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The US Trade in *Tamandua tetradactyla*

When animals for exhibit, breeding and/or interpretive program purposes cannot be sourced from other zoological institutions, zoos in the United States very rarely participate in the direct collection of specimens from the wild. Instead, they rely upon importers and animal dealers to provide the animals they desire. Relying upon such commercial sources, while mitigating costs relative to staff time and logistical planning, may also be influenced by the presumption that outside sources could accomplish the importation of wild specimens through established (presumably efficient) processes. This presumption may be unfounded.

The Pangolin, Aardvark and Xenarthra TAG (PAXTAG), a taxon advisory group of the Association of Zoos and Aquariums (AZA), has monitored data on the commercial trade in associated taxa since 2000. While the original intent had been to simply assess the potential availability of various species as it considered the TAG's ability for building sustainable populations of zoo-held species, the data raises questions about the volume of the commercial trade in xenarthrans and the disproportionately small percentage of imported specimens that ultimately appear within managed zoological collections.

Wildlife and wildlife products legally imported into the United States must be declared at their port of entry through the filing of a Form 3-177, *Declaration for Importation or Exportation of Fish or Wildlife*. Information from these forms is entered into the US Fish and Wildlife Service (USFWS) Law Enforcement Management Information System (LEMIS) database. Through a Freedom of Information Act (FOIA) request, USFWS provided data to the PAXTAG on the number of pangolins, aardvarks and xenarthrans declared to be imported into the United States from September, 2000 until September, 2015. The data relative to the importation of tamanduas were analyzed in detail, as trade in this species had become, at least anecdotally, a topic of concern.

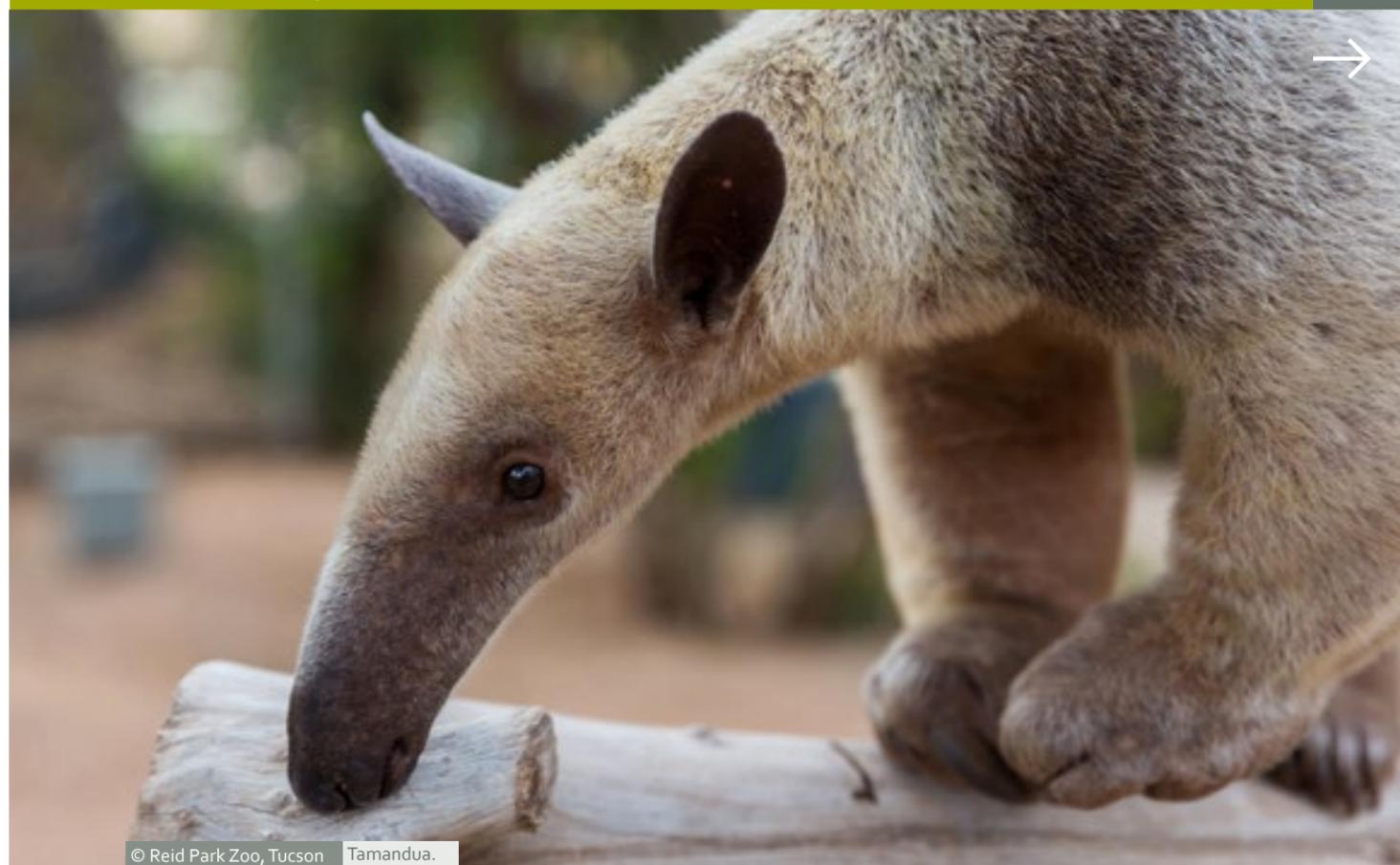
The LEMIS data related to tamanduas (both *Tamandua tetradactyla* and *T. mexicana*) were sorted so that individual animals that were exported and subsequently re-imported (for short-term purposes, such as public appearances and marketing promotions) were eliminated from the data set, as were individuals that passed through a given US port "in transit" to a different international destination. There were very few individuals (n=3) identified by importers as *Tamandua mexicana*, and one animal that had been identified only to the genus level. These animals were deleted from the dataset as they did not contribute to the overall findings of the investigation.

Information from the US regional studbook for southern tamandua (*Tamandua tetradactyla*) was compared to the data for the past 15 years that resulted from a global taxon report generated via ZIMS, the Zoological Management Information System, a product of ISIS. This process validated the completeness of the studbook data at least in relation to those institutions in the US that are ISIS contributors.

The challenge in assessing the role of zoos relative to the larger commercial trade in wildlife lies in the nature of the three datasets that have to be reconciled. LEMIS data is a comprehensive compilation of legally imported animals, but often non-specific about individual importers in as much as the names of these individuals are sometimes redacted in the reports provided under FOIA. Furthermore, animals that are acquired by importers often remain within their facilities until sold, often via intermediaries. Thus, there is no direct connection of individual animals that were acquired by importers and the zoos in which they ultimately may appear.

ZIMS data is a detailed picture of the collections of those institutions that participate in the reporting to ISIS, but this is not an all-inclusive list of zoological facilities. In addition, reporting institutions will often generalize non-zoos sources of animals as "PUBLIC" or "PRIVATE." Studbook data can address a broader set of participants, but seldom reflects specimens held by private individuals or dealers. While it is known that tamanduas sometimes appear in the pet trade in the US, an objective assessment of the number of pet tamanduas is lacking.

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Analysis and cross-referencing of the three data set reveals that 581 *Tamandua tetradactyla* were declared to be imported into the United States over the past 15 years. In striking contrast, only 50 wild-caught imports entered the studbook population over the same timeframe. Through both imports and captive births a total of 148 tamanduas passed through the studbook population during the period examined. Of these, 63 were zoo-born specimens, leaving 85 individuals that were either acquired from known importers, acquired from intermediaries, or acquired as captive born specimens from non-zoo sources.

Even if all of this latter group were to have actually been imported individuals, the total commercial trade in this species in the US would be seven-fold the number of individuals that appear in zoos that participate in collective management strategies. This suggests the conclusion that the number of tamanduas actually acquired by cooperating zoos is relatively small (>14.6%) in respect to the total volume of US trade in the species. Nonetheless, the contribution of non-zoo sources to the North American managed tamandua population has been significant.

Three importers alone accounted for minimum of 339 acquired during the timeframe evaluated (58.3% of the total number of imported tamanduas). Of these, only 46 are directly traceable to those importers although, through intermediaries and captive breeding, the number of tamanduas those three importers supplied to the studbook population could be as many as 81 (13.6% to 23.9% of the total they imported).

The fate of the imported animals that do not appear in the studbook remains a question. The few tamanduas that were directly imported by zoos, or acquired through small importers that have close ties with zoos, have seemingly good survival rates. As previously acknowledged, it is known that some pet tamanduas exist in the United States. However, if there were

truly a large-scale pet trade in tamanduas, the frequency with which former pets (having been relinquished by their owners) appeared in zoological collections would be expected to be greater than is evident. This is the pattern seen with many other exotic pet species, such as kinkajous, coatimundis, and even primates. The former pet tamanduas would appear as originating from "unknown" sources and thus would comprise a subset of some 35 animals that are not directly traced to zoos or specific importers. Anecdotal evidence would seemingly suggest that private entities (other than those that would report them to the studbook keeper) only rarely hold tamanduas. Informal verbal inquiries of non-traditional zoos ("rescue zoos") failed to identify any former pet tamanduas entering their collections.





© Guillermo Ferraris Tamandua.

Tamanduas can prove to be challenging to care for. Dietary issues and related nutritional disorders are matters that often undermine the species' ability to thrive in captivity. Behavioral and spatial requirements can also make tamanduas ill-suited for the novice caretaker. Nonetheless, there is a consistent trend of increase in the commercial importation of tamanduas, and this trend is increasing slowly but exponentially. (See graph.)

A collaborative campaign of the IUCN SSC Anteater, Sloth and Armadillo Specialist Group, the Pangolin, Aardvark and Xenarthra TAG, and the Southern Tamandua Species Survival Plan has recently been undertaken to discourage the pet trade in tamanduas. Funded by the Reid Park Zoo (Tucson, Arizona), 300 posters were printed in each of three languages (English, Spanish and Portuguese) and distributed at the 22nd congress of the ALPZA (Asociación Latinoamericana de Parques Zoológicos y Acuarios) that took place in June, 2015.

In October, 2015 there was a workshop on the Nutrition of Insectivorous Mammals sponsored by Busch Gardens (Tampa, FL) and the San Antonio (TX) Zoo at which new approaches to the feeding of myrmecophagous mammals were discussed. While advances are being made to better the husbandry of xenarthrans under the care of zoo professionals, the degree to which the survival of tamanduas in enhanced while in the possession of importers and pet owners is yet to be seen.

Persons responsible for zoo animal acquisition decisions are encouraged to carefully consider the sources of their collection animals. Large-scale importers may be driving a demand in exotic species that is much greater in volume than that which serves the zoo community itself. By resorting to the expediency of purchasing animals from commercial entities, zoos may be having much larger indirect toll on wild populations than would be immediately apparent. This is not a circumstance limited to tamanduas. A preliminary assessment of data relative to Linne's two-toed sloth, *Choloepus didactylus*, would indicate that that species is subject to at least 50% more commercial trade, with equally poor representation in the managed population.

Those zoos already in possession of captive xenarthrans are encouraged to help build a sustainable captive population through breeding the respective species, as well as to stay abreast of developments in the husbandry of the taxa. ■

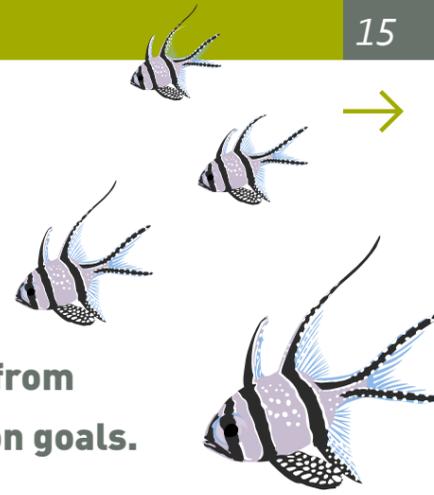
Graph Tamanduas imported into the USA



Scott Dowd – Project Piaba

Fishes as Pets: Buy a Fish, Save a Tree

How the aquarium fish hobby, with encouragement from zoos and aquariums can accomplish our conservation goals.



Our zoo and aquarium industry clearly prioritizes captive breeding as the most sustainable and environmentally benign way to source specimens for our exhibits, and certainly for the pet trade. However, Wild capture of live fishes for public aquariums and the home aquarium hobby can, in cases, go far beyond "sustainable". In fact, wild capture fisheries can even result in an overwhelming benefit for the environment and people living in areas of biological importance. Zoos and aquariums should be leaders in showcasing these examples through our exhibits.

There is a particular example in Brazil's Rio Negro basin, which has been elucidated and studied by Project Piaba. Here, aquarium fish can be collected in very high volumes (40,000,000+/year) and still result in negligible, if any, negative impact on the long term stability of the wild stocks. Interestingly, while the fish stocks are extremely resilient during natural environmental cycles, they are very sensitive to longer environmental disruptions such as those resulting from environmentally destructive practices. In the Barcelos region of the Rio Negro, exports for the global aquarium trade represent at least 60% of the cash income for the area, and provide the basis for the majority of livelihoods for the people. Since the fishery is of such importance to the residents, there is a very powerful and effective driver of environmental stewardship ingrained in the local culture. If one were to visit the town of Barcelos (the hub of the regional fishery) and introduced themselves as an assessor for a timber or mining company planning to move in to the area, that person would very likely have a very uncomfortable day.

The benefit from the protection of the fishing communities is not limited to the species being selected for capture and export. In order to maintain a long lasting and robust aquarium fishery, the entire ecosystem must be safeguarded, and that is exactly what has been happening in Barcelos for more than 60 years. Pink river dolphins, macaws, monkeys (and many other IUCN red listed species) all benefit by having the habitat that they depend on protected by the fishing communities. The very high quantity of carbon locked in the giant trees of the Amazon remains sequestered in these protected areas and the tropical forest continues its atmospheric scrubbing processes. The fishing communities have a lasting source of cash income alleviates poverty and assures them that they will be able to feed their children today and in the days to come.

Project Piaba did not conceive of nor initiate this model. The positive relation between the fishery, forest, forest-dwelling communities and the fish trade was in place when Project Piaba researchers first visited the area. However, it quickly became apparent that this interdependent system could be very powerful. With such encouraging findings related to the Brazilian case, it was natural for the conservation community to gain interest in aquarium fisheries as a mechanism for environmental protection and poverty alleviation. The IUCN Freshwater Fish Specialist Group has since established the Home Aquarium Fish Sub-group (HAFSG).

The HAFSG developed several goals, which include:

- To identify, validate, and promote the conservation and wise management of wild populations of tropical fishes that are part of the home aquarium trade, as well as the ecosystems where they are found.
- To support sustainable, socioeconomic, and environmental benefits for home aquarium fishing communities, especially living in regions of biological importance.
- To develop and implement solutions that result in the most robust market for home aquarium fish that result in environmental protectionism, poverty alleviation, and climate stability.

The HAFSG is currently developing a white paper which will list a variety of examples of where the aquarium trade currently results in environmental and socioeconomic benefits. It will also highlight regions where fisheries could reasonably be adapted to result in environmental benefits and areas where the aquarium trade could be considered as part of a conservation strategy.

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