



Ocean

On Borrowed Time

The ongoing illegal totoaba trade driving the critically endangered vaquita to extinction

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ABOUT EIA

We investigate and campaign against environmental crime and abuse.

Our undercover investigations expose transnational wildlife crime, with a focus on elephants, pangolins and tigers, and forest crimes such as illegal logging and deforestation for cash crops such as palm oil. We work to safeguard global marine ecosystems by addressing the threats posed by plastic pollution, bycatch and commercial exploitation of whales, dolphins and porpoises. Finally, we work to avert climate catastrophe by strengthening and enforcing regional and international agreements that tackle short-lived climate super-pollutants, including ozone-depleting substances, hydrofluorocarbons and methane, and advocating corporate and policy measures to promote transition to a sustainable cooling sector and away from fossil fuels.

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Front cover, ©Tom Jefferson: Only about 10 vaquitas remain because of illegal totoaba poaching and trade

Above: The totoaba population is decreasing due to illegal fishing for their highly valued maws.

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Summary

Illegal fishing of protected totoaba fish in Mexico's Gulf of California and their subsequent trafficking and retail as part of transnational organised crime are responsible for the rapid decline of vaquitas, the world's most endangered marine mammal.

Vaquitas are ensnared in illegal gillnets set to catch totoaba and now only about 10 remain after a decade of relentless totoaba poaching and trade.

This latest EIA investigation reveals that the market in China for dried totoaba swim bladders, or maw, on popular social media channels remains active and is increasing on WeChat. In 2023, the activity and quantities of totoaba maws advertised on WeChat and, by extension, in China exceeded those of previous years, indicating that wildlife traffickers have resumed business as usual since the COVID-19 pandemic.

EIA's investigation suggests a thriving and opportunistic network of traders and consumers willing to participate in the illegal trading of totoaba maws. Despite this, enforcement action, as measured by the number of seizures of totoaba maws, declined significantly in 2023.

Only urgent, strategic and collaborative efforts to end the illegal totoaba maw trade will give the critically endangered vaquita a chance to survive and recover.

Above: Vaquitas face imminent extinction because of illegal gillnet fishing in the Gulf of California, Mexico.



©Omar Vidal

Vaquita, the most endangered marine mammal on the planet

With only about 10 vaquitas remaining,¹ they are the most endangered marine mammal on the planet. These small, endemic porpoises exist in a small area of the Gulf of California, in Mexico.

A decline in the vaquita population, from about 567 individuals in 1997 to about 10 individuals now, has been tracked for two-and-a-half decades by the International Committee for the Recovery of the Vaquita (CIRVA).²

The sole threat to vaquitas is entanglement in fishing gear. A drastic decline in the vaquita population has occurred in the past decade and they face imminent extinction due to bycatch in illegal gillnets set to catch totoaba fish. Fishers target totoaba for their valuable swim bladders, also known as 'maw' or 'buche', which fetch high prices in the main market of China, despite being listed on Appendix 1 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) which bans international trade in the species. Totoaba and vaquitas are about the same size and it is not possible to fish for totoaba using static gillnets without the danger of catching vaquita.

In August 2023, the International Whaling Commission (IWC) issued its first ever 'Extinction Alert' to highlight the desperate plight of vaquitas.³ This initiative is led by the IWC Scientific Committee to voice extinction concerns for cetacean species and populations. Scientists have stated that, despite the very low number of individuals, there is still a chance of recovery if all gillnets are removed from their habitat.⁴

However, a complete cessation of illegal fishing can only be enforced if the illegal trade in totoaba maws is eliminated. Mexico, and the main transit and destination countries involved in the transnational trade, have so far taken insufficient steps to tackle this environmental crime driving a species to extinction.

Above: Vaquitas are the most endangered marine mammal on the planet because of illegal fishing.

Illegal totoaba fishing in the Gulf of California, Mexico and international trade

Nearly 50 years ago, in 1975, fishing for totoaba was banned in Mexico, yet the illegal totoaba fishery surged around 2011 to satisfy a burgeoning market for the fish's swim bladder.

Totoabas are large (up to two metres and more than 100kg) and long-lived (20-25 years). The totoaba population is decreasing due to illegal fishing for their highly valued maws. It is estimated annual removals of adult individuals by poaching increased five-fold from approximately 6,000 individuals in the mid-1980s to 30,000 individuals by 2017.⁵ The females are most prized,⁶ with large high-quality swim bladders reaching the highest prices.

Organised criminal networks are stripping Mexico's waters of totoaba to supply a demand in China and, increasingly, elsewhere. The persistent illicit trade in totoaba maws is supplied by transnational criminal syndicates.

Right: Illegal fishing of protected totoaba fish maw, and their subsequent trafficking and retail as part of transnational organised crime, are responsible for the rapid decline of vaquitas.



The trade in fish maw is lucrative and growing internationally

Fish maw has long been used as food and medicine in East Asia and is a luxury dried seafood product, also valued as an investment and for business gifts.⁷ Recently, collagen from farmed totoaba maw has been found for sale, purported to improve skin texture and maintain a youthful look.⁸

The global demand for maw has intensified in recent decades and increased prices have led to escalating demand in source countries with long histories in the trade of fish maw, as well as expansion into new and previously undocumented regions.⁹ The value and desirability of fish maws depends on a number of factors, including the species, size and age of the maw. Swim bladders from croaker species, such as totoaba, are large and fetch high prices, with the critically endangered Chinese bahaba considered the best and most valuable of all fish maws.¹⁰ Indeed, the trade term *Jinqian* maw or

'golden coin' maw describes the maw of the totoaba and bahaba.¹¹ Swim bladders attract investors who anticipate that the price will rise over time as totoaba become scarcer.

EIA investigations in 2015 and 2016 documented totoaba being offered at prices between \$2,400-25,500 per kg, with the higher price asked for a 500g totoaba maw.¹² Based on seizure data gathered from the General Administration of Customs of China, totoaba maw were estimated to be worth \$3,000-12,000 between 2017-18.¹³



Recent action under CITES

After decades of failure by Mexico to enforce measures to prevent vaquita bycatch, the 75th CITES Standing Committee met in November 2022 and required Mexico to prepare a Compliance Action Plan by March 2023 which would "effectively prevent illegal fishers and unauthorized vessels from entering the vaquita refuge and zero-tolerance areas and maintain them as gillnet net-free zones".¹⁴

In March 2023, the CITES Secretariat published a notification recommending a suspension of all trade from and with Mexico of any CITES-listed species, since the Compliance Action Plan was inadequate.¹⁵ This trade suspension was lifted when the Compliance Action Plan was completed.¹⁶

In July 2023, Mexico made publicly available its "Compliance Action Plan to prevent illegal fishing and trade in totoaba, its parts and/or derivatives, in protection of the vaquita marina".¹⁷

The IUCN Cetacean Specialist Group reviewed Mexico's Plan and found its actions to be "insufficient to save vaquitas", providing a detailed critique of each of the significant failings. These included the extensive and continued use of gillnets in the (very small) Zero Tolerance Area, no significant progress towards the use of safer, alternative fishing gear and impeded vaquita monitoring because of the illegal fishing activity.¹⁸

US Government agencies are also concerned, announcing in July 2023 that they are monitoring implementation of the Compliance Action Plan to

assess whether additional measures, including trade restrictions, are required.¹⁹

In August 2023, CITES put out a "Call for information and reporting from all Parties, especially transit and destination countries of totoaba" which included encouraging Parties to "support efforts related to the recovery and monitoring of wild populations of totoaba and vaquita" and to "support efforts to eliminate supply of and demand for illegally sourced specimens of totoaba to address and prevent their illegal trade".²⁰

Although a trilateral contact group on law enforcement to combat illegal trade of totoaba was set up in 2017 between China, Mexico and the US,²¹ the terms of reference and the first session of the trilateral contact group had yet to be concluded ahead of the CITES Standing Committee meeting in November 2023. Strong transnational collaboration is needed at multiple levels to dismantle the totoaba maw supply chain, particularly between Mexico, China and the US.²²

Above: CITES Parties must take urgent action to end the illegal totoaba trade.

EIA investigation finds wide availability of totoaba on social media

Between September and October 2023, EIA conducted a desk-based online investigation into the illegal trade of totoaba maws on Facebook and WeChat (within the sub-platform of “Ying Yin Hao” to specify user accounts that openly discuss and promote *jinqian* maws), searching for posts since January 2020 targeting Chinese-language speaking users and prospective buyers. This investigation follows previous desk-based and field investigations conducted by EIA into the illegal totoaba maw trade since 2015.²³

Despite trade being illegal, totoaba maws are still openly offered for sale on Facebook and WeChat. A total of 234 totoaba maws were documented to be available since 2020 – 90 on Facebook, 141 on WeChat and three available on both platforms.

A minimum estimate of 16.25kg of dried totoaba maw were available on Facebook and 8.05kg on WeChat (where the weights of 116 totoaba maws were not reported and therefore could not be accounted for). Data on the number or weight of individual totoaba maws for sale were not always available, so these are minimum values.

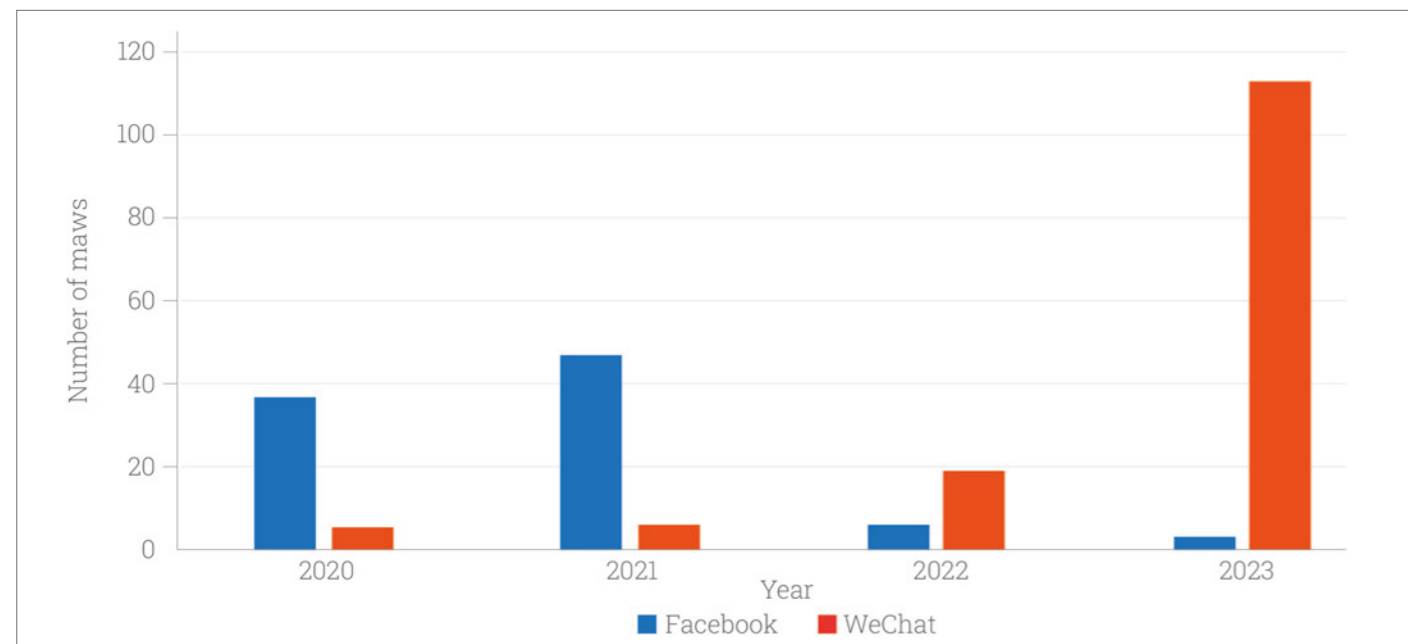
The number of totoaba maws found on Facebook is lower than previous research indicates; however, the number available on WeChat has significantly increased. In 2022, the number of totoaba maw tripled and the volume increased six-fold compared to 2021. In 2023, the number and volume of totoaba maw were more than five times higher than in 2022 on WeChat (see Figure 1). This increase and trajectory are alarming.



Above: Totoaba maws are highly prized. Organised criminal networks are stripping Mexico's waters of totoaba to supply a maw demand in China and elsewhere.



Figure 1: The number of totoaba maws identified for sale on Facebook and WeChat between 2020-23



WeChat activities were low at the beginning of the COVID-19 pandemic in 2020 and further declined in 2021 as a Chinese ban on terrestrial wildlife trade and consumption was implemented. Catering to an international network of users, Facebook saw its number of submissions, number of totoaba maws and the volume of maws advertised increase from 2020 and peak in 2021. Activity levels on WeChat increased in 2022, coinciding with the lifting of the Chinese ban in wildlife trade and consumption, and then dramatically increased in 2023 as normal post-COVID life resumed.

Four users were responsible for posting the totoaba maw adverts on Facebook, reportedly based in China (n=2) and Malaysia (n=2), while a total of 24 users were observed on WeChat. The number of active users advertising totoaba maws on WeChat more than quadrupled between 2020-23 from three to 14. With the exception of one WeChat user based in Malaysia, all identified users were reportedly based in China. One user was observed to have been active on both platforms. This user, reportedly based in Malaysia, advertised totoaba maws (n=19, weight = 4.98kg) through 47 submissions, with the majority being duplicates across Facebook groups.

In a few instances, pricing was openly discussed on Facebook. One China-based user quoted two separate prices for totoaba maw in November 2020: a per tael price of CNY 9,500 (~\$1,417.34). This calculates to a per gram value of a minimum CNY 190 (~\$28.90) or a maximum of CNY 251.32 (~\$38.20). A tael is a weight unit used in China to represent one-tenth or one-sixteenth (in mainland China, or Hong Kong and Taiwan, respectively) of a catty – another traditional weight unit that is approximately 500,604.8, or 600 grammes depending on the region. One tael is therefore approximately equal to 37.8g or 50g.

Given that none of the observed submissions re-occurred over extended periods, it appears likely that these maws were successfully sold after being advertised on the platforms, indicating a thriving market. The lack of intersection observed between Facebook and WeChat suggests an opportunistic network of traders and consumers willing to participate in the illegal trading of totoaba maws.

Above: EIA's investigation found increasing illegal online trade in totoaba maws

EIA's research shows that the demand and market for totoaba maws persists online, with activities shifting from Facebook to WeChat. In 2023, the activity and quantities of totoaba maws advertised on WeChat and, by extension, in China exceeded those of previous years, indicating that wildlife traffickers have resumed business as usual. Continued posts on Facebook and WeChat demonstrate the inadequacy of enforcement of laws prohibiting the sale of totoaba in China and also in Malaysia.

In addition to the maws, submissions advertising "jinqian fish scales" (n=4) and "jinqian fish gills" (n=1) were incidentally observed during EIA's research. This indicates the existence of markets for other body parts of bahaba and/or totoaba and highlights other channels traffickers may be exploring to maximise their profits from totoaba poaching. All observed submissions were published from September 2022 onwards by users based

in China's Guangdong Province. No specific quantities were recorded, although some users advertised 100g of scales for approximately 30 RMB (\$4).

"Jinqian scales" are promoted as being medicinally effective in preventing, curing and alleviating symptoms of coughing, catarrh, pharyngitis, bronchitis and gastritis, especially for children. In the post-COVID era, the propagation of beliefs that totoaba body parts are medicinally effective against respiratory ailments can potentially amplify existing demand and even transform the market for totoaba products, as similar unsubstantiated claims of miraculous medicinal properties have done to other endangered wildlife species.

Below: EIA's investigation discovered *jinqian* fish scales and gills available online, indicating the existence of markets for other body parts of bahaba and/or totoaba and highlights other channels traffickers may be exploring to maximise their profits from totoaba poaching.



Enforcement efforts: totoaba maw seizures

Law enforcement is a key tool to deter criminal activities, including the illegal trade of totoaba maws. Seizures are an important component of enforcement efforts, which can be effective if they result in arrests and prosecutions of the criminals involved.

EIA maintains a seizure database containing information about different types of international environmental crime incidents, including totoaba trade, and publishes open source data on the Global Environmental Crime Tracker,²⁴ is a publicly available resource.²⁵

Table 1: Totoaba maw seizures recorded in the Environmental Investigation Agency Global Environmental Crime Tracker²⁶ since January 2020. NA=Not Available; *Estimated value according to source, where available, and where bracketed, calculated in US\$ in Dec 2023/teak/hard wood (logs and conversions)

Location of seizure	Month / year	Exporting country	Destination	Description	Number of maws	Weight	Estimated value
Thailand	Nov 23	Mexico	NA	Customs seized two boxes of dried maws, declared as chocolate chips.	NA	40.4	58 million baht (\$1.6 million)
United States	Oct 23	NA	NA	Second largest seizure in Arizona of maws, concealed in shipment of frozen fish fillets.	91	49.4	\$910,000 - \$1,365,000
United States	Apr 23	NA	NA	Port of Nogales Arizona border patrol officers found maws in shipment of frozen fish fillets.	270	109.8	\$2.7 million
Hong Kong	Mar 22	Mexico	Hong Kong	Customs seized air express parcel of dried totoaba maws, declared as gifts and clothing.	NA	1.2	HK\$260,000 (\$33,307)
Vietnam	Mar 22	NA	NA	Totoaba maws hidden in frozen shipments transported via the US to Vietnam.	NA	44.2	NA
China	Jan 22	United States	NA	None provided	9	NA	NA
China	Dec 21	Mexico	NA	None provided	67	NA	NA
China	Dec 21	Mexico	NA	None provided	2	NA	NA
China	Dec 21	Mexico	NA	None provided	7	NA	NA
China	Dec 21	Mexico	NA	None provided	17	NA	NA
China	Dec 21	Mexico	NA	None provided	6	NA	NA
Vietnam	Nov/Dec 21	Mexico	NA	A shipment of totoaba maws were seized by Hanoi customs.	116	28.6	NA
China	Sep 21	Mexico	NA	None provided	8	NA	NA

Table 1 (cont'd): Totoaba maw seizures recorded in the Environmental Investigation Agency Global Environmental Crime Tracker²⁶ since January 2020. NA=Not Available; *Estimated value according to source, where available, and where bracketed, calculated in US\$ in Dec 2023teak/hard wood (logs and conversions)

Location of seizure	Month / year	Exporting country	Destination	Description	Number of maws	Weight	Estimated value
Mexico	Sep 21	Mexico	NA	Maws, contained in 63 ziplock bags, seized at a military checkpoint in Ojos Negros, Mexico.	63	50	NA
Hong Kong	Sep 21	Mexico	NA	Customs seized an air consignment of fresh totoaba maws, declared as frozen fish fillets.	NA	46	HK\$7.4 million (\$948,000)
Mexico	Sep 21	Mexico	NA	Two people convicted of trafficking maws inside 56 plastic wrappers found in vehicle.	NA	30.1	NA
Mexico	Jul/Aug 21	Mexico	NA	Fresh, frozen and dry maws located in four buildings in San Felipe, Baja California.	NA	NA	NA
Hong Kong	Jul 21	Mexico	Vietnam	Customs seized dried totoaba maws, declared as dried fish, in air cargo bound for Vietnam.	39	14.4	HK\$3.3 million (\$423,100)
Mexico	Apr/May 21	Mexico	NA	Totoaba maws seized in Mexicali within a federal operation where three men were captured.	224	131.8	NA
Hong Kong	Oct 20	Mexico	Hong Kong	Customs seized fresh totoaba maws in an air consignment declared as frozen squid.	NA	114	HK\$18 million (\$2.3 million)
Mexico	Oct 20	NA	NA	A person who allegedly tried to fly 187 maws from Mexico to South Korea was detained.	187	NA	More than \$2 million
United States	Aug/Sep-20	NA	NA	Operation Apex agents seized totoaba maws, drugs, diamonds, guns and shark fins.	18	NA	NA
China	Aug 20	Mexico	NA	None provided	288	NA	NA
China	Aug 20	Mexico	NA	None provided	75	NA	NA
United States	Aug 20	Mexico	Taiwan	Dried maws reported to customs authorities of Taiwan, shipped via international courier.	160	19	NA

Table 1 (cont'd): Totoaba maw seizures recorded in the Environmental Investigation Agency Global Environmental Crime Tracker²⁶ since January 2020. NA=Not Available; *Estimated value according to source, where available, and where bracketed, calculated in US\$ in Dec 2023teak/hard wood (logs and conversions)

Location of seizure	Month / year	Exporting country	Destination	Description	Number of maws	Weight	Estimated value
Mexico	Aug 20	Mexico	NA	Driver arrested after Mexican Army found fresh maws in a cooler at military checkpoint in Ojos Negros, Ensenada.	37	30	10 million 584 thousand pesos (\$60,250)
Mexico	Jun/Jul 20	Mexico	NA	Totoaba maw seized by the National Guard at Cancun International Airport.	27	NA	NA
Mexico	Jun/Jul 20	Mexico	Mexico	Totoaba maws in a cardboard box seized at Querétaro Intercontinental Airport.	42	NA	NA
Hong Kong	May/June 20	United States	Hong Kong	Hong Kong customs seized maws airmailed from the US, hidden in 15 Styrofoam boxes.	270	160	HK\$25 million (\$3.2 million)
Mexico	May 20	Mexico	NA	Dehydrated maw found by the canine unit in a cardboard box abandoned at the bus terminal.	127	NA	NA
Mexico	Apr 20	Mexico	NA	Maws seized at a checkpoint on the Mazatlán-Culiacán highway, in abandoned suitcases.	66	NA	NA
Mexico	Mar/Apr 20	Mexico	NA	Two men detained at a military checkpoint, with maws and turtle meat.	26	NA	NA
Mexico	Mar 20	Mexico	China	Maws and meat were seized at Mexico City International Airport and incinerated.	417	NA	NA
Mexico	Feb 20	Mexico	NA	23 bags of totoaba maws were secured at Ciudad Juárez Airport, Chihuahua.	NA	5.5	NA
Mexico	Jan/Feb 20	Mexico	NA	Eight plastic bags of totoaba maws were seized in a home search, along with firearms and drugs.	NA	0.1	NA
				<i>Total (absolute minimum, given data gaps)</i>	<i>N=1,121</i>	<i>361.5kg</i>	

[i: https://eia-international.org/global-environmental-crime-tracker/](https://eia-international.org/global-environmental-crime-tracker/)

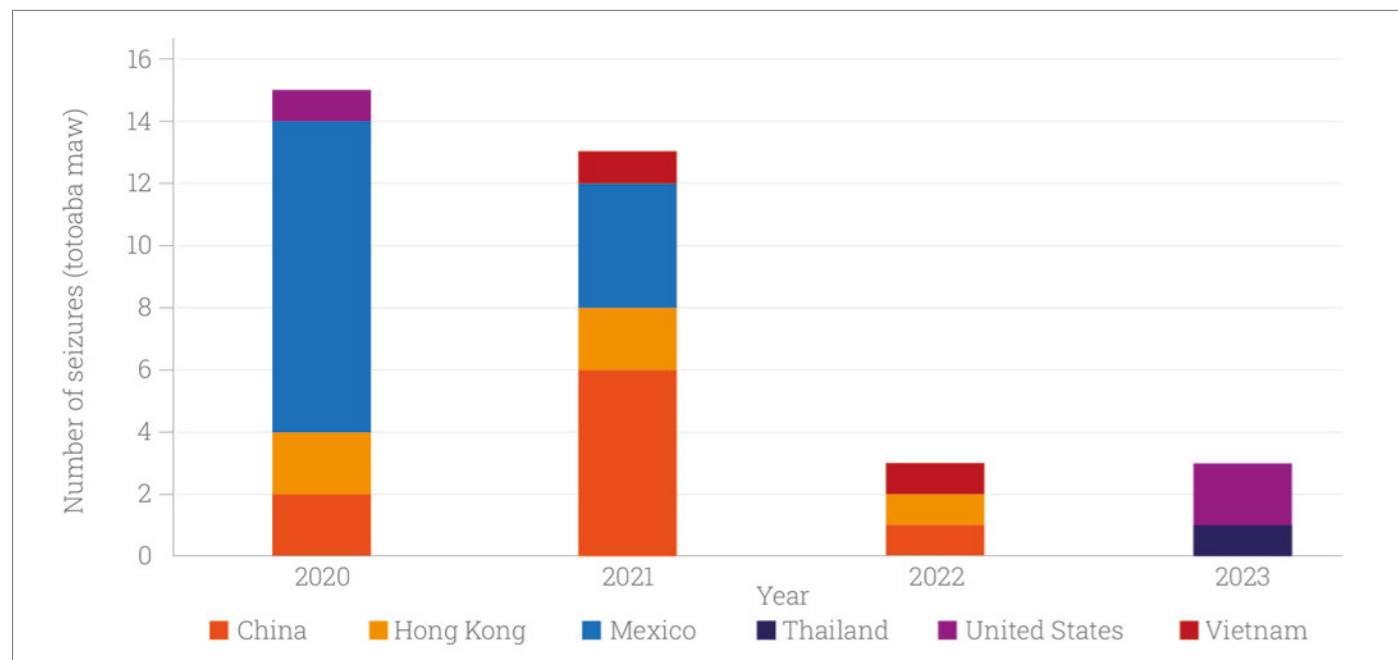


Figure 2: The number and locations of totoaba maw seizures recorded in the Environmental Investigation Agency Global Environmental Crime Tracker database since January 2020

Totoaba maws are frequently concealed among other goods, often other fish products.²⁷ In April 2023, US Customs and Border Protection officers at the Port of Nogales in Arizona seized 270 totoaba swim bladders weighing 110kg concealed within a commercial shipment of frozen fish fillets and with an estimated value of \$2.7 million. This seizure is thought to be the second largest of its kind in the US and the largest totoaba seizure in Arizona to date.

Hong Kong customs seized about 114kg of fresh totoaba maw with an estimated market value of HK\$18 million (~\$2.3 million) at Hong Kong International airport in October 2020.²⁸ This followed a seizure of 160kg of suspected fresh totoaba maws in June 2020, estimated to be worth HK\$25 million (~\$3.2 million) which was the largest recorded Hong Kong seizure according to weight and value.²⁹

Although the availability of illegal totoaba maw has greatly increased on social media since the COVID-19 pandemic, EIA's records suggest the number of totoaba seizures has significantly reduced since 2020, particularly in Mexico and Hong Kong (see Figure 2). There were nine reported seizures in China (eight of which occurred in 2020 and 2021),³⁰ compared to a total of 13 seizures in 2018 and 2019. This apparent reduction of enforcement attention from China contrasts significantly with previous enforcement efforts in 2018 where, based on leads provided by EIA, the Government investigated, uncovered and shut down a smuggling network which had smuggled 15,955 maws since September 2015, arresting 16 people and seizing 2,621 maws in the process.³¹

While China remains the main market for totoaba maws, seizure records indicate emerging markets in Thailand and Vietnam. Given the ongoing availability of totoaba maws online in China, there is clearly an inadequate focus on enforcement efforts and a requirement for a renewed commitment to act from all countries.



Above: Fresh totoaba maws seized in the USA, June 2023.



The wider impact of the fish maw trade

The illegal and unregulated transnational trade in fish maws has impacts extending beyond totoaba and vaquitas.

International trade in croaker maws and associated protected species bycatch in fisheries targeting croakers for their maws poses a global and increasing problem. This needs addressing to protect croakers that are targeted as well as globally threatened small cetaceans and other species, such as elasmobranchs and turtles, which are incidentally bycaught.³²

A recent IUCN Motion 132 for 'Controlling and monitoring trade in croaker swim bladders to protect target croakers and reduce incidental catches of threatened marine megafauna' recommended conducting an analysis on the impacts of the demand for and trade in fish maws on croaker species and threatened marine mega-fauna, regulating trade in fish maws through national laws and developing a potential proposal to list croaker species at CITES.³³

This Motion identified high prices being paid for croaker maws in Bangladesh, India, Papua New Guinea and French Guiana, with associated impacts on both the target croaker as well as on vulnerable, endangered and critically endangered marine megafauna.

One in four cetacean species is threatened with extinction, particularly river and coastal species in Asia.³⁴ Some of these species are vulnerable to bycatch associated with fishing for maws and there is an urgent need to shine a spotlight on and tackle this little-known and poorly reported issue.

Above: Small cetaceans suffer capture in gillnets used to catch fish species for the maw trade.

Conclusions and recommendations

The conservation impact of ongoing illegal totoaba fishing on critically endangered vaquitas is clear. The species will simply not survive without the elimination of the illegal trade in totoaba. It is the predominant driver of illegal fishing in the vaquita's habitat, which results in their entanglement and mortality in gillnets.

Social media has become an important platform for online wildlife trade and an effective channel for the dissemination of market information.³⁵ Here, evidence is provided of increasing illegal online trade in totoaba maws in China and Malaysia, as well as potential new trade in other body parts of totoaba. Seizure records indicate emerging markets in Thailand and Vietnam. Despite this, enforcement efforts have continued to be wholly insufficient and may even have reduced in recent years.

Swift action must be taken by social media companies to remove advertisements for totoaba products from online platforms.

Evidence provided within this report should lead to focused political pressure on source, transit and end-destination countries to increase efforts to dismantle the supply chain and end the illegal totoaba trade.

Specifically, authorities in countries where totoaba maws are transited or traded – including, but not limited to, Mexico, China, Hong Kong, Malaysia, Thailand, Vietnam and the US – need to substantially and urgently increase coordinated, intelligence-led efforts on trafficking investigations and transparent law enforcement operations through the supply chain, resulting in a dramatic increase in seizures, arrests and prosecutions to prevent and shut down criminal networks illegally transiting and trading totoaba maw. This should include a comprehensive examination of all social media platforms that may be utilised to trade in totoaba, both nationally and internationally.

Transnational investigations should result in prosecutions with appropriate penalties to deter repeat offences and dismantling of criminal syndicates responsible for the totoaba trade.

Parties to CITES must swiftly implement these recommendations to effectively combat the illegal totoaba trade and report to the CITES Secretariat on all such measures taken.

We request the CITES Secretariat to undertake an urgent compliance mission to Mexico, as well as missions to China and other countries with totoaba markets, to assess the efficacy of actions to combat the illegal totoaba trade.



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