

Frog Farming Scoping Research

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Note: I spent about 8-10 hours on this, and there is quite limited data, so it's fairly rough and not conclusive.

Overall recommendation

Approximately 1 billion frogs are farmed each year for food, and there is a similar number alive on farms at any one time. Despite this, the vast majority of them (93%) are farmed in China, meaning it is very challenging to advocate for ways to improve their lives. The most promising approach would be via targeting US imports of frog legs, which amount to approximately 58-146 million frogs killed per year. However, there are very few organisations working on this and it's not clear what leverage groups would have to affect US imports or sellers. Overall, I expect that there are more cost-effective ways to help other groups of very populous animals, such as chickens, fish or shrimp.

Executive Summary

- **I estimate there are around 1 billion frogs killed each year for food, with around 950 million alive at any one time.**
 - See my summary spreadsheet [here](#) for calculations and assumptions around lifespan, mortality, etc.
- **FAO statistics suggest that 93% of frogs are farmed in China**, 5% in Vietnam and approx 1% in Thailand.
- Overwhelmingly, China is the most important country for frogs but **the obvious challenge is that there are very limited ways to affect the Chinese animal industry.**
 - This is especially true for frogs as most of them are consumed internally, rather than exported
- That said, the US is a moderate importer of frogs, so there is some scope for advocacy. **The size of US imports is approx. 58-146 million frogs killed per year.**
 - The vast majority of these (99.9%) are imported as frog legs
- For reference, there are approx. 380 million hens and 1.1 billion broiler chickens alive in the US at any one time.
 - Also for reference, there are 400 million fish alive in the US at any one time and my rough guess is that the US imports an additional 800 million farmed fish per year¹
- **The US import market seems more important than the EU market, as the latter is made up primarily of wild frogs caught in Indonesia, rather than farmed frogs.**
 - This rests on the assumption that wild frogs have better lives than farmed frogs, which I feel relatively confident about
 - See [Appendix on EU Imports](#) for more information about the EU

¹ Assuming the US imports [80% of it's seafood](#) and [half of that](#) is from aquaculture

- The data is very limited and poor for most aspects of the frog farming industry so I am very uncertain about key factors like:
 - How long does it take for a frog to reach slaughter weight
 - I've seen disagreements between 2 months to 1 year, which would significantly change the number of frogs alive at any one time
 - To what extent are EU imports mostly wild-caught or farmed? Specifically thinking about how much of Indonesia's frog production which is 80% of EU imports
 - How much of Chinese frogs are exported or consumed internally?
- Ways you could help frogs
 - Support expansion of California-style live import bans to other states and cities (In Defense of Animals [secured a ban on live imports](#) of bullfrogs into California in 2023)
 - You could work with wildlife conservation groups that are worried about frog farms spreading diseases like chytrid fungus.
 - **This would only be limited to live imports (less than 25% of total weight and approx. 2.5-5% of total frog numbers) - roughly 2-7 million frogs per year.**
 - Advocate for federal/state import regulations based on environmental damages, zoonotic diseases and biosecurity
 - E.g. push for stricter biosecurity requirements around frog imports or support requirements for species labelling and origin documentation
 - This would definitely slow the industry down as it's very informal currently
- My recommendations would be:
 - If interested in exploring some advocacy around US imports, it would be worthwhile to speak with In Defense of Animals and the [Bullfrog Action Group](#) which worked on the California Imports Ban
 - Further research (I couldn't find these very easily)
 - What percentage of US frog imports are live vs frozen?
 - Which states are the largest importers of frog legs?
 - **Consider whether frogs are the biggest bang for the buck we can find to help animals or it might be easier and more effective to focus on other highly farmed species e.g. fish, shrimp or chickens.**
 - I expect that there are currently much more cost-effective ways to help fish, shrimp or chickens due to existing nonprofit infrastructure, availability of information, non-Chinese markets and leverage over those supply chains.
 - Also, it's unclear to me who are the right groups to work on frogs (basically no one is working on it now so it would need some effort to get this going)

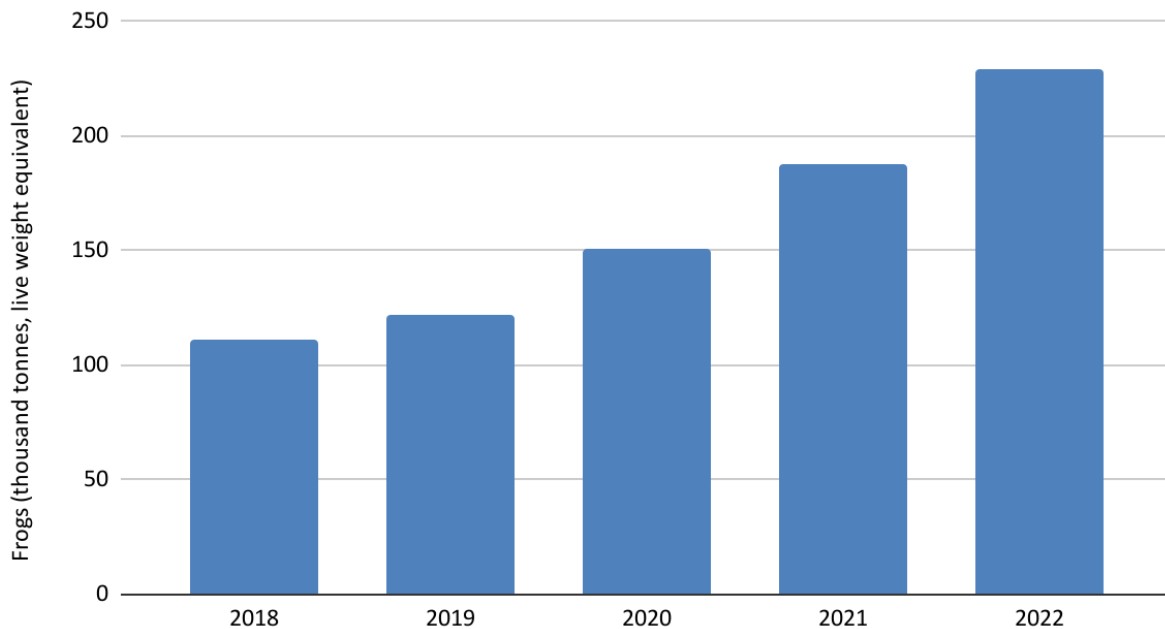
Scale of the problem

Key takeaways

- Based on my calculations, **there are approximately 1 billion frogs killed per year and 950 million alive at any one time**
 - This is because they live for about 8 months before slaughter and there is a 40% mortality rate over their lifetime. This is my best guess based on previous research, mainly by [Saulius](#) from Rethink Priorities, but the data is pretty poor.
- 93% of frogs are farmed in China, the next biggest country is Vietnam with 5%
 - **This poses a problem as it seems like most frogs farmed in China are for internal consumption by the Chinese market**
- The industry is steadily growing year-on-year
- See full figures in my overview spreadsheet [here](#)

Country	Percentage of total tonnage farmed (2022)	2022: Number of frogs killed (millions)	2022: N of frogs alive, inc. mortality (millions)
Brazil	0.1%	0.89	0.83
Cambodia	0.1%	0.89	0.83
China	93.2%	955.93	892.20
Democratic People's Republic of Korea	0.0%	0.07	0.06
Ecuador	0.1%	0.67	0.62
Lao People's Democratic Republic	0.1%	0.53	0.50
Malaysia	0.2%	2.22	2.07
Mexico	0.0%	0.00	0.00
Mexico	0.0%	0.17	0.16
Singapore	0.1%	1.16	1.08
Taiwan Province of China	0.4%	4.53	4.23
Thailand	0.8%	8.04	7.51
Türkiye	0.0%	0.11	0.10
Viet Nam	4.9%	50.07	46.73
Total (tonnes) farmed	1	1025.28	956.93

Global frog production (thousand tonnes, live weight equivalent)



The size of US frog imports

Key takeaways:

- US Import Data (from [United States International Trade Commission](#)) puts US imports of frog legs at approx. 2.9 million kg in 2023. See the spreadsheet of this data [here](#).
- Using estimates of kg of frog's legs to the number of frogs (with 1kg of frog's legs being approx. 20-50 frogs), this leads to the **number of frogs killed for US imports being 58-146 million frogs per year**.
- **81% of these come from China and 19% of them come from Vietnam.**
- US Import data does not say how many of these frogs are farmed vs wild-caught
- The number of frogs alive for US imports is likely to be quite similar to the 58-146 million frogs figure killed per year, due to them being farmed for approx. 8 months (a reduction of 33%) but a 40% mortality rate which drives up overall numbers and balances out both factors.

Country	2023: % of Total Frog Legs	2023: Total frogs for US imports (millions) - lower bound	2023: Total frogs for US imports (millions) - upper bound
China	81%	47.3	118.2
Vietnam	19%	11.0	27.4
Total	100%	58.3	145.6

Welfare conditions

My takeaways:

- It doesn't seem like there are any welfare regulations or strict guidelines followed by frog farmers in China or Vietnam
- There is like a very high density of frogs on each farm (seen in [this video](#))
- The frogs are harvested live in nets and transported to a processing facility or for export. This is likely quite a stressful experience as they are stuffed into small bags with many other frogs
 - When they spend too much time out of the water, this is likely not good for their well-being and video shows farmers hosing them down when they are in nets
- Some (see [PETA Investigation](#) in frog farming in Vietnam) frogs are put into ice to kill them and then their skin is cut off. It seems like ice doesn't always work so they are alive when their skin is cut off
 - **Very gruesome footage above - be warned.**
- Overall, very little information is available here.
- The [best paper](#) I could find on EU-imported frogs seems to suggest they are likely wild-caught rather than farmed.
 - These wild-caught frogs come mostly (80%) from Indonesia and I assume they have a better life than farmed frogs, hence I don't focus much on them.
- Apparently frogs imported into the US are mostly farmed ([source](#)) whereas EU imports are mostly wild-caught
- The main farmed species is the American Bullfrog (although FAO data doesn't specify what it is for China)

Sources:

- [PETA Investigation 1](#) into frog farming in Vietnam
 - Animals are handled extremely poorly
 - They put them in ice to kill/stun but doesn't seem to be perfect
 - They cut and pull their skin off when some are still alive (very gruesome)
 - They then cut their legs off
- [PETA Investigation 2](#) (mainly into wild frog harvesting in Indonesia)
 - They are killed by getting their head chopped off
 - Some seem to keep living/suffering after their head gets cut
- [Video 1](#) - from China
 - Said 100-150 frogs per m²
 - Said frogs are harvested after 2-3 months (much quicker than other estimates)
 - Said they reach 150-300g after 2-3 months then sold
 - They are harvested and transported live and killed at processing facility it seems
 - They spend a lot of time out of water in this process and seems like they occasionally hose them down so they don't get suffer too much / dry out

- [Video 2](#) (starts around 20+ minutes in) - from China
 - Shows very high density of frogs
 - Harvested by nets from breeding tanks

From [Robin De Bois](#) report:

- “In practice, many attempts to establish frog farms failed for different reasons. A major challenge is to switch the diet of frogs from live and moving prey to non-live food (Helfrich et al. 2009; Miles et al. 2004) and provisioning of frogs with live prey is expensive and too time consuming to make it profitable (Dittrich et al. 2017). In addition, cannibalism among tadpoles causes high mortality (Nguyen 2017; Pandian & Marian 1986).”
- Small-scale fly farms are present in nearly all frog farms for adult frog feeding ([source](#))

How long are they farmed until Slaughter?

- [CNN article](#) says 7-8 months
- Research [here](#) says 3-4 months to reach 0.25kg slaughter weight
- [Video 1](#)
 - Said frogs are harvested after 2-3 months (much quicker than other estimates)
 - Said they reach 150-300g after 2-3 months then sold
- Saulius thinks 10 months based on [his research](#)
 - Also 50% mortality over their lifetime
- Overall, I updated Saulius’ estimate down to 8 months as all other sources I found expected less time than him.

Potential interventions to help

What has already been done:

- In Defense of Animals [secured a ban on live imports](#) of bullfrogs into California in 2023
 - According to old data shown [here](#), approx. 25% of frog imports to the US are live
- In 2012, [Santa Cruz also banned](#) the importation, sale, release, and possession of the American bullfrog (main farmed species)
- In May 2024, Carrefour (a major French retailer) stopped selling frog legs from Indonesia due to an [investigation and campaign from PETA](#) in Indonesia showing the cruelty of the industry

Possible ways to help frogs (not prioritised, just a rough list):

- Support expansion of California-style live import bans to other states and cities
 - You could work with wildlife conservation groups that are worried about frog farms spreading diseases like chytrid fungus.
 - This would only be limited to live imports (approx. 2.5-5% of total frog numbers) but could be a start.

- Investigations and campaigns against retailers who sell frog legs to stop them from selling this product
 - E.g. investigation in Asia as [PETA did](#) against Carrefour
 - However, it's not clear how many major retailers actually stock them or how much of their sales is via formal channels vs informal small markets
 - It may just end up with some suppliers getting dropped, rather than stopping retailers selling frog legs more generally
 - I couldn't find a source besides [here](#) but also "Other French supermarket chains Thiriet and Picard have a permanent ban on all frog meat,"
- Advocate for import regulations based on environmental damages, zoonotic diseases and biosecurity
 - Advocate for stricter biosecurity requirements around frog imports
 - Support requirements for species labelling and origin documentation (this would definitely slow the industry down as it's very informal currently)
 - E.g. [See CITES work](#) on amphibian diseases
 - Again, can ally with wildlife conservation groups in the US
- Work with major importers to adopt voluntary welfare commitments
 - Might be challenging as I assume the market is mostly many small Asian/ethnic supermarkets so the market may be very dispersed
 - That said, they may be susceptible to pressure
- Create comprehensive welfare guidelines for frog farming
 - Seems tough as not a premium product with very little labelling and quite an informal market
 - **No clear leverage to apply to farms in China**

Overall recommendations

- If interested in exploring some advocacy around US imports, it would be worthwhile to speak with In Defense of Animals and the [Bullfrog Action Group](#) which worked on the California Imports Ban
- Further research (I couldn't find these very easily)
 - What percentage of US frog imports are live vs frozen?
 - Which states are the largest importers of frog legs?
- **Consider whether frogs are the biggest bang for the buck we can find to help animals or it might be easier and more effective to focus on other species e.g. fish or chickens.**
 - I expect that there are currently much more cost-effective ways to help fish or chickens due to existing nonprofit infrastructure, availability of information, non-Chinese markets and leverage over those supply chains.
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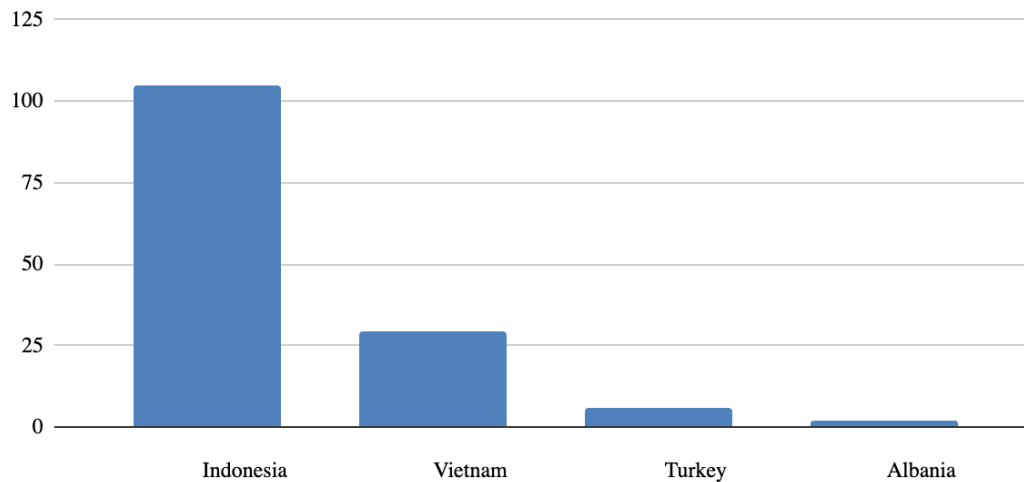
Appendix: EU imports

Note: I deprioritised the EU due to imports largely being from wild-caught frogs, which likely have better lives than farmed frogs

Production for the EU

- See the spreadsheet with all calculations and numbers [here](#)
- Data comes from [Auliya et al. \(2023\)](#)

Frogs exported per year (millions, mid point)

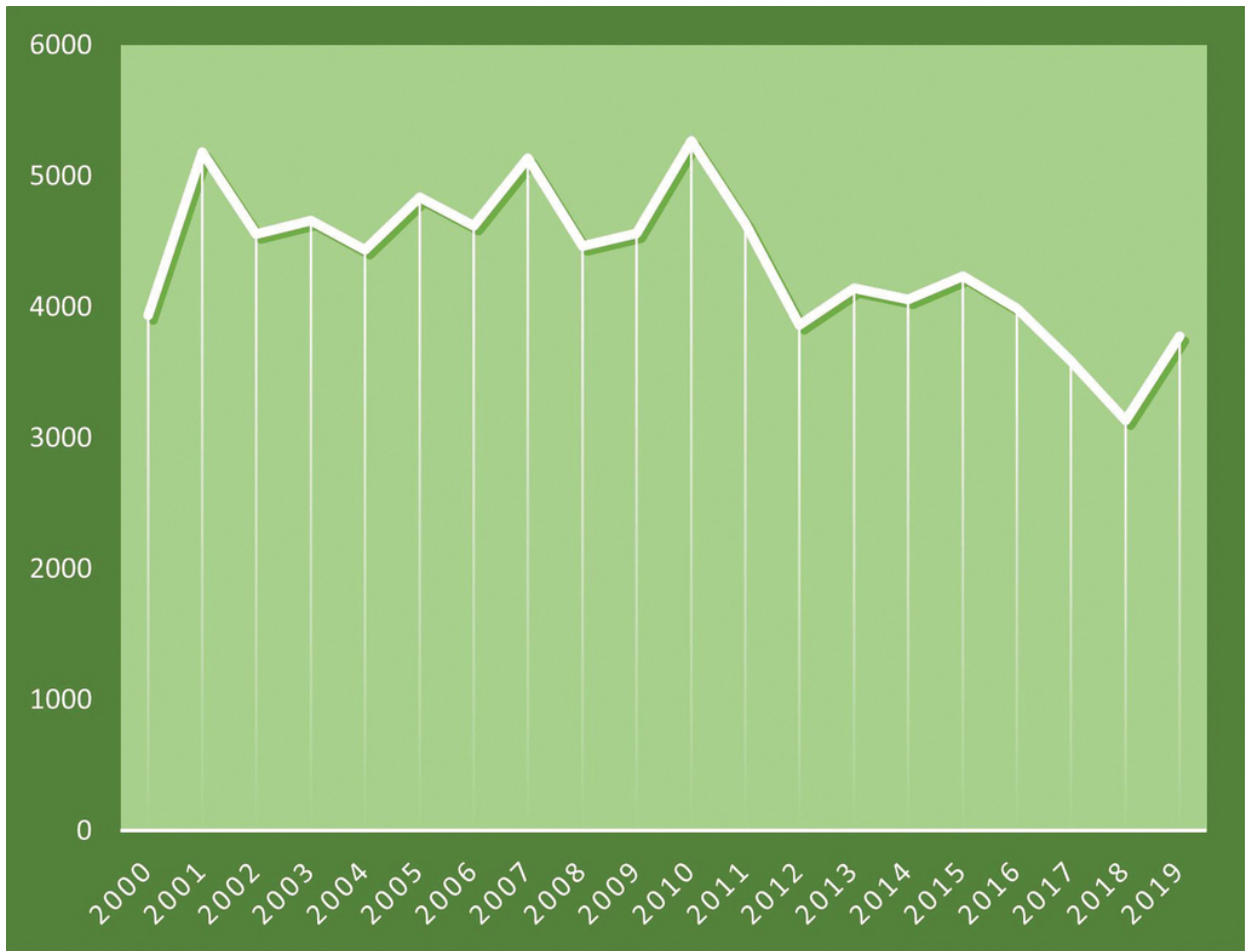


Major suppliers of frogs' legs into the EU

Major suppliers of frogs' legs into the EU	Weight (tonnes) exported from 2010-2019	Frogs exported per year (millions, mid point)	Percentage of total exports
Indonesia	30019	105	74%
Vietnam	8439	30	21%
Turkey	1594	6	4%
Albania	587	2	1%
Total	40639	142	100%

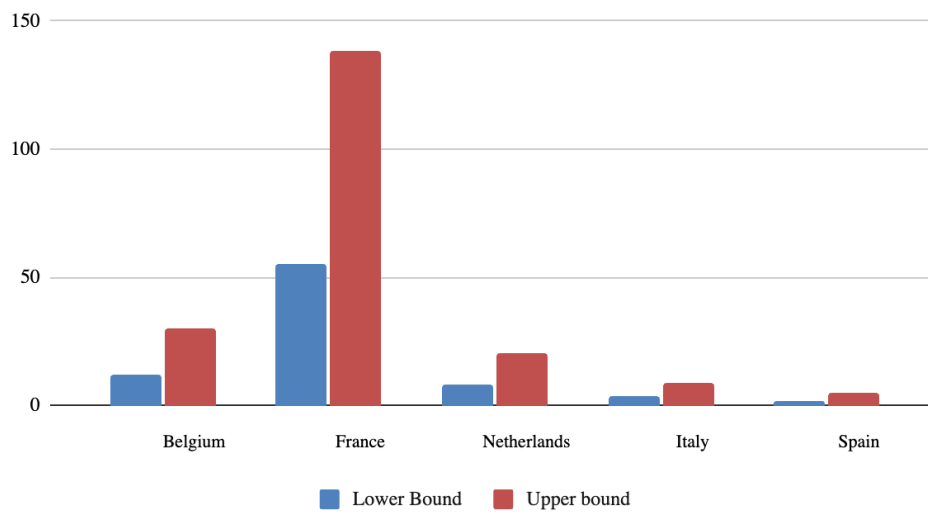
- 80% of French imports originally come from Indonesia ([Auliya et al. 2023](#))

EU's frogs' legs imports (tonnes) over 2000-2019



Source: Auliya et al. (2023)

Frogs consumed per European country per year (millions)



Where most consumption in EU is

Major EU importers	Import frogs (tonnes)	Consumed frogs (tonnes) from 2010-2019	Lower Bound: Frogs consumed per year (millions)	Upper bound: Frogs consumed per year (millions)	Percentage of total consumed in EU
Belgium	28429	5970	12	30	15%
France	6794	27714	55	139	69%
Netherlands	2622	4032	8	20	10%
Italy	1787	1787	4	9	4%
Spain	923	923	2	5	2%
Total	40556	40427	81	202	100%

- According to [Auliya et al. \(2023\)](#):

- “In the study period 2010 to 2019, total imports of frog’s legs into the EU numbered 40.7 million kg. This total weight can be converted, when 1 kg equals 20–50 individual frogs (Veith et al. 2000), to at least 814 million and up to roughly 2 billion frogs.”
 - **This is approximately 80-200 million frogs imported into the EU each year.**
- Within the EU, Belgium re-exports a large part of its imports to other EU countries. For example, Belgium re-exported 20,920 tonnes to France (> 73% of all its imports in the study period) and 1410 tonnes to the Netherlands (ca. 5% of all its imports in the study period) and, accordingly, Belgium consumed 21% of its total imports.
 - Note to self: Some French import stats ignore this and just state original export country (e.g. Indonesia).

Are EU imports wild-caught or farmed?

From Auliya et al (2023):

- Results of the online market Survey in December 20221 – found 20 products
 - 11 products from Indonesia, 3 from Vietnam, one from France and one from Turkey
 - Six products don’t give a species name (illegal according to EU law which needs to give species and country of origin)
 - In eight sources, origin is highlighted as “wild”, three refer to “fishing” (e.g. fresh water, rice fields) and, in one, “collected” is indicated as the source. **Not a single product, however, indicates a captive bred or farmed source.**
 - Weird!
- Also, “An additional market survey through Google Alert for more than 10 weeks (see Methods) identified 38 commercial offers for frogs’ legs (20 from Belgium and 18 from France). Regarding the offers from France, trends from the December 2021 study are largely confirmed, with only one offer indicating an origin “Vietnam and/or Indonesia captive bred”.
- Despite government support programmes for the commercial breeding of frogs, the initiative remained less promising mainly because costs of harvesting wild-caught native species are lower (Kusrini 2005). Not only are high costs of breeding bullfrogs leading many farms to stop breeding *L. catesbeianus*, the susceptibility of the species to disease is also a factor (Kusrini and Alford 2006).
- More recent information on frog farms in Indonesia is not available, but examination of stable isotopes of frogs’ legs in the trade from Indonesia indicate that commercial frog farms are still not established and that wild-sourced populations are being harvested, not farmed species (Dittrich et al. 2017).

Other/Older US Data

Corroborating data from [CITES](#) (page 101) about number of US frog imports:

- “Within our 5-year study period in addition to the American bullfrogs imported from western hemisphere countries of origin, 10,450,767 individual American bullfrogs (including live animals, bodies, legs, specimens, skeletons, and unspecified material) plus 17,256,215.95 kilograms (including live animals, legs, meat) were also collectively imported from the following western hemisphere country/region of origins described in LEMIS as: China, Republic of Korea, Malaysia, Thailand, Taiwan Province of 96 China, and Viet Nam.”
- This means 2 million bullfrogs + approx. 3.5 million kg imported into the US per year from East Asia (given it was a 5-year study).
 - Given 0.25kg slaughter weight, that is 16 million frogs imported into the US each year from Asia alone.
 - **However, if all of that meat is frog’s legs, where 1kg = 20-50 frogs, this leads to 72-177 million frogs killed for imports each year.**
 - These are similar numbers to [US import data](#) of 58-146 million frogs per year.

How much of US frog imports are farmed?

- “Most of [the American bullfrogs] come from frog farms in Taiwan and China and are infected by the chytrid fungus, which has driven 100 amphibian species to complete extinction in recent decades,” - [source](#) (2012)
- “While frogs imported into the USA are mostly farmed, the European Union’s imports until today mostly derive from wildcaught specimens from Indonesia.” - [source](#)

From [FrogLife](#)

- The USA imports four species: the bullfrog *Lithobates catesbeianus* from Mexico, Ecuador and China; the East Asian *Hoplobatrachus rugulosus* from Thailand and Vietnam; Forrer’s leopard frog *Lithobates forreri* from Mexico; and the pig frog *Lithobates grylio* from China. The dominant species was *L. catesbeianus*, with 14.5 thousand tonnes imported as live individuals or frozen meat over the period 2015-20

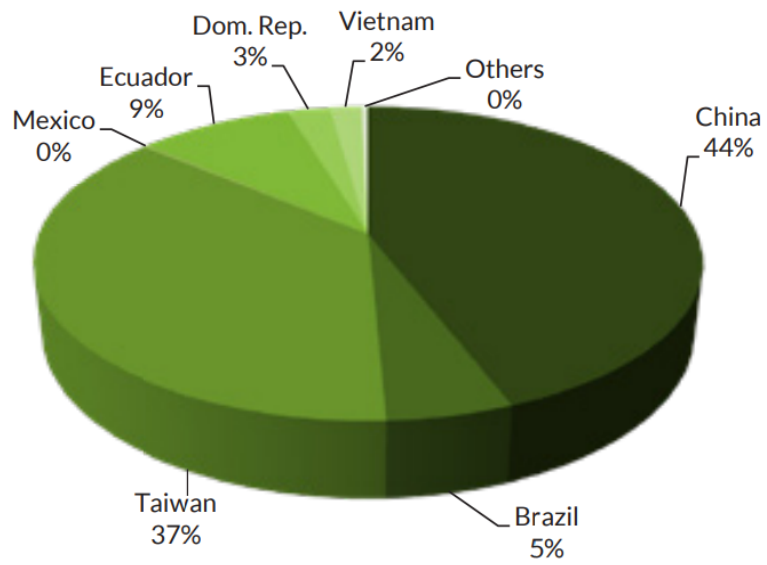


FIGURE 4
Countries of origin for US imports of American
bullfrogs (*Lithobates catesbeianus*, recorded as
Rana catesbeiana, i.e. the old nomenclature), 2000-
2009 (US LEMIS Database).

Source: [Wildlife Defenders](#)

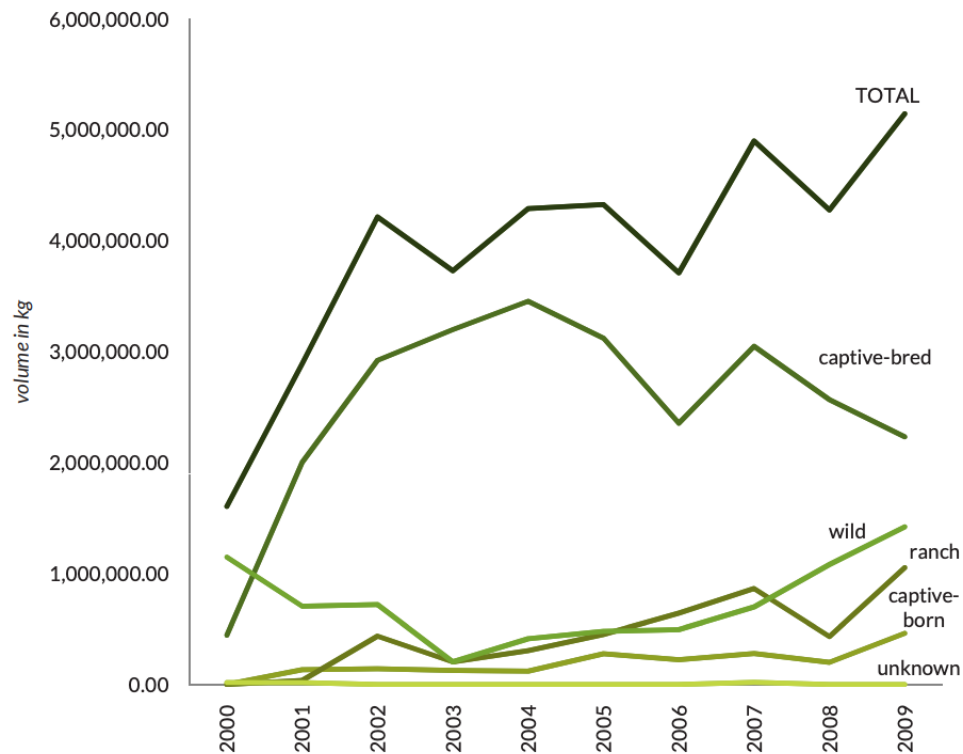


FIGURE 8
US imports
of American
bullfrogs
(*Lithobates
catesbeianus*)
per source,
2000-2009
(US LEMIS
Database)

Source: [Wildlife Defenders](#)

Other facts:

- These data correspond with import statistics of the USA, which record 34.7% of frogs (437 tonnes) coming from Taiwan (18.6% as frogs' legs).