

**A RIBBITING PROPOSAL: USING THE ANIMAL HEALTH
PROTECTION ACT TO COMBAT THE GLOBAL SPREAD OF
FROG-KILLING CHYTRID FUNGUS**

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Introduction.....77

I. Background.....79

 A. Batrachochytrium dendrobatidis: What is it and Why is it Bad?.....79

 B. The AHPA’s History, Purpose, and Why it is a Potential Solution.83

II: Argument84

 A. The AHPA and How the Courts Have Applied It.....84

III. Proposal88

 A. How the USDA Could Weaponize AHPA.....88

 B. Why Defining Frogs as “Livestock” May be a Problem.....90

 C. Why Other Federal Statutes and International Agreements are not the most
 Effective Solution.91

 1. The Animal Welfare Act.....92

 2. The Endangered Species Act94

 3. Convention on International Trade in Endangered Species of Wild Fauna
 and Flora (CITES).....96

Conclusion99

INTRODUCTION

Amphibians are sensitive to temperature changes, habitat pollution, and disease.¹ International commercial frog trade is a vector for globally transporting the frog-killing pathogen, *Batrachochytrium dendrobatidis*

1. Jonathan E. Kolby, *Presence of the Amphibian Chytrid Fungus Batrachochytrium dendrobatidis in Native Amphibians Exported from Madagascar*, PLOS ONE, Mar. 5, 2014, at 1.

(Bd).² Diseased frogs, their legs, and their water are exported all around the world and effectively become vehicles for spreading disease in their destination countries.³ International frog trade exposes wild, captive, and farm-raised frog populations to Bd, which can cause mass frog deaths, ultimately impacting international trade economics, and devastating amphibian biodiversity.⁴

Mass frog deaths resulting from Bd outbreaks have resulted in several extirpations and extinctions, thus having dramatic impacts on amphibian biodiversity.⁵ Such mass-mortality events can also have unanticipated,

2. See generally *id.* (saying commercial frog trade transports deadly pathogens); Ben C. Scheele et al., *Amphibian Fungal Panzootic Causes Catastrophic and Ongoing Loss of Biodiversity*, 363 SCIENCE 1459, 1459 (2019) (showing how amphibian fungal species spread through trade); Jonathan E. Kolby et al., *First Evidence of Amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*) and Ranavirus in Hong Kong Amphibian Trade*, PLOS ONE, Mar. 5, 2014, at 1–2 (discussing transnational trade and emerging infectious diseases responsible for global amphibian population declines); Ché Weldon et al., *Origin of the Amphibian Chytrid Fungus*, 10 EMERGING INFECTIOUS DISEASES 2100, 2100 (2004) (arguing appearance of pathogens is causing amphibian population decline); Trenton W. J. Garner et al., Letter, *The Amphibian Trade: Bans or Best Practice?*, 6 ECOHEALTH 148, 148 (2009) (discussing amphibian trade contribution to Bd distribution); William B. Karesh et al., *Wildlife Trade and Global Disease Emergence*, 11 EMERGING INFECTIOUS DISEASES 1000, 1001 (2005) (linking increased food demand to global wildlife trade and disease outbreaks); Kerry Kriger & Jean-Marc Hero, *Chytridiomycosis, Amphibian Extinctions, and Lessons for the Prevention of Future Panzootics*, 6 ECOHEALTH 6, 7 (2009) (finding human-mediated transport of infected amphibians as a plausible driver of chytridiomycosis); Rolando Mazzoni et al., *Emerging Pathogen of Wild Amphibians in Frogs (*Rana catesbeiana*) Farmed for International Trade*, 9 EMERGING INFECTIOUS DISEASES 995, 997 (2003) (showing that international frog trade spreads Bd); Brian Gratwicke et al., *Is the International Frog Legs Trade a Potential Vector for Deadly Amphibian Pathogens?*, 8 FRONTIERS ECOLOGY & ENV'T 438, 438 (2010) (showing amphibian trade for food, pets, zoos, and laboratories is a mode of Bd spread); *Live Bullfrog Trade Blamed for Spread of Deadly Disease*, CBS NEWS: LIVESCIENCE (Aug. 10, 2012), <https://www.cbsnews.com/news/international-bullfrog-trade-blamed-for-deadly-disease/>; SANDRA ALTHERR ET AL., CANAPÉS TO EXTINCTION: THE INTERNATIONAL TRADE IN FROGS' LEGS AND ITS ECOLOGICAL IMPACT 28–30 (2011), https://www.prowildlife.de/wp-content/uploads/2016/02/Frogs-Legs_report_finalA4_web.pdf.

3. See Kolby, *supra* note 1, at 1 (discussing the impact of commercially exported frogs from Madagascar to the United States).

4. *Id.*; see generally Scheele et al., *supra* note 2, at 1459 (explaining how chytridiomycosis causes mass amphibian die-offs); Kolby et al., *supra* note 2, at 1 (explaining how transportation of frogs spreads infection); Weldon et al., *supra* note 2, at 2100 (showing diseases arise when local pathogens go beyond previous boundaries); Garner et al., *supra* note 2, at 148 (showing trade contributes to distribution of Bd); Karesh et al., *supra* note 2, at 1001 (linking global wildlife trade to disease outbreaks); Kriger & Hero, *supra* note 2, at 8, 9 (showing correlation of amphibian trade to global spread of Bd); Mazzoni et al., *supra* note 2, at 997 (showing that Bd positive frog populations can impact trade economics and amphibian biodiversity); Gratwicke et al., *supra* note 2, at 438 (showing commercial exchange of live amphibians adversely influences wild populations); CBS NEWS: LIVESCIENCE, *supra* note 2 (reporting disease spread is causing amphibian extinction); ALTHERR ET AL., *supra* note 2, at 27 (showing poorly regulated amphibian trade is a great risk to biodiversity).

5. Alex Strauss & Kevin G. Smith, *Why Does Amphibian Chytrid (*Batrachochytrium dendrobatidis*) Not Occur Everywhere? An Exploratory Study in Missouri Ponds*, PLOS ONE, Sept. 25, 2013, at 1.

cascading impacts on our economic systems.⁶ This Note discusses how the Animal Health Protection Act (AHPA) could be used to prevent further spread of Bd. Part I provides background about Bd and proposes that the USDA, under the powers delegated to it by the AHPA, should move to include frogs in the Act’s definition of “livestock,” recognize Bd as a “pest,” and classify frog parts and their shipping water as “articles” under the Act. Part II analyzes relevant case law and legal challenges of this proposal. Part III discusses why using the AHPA, rather than other federal statutes or international agreements, is the most effective legal mechanism for preventing disease spread in farm-raised amphibians and their native ecosystems. While Bd impacts all orders of amphibians (frogs, salamanders, and caecilians), this Note will specifically focus on frogs and the regulation of captive-bred frogs introduced into trade for human consumption.⁷ This Note will not discuss the impacts of frogs involved in pet trade, research, or other commercial uses, nor will this Note discuss solutions for disease spread for such frogs.

I. BACKGROUND

A. Batrachochytrium dendrobatidis: What is it and Why is it Bad?

Amphibians are natural measures of a healthy ecosystem because they are sensitive to environmental changes, pollution, and toxic substances.⁸ When submerged in water, amphibians breathe using their skin.⁹ Their permeable skin contains a vast network of blood vessels, allowing gases to flow from their surroundings into their bodies.¹⁰ This permeability causes

6. Kolby, *supra* note 1, at 1 (discussing amphibian trade between US and Madagascar); *see generally* Scheele et al., *supra* note 2, at 1459 (showing Bd is among most destructive invasive species); Kolby et al., *supra* note 2, at 1 (showing need to quickly evaluate trade-associated exposure); Weldon et al., *supra* note 2, at 2100 (showing sudden appearance of chytridiomycosis caused amphibian population declines); Garner et al., *supra* note 2, at 148 (showing trade restrictions drive trade to the black market); Karech et al., *supra* note 2, at 1001 (animal disease outbreaks cause economic damage); Kriger & Hero, *supra* note 2, at 8 (highlighting importance of amphibian food trade to the global economy); Mazzoni et al., *supra* note 2, at 997 (saying mass frog deaths can have an impact on economic systems); Gratwicke et al., *supra* note 2, at 438 (saying goals of biodiversity and profit can be met if sustainably managed); CBS NEWS: LIVESCIENCE, *supra* note 2 (discussing US frog imports from other countries); ALTHERR ET AL., *supra* note 2, at 13, 16 (showing economic value of frog exports).

7. Robert J. Ossiboff et al., *Differentiating Batrachochytrium dendrobatidis and B. salamandrivorans in Amphibian Chytridiomycosis Using RNAScope in situ Hybridization*, 6 FRONTIERS VETERINARY SCI., Sept. 12, 2019, at 2.

8. ALTHERR ET AL., *supra* note 2, at 2.

9. Brown, *Univ., Frog Respiration*, <https://www.brown.edu/Departments/Engineering/Courses/En123/MuscleExp/Frog%20Respiration.htm> (last visited Jan. 17, 2021).

10. *Id.*

their environmental sensitivity.¹¹ If their environment is polluted, they take in that pollution directly.¹² They are an integral piece of the food web, acting as both prey and predator throughout their lifecycle.¹³ Despite their environmental importance, amphibians are “the most threatened taxa of wildlife.”¹⁴

Globally, amphibian populations are rapidly declining.¹⁵ A leading cause of this is the infectious pathogen, *Batrachochytrium dendrobatidis* (Bd).¹⁶ Bd is a chytrid fungus.¹⁷ In its infectious stage, Bd is a swimming zoospore.¹⁸ The zoospore swims to the host species, infecting tadpole mouthparts and adult frog skin cells.¹⁹ The zoospores swim less than two centimeters before latching onto a host, so the infection is likely spread through direct frog contact or via Bd-infected water.²⁰ After the zoospores mature in the host’s healthy skin cells, the zoospores become motile, and travel towards ion transport activity.²¹ This leads to chytridiomycosis—the disruption of an amphibian’s ability to pass ions and water (and by extension, to breathe normally) through its skin.²² Eventually, chytridiomycosis can cause cardiac arrest and death in many amphibian species.²³

The catastrophic impacts of chytridiomycosis and Bd cannot be overstated. Experts deem chytrid fungus as “the most destructive pathogen

11. *See id.* (noting that frogs have a thin membranous skin that allows substances from their surroundings into their blood vessels).

12. *The Amazing, Adaptable Frog*, EXPLORATORIUM, <https://www.exploratorium.edu/frogs/mainstory/frogstory6.html> (last visited Jan. 17, 2021).

13. Holly J. Puglis & Michelle Boone, *Effects of Terrestrial Buffer Zones on Amphibians on Golf Courses*, PLOS ONE, June 2012, at 1.

14. ALTHERR ET AL., *supra* note 2, at 1.

15. *See generally id.* (saying amphibian populations are declining); Scheele et al., *supra* note 2, at 1461 (showing unprecedented lethality of a disease to a vertebrate class); Kolby et al., *supra* note 2, at 1 (showing how pathogens are causing amphibian population decline); Weldon et al., *supra* note 2, at 1 (showing the biggest threat to amphibians population is chytrid fungus); Garner et al., *supra* note 2, at 3 (showing some breeds are at high risk of extinction); Karesh et al., *supra* note 2, at 1000 (disease outbreaks cause animal populations to decline); Kriger & Hero, *supra* note 2, at 7 (hypothesizing that one-third of the global amphibian species are already threatened by extinction); Mazzoni et al., *supra* note 2, at 995 (saying amphibian populations are declining); Gratwicke et al., *supra* note 2, at 438 (showing there have been declines in amphibian species around the world); CBS NEWS: LIVESCIENCE, *supra* note 2 (showing chytrid fungus has caused species decline); ALTHERR ET AL., *supra* note 2, at 2 (showing 42% of amphibian species as declining).

16. Kolby, *supra* note 1, at 1.

17. *Id.*

18. Louise A. Rollins-Smith et al., *Amphibian Immune Defenses Against Chytridiomycosis: Impacts of Changing Environments*, 51 INTEGRATIVE & COMPAR. BIOLOGY 552, 552 (2011).

19. *Id.* at 553.

20. Jeff S. Piotrowski et al., *Physiology of Batrachochytrium Dendrobatidis, a Chytrid Pathogen of Amphibians*, 96 MYCOLOGIA 9, 13 (2004); Kolby et al., *supra* note 2, at 1.

21. Rollins-Smith et al., *supra* note 18, at 553.

22. *Id.*

23. *Id.*

ever described by science.”²⁴ Globally, chytridiomycosis is conservatively linked to the decline of at least 501 amphibian species.²⁵ Bd is highly tolerant to a wide range of temperatures: from 4°C to 28°C (39°F to 82°F).²⁶ This temperature tolerance allows Bd to successfully infect hosts across at least 37 countries, spread over six continents.²⁷

Chytridiomycosis is an emerging infectious disease in the wild, and international frog trade is the main vector for spreading this disease.²⁸ Despite being highly infectious, Bd is not lethal for all frog species.²⁹ Instead, the frogs that survive infection become disease-introducing vehicles when they are transported to new geographic locations.³⁰ Imported disease-carrying frogs can infect both regional livestock and wild populations, effectively causing global pathogen pollution.³¹ The disease can spread from captive-bred populations to wild populations in a number of ways including: infected or host frogs accidentally escaping from or being intentionally released from breeding operations, or by improperly releasing contaminated frog-holding tank water into the natural environment.³² Under proper conditions, the fungal pathogen can live outside hosts for months at a time.³³ Because of these factors, the international transportation of these frogs is a major contributor to global pathogen pollution.

24. Michael Greshko, *Amphibian ‘Apocalypse’ Caused by Most Destructive Pathogen Ever*, NATIONAL GEOGRAPHIC (Mar. 28, 2019), <https://www.nationalgeographic.com/animals/2019/03/amphibian-apocalypse-frogs-salamanders-worst-chytrid-fungus/>.

25. *Id.*; See generally Scheele et al., *supra* note 2, at 1 (showing chytridiomycosis contributed to decline in 501 amphibian species).

26. Jamie Bosch et al., *Climate Change and Outbreaks of Amphibian Chytridiomycosis in a Montane Area of Central Spain; Is There a Link?*, 274 PROC. BIOL. SCI. 253, 258, 259 (2007).

27. Kriger & Hero, *supra* note 2, at 6, 6–7.

28. See generally Scheele et al., *supra* note 2, at 1459 (showing that diseases have been facilitated by humans); Kolby, *supra* note 1, at 1 (saying international frog trade spreads Chytridiomycosis); Kolby et al., *supra* note 2, at 1 (showing there is concern about transport of frogs due to their propensity to carry disease); Weldon et al., *supra* note 2, at 1 (showing that Bd is facilitated by international movement of amphibians); Garner et al., *supra* note 2, at 1 (showing amphibian trade contributed to distribution of Bd); Karesh et al., *supra* note 2, at 1001 (linking global wildlife trade to disease outbreaks); Kriger & Hero, *supra* note 2, at 6 (showing human-mediated transport of amphibians is a driver of disease spread); Mazzoni et al., *supra* note 2, at 995 (saying international frog trade is spreading Chytridiomycosis); Gratwicke et al., *supra* note 2, at 438 (hypothesizing Bd may have spread through amphibian trade); CBS NEWS: LIVESCIENCE, *supra* note 2 (how chytrid infected frogs and began spreading); ALTHERR ET AL., *supra* note 2, at 5 (showing amphibian trade is a major contributor to spread of Bd).

29. Greshko, *supra* note 24.

30. Mazzoni et al., *supra* note 2, at 997.

31. *Id.* at 995.

32. AUSTRALIAN GOV’T DEP’T SUSTAINABILITY, ENV’T, WATER, POPULATION AND COMMUNITIES, CHYTRIDIOMYCOSIS (AMPHIBIAN CHYTRID FUNGUS DISEASE), https://www.environment.gov.au/system/files/resources/279bf387-09e0-433f-8973-3e18158febb6/files/c-disease_1.pdf (last visited Jan. 17, 2021).

33. Greshko, *supra* note 24.

Over 85,000 tons of amphibians were harvested through aquaculture in 2005 alone.³⁴ Large-bodied frogs are at the forefront of amphibian species transported for their meat.³⁵ The North American bullfrog is farmed in the United States, Brazil, Indonesia, Malaysia, Thailand, Uruguay, Mexico, China, Vietnam, Taiwan, and others.³⁶ While many farmed amphibians are raised and consumed domestically, a substantial number are farmed for international trade.³⁷ No matter where they are destined, farm-raised frogs are at risk of infection. An example of this occurred at a commercial farm in Uruguay in 1999.³⁸ The farm normally produced 150,000 tadpoles and 30,000 metamorphs each summer, with a regular mortality rate of 0.5%.³⁹ Following the twenty-six-day Bd epidemic, only 2,000 of the metamorphs survived, and 95% of the recent metamorphs perished.⁴⁰

Most frogs imported into the United States for human consumption are captive-bred frogs.⁴¹ As both an importer and exporter of farm-raised frogs,⁴² the United States should be concerned with Bd for two reasons: the economic impact from stock collapse of farm-raised frogs and the risk to wild amphibian biodiversity.⁴³ Multiple studies have found Bd-positive frogs or frog parts being imported into the United States.⁴⁴ Currently, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) regulates international amphibian trade.⁴⁵

However, many amphibian species that are traded by the United States are not included in CITES.⁴⁶ Scientists are tracking the fungal spread through regional networks, but this does not proactively prevent the pathogen from moving.⁴⁷ The World Organization for Animal Health (OIE) issued recommendations for ways to minimize Bd spread in amphibian trade.⁴⁸ These are merely recommendations, and are not binding on the United

34. Garner et al., *supra* note 2, at 1.

35. ALTHERR ET AL., *supra* note 2, at 2.

36. See generally *id.* (describing the various countries that farm, import, and export North American bullfrogs and other bullfrog species for human consumption).

37. *Id.* at 2.

38. Mazzoni et al., *supra* note 2, at 995.

39. *Id.*

40. *Id.*

41. ALTHERR ET AL., *supra* note 2, at 14.

42. *Id.* at 10–11.

43. Gratwicke et al., *supra* note 2, at 438.

44. See generally Kolby, *supra* note 1, at 1 (showing that Bd positive frog parts are shipped to the United States); Kolby et al., *supra* note 2, at 1; Weldon et al., *supra* note 2, at 1; Garner et al., *supra* note 2, at 1; Karesh et al., *supra* note 2, at 1001 (linking global wildlife trade to disease outbreaks); Kriger, *supra* note 2, at 6; Mazzoni et al., *supra* note 2, at 997 (saying that Bd positive frog parts are shipped to the United States); Gratwicke et al., *supra* note 2, at 440.

45. Philip J. Bishop et al., *The Amphibian Extinction Crisis – What Will it Take to Put the Action into the Amphibian Conservation Action Plan?*, 5 SAPIENS 97, 101 (2012).

46. *Id.*

47. Greshko, *supra* note 24.

48. *Id.*

States.⁴⁹ As a substantial trade participant, the United States needs an effective mechanism of disease detection and prevention, or else amphibians across the globe are at risk of devastating infection and death. In Part II, this Note proposes that an existing law, the Animal Health Protection Act (AHPA), offers the mechanisms to help mitigate this pressing problem. The next subpart, B, introduces the Act, its purpose, and its potential as a solution to the Bd problem.

B. The AHPA's History, Purpose, and Why it is a Potential Solution.

The United States Legislature passed the AHPA in the wake of the September 11, 2001 attacks as part of the 2002 Farm Bill, for the stated purpose of protecting health of animals, human consumers, American agricultural economy, and the environment.⁵⁰ However, the AHPA's scope is limited to livestock.⁵¹ Particularly, the AHPA focuses on diseases and pests that could negatively impact livestock health.⁵² The AHPA begins by defining the following terms: "livestock," "pest," and "article."⁵³

"Livestock" is defined as "all farm-raised animals."⁵⁴ A "pest" includes any fungus or pathogen that "can directly or indirectly injure, cause damages to, or cause disease in livestock."⁵⁵ An "article" is "any pest or disease or any material or tangible object that could harbor a pest or disease."⁵⁶ The AHPA authorizes the United States Department of Agriculture (USDA), at the Secretary of Agriculture's (Secretary) discretion, to limit imports, exports, and interstate movement; impose importation quarantines; and order the destruction of animals and articles that may be infected with a pest.⁵⁷ The USDA may do so if it deems a restriction necessary to prevent the transmission of disease to livestock.⁵⁸ The AHPA also defines the term "move" to include "to release into the environment."⁵⁹ Meaning, the AHPA's scope extends to preventing diseases that devastate livestock from spreading

49. *Cf. id.* (distinguishing that the recommendations are not legally binding decisions; instead, they serve as non-binding guidance or best management practices for member countries).

50. 7 U.S.C. § 8301; *Agricultural Biosecurity – Overview*, NAT'L AGRIC. L. CTR., (last visited Jan. 17, 2021).

51. Jane Cynthis Graham, *Snakes on a Plain, or in a Wetland: Fighting Back Invasive Nonnative Animals—Proposing A Federal Comprehensive Invasive Nonnative Animal Species Statute*, 25 TUL. ENV'T L. J. 19, 61 (2011) (reinforcing that the AHPA only applies to impacts on livestock).

52. *Id.* at 62. (noting that the AHPA was designed to prevent the introduction of any pests on livestock).

53. 7 U.S.C. § 8302.

54. *Id.* § 8302(10).

55. *Id.* § 8302(13)(A), (F).

56. *Id.* § 8302(2).

57. *Id.* § 8303; NAT'L AGRIC. L. CTR., *supra* note 50.

58. 7 U.S.C. § 8303(a).

59. 7 U.S.C. § 8302(12)(E).

to surrounding natural ecosystems. While the AHPA does not directly protect wildlife, it could.⁶⁰

Under this statute, the Secretary “must continue to conduct research on animal diseases and pests that constitute a threat to the livestock of the United States.”⁶¹ Scientific research reveals that the international trade of farm-raised amphibians is significantly contributing to the catastrophic spread of Bd.⁶² Even though frogs may not be livestock in the traditional sense, they are a piece of international agricultural trade.⁶³

Therefore, farm-raised frogs could fall within the AHPA’s scope. Farm-raised frogs fall within the definition of “livestock,” as the definition includes “all farm-raised animals.”⁶⁴ Since Bd is a chytrid fungus that can “directly . . . injure, cause damage to, or cause disease in livestock,” it meets the definition of “pest.”⁶⁵ Frog legs, and their shipping and storage water, are “articles,”⁶⁶ as they are tangible objects that can harbor Bd—the pest.⁶⁷ Including farm-raised frogs, Bd, frog parts, and their storage water within the AHPA’s definitions would allow the USDA to put limits on the international frog trade. Doing so would provide a proactive legal mechanism for preventing disease spread and ultimately could protect amphibian biodiversity.

II: ARGUMENT

A. The AHPA and How the Courts Have Applied It.

Regulating animal trade through statutory provisions is not a new concept.⁶⁸ In 1884, Congress enacted “[a]n act for the establishment of a Bureau of Animal Industry, to prevent the exportation of diseased cattle, and to provide means for the suppression and extirpation of pleuro-pneumonia

60. Graham, *supra* note 51, at 62 (explaining why AHPA’s scope includes invasive species affecting livestock but not affecting wildlife).

61. 7 U.S.C. § 8301(4).

62. *See generally* Kolby, *supra* note 1, at 1 (showing that farm raised amphibians are contributing to the spread of Bd); Scheele et al., *supra* note 2 at 1459; Kolby et al., *supra* note 2 at 1; Weldon, *supra* note 2, at 1; Garner et al., *supra* note 2 at 2100; Karesh et al., *supra* note 2, at 1000 (linking global wildlife trade to disease outbreaks); Kriger & Hero, *supra* note 2, at 8 (advocating for more bio-security precautions to reduce international trade impact on spread of Bd); Mazzoni et al., *supra* note 2, at 995 (saying the trade of farm raised amphibians is contributing to the spread of Bd); Gratwicke et al., *supra* note 2 at 439; CBS NEWS: LIVESCIENCE, *supra* note 2 (international trade of farm raised frogs increases disease infections); ALTHERR ET AL., *supra* note 2, at 30.

63. ALTHERR ET AL., *supra* note 2, at 13–15.

64. 7 U.S.C. § 8302(10).

65. 7 U.S.C. § 8302(13).

66. 7 U.S.C. § 8302(2).

67. Kolby, *supra* note 1, at 1.

68. *See generally* United States v. Johnson, 35 F.2d 256, 257 (Dist. Ct. Nev. 1929); Reid v. Colorado, 187 U.S. 137 (1902).

and other contagious diseases among domestic animals.”⁶⁹ This statute made it the Commissioner of Agriculture’s (Commissioner) duty to draft rules and regulations to effectively prevent disease spread.⁷⁰ This gave the Commissioner the power to use his discretion to authorize or expand quarantine measures as needed to prevent disease spread across the states.⁷¹ However, this statute limited funds for quarantines only to states whose executive authorities agreed to cooperate with the quarantine measures.⁷²

To make quarantines more consistent and ultimately more effective across state lines, Congress enacted “[a]n Act to enable the Secretary of Agriculture to establish and maintain quarantine districts, to permit and regulate the movement of cattle and other live stock therefrom, and for other purposes.”⁷³ This statute gave the Secretary the power to enact a quarantine in any state, or part of a state, where cattle or other livestock had any “contagious, infectious, or communicable disease.”⁷⁴ This history demonstrates that Congress has long recognized the importance of preventing disease spread and that the USDA, at its discretion, should be responsible for determining how to do so. This regulatory trend currently lives on in the AHPA.⁷⁵

The Animal and Plant Health Inspection Service (APHIS) enforces the AHPA and USDA bans.⁷⁶ As stated in Part I, the AHPA gives the USDA a great breadth of discretion for dealing with disease.⁷⁷ One Conference Report states, “a regulatory definition of disease should be left to the discretion of the Secretary” allowing “the Agency to have maximum flexibility to focus it’s [sic] resources and respond to new or emerging disease threats.”⁷⁸ The AHPA’s legislative history shows that Congress believed the most efficient way to prevent disease spread was to give the USDA broad discretionary authority.

The Ranchers Cattlemen Action Legal Fund (R-CALF) challenged the USDA’s discretion in a series of cases, *Ranchers Cattlemen Action Legal Fund United Stockgrowers of America v. United States Dep’t of Agric. I, II, and III* (*R-CALF I, II, and III*, respectively). In *R-CALF I, II, and III*, R-CALF sued the USDA for issuing a final rule that partially lifted a ban on the importation of ruminants and ruminant products from Canadian beef and

69. Animal Industry Act of 1884, ch. 60, 23 Stat. 31 (1884) (codified at 21 U.S.C. § 119).

70. *Id.*

71. *Id.*

72. *Johnson*, 54 F.2d at 258 (citing 21 U.S.C. § 123).

73. *Id.*

74. *Id.*

75. 7 U.S.C. § 8303(b).

76. *United States v. 8,800 Pounds, More or Less, of Powdered Egg White Product*, 551 F.3d 759, 760 (8th Cir. 2007).

77. 7 U.S.C. § 8303.

78. H.R. REP. No. 107-424, at 664, 668 (2002).

cattle.⁷⁹ R-CALF sought a preliminary injunction to bar this final ruling, wanting to maintain the USDA's original ban on Canadian ruminant cattle products into the United States to prevent the potential spread of Bovine Spongiform Encephalopathy (BSE).⁸⁰

BSE, commonly known as "mad cow disease," originated in England from the agricultural practice of feeding cows the brains and central nervous system tissues of deceased cows.⁸¹ In 2003, a native North American cow named Alberta was diagnosed with BSE.⁸² This discovery led then-Secretary Veneman to issue an Emergency Order (Change in Disease Status of Canada Because of BSE), which added Canada to the list of countries with known BSE incidents.⁸³ The USDA then issued an official ban on "all imports of live ruminants or ruminant meat products from Canada."⁸⁴

However, in 2005, the USDA changed its tune and issued a final rule named "Bovine Spongiform Encephalopathy: Minimal Risk Regions and Importation of Commodities: Final Rule and Notice."⁸⁵ This rule now allowed some ruminant imports from Canada.⁸⁶ The USDA began to further relax the ban. On April 19, 2004, the USDA moved to allow for increased types of ruminant imports from Canada.⁸⁷ The USDA issued the Final Rule on January 4, 2005, ultimately lifting the ban on ruminant imports from Canada.⁸⁸ While the main allegations raised in R-CALF's initial complaint were alleged violations of the Administrative Procedure Act (APA), the Regulatory Flexibility Act (RFA), and the National Environmental Policy Act (NEPA), AHPA played a large role in the appellate and Supreme Court decisions.⁸⁹

In *R-CALF I*, the court found the USDA's Final Rule arbitrary and capricious and granted R-CALF's request for an injunction.⁹⁰ The *R-CALF*

79. *Ranchers Cattleman Action Legal Fund United Stockgrowers of Am. v. USDA, AHPIS (R-CALF I)*, 359 F.Supp.2d 1058, 1063 (D. Mont. 2005) ; *Ranchers Cattleman Action Legal Fund United Stockgrowers of America v. USDA, APHIS (R-CALF II)*, 415 F.3d 1078, 1084 (9th Cir. 2005); *Ranchers Cattleman Action Legal Fund United Stockgrowers of Am. v. USDA (R-CALF III)*, 499 F.3d 1108, 1111 (9th Cir. 2007).

80. *R-CALF I*, 359 F.Supp.2d at 1063.

81. *Id.*

82. *R-CALF II*, 415 F.3d at 1088.

83. *Id.*

84. *Id.* (citing 9 C.F.R. §§ 93.401, 94.18 (2003)).

85. *Bovine Spongiform Encephalopathy; Minimal Risk Regions and Importation of Commodities*, 70 Fed. Reg. 460 (Jan. 4, 2005) (to be codified at 9 C.F.R. pts. 93-96).

86. *R-CALF II*, 415 F.3d at 1084 (citing 70 Fed. Reg. 460 (Jan. 4, 2005)).

87. *Id.* at 1089.

88. *Id.* at 1084, 1089-90 (citing 70 Fed. Reg. at 460, 469) (describing how the ban allowed for imports of Canadian cattle under 30 months old, as long as the cattle were immediately slaughtered or fed than slaughtered upon arrival, and allowed for the imports of beef from Canadian cows of all ages).

89. *R-CALF I*, 359 F.Supp.2d at 1063, 1069-72; *R-CALF II*, 415 F.3d at 1090; *R-CALF III*, 499 F.3d at 1113.

90. *R-CALF I*, 359 F.Supp.2d at 1074; *R-CALF II* 415 F.3d at 1090; *R-CALF III*, 499 F.3d at 1116.

II court, however, reversed the *R-CALF I* court after concluding that the *R-CALF I* court failed to give deference to the agency, as instructed by the AHPA.⁹¹ The *R-CALF II* court found that the AHPA's statutory language (e.g., the use of the word "may") and legislative history gave the agency broad discretion to make decisions on the imports of animal products.⁹² Further, the *R-CALF II* court held that the AHPA "does not impose any requirement on USDA that all of its actions carry no associated increased risk of disease."⁹³ The district court's decision effectively imposed an additional requirement of disease eradication on USDA by holding the Final Rule arbitrary and capricious, and finding USDA did not completely eliminate the risk of disease, here BSE, to humans and animals.⁹⁴ The *R-CALF II* court further noted that open borders are default under the AHPA, and that the USDA may only close the borders when they deem it necessary to prevent contagion.⁹⁵

In *R-CALF III*, the Ninth Circuit Court of Appeals affirmed the *R-CALF II* court's decision, agreeing that the district court did substitute its judgment for the USDA's, despite the USDA's broad discretion.⁹⁶ The *R-CALF III* court held the ban was appropriate because the USDA properly relied on studies available at the time of issuing the ban, and that the ban was merely considered as part of the solution instead of the sole mitigating factor for disease spread.⁹⁷ Further, the court held that, as long as the USDA provided its reasoning for banning some products and not others, the Agency properly acted within its discretion.⁹⁸

AHPA also grants the agency discretion to "order the destruction or removal from the United States . . . animals, articles, or means conveyance that [have] been imported but have not entered"; were improperly imported or entered; or animals that "have strayed" into the United States, if it is deemed necessary to prevent pest or disease introduction to livestock.⁹⁹ This issue was argued in *United States v. 8,000 Pounds, More or Less, of Powdered Egg White Product*, where the defendant, Creative Compounds, LLC (Creative) argued that the courts should allow the illegal shipment of 8,800 pounds of powdered egg whites to be exported back to Peru instead of destroyed.¹⁰⁰ One of the relevant statutes regulating treatment of the illegal

91. *R-CALF II*, 415 F.3d at 1084 (discussing *R-CALF I*, 359 F.Supp.2d at 1105).

92. *Id.* at 1094–95.

93. *Id.* at 1094.

94. *Id.* at 1084, 1090, 1096.

95. *Id.* at 1095.

96. *R-CALF III*, 499 F.3d at 1117.

97. *Id.* at 1118–19.

98. *Id.* at 1120.

99. 7 U.S.C. § 8303(c).

100. *8,800 Pounds, More or Less, of Powdered Egg White Product*, 551 F.3d at 761–62.

powdered egg white product was the AHPA.¹⁰¹ USDA regulations barred imports of egg products from Peru unless the eggs “have been cooked or processed or will be handled in a manner that will prevent the introduction of [Exotic Newcastle Disease] into the United States.”¹⁰²

While much of this case’s decision is based on a separate statute protecting human consumers from potential harm,¹⁰³ language from the AHPA was also a deciding factor. Creative lacked the proper permits to allow for the product to be used for human or animal consumption, so the USDA sought for condemnation and destruction of the illegal imported shipment.¹⁰⁴ The court held that this judgment was proper because the USDA, under both acts, was acting within its discretion to prevent the introduction of disease into the United States.¹⁰⁵

The fact that courts have continuously upheld the USDA’s broad discretion under the AHPA to make and loosen bans and quarantines indicates that the AHPA may be a powerful tool in the fight against the spread of Bd.¹⁰⁶ If the USDA deemed it necessary to protect both captive-bred and wild native populations of frogs from Bd, the Agency could issue a ban on frog imports from areas with known instances of the fungal pathogen. A ban would be well within the USDA’s purview, so long as it relied on current data when issuing the ban and reiterated that a ban of this kind is merely a piece of the contagion-mitigation puzzle. The current science clearly and urgently begs for governmental intervention to prevent the communication of Bd into new geographic areas.¹⁰⁷ The AHPA may be that solution.

III. PROPOSAL

A. How the USDA Could Weaponize AHPA.

The USDA should impose a ban on imports of captive frogs, their legs, and their storage water from countries with recorded instances of Bd at frog farms. The AHPA prevents disease spread and introduction of pests from imports and exports among livestock.¹⁰⁸ The AHPA affords the agency broad discretion to restrict the imports, further movement, or means of conveyance of any animal, article, or pest that the USDA deems necessary to prevent

101. *Id.* at 760.

102. *Id.*

103. *Id.* at 763.

104. *Id.* at 760.

105. *Id.* at 760.

106. See generally *R-CALF II*, 415 F.3d at 1094 (describing that the USDA has broad discretion under Animal Health Protection Act); *R-CALF III*, 499 F.3d at 1115.

107. *Supra* Part I.

108. Graham, *supra* note 51, at 61–62. (defining what constitutes a pest to livestock).

disease spread to livestock.¹⁰⁹ The USDA may do so via rulemaking, adjudicatory orders, or post-importation quarantines.¹¹⁰ As the case law discussed in Part II demonstrates, the AHPA foundationally provides USDA broad discretion to restrict or ban importations, and to impose quarantines, as they deem necessary. To satisfy the conditions set forth in the AHPA, a restriction must reasonably rely on the best scientific data available to the Agency at the time the restriction was implemented.¹¹¹ The USDA, in its discretion, can place restrictions on certain “parts” or “articles” as long as their decision reasonably relied on experts at the time.¹¹² The ban need only be part of the solution for mitigating disease transmission; it does not need to be 100% effective to be appropriate under the AHPA.¹¹³

Much like BSE for cattle and Exotic Newcastle Disease for avians, Bd poses a substantial threat to farm-raised and native frog populations in the United States. The current science, stated in Part I, points to trade as being one of the main vectors for the global spread of Bd.¹¹⁴ There are two main differences between BSE and Exotic Newcastle Disease: (1) Bd does not directly impact human health and (2) cattle and poultry products are traditional farm-raised products, unlike frog parts.¹¹⁵ AHPA’s purpose, however, is not only to protect human health; it is also to protect the health of “livestock.”¹¹⁶ In the AHPA, livestock is defined as “all farm-raised animals.”¹¹⁷ Therefore, despite not being a staple of traditional American cuisine, farm-raised frogs could fall under this definition of “livestock.”¹¹⁸ A “pest” is any fungal pathogen that “can directly or indirectly injure, cause damages to, or cause disease in livestock.”¹¹⁹ Bd, thus, is also clearly a “pest.” Lastly, an “article” is “any pest or disease or material or tangible object that could harbor a pest or disease.”¹²⁰ Frog legs, and the water that frogs or their parts are shipped in, arguably fall under this term.¹²¹ The USDA, using its discretionary power provided by the AHPA, could limit or ban imports, exports, and interstate movement; impose importation

109. 7 U.S.C. § 8303(a).

110. *Id.* § 8303(b).

111. *R-CALF II*, 415 F.3d at 1091, 1094.

112. *Id.*

113. *Id.* at 1095.

114. *Supra* Part I.

115. *Notice of Inquiry for Injurious Species Listing for Amphibians with Chytrid Fungus*, FISH & WILDLIFE SERV. 2, https://www.fws.gov/injuriouswildlife/pdf_files/Chytrid_fungus_FAQs_045679_FINAL_9-15-10.pdf (last visited Jan. 17, 2021).

116. 7 U.S.C. § 8301.

117. *Id.* at § 8302(10).

118. *Id.*

119. *Id.* at § 8302(13).

120. *Id.* at § 8302(2).

121. *Id.*

quarantines; or order the destruction of frogs, their parts, and articles from countries with known instances of Bd in their captive-raised frogs.

The AHPA states that the USDA must “continue to conduct research on animal disease and pests that constitute a threat to the livestock of the United States.”¹²² Following this mandatory call-to-action, the Agency, relying on current expert studies of the time, could reasonably conclude there is a need to regulate trade of farm-raised frogs. In the R-CALF cases, the USDA first enacted the ban and quarantine of ruminant products from Canada following reported instances of BSE.¹²³ If the USDA relied on studies that showed which countries have tested positive for Bd in their frog populations, it would be within the Agency’s discretion to implement any restrictions, bans, or quarantines that they saw fit.

AHPA defines the term “move” to include “to release into the environment.”¹²⁴ The USDA, within its discretion, could implement a regulation or ban on frogs, parts, and articles from countries with known Bd instances (i.e., from countries with populations of captive frogs known to be infected with Bd) to prevent disease spread to native frog populations. The science again suggests that Bd spreads from captive frog populations to the wild, and frogs raised for human consumption play a significant role in this. Bd is hopping into wild populations by virtue of rouge-escapee frogs, intentionally released frogs, and/or via the careless disposal of contaminated frog tank water.¹²⁵ While the AHPA does not directly protect wildlife¹²⁶ and there has been no case law debating this use of the AHPA, the courts in R-CALF I and II highlighted the importance of agency discretion afforded by the AHPA.¹²⁷

B. Why Defining Frogs as “Livestock” May Be a Problem.

As stated in Part III.A., farm-raised frogs could fall under the definition “livestock.”¹²⁸ However, the USDA has defined “livestock” to include different animals, depending on the statute.¹²⁹ Under the Human Methods of Slaughter Act (HMSA), “livestock” currently includes cows, horses, pigs, and most other four-legged animals.¹³⁰ The HMSA purposefully excludes

122. *Id.* at § 8301.

123. *R-CALF II*, 415 F.3d at 1084.

124. 7 U.S.C. § 8302(12)(E).

125. AUSTRALIAN GOV’T DEP’T SUSTAINABILITY, *supra* note 32.

126. Graham, *supra* note 51, at 62. (reinforcing the notion that the AHPA is only triggered for livestock protection).

127. *See generally R-CALF II*, 415 F.3d at 1095 (emphasizing importance of agency discretion). *R-CALF III*, 499 F.3d at 1115.

128. *See infra* Part III.A.

129. 7 U.S.C. § 8302(10).

130. *Id.* at § 1902.

poultry birds.¹³¹ The USDA's inconsistent history with the term "livestock" re-illuminates the agency's discretionary power. Redefining AHPA's definition "livestock" to include frogs would be a wholly discretionary choice.

The AHPA differs from the HMSA in two important ways. First, the AHPA's priority is maintaining livestock health through the prevention of pest or disease introduction.¹³² Second, the AHPA has a stated interest in protecting the natural environment.¹³³ In contrast, the HMSA is a welfare statute.¹³⁴ Its purpose is to prevent "needless suffering" of livestock, while balancing the economic desires of "producers, processors, and consumers" against the working conditions of "persons engaged in the slaughtering industry."¹³⁵ The HMSA is not concerned with disease outbreaks from imported animals that could lead to economic and environmental devastation.¹³⁶ Its purpose is to make slaughter as humane as possible, while maintaining economic efficiency.¹³⁷ This Note acknowledges the discrepancies of "livestock" definitions across various statutes, however, seeing that the AHPA and HMSA are fundamentally different, their definitions of "livestock" could reasonably encompass different animals. Therefore, frogs could fall into the AHPA's definition of "livestock" without their inclusion in the HMSA's definition.

C. Why Other Federal Statutes and International Agreements are not the Most Effective Solution.

The AHPA could help mitigate Bd dissemination in the United States, but it is recognizably not a panacea. The number of frogs in trade for human consumption is minuscule compared to those in trade for research or pets.¹³⁸ Having the USDA, in its discretion, redefine key definitions of AHPA may seem like a round-about way to prevent disease spread, but it is also currently the most efficient and effective means of responding to the spread of Bd. Congress could always pass legislation specifically addressing the devastation of amphibian populations wrought by Bd, but Congress is a lethargic creature, and frogs have never been the most charismatic of megafauna.

131. *Id.*

132. *Id.* at § 8301.

133. *Id.*

134. *Id.* at §§ 1901–02.

135. *Id.* at § 1901.

136. *Id.*

137. *Id.*

138. ALTHERR ET AL., *supra* note 2, at 21–22.

While other federal legislation and international agreements, such as the Animal Welfare Act (AWA), the Endangered Species Act (ESA), and the CITES agreement could play a role in preventing disease spread, they have not been effective for combating Bd. These statutes either do not protect frogs¹³⁹ or captive frogs¹⁴⁰ or do not adequately protect the native frogs in this import country.¹⁴¹ In fact, imports of frogs that are not meant for human consumption, such as frogs for pets, research, or even wild frogs, have been left virtually unregulated.¹⁴² Consequently, while the “solution” this Note proposes may be an ad hoc, “stopgap,” half-measure, it is also the most likely to occur. AHPA’s purpose is to protect the health of domestic “livestock.”¹⁴³ The USDA could therefore theoretically block one key vector for the transmission of Bd, and perhaps even stop amphibian Armageddon, with one wave of their hand. The regulatory architecture created under the AWA, ESA, and CITES lacks such broad grants of authority, and is thus worse suited to the task of Bd prevention.

1. The Animal Welfare Act

At first glance, the AWA seems to be a promising solution for preventing the spread of Bd in captive-bred frogs. Diseases, including fungal pathogens, are arguably an animal welfare issue. It is facially inhumane to not take precautionary measures to prevent animals from contracting a fast-spreading disease that can cause cardiac arrest and death.¹⁴⁴ However, exemptions riddle the AWA, effectively eradicating protection for many animals, including amphibians and farm-raised animals.¹⁴⁵

APHIS is within the USDA, and is responsible for administering the AWA.¹⁴⁶ The purpose of the AWA is three-fold: First, to provide humane care and treatment of animals used for the purpose of research, exhibition, or as pets; second, to extend that humane treatment throughout transportation in commerce; and third, to prevent the sale or use of stolen animals in order to protect the interest of the animal’s actual owner.¹⁴⁷

139. 7 U.S.C. § 2132(g) (defining “animals” to include warm-blooded animals only).

140. 16 U.S.C. § 1538(b)(1).

141. See *How CITES Works*, CITES, <https://www.cites.org/eng/disc/how.php> (last visited Jan. 17, 2021) (explaining that a State of import is required to get a permit from the Management Authority under CITES).

142. Cf. ALTHERR ET AL., *supra* note 2 (discussing regulations surrounding international frog trade for human consumption, pets, and research).

143. 7 U.S.C. § 8301.

144. *Supra* Part I.

145. 7 U.S.C. §§ 2131, 2138–39.

146. Animal Welfare; Definition of Animal, 69 Fed. Reg. 31,513 (June 4, 2004) (to be codified at 9 C.F.R. pt. 1).

147. 7 U.S.C. § 2131.

Businesses that work with animals covered by the AWA must either obtain an AHPIS license or register with AHPIS.¹⁴⁸ Businesses and activities which require licensing include: “dealers” (“pet and laboratory animal breeders and brokers, auction operators, and anyone who sells exotic or wild animals, or dead animals or their parts . . .”), “exhibitors” (“zoos, marine mammal shows, circuses, carnivals, and promotional and educational exhibits”), and “animal transporters” (specifically “[b]usinesses that contract to transport animals for compensation [because they] are considered dealers . . .”).¹⁴⁹ Businesses and activities that require AHPIS registration include: “animal transporters” (specifically “general carriers (e.g., airlines, railroads, and truckers)”), and “research facilities” (including “state and local government-run research institutions, drug firms, universities, diagnostic laboratories, and facilities that study marine mammals”).¹⁵⁰ To receive a license, APHIS first inspects the facility to verify that it is complying with its regulations, then the business pays an annual fee to renew the license.¹⁵¹ For businesses that only require registration with APHIS, the business only undergoes “periodic inspections” to verify compliance to regulations.¹⁵²

Under the AWA, the term “animal” includes “any live or dead dog, cat, nonhuman primate, guinea pig, hamster, rabbit, or other warm-blooded animal determined by the Secretary of Agriculture to be for research or exhibition purposes, or used as a pet.”¹⁵³ By specifically including “warm-blooded” animals in the definition, the AWA intended to exclude cold-blood animals, such as frogs, from its protection. Even though the agency may expand the definition of an animal, the plain reading of the definition seems to restrict this expansion only to “other warm-blooded animal[s].”¹⁵⁴ This effectively would exclude frogs, other amphibians, reptiles, and fishes from receiving welfare protections.¹⁵⁵

While the AWA has been amended eight times, amendments are not a surefire method to gaining broader species protections.¹⁵⁶ The AWA of 1970

148. TADLOCK COWAN, CONG. RSCH. SERV., RS22493, *THE ANIMAL WELFARE ACT: BACKGROUND AND SELECTED ANIMAL WELFARE LEGISLATION I* (2016).

149. *Id.* at 2.

150. *Id.*

151. *Id.* at 1.

152. *Id.*

153. *Id.*

154. 7 U.S.C. § 2132(g).

155. *Id.*

156. *See generally* Animal Welfare Act Amendments of 1970, Pub. L. No. 91-579, 84 Stat. 1560; Farm Security and Rural Investment Act of 2002, Pub. L. No. 107-171, 116 Stat. 134; Animal Welfare Act Amendments of 1985, Pub. L. No. 99-198, §§ 1751–1759, 99 Stat. 1645; Animal Fighting Prohibition Enforcement Act of 2007, Pub. L. No. 110-22, Sec. 3, § 26, 121 Stat. 88; Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, 122 Stat. 1651; Animal Welfare Act Amendments of 1976, Pub. L. No. 94-279, 90 Stat. 417; Animal Welfare Act Amendment of 2013, Pub. L. No. 112-261, 126 Stat. 2428;

expanded the protection from dogs and cats in research facilities to all warm-blooded animals used for “experimentation or exhibition.”¹⁵⁷ This expansion specifically excluded cold-blooded animals and farm animals from welfare protections.¹⁵⁸ The remaining amendments gained baseline protections for animals used in research and pet trade,¹⁵⁹ prohibited animal fighting,¹⁶⁰ and gained protections for animal owners.¹⁶¹ Amendments are often pushed by public opinion.¹⁶² Protections for pets and their owners occurred after dogs were being “dognapped” from their yards and improperly sold to research laboratories.¹⁶³ The 2008 amendment followed the indictment of National Football League quarterback Michael Vick, who was charged due to dog-fighting related activities.¹⁶⁴ The public may never gain the opinion that cold-blooded animals need welfare protections. The public may not believe that animals produced for human consumption require welfare protections either. While public campaigning and outcry has forced much-needed legislative movement to expand animal welfare protections, a campaign for increasing welfare rights for non-charismatic microfauna is likely not the most effective or expedient route to preventing global Bd spread.¹⁶⁵ Therefore, the AWA is an unlikely solution to this complex problem.

2. The Endangered Species Act

“The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend.”¹⁶⁶ The United States Fish and Wildlife Services (FWS) and National Marine Fisheries Service (NMFS) administer the ESA, but have jurisdiction over different animals.¹⁶⁷ FWS is

Food, Agriculture, Conservation, and Trade Act of 1990, Pub. L. No. 101-624, § 2503, 104 Stat. 3359 (demonstrating that the AWA was amended in 1970, 1976, 1985, 1990, 2002, 2007, 2008, and 2013).

157. Animal Welfare Act Amendments of 1970, Pub. L. No. 91-579, 84 Stat. 1560, 1561.

158. *Id.*

159. Animal Welfare Act Amendments of 1985 Pub. L. No. 99-198, § 1752, 99 Stat. 1354, 1645.

160. Animal Welfare Amendments Act of 1976, Pub. L. No. 94-279, 90 Stat. 417, 421; Animal Fighting Prohibition Enforcement Act of 2007, Pub. L. No. 110-22, Sec. 3, § 26, 121 Stat. 88, 88; Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-246, 122 Stat. 1651, 2223; Animal Welfare Act Amendment of 2013, Pub. L. No. 112-261, 126 Stat. 2428, 2428; Food, Agriculture, Conservation, and Trade Act of 1990, Pub. L. No. 101-624, § 2503, 104 Stat. 4066–4067.

161. Food, Agriculture, Conservation, and Trade Act of 1990, Pub. L. No. 101-624, § 2503, 104 Stat. 4066–4067.

162. BRYON W. DAYNES ET AL., *AMERICAN POLITICS AND THE ENVIRONMENT* 47–48 (SUNY Press, Albany, 2nd ed. 2016).

163. COWAN, *supra* note 147, at 1.

164. *Id.* at 5–6.

165. See generally *Protecting the Endangered Species Act*, ENDANGERED SPECIES COALITION, <https://www.endangered.org/campaigns/protecting-the-endangered-species-act/> (showing why legislation is a better path to protecting non-charismatic microfauna) (last visited Jan. 17, 2021).

166. *ESA Basics: 40 Years of Conserving Endangered Species*, U.S. FISH & WILDLIFE SERV. 1–2 (2013), https://www.fws.gov/endangered/esa-library/pdf/ESA_basics.pdf.

167. *Id.*

primarily responsible for “terrestrial and freshwater organisms,” whereas NMFS has jurisdiction over organisms that interact with marine wildlife.¹⁶⁸ Frogs are primarily aquatic, freshwater organisms, and are under FWS’s purview.¹⁶⁹ Animal species can be listed as “endangered” or “threatened” to gain protection under the ESA.¹⁷⁰ “Endangered” species are those who are “in danger of extinction throughout all or a significant portion of its range,” while “threatened” species are those who are “likely to become endangered within the foreseeable future.”¹⁷¹

As discussed in Part I, when Bd is introduced to new areas, it wreaks havoc on native frogs.¹⁷² It is a fast-spreading disease, and listing a species as “threatened” or “endangered” is not a quick process.¹⁷³ Animals are listed species-by-species; consequently, because Bd impacts whole families of Lissamphibia, it would take a very long time to list all of the species impacted.¹⁷⁴ Review of whether a species can be listed can occur in two ways: through the initiation of a petition to list a species or through an intra-agency determination that a certain species is a “candidate.”¹⁷⁵ A proposal is a formal request to list a species.¹⁷⁶ Within 90 days of receiving the petition, FWS must make a finding on whether there is “substantial information” that demonstrates the animal in the petition should receive status review.¹⁷⁷ Within a year, FWS must find whether “listing is warranted.”¹⁷⁸ If so, the species may be listed, but if there are species with higher priority, FWS may defer the proposal and add them to the “candidate” list to be reviewed later.¹⁷⁹ The priority system ranks candidate species in order of greatest degree of threat, “immediacy of threat and the taxonomic distinctiveness of the species.”¹⁸⁰ FWS must publish notices of review of “candidate” species, which are species the agency believes could fall within the definition of “threatened” or “endangered.”¹⁸¹ The agency reviews biological information

168. *Id.*

169. *Id.*

170. *Id.*

171. *Id.*

172. *See infra* Part I.

173. *See, e.g., Listing a Species as a Threatened or Endangered Species*, U.S. FISH & WILDLIFE SERV. 1–2 (2016), <https://www.fws.gov/endangered/esa-library/pdf/listing.pdf> (showing that a petition to list a species can take more than two years to get a final rule on whether a species will be listed as endangered, and that a species that FWS declares as a “candidate” species can take over a year to get a final rule on that species listing status).

174. *Id.*

175. *Listing and Critical Habitat*, U.S. FISH & WILDLIFE SERV. (June 10, 2020), <https://fws.gov/endangered/what-we-do/listing-overview.html>.

176. U.S. FISH & WILDLIFE SERV., *supra* note 173, at 2.

177. *Id.*

178. *Id.*

179. *Id.*

180. *Id.*

181. *Id.*

throughout the notices of review period to determine whether a candidate species falls within these definitions.¹⁸²

If a species is listed, the ESA makes it “unlawful for a person to take a listed animal without a permit.”¹⁸³ To “take” is defined as any of the following: “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct.”¹⁸⁴ Hypothetically, the ESA could protect a listed species if this specific scenario occurred: a person actively took Bd-infected frogs from the wild, transported these frogs to another area, where they then released these frogs into the wild, where these frogs then infected an already listed frog species with Bd. Outside of this specific scenario, the ESA could likely not prevent the spread of Bd to new frog populations. The ESA could also only protect captive-bred species of listed frogs found to be in improper care.¹⁸⁵ Even then, contracting or carrying Bd may not be improper care, so it may not trigger ESA protection.

While the ESA provides some great protection against human-induced harm on listed species, listing a species is a long process, and does not attack the problem of disease-spread. As the government reviews what animals should be listed as endangered, amphibians are succumbing to Bd.¹⁸⁶ Due to the fast-acting nature of this fungal pathogen, we cannot afford to wait for individual species to gain ESA protection (which may not even protect them from contracting Bd). The ESA is therefore not the appropriate mechanism to prevent catastrophic declines in amphibian populations from the perils of Bd infection.

3. Convention on International Trade in Endangered Species of Wild Fauna and Flora

CITES governs the international trade of endangered flora and fauna species.¹⁸⁷ CITES’s purpose is to prevent the overutilization of wild species to protect them from extinction.¹⁸⁸ The United Nations Environment Programme (UNEP) administers CITES, and a Secretariat verifies proper CITES implementation and aids in facilitating proper trade between

182. *Id.*

183. U.S. FISH & WILDLIFE SERV., *supra* note 166, at 1.

184. *Id.*

185. *See Captive Animals*, ANIMAL LEGAL DEFENSE FUND 4 (Sept. 5, 2020) <https://aldf.org/focus-area/captive-animals/> (describing a case where the ESA was used to protect wild, captive animals that were being mistreated).

186. Forrest M.R. Brem, *Amphibian Chytridiomycosis*, ENCYC. BRITANNICA (Feb. 14, 2020), <https://www.britannica.com/science/amphibian-chytridiomycosis>.

187. CITES, *supra* note 141.

188. *How CITES Works*, U.S. FISH & WILDLIFE SERV., <https://www.fws.gov/international/cites/how-cites-works.html> (last visited Jan. 17, 2021).

countries.¹⁸⁹ By joining CITES, countries voluntarily agree to be legally bound to its guidelines.¹⁹⁰ Governments that join CITES are called “Parties.”¹⁹¹ A Party must adopt its own legislation enacting the terms the Party has agreed to¹⁹² and designate a Management Authority and Scientific Authority to ensure that the treaty is properly implemented.¹⁹³ The Management Authority issues permits, allowing CITES-listed species to be legally traded.¹⁹⁴ The Scientific Authority, a fact-finding body, decides if trade of a certain species may negatively impact the species’ ability to survive in the wild.¹⁹⁵ Currently, there are 183 Parties, including the United States.¹⁹⁶ FWS acts as both the Management Authority and Scientific Authority for the United States; therefore, FWS determines whether the trade is legal and if trade would detrimentally impact a species survival in the wild prior to issuing a trade permit.¹⁹⁷

Like in the regulatory framework under the ESA, there are CITES-listed species that are separated into categories based on trade’s impact on the species survival rate.¹⁹⁸ The categories are Appendix I, II, and III.¹⁹⁹ Appendix I protects species that are “threatened with extinction” and only allows trade of these species under “exceptional circumstances.”²⁰⁰ Trade of an Appendix I species requires a permit from both the exporting and importing countries (provided that both countries are CITES Parties).²⁰¹ Appendix II protects species that could become threatened with extinction if trade is not regulated and requires a permit from the exporting country.²⁰² Appendix III is for species that Parties have specifically requested for help to control and only requires a certificate of origin from the exporting country.²⁰³ The majority of species fall into Appendix II.²⁰⁴ Currently, amphibian species fall under the following categories in the following

189. *Id.*

190. See *What is CITES?*, CITES, <http://cites.org/eng/disc/what.php> (last visited Jan. 17, 2021).

191. *Id.*

192. *Id.*

193. CITES, *supra* note 141.

194. See U.S. FISH AND WILDLIFE SERV., *supra* note 188.

195. *Id.*

196. CITES, *supra* note 190.

197. U.S. FISH AND WILDLIFE SERV., *supra* note 188.

198. *Id.*

199. *Id.*

200. CITES, *supra* note 141.

201. *CITES Permits and Certificates*, U.S. FISH & WILDLIFE SERV. (Dec. 2012), <https://www.fws.gov/international/pdf/factsheet-cites-permits-and-certificates-2013.pdf>.

202. U.S. FISH & WILDLIFE SERV., *supra* note 188.

203. *Id.*

204. *Id.*

quantities: in Appendix I, 24 species; in Appendix II, 134 species; in Appendix III, four species.²⁰⁵

As a comprehensive, international trade agreement, CITES appears to be another promising disease-preventing mechanism. CITES is broader than the AHPA in terms of what types of trade imports and exports it can regulate and how many countries must follow it. Amphibian trade is a global issue, and amphibians enter into trade for far more reasons than human consumption.²⁰⁶ These factors make CITES seem like the best option for protecting amphibians across the globe from Bd. However, CITES's permitting process still allows Parties to trade species, so long as the Parties comply to the permitting requirements.²⁰⁷ As long as a Party's Management and Scientific Authorities agree that the specific instance of trade is legal and will likely not detrimentally impact that specific species' survival in the wild, a permit will likely be issued.²⁰⁸ As stated in Part I, carrier species of Bd may not succumb to the pathogen, but instead act as vectors for spreading the disease to other vulnerable frog populations.²⁰⁹ The Scientific Authority is concerned with how the trade of a species would impact wild populations of the traded species; specifically, it does not necessarily look at how the trade of that species could impact other related populations in an importing Party's borders.²¹⁰ The purpose of CITES is not to prevent disease spread, but to ensure that wild species are not being overutilized or over-captured in a way that could threaten extinction.²¹¹

CITES also focuses narrowly on wild species, so captive-bred amphibians could not benefit from the CITES protections.²¹² Further, CITES enforcement poses an issue. Each Party to the agreement adopts its own implementing legislation, that enables the Party to implement and enforce the treaty.²¹³ The ESA is the United States' implementing and enforcement legislation (and we have already discussed the ESA and its short comings for preventing Bd-spread).²¹⁴ For international trade, Parties may cooperate with each other and may work with the International Criminal Police Organization (Interpol) to prevent illegal trade.²¹⁵ However, this is a remedy for illegal—

205. See *The CITES Species*, CITES, <https://cites.org/eng/disc/species.php> (last visited Jan. 17, 2021).

206. *Exploring the International Trade in Amphibians*, FAUNALYTICS (Sept. 21, 2017), <https://faunalytics.org/exploring-international-trade-amphibians/>; ALTHERR ET AL., *supra* note 2, at 21.

207. U.S. FISH AND WILDLIFE SERV., *supra* note 188.

208. *Id.*

209. See *supra* Part I.

210. U.S. FISH AND WILDLIFE SERV., *supra* note 188.

211. *Id.*

212. See CITES, *supra* note 205.

213. *FAQs about CITES*, HUMANE SOC'Y INT'L, https://www.hsi.org/news-media/faqs_about_cites/ (last visited Jan. 17, 2021).

214. See *infra* Part III.C.2.

215. HUMANE SOC'Y INT'L, *supra* note 213.

not legal—trade, and is not mandatory.²¹⁶ Ultimately, CITES may play an important role for preventing the global spread of Bd, but it is not currently the most efficient way to safeguard the United States’ vulnerable amphibian populations.

CONCLUSION

Using current legislation that relies on the discretion of the USDA to implement a regulation on trade may be the most efficient response to immediately address this large-scale problem of global amphibian collapse. Captive-bred frogs are a likely vector for disease, and the frogs that do not die from Bd host and communicate it to healthy populations. If contaminated frogs in trade escape captivity, or their carcasses, parts, or storage water is disposed improperly, then Bd is released into our environment. Consequently, an AHPA regulation on frogs, their legs, and the water they travel in is an appropriate measure to stem the spread of Bd.

Importantly, the USDA order does not have to be 100% effective to be an appropriate use of the agency’s discretion.²¹⁷ A regulation on farm-raised frogs, bred specifically for human consumption, may only be one piece of the puzzle in the fight against Bd-spread but, as recent studies show, susceptible amphibian populations may be running out of time.²¹⁸ AHPA prevents disease spread and introduction of pests from imports and exports amongst livestock.²¹⁹ Farm-raised frogs should be included within the definition of “livestock,” Bd should be considered as a “pest,” and imported frog parts and their shipping water should be considered “articles” under AHPA. Including farm-raised frogs, Bd, frog parts, and their water in these definitions may provide disease protection to amphibians in trade at the federal level. Expanding these definitions would utilize existing legislation instead of relying on Congress to pass a new disease-preventing statute. Doing so is within the USDA’s power and conforms to the purpose of the statute.²²⁰ This is a necessary step in safeguarding the United States’ farm-raised frogs and preventing catastrophic disease spread in wild frog populations.

216. *Id.*

217. *R-CALF II*, 415 F.3d at 1095.

218. See generally Simon J. O’Hanlon et al., *Recent Asian Origin of Chytrid Fungi Causing Global Amphibian Declines*, 360 *SCIENCE* 621 (2018) (discussing the origin of Bd and its responsibility for global amphibian declines).

219. Graham, *supra* note 51, at 61–62 (reiterating that the AHPA was designed to prevent the introduction of pests into livestock).

220. 7 U.S.C. § 8301.