



THERE IS NO PROPOSED BAN ON THE U.S. AMPHIBIAN TRADE;

THE U.S. GOVERNMENT IS ONLY PLANNING TO ASK YOUR OPINION!

The Amphibian Ark has received a number of emails/calls concerning rumors of a ban on amphibian trade in the U.S. Below we outline the facts, the implications, the opportunities for you, and our official position so that our US partners and fans can make informed decisions for themselves. We hope that you find this information useful, and we welcome your feedback (KevinZ@AmphibianArk.org).

The Facts About Disease and Commerce:

- Infections with *Batrachochytrium dendrobatidis* (*Bd*) and ranavirus can be deadly for amphibians; *Bd* alone has already affected over 350 species and caused the decline or extinction of about 200 of them (1-2).
- Although both diseases are already widespread, they occur in regional strains that can affect amphibians differently (3-17), i.e., the potential remains for these diseases to do much more harm with further spread.
- Trade plays an unequivocally significant role in spreading both diseases (6, 8, 14, 16, 18-25).
- While amphibian trade into, out of, and within the US is considerable (14, 16, 19-20, 23-27), there are currently no regulations to minimize the risk of spreading disease.

The Facts About Proposed Changes in Regulation:

- In May 2008, the World Organization for Animal Health (OIE) declared infections with *Bd* and ranavirus as ‘notifiable diseases’ as a first step to promoting global monitoring and control (22). Countries that are members of the OIE are advised to report semi-annually on the status of notifiable diseases in their country and what they are doing to control them. The OIE does make recommendations regarding control, but details and implementation of regulation are left to the individual member countries. Although the US is a member of the OIE, it did not take immediate action following the OIE’s 2008 declaration.
- On 9 September 2009, Defenders of Wildlife filed [petitions](#) with the US Department of the Interior and the US Department of Agriculture encouraging them to follow the advice of the OIE and take some action to regulate (**not ban**) amphibian trade in an effort to reduce the spread of disease, although specific details of how such regulation would be implemented (e.g., mandatory pre-shipment testing) have not yet been detailed.
- In response to having been petitioned, the USFWS recently announced their intention to publish a notice in the Federal Register, perhaps within the next 2 months.





Although this announcement has created a stir among hobbyists fearing an imminent ban, there is no need to worry at this time. Publishing a notice in the Federal Register does not represent enactment of new regulation; this is how the US government invites public feedback on such petitions. The government simply wants to know whether people think that regulating and reducing disease in the amphibian trade is a good idea. Specific details of how regulation would be implemented, if it occurs, would happen at a later date.

The Implications:

- After the notice in the Federal Register receives feedback, new regulation may eventually be written to detail the exact requirements (e.g., mandatory pre-shipment testing, how many, how often, etc.). Based on past experience, the time between publication in the Register and creation of new regulation is in years. That new regulation might lead to 2 outcomes. First, the trade of amphibians into, out of, and within the US could involve an extra step (disease testing for certification) and associated extra cost, but will otherwise continue as it always has. Similar regulation exists to regulate trade in salmonid fish, also to control the spread of disease, and trade has not ceased. Second, the spread of these diseases will be reduced, leading to healthier animals in captivity and in the wild. However, this is speculation until we see if new regulation is proposed and what details it contains.

The Opportunity:

- After the notice is published in the Federal Register, you will have time (typically 60-90 days) to comment, giving the government your feedback on whether disease should be regulated and reduced in the amphibian trade. This is an important part of the process and the more feedback the government receives, the more informed subsequent decisions will be. If you also have strong feelings about what the new regulation should (or should not) be, this is an opportunity to be heard. But primarily, they will likely be asking whether you want to see a reduction of disease in the amphibian trade.

The AArk's Position:

- We will comment in the Federal Register (and encourage our partners to do the same) that regulation to effectively reduce the role of amphibian trade in spreading disease can only be a good thing for captive and wild amphibians. We will then encourage development of some forum where experts and stakeholders can get together for productive discussion of whether, and exactly how, regulation might effectively diminish disease in the trade. But the first step is to let the government know that you think that reducing disease in the amphibian trade is a good thing!



For further reading, we highly recommend: www.int-res.com/articles/dao2009/special/fungus/fungpp7.pdf

Literature Cited:

1. Fisher, M. C., T. W. J. Garner, & S. F. Walker. 2009 - Global emergence of *Batrachochytrium dendrobatidis* and amphibian chytridiomycosis in space, time, and host. *Annu. Rev. Microbiol.*, 63: 291-310.
2. Skerratt, L. F., Berger, L., Speare, R., Cashins, S., McDonald, K. R., Phillott, A., Hines, H. & Kenyon, N., 2007. - Spread of chytridiomycosis has caused the rapid global decline and extinction of frogs. *EcoHealth*, 4: 125–134.
3. Berger L, Hyatt AD, Speare R, Longcore JE. 2005a. Life cycle stages of *Batrachochytrium dendrobatidis* Longcore et al. 1999, the amphibian chytrid. *Dis. Aquat. Organ.* 68:51–63
4. Berger, L., G. Marantelli, L. F. Skerratt, And R. Speare. 2005b. Virulence of the amphibian chytrid fungus, *Batrachochytrium dendrobatidis*, varies with the strain. *Dis. Aq. Org.* 68(1):47–50.
5. Chinchar VG. 2002. Ranaviruses (family Iridoviridae): Emerging coldblooded killers. *Archives of Virology* 147: 447–470.
6. Fisher MC, Garner TWJ (2007) The relationship between the emergence of *Batrachochytrium dendrobatidis*, the international trade in amphibians and introduced amphibian species. *Fungal Biol Rev* 21: 2–9.
7. Fisher MC, Bosch J, Yin ZK, Stead D, Walker J, et al. 2009. Proteomic and phenotypic profiling of an emerging pathogen of amphibians, *Batrachochytrium dendrobatidis*, shows that genotype is linked to virulence. *Mol. Ecol.* 18:415–29
8. Goka K, Yokoyama, J., Une, Y., Kuroki, T., Suzuki, K., Nakahara, M., Kobayashi, A., Inaba, S., Mizutani, T. & Hyatt, A. D., 2009. - Amphibian chytridiomycosis in Japan: distribution, haplotypes and possible route of entry into Japan. *Molec. Ecol.*, 18: 4757-4774.
9. Green, D. E., K. A. Converse, And A. K. Schrader. 2002. Epizootiology of sixty-four amphibian morbidity and mortality events in the USA, 1996–2001. *Annals of the New York Academy of Sciences* 969: 323–339
10. James TY, Litvintseva AP, Vilgalys R, Morgan JA, Taylor JW, et al. 2009. Rapid global expansion of the fungal disease chytridiomycosis into declining and healthy amphibian populations. *PLoS Pathog.* 5(5):
11. Longcore JR, Longcore JE, Pessier AP, Halteman WA. 2007. Chytridiomycosis widespread in anurans of northeastern United States. *Journal of Wildlife Management* 71: 435–444.
12. Morehouse EA, James TY, Ganley ARD, Vilgalys R, Berger L, Murphy PJ, Longcore JE. 2003. Multilocus sequence typing suggests the chytrid pathogen of amphibians is a recently emerged clone. *Molecular Ecology* 12:395–403.





13. Morgan JAT, Vredenburg V, Rachowicz LJ, Knapp RA and others (2007) Enigmatic amphibian declines and emerging infectious disease: population genetics of the frog-killing fungus *Batrachochytrium dendrobatidis*. Proc Natl Acad Sci USA 104:13845–13850
14. Picco, A.M. and Collins, J.P. (2008) Amphibian commerce as a likely source of pathogen pollution. Conserv. Biol. 22, 1582–1589
15. Retallick RW, Miera V. 2007. Strain differences in the amphibian chytrid *Batrachochytrium dendrobatidis* and nonpermanent, sublethal effects of infection. Dis. Aquat. Organ. 75:201–7
16. Schloegel, L.M. et al. (2009) Magnitude of the US trade in amphibians and presence of *Batrachochytrium dendrobatidis* and ranavirus infection in imported North American bullfrogs (*Rana catesbeiana*). Biol. Conserv. 142, 1420–1426
17. Storfer, A. et al. (2007) Phylogenetic concordance analysis shows an emerging pathogen is novel and endemic. Ecol. Lett. 10, 1075–1083
18. Daszak, P., Cunningham, A.A., and Hyatt, A.D. 2003. Infectious disease and amphibian population declines. *Diversity and Distributions* 9: 141–150;
19. Garner TW, Perkins M, Govindarajulu P, Seglie D, Walker S, et al. 2006. The emerging amphibian pathogen *Batrachochytrium dendrobatidis* globally infects introduced populations of the North American bullfrog, *Rana catesbeiana*. Biol. Lett. 2:455–59
20. Hanselmann, R., Rodríguez, A., Lampo, M., Fajardo-Ramos, L., Aguirre, A.A., Kilpatrick, A.M., Rodríguez, J.P., and Daszak, P. 2004. Presence of an emerging pathogen of amphibians in introduced bullfrogs *Rana catesbeiana* in Venezuela. *Biological Conservation* 120:115-119
21. Jancovich JK, Davidson EW, Parameswaran N, Mao J and others (2005) Evidence for emergence of an amphibian iridoviral disease because of human-enhanced spread. Mol Ecol 14:213–224
22. Rowley JJJ, et al. (2007) Survey for the amphibian chytrid *Batrachochytrium dendrobatidis* in Hong Kong in native amphibians and in the international amphibian trade. Dis Aquat Organ 78:87–95.
23. Schloegel LM, Daszak P, Cunningham AA, Speare R, Hill B. 2010. Two amphibian diseases, chytridiomycosis and ranaviral disease, are now globally notifiable to the World Organization for Animal Health (OIE): an assessment. Dis Aquat Org
24. Weldon C., Du Preez, L. H., Hyatt, A. D., Muller, R. & Speare, R., 2004. - Origin of the amphibian chytrid fungus. Emerging Infectious Dis., 10: 2100-2105.
25. Warkentin IG, Bickford D, Sodhi NS, Bradshaw CJA (2009) Eating frogs to extinction. Conserv Biol 23:1056–1059.
26. Parker PM (2004) The world market for frogs' legs: a 2005 global trade perspective. ICON Group, San Diego, CA, p 1–39
27. Schlaepfer MA, Hoover C, Dodd CK (2005) Challenges in evaluating the impact of the trade in amphibians and reptiles on wild populations. Bioscience 55:256–264.

