native or exotic parrot species to fool customers (Cantú and Sánchez, 1996; Backstrom, 2019). So, specimens in the illegal trade are coming from remnant nesting populations and illegal breeding facilities, and some of the seized specimens could be misidentified parrots of other species. Nevertheless, the seizure trend after the ban is decreasing (see figure 20).

Northern Mealy parrot

The Northern Mealy parrot (*Amazona guatemalae*) had an increase in total seizures after the ban of 29.7%, climbing from eleventh place to ninth. In Mexico, the Northern Mealy Amazon has been extirpated from a large part of its historical range, suffering a 45% to 46.8% reduction from its original distribution (Ríos-Muñoz and Navarro-Sigüenza, 2009, Monterrubio-Rico *et al.*,

2016). As deforestation of its preferred habitat occurs, it is more susceptible to poaching because, at the forest edge, parrot nests are more easily found and removed by poachers (Plasencia *et al.*, 2014). In the Biosphere Reserve of Los Tuxtlas, Veracruz, the species disappeared because of deforestation and illegal poaching (De Labra *et al.*, 2010).

The species moves from the border with Guatemala to local areas in the Yucatan Peninsula, migrating from El Peten in Guatemala (Plasencia and Escalona, 2014). Most parrots poached in Guatemala end up in Mexico or Belize (Soberanes, 2019). It was the third most seized bird species in Petén, Guatemala, from 1999 to 2007 (Jolón, 2008) and was the sixth most seized bird species in Guatemala from 2003 to 2018 (Flores, 2020).

◀ Photo: *Amazona oratrix*, PROFEPA

The increase in seized Northern Mealy parrots after the ban can result from increased deforestation that has created access for poachers to nesting sites and the influx of illegal parrots from neighboring Guatemala. Nevertheless, the seizure trend after the ban is decreasing (see figure 20).

Photo: Northern Mealy parrot, (*Amazona guatemalae*), PROFEPA



REASONS FOR THE DECREASE IN THE ILLEGAL TRADE OF PARROTS

One of the reasons for the decrease in the illegal trade of parrots is the ban itself. In 2012, we documented that the seizures from parrot species allowed to be legally trapped decreased dramatically after a ban (Cantú *et al.*, 2007; Cantú and Sánchez, 2012) (Figure 22). We compared the years where permits to trap parrots were issued with two periods where no permits were issued. We used the period from 2003 to 2005 when no permits were issued (because no UMA complied with the requisites

of the law (Cantú *et al.*, 2007)) and the 2008 trade ban.

The seizures of species permitted to be trapped were four times higher than seizures from species that were not allowed to be trapped, even though the permitted species were two or three times less numerous than the non-permitted species (figure 23).

Furthermore, during the periods where no permits for trapping were issued, the seizures of the permitted species (we used the four species with more trapping permits and the most seized species) decreased by half and still were twice as high as the non-permitted species.

Figure 23.

Comparison of seizures of permitted and non-permitted species for trapping from 1995-2012.

Year	Trapping Permitted	Seizures of permitted species (3-7 species)	Seizures of non-permitted species (9-16 species)	Difference between seizures of permitted to non-permitted species
1995-2002	YES	8,190	2,022	4.05
2003-2005	NO	2,266*	1,063	2.13
2006-2008	YES	2,026	463	4.37
2009-2012	NO	2,486*	1,038	2.39

Source:
PROFEPA en
Cantú y Sánchez 2012
**Eupsittula nana*,
Eupsittula canicularis,
Amazona albifrons,
Amazona autumnalis

Some people argue that the high number of seizures of the permitted species is a consequence of their being the most abundant species. This is a false argument given that wild populations don't increase and decrease yearly to the whim of a trap-

ping policy. PROFEPA documented that the trapping permits were used illegally to trap more specimens than those permitted; to trap other species than permitted; trap outside the limits of the UMA; trap within natural protected areas; trap outside the

permitted season; trap for more years than the authorized one; used by unauthorized third parties; didn't use the leg rings to identify captured specimens, etc. (Cantú *et al.*, 2007, Cantú and Sánchez, 2012; PROFEPA, 2002). The illegal trapping that occurred under the umbrella of legal trapping

was enormous. We estimated that for every parrot trapped with a permit, 20–25 parrots were captured illegally (*figure 24*).

In other words, the legal trapping system was being used to cover up illegal trade. And during the periods when no permits existed,

Figure 24.

Comparison of legal and illegal trapping.

Annual Trapping	Parrots trapped legally and illegally	Percentage	Parrots trapped
Average legal trapping (1998–2008)	2,974	4.3% - 3.6%	1
Illegal trapping	65,000 - 78,500	95.4 % - 96.2%	20 - 25

Source:
Cantu *et al.*, 2007,
modified and revised from
Cantú and Sánchez 2012

it was more difficult for traffickers to cheat and fool government authorities because they had no valid documentation.

With no valid permits, it was harder for traffickers to fool anyone as the years passed. So, since the 2008 ban, there has been a decreasing trend in seizures (*see figure 8*). But this does not fully explain the decrease, given that traffickers adapt to new circumstances, as was documented in 2011–2012 (*see above*).

Another reason contributing to the continuous decrease in seizures is the awareness campaign. In 2009 Defenders of Wildlife, Teyeliz, A.C., and PROFEPA launched a nationwide awareness campaign to inform the people about the ban, the threats parrots faced, and to denounce any illegal sales of parrots to PROFEPA (PROFEPA, 2009, Cantú and Sánchez, 2011).

The campaign is ongoing, and it has reached tens of millions of people. It has produced hundreds of thousands of materials like posters, infographics, children's books, coloring books, comic books, stickers, identification guides, videos, etc., which have been distributed all over the country by federal, state, and municipal authorities, universities, schools, NGOs, rural communities, scientists, companies, etc. The campaign has used media outlets to disseminate its messages like tv, radio, newspapers, internet news outlets, magazines, social media, etc. In the last few years, PROFEPA started an awareness campaign on Facebook with infographics against the illegal trade of parrots and macaws.

One of the campaign's primary outcomes is that people now know they can present a complaint to PROFEPA about any illegal sales of Mexican parrots. The annual number of complaints of illegal sales of parrots





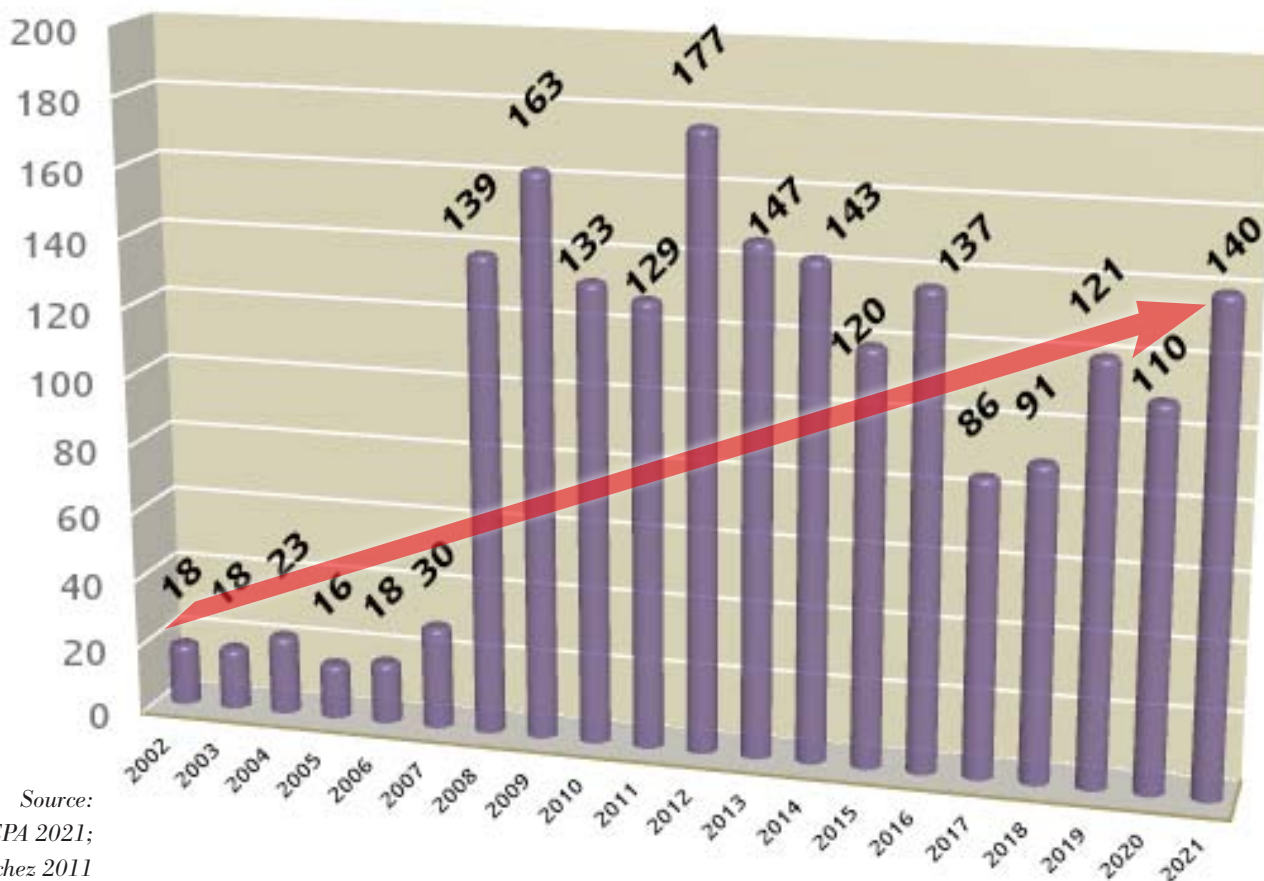
Artwork, campaigns against illegal trade

to PROFEPA increased after the 2008 ban (Cantú and Sánchez 2011; PROFEPA 2021) (figure 25).

The awareness of the illegality of selling Mexican parrots is turning into action by the ordinary people. In 2019, in Mexico

City, while researching the prices of parrots and other birds, it was difficult to find bird salespeople on the streets because they claimed it had become harder for them to work given that people kept calling police officers to detain them (Cynthia Ruiz, pers. comm.).

Figure 25. Complaints of Illegal Sales of Parrots to PROFEPA 2002-2021.



Source: PROFEPA 2021; Cantú and Sánchez 2011

The public also started to complain to PROFEPA about illegal sales of parrots on the internet. In 2014, PROFEPA reached agreements with two major sales platforms on the internet (Mercado Libre and Segunda Mano) to stop any sale advertisements on parrots and other wild species (PROFEPA, 2014a, b). In 2018, Facebook changed its commerce policy in Mexico and prohibited the sale of animals (Expansión, 2018). After users presented complaints, whole pages and publications that sell parrots and other birds were taken down by the administrators (JC Cantú, pers. obs.).

There is another reason that could explain the decrease in the illegal trade of parrots. After the 2008 ban, the interest in the conservation of parrots grew, and the number of NGOs working on in situ conservation projects increased. Some companies also started projects of parrot conservation, as well as some federal and state institutions (Figure 26). Most of these projects also developed awareness campaigns and environmental education projects with the local communities, and all of them participated in campaigns against illegal trade locally and nationally.

Figure 26.
Some conservation projects for parrots and macaws that were created after the 2008 ban.

NGO / Company / Institution	Project	State	Year project started
Unidos por las Guacamayas A.C.	Nest monitoring of Military macaw, avitourism	Jalisco	2009
Vidas A.C.	Conservation of Military Macaw, avitourism	Oaxaca	2009
Fundación Txori	Reintroduction of Military macaw, avitourism	Jalisco	2010
United Corridors	Conservation of Military Macaw	Querétaro	2013
Los Aluxes	Reintroduction of Scarlet Macaw, avitourism	Chiapas	2013
Bosque Antiguo	Reintroduction of Scarlet Macaw, avitourism	Veracruz	2014



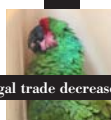
NGO / Company / Institution	Project	State	Year project started
Organización Vida Silvestre A.C.	Conservation of Thick-billed parrots	Chihuahua	2017
CONANP-Reserva de la Biósfera La Encrucijada	Conservation of Yellow-naped parrot, avitourism	Chiapas	2017
Salvando al Loro Huasteco	Conservation of the Yellow-headed parrot, avitourism	San Luis Potosí	2017
Proyecto Santa María	Conservation of Yucatan parrot	Yucatán	2019
Pronatura Sur	Conservation of parrots and macaws, avitourism	Chiapas	2019
Vuela con Loros	Conservation of Yellow-headed; Yellow-cheeked; Red-crowned parrots, avitourism	San Luis Potosí	2020
Pronatura Noreste y el estado de Tamaulipas	Conservation of Red-crowned and Yellow-headed parrots, avitourism	Tamaulipas	2020

Source:

C. Bonilla; C. Macias; JC Orraca; V. Martínez, E. Jiménez; G. Reyes; Escalante et al 2019; Estrada 2014; Milenio 2020; United Corridors 2022; OVIS 2022; Busteros 2016.

After the 2008 ban, the Environment Ministry, through the National Commission of Natural Protected Areas (CONANP), created recovery programs for the Scarlet and Military macaws, Yellow-naped and Yellow-headed parrots, and the Thick-billed and Maroon-fronted parrots (CONANP, 2009 a, b, c; 2012). To reach the conservation objec-

tives of the programs, the CONANP has been funding projects of research and conservation of these species inside natural protected areas. The programs' goals also include environmental education, promotion of avitourism, and campaigns against illegal trade (CONANP, 2009 a, b, c; 2012).



Avitourism has grown exponentially in Mexico (Cantú *et al.*, 2020a). By 2019, avitourism focused on parrots and macaws had the participation of 86,870 avitourists, leaving an economic revenue of 18 million dollars (Cantú *et al.*, 2021). Parrot avitourism took place in 11 states, and more projects are being developed as an economical alternative to parrot poaching (Cantú *et al.*, 2021). The revenue from parrot avitourism is 153 times greater than sales from captured parrots (Cantú *et al.*, 2021). Parrot avitourism is carried out by companies, NGOs, and rural communities, and it is being fostered by environmental institutions and recently by the Tourism Ministry.

Altogether, the efforts by NGOs, environmental institutions, companies, and rural communities to promote conservation, environmental education, and alternative economic uses of parrots like avitourism, have reached hundreds of thousands of people since the 2008 ban. All these activities have created more awareness and interest in parrot conservation nationwide.

The last reason would apply to the first years after the 2008 ban, and it is the immense importation of exotics species that began two years before the ban (*see figure 5*). It has been demonstrated that the high importation was not the result of the loss of the number of legally trapped parrots because there was no need to import hundreds of thousands of parrots to offset the loss of an average of 2,974 parrots a year (Sánchez and Cantú, 2010, 2013, 2017; Cantú and Sánchez 2018). After 2010 most of the imports corresponded to the Monk parakeet (*Myiopsitta monachus*), and by 2012 the Monk parakeet imports more than doubled the rest of the exotic species (Sánchez and Cantú, 2017).

The price of imported parrots could be, on average, 11 times higher than the prices of native parrots (Cantú *et al.*, 2007). Monk parakeets could cost as much as a Yellow-naped parrot when in size they would be more like an Orange-fronted parakeet which

would cost ten times less than a Monk parakeet (Cantú *et al.*, 2007; Cantú and Sánchez, 2018). The reality is that imported parrots could never compete in price with legal or illegal native Mexican parrots. So basically, what happened was that imported parrots created a whole new market for this type of parrots. Eventually, the Monk parakeet prices came down as much as three times their original cost but still were more than double the price of an Orange-fronted parakeet.

Nevertheless, exotic species were abundant for sale before and after the 2008 ban. Monk parakeets were sold in markets and by street vendors, and even some had their head feathers bleached yellow to look like a Yellow-headed parrot to fool customers (Backstrom, 2019). In 2014, all imports of the monk parakeet stopped, and the total number of imports of exotic species plummeted (Sánchez and Cantú, 2017; Cantú and Sánchez, 2018; Cantú *et al.*, 2021). Most post-2014 imports were captive-bred *Agapornis* from Cuba, which is about half the size of the most trafficked species, the Orange-fronted parakeet, yet more expensive.

So, during the heydays of the massive importation of exotic parrots, there was a new option for customers. Still, the availability of illegal native Mexican parrots continued to exist, and customers could decide which species to buy (Cantú y Sánchez, 2018). After the Monk parakeet imports were stopped in 2014, one would think that the illegal trade of native parrots would have increased again, but it didn't happen. As we have seen, seizures of Mexican parrots continued to decrease after 2014, which shows that the other factors affecting the decrease had a more profound impact on the illegal trade.



The number of total seizures after the ban was 42% lower than total seizures before the ban. The number of annual parrot seizures by PROFEPA shows a downward trend after the 2008 ban. All species except one, which did not change, showed a downward trend in seizures. At the same time, the number of inspection/operational

acts that resulted in seizures of parrots by PROFEPA was 49% higher after the 2008 ban. Twelve species had a total decrease in seizures after the ban, representing 7,359 specimens (88.6%), while seven species had an increase of 842 specimens (11.4%), and one species had no change. Illegal international trafficking of native parrots from Mexico to the United States shows a decrease in seizures of 88% from 2009 to 2020 (figure 27).

Figure 27.
PROFEPA and U.S. inspection effort and seizure parameters after the ban.

Parameters	Results (after the ban)
Total seizures	42% decrease
Inspection / operations acts	49% increase
Seizures trends	All species with decreasing trend. 1 species with no change.
Total seizures per species	12 species with a decrease (7,359 specimens 88.6%). 7 species with an increase (842 specimens 11.4%). 1 species with no change.
Seizures in the US	88% decrease

These trends demonstrate that annual seizures decreased as PROFEPA inspectors increased their efforts to secure parrots after the ban. All parameters indicate a decrease in seizures, both in total seizures and in the comparison by species (88.6% decreased; 11.4% increased). There was an 88% decrease after the ban even in U.S. seizures.

PROFEPA had noted a decline in illegal parrot trafficking in 2010, and in 2017 they estimated a 24% decline. **Our estimates put the decrease in illegal traffic in 2022 at 47.14%, with a range of 34,000 to 41,500 illegally captured parrots per year.**

All parrot species show a decreasing trend in seizures after the ban, which is surprising because each species has its different trade demand and its own population size, reproductive behavior, nesting sites, availability to poaching, etc. Nevertheless, when comparing total seizures before and after the ban, there was an increasing trend for a few species, especially those most sought after like the macaws or big amazons like the Yellow-headed, Northern Mealy, or Yellow-cheeked. Each had its circumstances as to the reasons for the increase, but in the end, all had a decreasing trend in seizures after the 2008 ban.

No one reason can explain the 47.14% decrease. Still, several reasons have affected the behavior of traffickers, consumers, and people in general about their relationship with parrots. The ban by itself stopped the issuing of trapping permits which in turn made it more difficult for traffickers to cheat and fool authorities; a nationwide ongoing communication campaign informing of the ban,

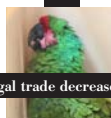
threats to parrots, and ways to denounce illegal sales have reached tens of millions of Mexicans; many recovery programs were created along with funding for conservation, education programs and alternative uses of parrots like avitourism that have developed into projects that have reached hundreds of thousands of people in rural communities and tens of thousands of avitourists go out each year to see wild parrots and macaws. Finally, the market was flooded with exotic species for some years before and after the 2008 ban.

The ban is working, but even though the annual illegal capture of 31,000 to 37,000 parrots has been prevented, tens of thousands of parrots continue to be illegally captured each year. It will take a few decades of continued work to bring the illegal trade down to a level where parrot and macaw populations can recover and begin to increase again.

Photo: Lilac-crowned parrot (*Amazona finschi*), PROFEPA



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Statistical analysis

The following data shown in *Table 1* contains information separated into three

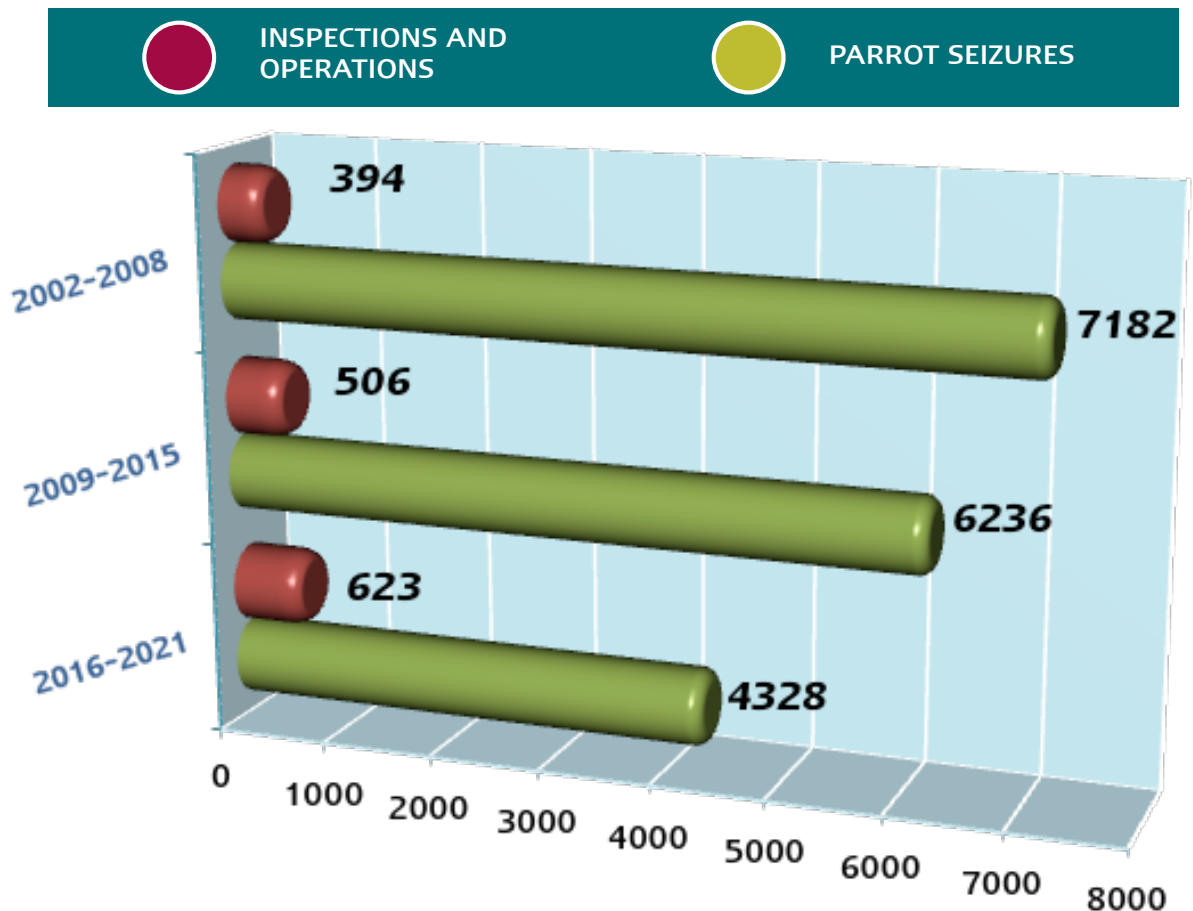
blocks, the first from the years 2002-2008 before the closure followed by two blocks from 2009-2015 and 2016-2021 after the closure.

Graph 1 shows the inspections and operations and the results obtained per year.

Table 1.

Year	Parrot seizures	Inspections and operations
2016 - 2021	4,328	623
2009 - 2015	6,236	506
2002 - 2008	7,182	394

Graph 1.



The data shown is evidence of the work of the authorities, which shows that despite the increase in inspections and operations, the seizure of psittacines represents a significant drop after the 2009 ban.

Table 2 shows the percentage representation of the total efforts and seizures of the three blocks, showing high differences in the number of seizures after the ban and significant differences in the efforts after 2009 concerning the pre-ban block:

Table 2.

Year	Parrot seizures	Inspections and operations
2016 - 2021	24.39%	40.91%
2009 - 2015	35.14%	33.22%
2002 - 2008	40.47%	25.87%

As a result of these changes, a percentage comparison of the effective number of psittacines secured per operation in the two blocks of years after the ban compared to the effective number before the ban (18.2)

shows that for 2009-2015 the number of seizures obtained represented 67.61% of the effective number before the ban and 38.11% for 2016-2021 respectively. Table 3 shows these changes after the ban decree:

Table 3.

Year	Parrot seizures	Inspections and operations	Number of parrots seized per act of inspection / operation	Percentage representation of the number of parrots per operation concerning 2002 -2008	Percentage difference from 2002-2008
2016-2021	4,328	623	6.9	38.11%	61.89%
2009-2015	6,236	506	12.3	67.61%	32.39%
2002-2008	7,182	394	18.2		



With the above information, the percentage differences were obtained concerning the pre-ban block, with a 32.39% decrease for the first years after the ban (2009 - 2015) and a more marked reduction of 61.89% for the last five years (2016-2021). These previous two percentages give an

average decrease after the ban of **47.14%** in the mitigation of the traffic of Mexican psittacines.

To support our data, we present a study with a 95% acceptance rate for the percentages obtained for each data set (*Table 4*).

Table 4.

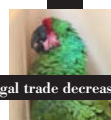
Year	Parrot seizures
2016 - 2021	24.39%
2009 - 2015	35.14%
2002 - 2008	40.47%

Descriptive statistics are shown in *Table 5*:

The average reduction is **33.33%** in the post-ban until 2021, with a variability of **8.19%** decrease, obtaining a maximum decrease of **44.89%**.

Table 5.

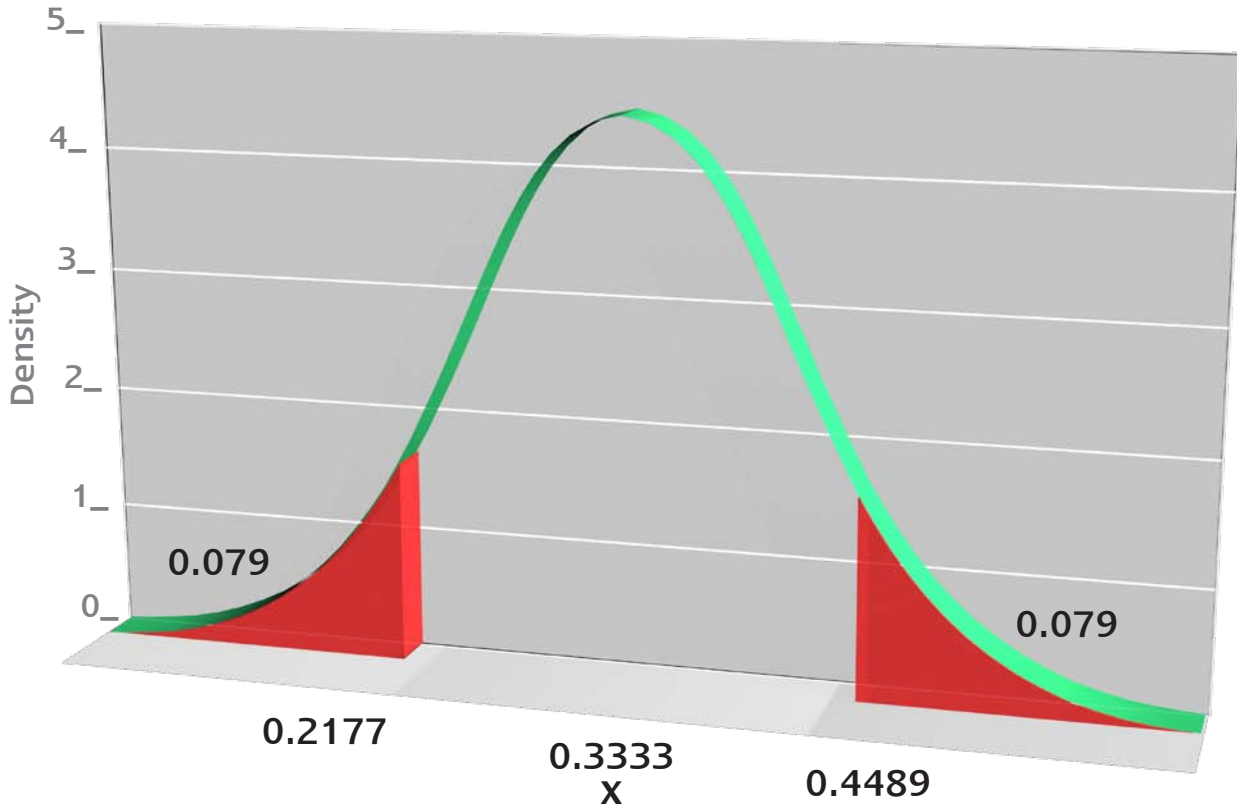
Variable	N	N*	Mean	Standard error of Mean	Std.Dev.	Minimum	Q1	Median	Q3
Parrots seizures_1	3	0	0.3333	0.0473	0.0819	0.2439	0.2439	0.3514	0.4047
Variable	Maximum								
Parrot seizures	0.4047								



Graph 2 shows the standard distribution with a high degree of acceptability of 68.4%.

The parametric test is: **$P(0.2177 \leq \mu \leq 0.4489)$** , where it can be seen that there is a maximum of 44.89% in the decrease of parrot traffic in the years studied.

Graph 2.
Graph of distribution.
 Normal, media = 0.3333, Desv.Est. = 0.0819



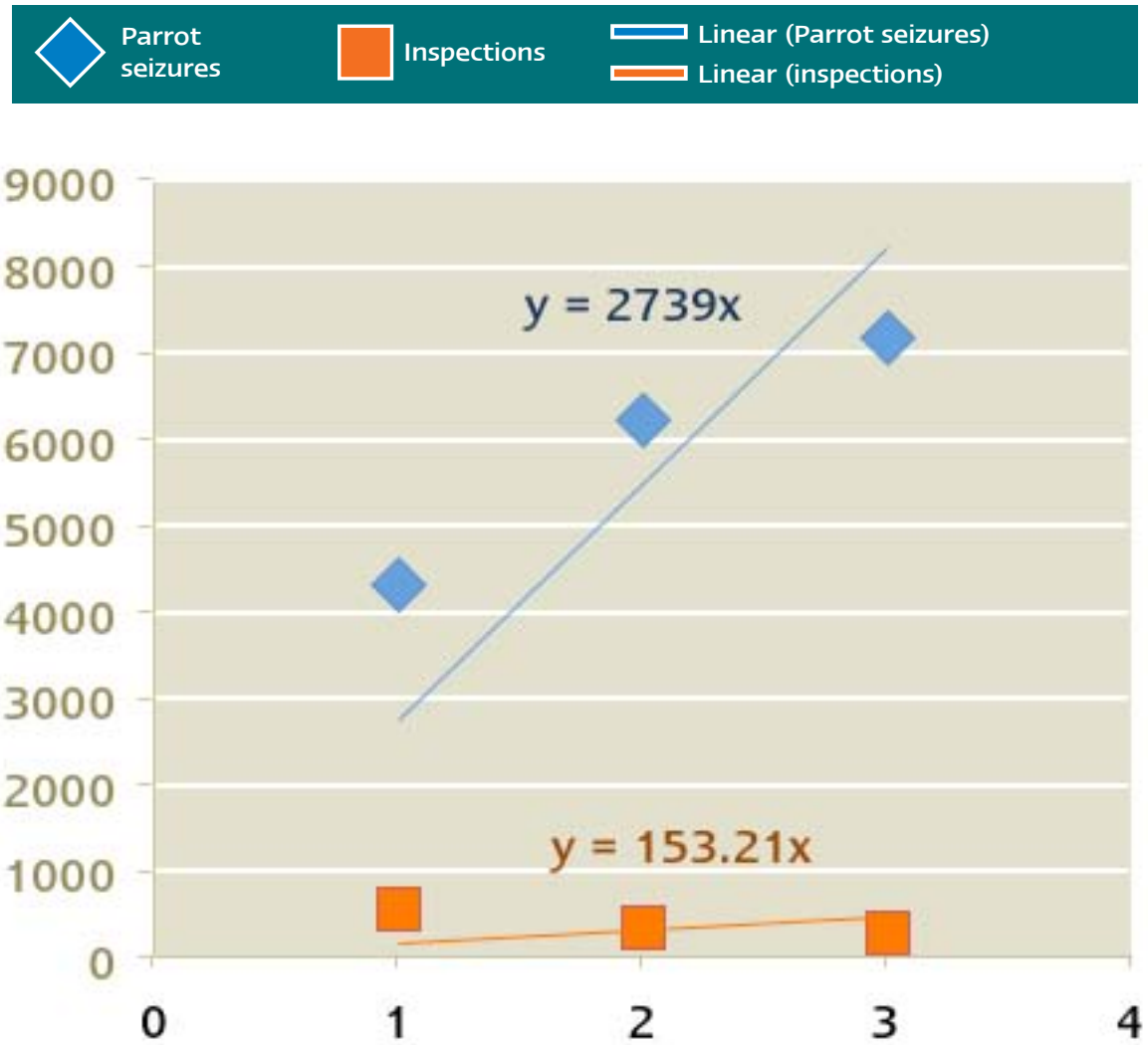
Now to contrast the data of the work of our authorities and the psittacids seizures in the three blocks (2002-2008, 2009-2015,

and 2016-2021) using a Pearson correlation, the following data were obtained:

Pearson correlation	-0.984
Value p	0.114
Transformation of Box-Cox	$\lambda = 0.5$



Graph 3.



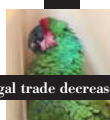
This means that there is a high correlation between the two variables, since, if inspection operations increase, parrot seizure decreases at a correlation of $r = -0.984$ with a probability of decrease

of 47.14% and with an average seizure of 33.33% in the 3 blocks of years, with an acceptance level of 95%.

Standardization of continuous predictors.

Levels coded at -1 y +1

Predictor	Low	High
Inspection / operations	394	623



Analysis of variance for transformed response.

Source	GL	SC Ajust.	MC Ajust.	Value F	Value P
Regression	1	180.719	180.719	22.21	0.133
Inspection / operations	1	180.719	180.719	22.21	0.133
Error	1	8.139	8.139		
TOTAL	2	188.857			

Model summary for transformed response.

There is a 13.3 % probability that parrots will be seized in an operation by our authorities, taking into consideration the ratios of the percentages in *table 2*.

S	R-cuad.	R-cuad. (adjusted)	R-cuad. (pred)
2.85283	95.69%	91.38%	41.74%

Model summary for transformed response.

Term	Coef	EE del coef.	Value T	Value P	FIV
Constant	76.43	1.65	46.40	0.014	
Inspection / operations	-9.50	2.02	-4.71	0.133	1.00

Regression equation in uncoded units.

$$\text{Parrot seizures}^{\wedge 0.5} = 118.64 - 0.0830 \text{ Inspection / operations}$$

In conclusion, the data shown above demonstrate that the overall probability of operations and seizures is 2.3% per event, with an acceptability index of 95%. Therefore, the average number of sei-

zures of the species is 33.33% in the operations, which had a 47.14% decrease, after the ban was decreed in 2008.

