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A MESSAGE FROM THE EDITORIAL BOARD OF VERMONT JOURNAL OF ENVIRONMENTAL LAW, VOLUME 22, ISSUE 1

Editorial Board

Dear Readers,

A pandemic, caused by the spread of the SARS-CoV-2 virus, hit the world in 2020. The Editorial Board want to extend our deepest gratitude to our incredible staff, faculty advisor, and the authors of *Vermont Journal of Environmental Law*, Volume 22, Issue 1 for their strength, compassion, and guidance during this difficult and unprecedented time.

In Issue 1, we especially looked to Vermont Law School's motto: *Lex Pro Urbe et Orbe* ("Law for the Community and the World"). Issue 1 takes the reader on a journey, first looking within oneself, then to the surface of our actions, and finally outward to our actions to come. A journey from within, into space.

Issue 1 begins with a discussion on the rights of nature movement, focusing on the Lake Erie Bill of Rights and Whanganui examples. The article demands reconsideration of our underlying environmental ethics and their reflection in environmental law and practice.

The next publications take the reader outside the inner self. Focusing on regulation, they explore solutions to the issues of toxic waste management and the spread of disease among vulnerable animal species. Finally, the issue concludes by looking beyond our planet, to the next frontier.

The final publication, a note authored by our very own Editor-in-Chief, begs a reevaluation of our approach to lawmaking and regulation of the environment. Discussing the Space Act of 2015, the note heeds caution in continuing a status quo we have become familiar to on Earth. We hope you enjoy this journey.

Sincerely,

Volume 22 Editorial Board Vermont Journal of Environmental Law

WATCHING WHANGANUI & THE LESSONS OF LAKE ERIE: EFFECTIVE REALIZATION OF RIGHTS OF NATURE LAWS

Dana Zartner, JD, LLM, Ph.D.*

ABSTRACT

The rights of nature movement has become a hot topic among environmental lawyers and the number of communities around the world that have recognized some version of rights of nature or legal personhood for nature has grown rapidly over the past decade. Whether the result of constitutional amendments like in Ecuador, legislation in New Zealand and Uganda, or judicial decisions in India, Bangladesh, and Colombia, more communities are adopting rights of nature laws. Yet, despite this proliferation, we have not seen a great deal of successful implementation and enforcement of these laws. This paper examines this issue and considers the roles cultural and institutional factors play in the acceptance and internalization of rights of nature law. Using the cases of Te Awa Tupua (Whanganui River Claims Settlement Agreement) from New Zealand and the Lake Erie Bill of Rights from the United States, this article explores how these two communities, while both grounded in the common law legal tradition, have very different outcomes for their efforts at enacting rights of nature law. This article argues that understanding the context in which rights of nature laws are created is essential for the ultimate success of this new legal movement. Drawing on in-person interviews conducted by the author in New Zealand in April 2019 and analysis of primary source documents, this article highlights some lessons to guide future efforts to craft effective laws recognizing the rights of nature.

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I. INTRODUCTION

In 2017, the New Zealand Parliament passed the Te Awa Tupua (Whanganui River Claims Settlement Agreement) Act recognizing the legal personhood and intrinsic values of the Wanganui River.¹ This new law was the culmination of decades of efforts by the local iwi to redress wrongs of the past related to sovereignty over the land and treatment of nature. The new law recognizes the intrinsic values of the river, always part of the Māori cosmology, through codification in the State's secular legal framework. While still new and relatively untested, Te Awa Tupua, is probably the most successful rights of nature law in existence.²

Halfway across the world, in February 2019, the citizens of Toledo, Ohio voted on the Lake Erie Bill of Rights (LEBOR), a citizen-led effort to protect the right of Lake Erie to exist and flourish.³ LEBOR was the culmination of a grass-roots campaign that began in 2014 after toxic algae blooms made the water in the region undrinkable.⁴ The day after the legislation was passed, a local farm filed a lawsuit that argued LEBOR violated the farm's constitutional rights.⁵ After a year in court, a judge issued a decision that LEBOR was unconstitutional and struck down the law.⁶

Two communities, two bodies of water, two efforts to incorporate the recognition of the rights of nature into a legal framework. Yet two very different outcomes. Why?

This article considers the "why?" and examines the role that cultural and legal factors play in the respective communities and their acceptance of the concept of rights of nature. While both common law states, the legal

^{1.} Te Awa Tupua (Whanganui River Claims Settlement Agreement) Act 2017 (N.Z.).

^{2.} Toni Collins & Shea Esterling, *Fluid Personality: Indigenous Rights and the Te Awa Tupua (Whanganui River Claims Settlement) Act 2017 in Aotearoa New Zealand*, 20 MELB. J. INT^{*}L. L. 197, 200 (2019).

^{3.} Dana Zartner, How Giving Legal Rights to Nature Could Help Reduce Toxic Algae Blooms in Lake Erie, THE CONVERSATION (Sept. 10, 2019),

https://theconversation.com/how-giving-legal-rights-to-nature-could-help-reduce-toxic-algae-blooms-in-lake-erie-115351.

^{4.} *Id*.

^{5.} *Id.*

^{6.} *Id*.

traditions in the U.S. and New Zealand are very different on a number of key points relevant to realizing the rights of nature. Understanding the context in which rights of nature laws are created is essential for this new legal movement's ultimate success. After examining the development of rights of nature law in Whanganui and Toledo, and considering the respective outcomes, this article draws together some lessons for future efforts to craft laws recognizing the legal personhood or the rights of nature. Seen by many as effective new tools of environmental protection, the rights of nature movement also has the potential to fundamentally shift our understanding of the human-nature relationship, providing a better global environment for all living things.

II. WHAT IS THE 'RIGHTS OF NATURE'?

The rights of nature movement is a growing effort to recognize, through existing legal frameworks, the rights of natural entities such as rivers, mountains, forests, and in some cases, entire ecosystems to exist, flourish, and defend themselves through legal mechanisms.⁷ Countries around the world, including New Zealand, India, Bangladesh, Colombia, Ecuador, Peru, and Uganda recognize some version of the rights of nature in their national laws.⁸ In other places such as in the United States, Mexico, and Brazil, substate communities such as indigenous groups and municipalities also recognize rights of nature.⁹

These laws have taken many different forms. Some, as in Ecuador and, perhaps soon, Sweden, have come through changes to the country's constitution.¹⁰ New Zealand and Uganda enacted new legislation.¹¹ India, Bangladesh, and Colombia have all seen the rights of nature recognized through judicial decisions.¹² Finally, in the case of the Lake Erie Bill of Rights, recognition came through a public referendum to amend the city charter.¹³ While in each of these cases there is a natural entity or ecosystem

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^{7.} *What is Rights of Nature?*, GLOB. ALL. RTS. NATURE, https://therightsofnature.org/what-is-rights-of-nature/ (last visited Nov. 29, 2020).

^{8.} *Advancing Legal Rights of Nature: Timeline*, CMTY. ENV'T LEGAL DEF. FUND (last updated Dec. 3, 2020), https://celdf.org/advancing-community-rights/rights-of-nature/rights-nature-timeline/.

^{9.} *Id*.

^{10.} THE CONSTITUTION OF THE REPUBLIC OF ECUADOR Oct. 20, 2008, RO 449, (N.Z.); Jon Queally, In European First, Proposed Constitutional Amendment in Sweden Would Enshrine Rights of Nature, COMMON DREAMS (Oct. 8, 2019),

https://www.commondreams.org/news/ 2019/10/08/european-first-proposed- constitutional-amendment-sweden- would-enshrine-rights-nature.

^{11.} CMTY. ENV'T LEGAL DEF. FUND, supra note 8.

^{12.} *Id*.

^{13.} *Id*.

being identified, what is being recognized for the nature in question differs.¹⁴ This is one of the difficulties of the rights of nature movement. The concept of this right is being realized in different ways by different communities. It is not a one-size-fits-all effort.¹⁵ The issues driving the creation of such laws, the content of the legal provisions themselves, and the mechanisms through which they manifest, draw on the contexts of the communities from which they emerge.¹⁶ In general, rights of nature laws provide one of several things: legal personhood for a natural entity to enable it to file legal claims; rights of the natural entity, such as the right to exist or flourish; and rights for persons related to the natural entity, such as a right to clean water or a healthy environment.¹⁷

A. Legal Personhood

Most rights of nature laws contain some form of legal personhood for the natural entity in question. There are different definitions of legal personhood, and in fact, this is one of the main points of debate that emerges in an attempt to recognize the rights of nature.¹⁸ In general, however, legal personhood enumerates privileges and obligations for a specified entity under the law, including various rights and the ability to appear before legal bodies to defend these rights.¹⁹ Some entities for whom legal personhood have been created include states, corporations, churches, and animals.²⁰ We speak of the United States as an actor in the international system.²¹ It has rights and responsibilities under international law and through its membership in organizations like the United Nations. But, these are legal creations and only as extensive as the law provides. Similarly, in the United States, corporations have rights, including Constitutional rights, and they are able to defend those rights in court.²²

^{14.} Dinah Shelton, *Nature As A Legal Person*, VERTIGO (2015), https://journals.openedition.org/vertigo/16188.

^{15.} See Lidia Cano Pecharroman, *Rights of Nature: Rivers That Can Stand in Court*, 7 RES. 13, 19 (2018) (describing how the Whanganui River gained legal rights).

^{16.} Dana Zartner, Courts, Codes, And Custom: Legal Tradition And State Responsibility Toward International Human Rights and Environmental Law 25 (Oxford Univ. Press 2014).

^{17.} GLOB. ALL. FOR RTS. NATURE, supra note 7.

^{18.} Alexis Dyschkant, Note, *Legal Personhood: How We Are Getting It Wrong*, 2015 U. ILL. L. REV. 2075, 2090 (2015).

^{19.} Shelton, *supra* note 14.

^{20.} Jon Garthoff, *Corporations, Animals, and Legal Personhood*, SCHOLARS STRATEGY NETWORK (May 30, 2018), https://scholars.org/brief/corporations-animals-and-legal-personhood.

^{21.} See generally Carmen Gebhard, One World, Many Actors: Levels of Analysis in International Relations (Dec. 28, 2016), https://www.e-ir.info/pdf/67033 (discussing how States play a major role in discourse of challenges globally).

^{22.} Ciara Torres-Spelliscy, Does "We The People" Include Corporations?, 43 A.B.A HUM. RTS.

Giving legal personhood to a natural entity is, in essence, no different: the law constructs whatever rights, responsibilities, and legal standing the natural entity may have within that particular legal system. The "right" in rights of nature includes a right of the entity through its guardians or representatives to file a legal claim for damage that is, or that may be, inflicted upon it.²³ In essence, this provides standing for the natural entity to bring a lawsuit on its own behalf rather than having to wait for someone else to have standing based on a harm to them. Of course, this requires a representative to bring the claim on behalf of the natural entity, but this is not a new concept. Representatives, guardians, and trustees have long protected the legal interests of those who cannot represent themselves; whether that is because they do not possess the capacity (children, the mentally unwell) or because they are fictitious persons created under the law that require representation (animals, corporations, states).²⁴

B. Rights of Nature and Rights of Persons Related to Nature

The second and third components of many rights of nature laws go beyond the idea of legal personhood and recognize rights attaching to the natural entity at issue, or in some cases, rights of persons related to the natural entity.²⁵ For example, in the case of the Whanganui River, Te Awa Tupua recognizes that the River "has all the rights, powers, duties, and liabilities of a legal person."²⁶ Similarly, the Lake Erie Bill of Rights recognizes the right of Lake Erie and its watershed to "exist and flourish" as well as the right of citizens of Toledo to bring a legal claim on behalf of the lake.²⁷ Other examples include the Constitution of Ecuador, which recognizes the rights of Pachamama (Mother Earth) itself, as well as the rights of Ecuadorian citizens to clean water and a healthy environment.²⁸

MAG. 2 (Jan. 6, 2019), https://www.americanbar.org/groups/crsj/publications/human_rights_magazine_home/we-thepeople/we-the-people-corporations/.

^{23.} Lindsay Fendt, *Colorado River 'Personhood' Case Pulled By Proponents*, ASPEN JOURNALISM (Dec. 5, 2017), https://www.aspenjournalism.org/colorado-river-personhood-case-pulled-by-proponents/.

^{24.} Public Interest Litigation: Its Origin and Meaning, LEGAL SERVICE INDIA, http://www.legalserviceindia.com/article/l273-Public-Interest-Litigation.html (last visited Nov. 29, 2020).

^{25.} Dyschkant, *supra* note 18.

^{26.} Te Awa Tupua Act, s 14, subs 1.

^{27.} Kenneth Kilbert, *Lake Erie Bill of Rights: Legally Flawed But Nonetheless Important*, JURIST: COMMENTARY (Mar. 14, 2019), https://www.jurist.org/commentary/2019/03/kenneth-kilbert-lebor-important/.

^{28.} THE CONSTITUTION OF THE REPUBLIC OF ECUADOR Oct. 20, 2008, RO 449.

As with the idea of legal personhood, granting rights to non-human entities is not completely unheard of. The familiar analogy is to corporations, which in some jurisdictions, like the United States, are considered to have certain rights that may be enforced in court.²⁹ Recent examples of this are the *Citizens United* and *Hobby Lobby* cases before the U.S. Supreme Court, which recognized the entities' freedom of speech and freedom of religion, respectively.³⁰ In those cases, the rights of the fictional legal persons (the corporations) were represented in court by actual legal persons who had standing on their behalf. This is the same logic that is put forward by the rights of nature movement.

C. Cultural Connections and the Human-Nature Relationship

Despite the fact that providing legal personhood to nature and recognizing its rights are building on other examples of non-human entities receiving such treatment, there are still significant hurdles facing these efforts.³¹ Often, this is because the views of the human-nature relationship that exist within a culture have not incorporated this shifting positioning of nature as an equally important entity in the broader ecosystem. In some places, such as New Zealand, Ecuador, and among many indigenous communities around the world, this recognition of a natural entity as a living being which is equally deserving of rights is part of the greater cosmology. In other places, such as many in the developed world with their secular legal systems based in common or civil laws, nature is still largely thought of as a commodity, as something that is here for the use of, or pleasure of, human beings, without recognizing its importance in the overarching ecosystem. These different cultural approaches to nature and varying views on the human-nature relationship greatly impacts community acceptance of rights of nature laws.

Even for those communities reluctant at this moment to accept rights of nature law, it is important to remember that community beliefs can change. Sometimes this change can be pushed by the law and sometimes the law is pushed by change in community values.³² Often the two are moving side-by-

^{29.} Nina Totenberg, *When Did Companies Become People? Excavating the Legal Evolution*, NAT'L PUB. RADIO (July 28, 2014), https://www.npr.org/2014/07/28/335288388/when-did-companies-become-people-excavating-the-legal-evolution.

^{30.} Citizens United v. Federal Elections Commission, 558 U.S. 310 (2010); Burwell v. Hobby Lobby Stores, 573 U.S. 682 (2014).

^{31.} Shannon Biggs et al., *Rights of Nature & Mother Earth: Rights-Based Law for Systematic Change* (2017), https://www.ienearth.org/wp-content/uploads/2017/11/RONME-RightsBasedLaw-final-1.pdf.

^{32.} Richard Ayres et al., The Paths to Change in Environmental Law, in LEGAL CHANGE: LESSONS

side to produce change. There are many examples of this, but some recent ones include changes in ideas and laws regarding LGBTQ rights, same-sex marriage, and the death penalty, especially for juveniles. In these cases, we have seen community values and the law shift over time to a place of acceptance of different normative standards and expanded views of rights that should attach to different groups of legal persons.³³ That is where we currently find debates over rights of nature laws. In some places, culture and values have already shifted to recognize this place for nature within the community and in the law. In other communities this has not yet occurred. Rights of nature laws, and the conversations, debates, and even setbacks surrounding these laws, can help shape cultural understandings on this issue.

III. THE ROLE OF LEGAL TRADITION AND EFFECTIVE LEGAL CHANGE

A. Legal Tradition

The successful development of rights of nature law includes several components. First, there must be a change in the laws and legal processes to recognize and protect the rights of natural entities and ecosystems. This may be done through constitutional amendment, legislation, court decision, public referendum, or other means. Second, there must be a shift in a community's understanding of the human-nature relationship to recognize a more balanced and equitable connection between human beings and nature. While the former is the focus of many rights of nature efforts and is the tangible legal outcome desired in the short-term, the latter is a necessary component of this process to ensure communal acceptance of these new laws, as well as successful compliance and change for the long-term. Successful rights of nature law will consider both the institutional and the cultural, through an understanding of the legal tradition in a place.

Legal tradition is the "set of deeply rooted, historically conditioned attitudes about the nature of law, the role of law in society and the polity, and the proper organization and operation of a legal system in existence within a state."³⁴ A legal tradition is more than "the institutions and processes that

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FROM AMERICA'S SOCIAL MOVEMENTS (Jennifer Weiss-Wolf & Jeanine Plant-Chirlin eds. 2015) 63, 63-64.

https://www.brennancenter.org/sites/default/files/publications/Legal Change Lessons from America% 27s Social Movements.pdf.

^{33.} Addressing the Social and Cultural Norms That Underlie the Acceptance of Violence Proceedings of a Workshop—in Brief, THE NAT'L ACADEMIES PRESS (Apr. 2018), https://www.nap.edu/read/25075/chapter/1.

^{34.} ZARTNER, supra note 16, at 27.

make up a state's legal system."³⁵ Legal systems are a part of legal tradition, but legal tradition is a broader concept that also includes legal culture.

Legal systems are the legal institutions and processes present in a place. Legal institutions include the forms of law that are recognized, the authority granted to different branches of government, and the process by which law is implemented and enforced.³⁶ For example, the U.S. legal system relies on a hierarchical structure of laws. The Constitution is at the top with a very strong system of checks and balances, including a judicial branch with authority to declare acts of the other government branches unconstitutional. Other legal systems might have a more horizontal system of law that concentrates legal authority in a non-judicial branch of government such as a parliament or even in a religious council or customary framework.³⁷

Legal culture, on the other hand, encompasses "a general consciousness of experience of law" shared among community members and includes values, beliefs, traditions, cosmologies, and the underlying view that a community has towards the law and legal processes.³⁸ Legal culture can be understood by looking at legal history, contextual development, and the origins of a country's normative belief systems.³⁹ Factors like whether a society tends to be more communal or more individual also shapes legal culture.⁴⁰ Legal culture centers on community perceptions of appropriate behavioral standards, which encompass the values and beliefs behind a law. In New Zealand, for example, the primary legal system is a secular common law system derived from England.⁴¹ But, the incorporation of indigenous law and Maori norms has had an impact on the overarching legal culture of the country and thus has shaped the development of rights of nature law.

Legal tradition is a framework that shapes how the law is made and implemented.⁴² However, it does more than that: it can help us understand what kind of law might best suit a particular community, and can guide in crafting this law so that it is accepted by that community. This ultimately leads to better compliance and long-term change.⁴³ Consideration of these factors can help explain the different outcomes we can see in the Whanganui and Lake Erie cases and also help provide guidance for future efforts to develop similar kinds of laws.

^{35.} Id.

^{36.} Id.

^{37.} Id.

^{38.} Id.

^{39.} Id.

^{40.} Id.

^{41.} Id. at 28. 42. Id. at 27.

^{43.} Id.; Dana Zartner, The Culture of Law: Understanding the Influence of Legal Tradition on Transitional Justice in Post-Conflict Societies, 22 IND. INT'L & COMPAR. L. REV. 297, 297–98 (2012).

B. How Legal Tradition Creates Effective Legal Change

Any law is only as good as its ability to be understood, implemented, and enforced.⁴⁴ Sustainable change in the law requires consideration of two things: legal culture and legal institutions.⁴⁵ Change in both is necessary for acceptance and implementation of new legal ideas, such as legal personhood for, or the rights of, nature. Law alone is not always enough. Law does not "offer iron-clad protections," but the creation of law does often mean that the principle "stands a better chance."⁴⁶ In other words, simply passing a law recognizing legal personhood for a river is not enough to make that law successful. A law requires community support. However, a law can push the conversation with the community forward and contribute to shifting the underlying values of a community towards internalizing the law in the long-term.

In the case of new rights of nature laws, issues that must be addressed include not only how to implement these new laws, but also how to convince communities that these laws are a good thing. Rights of nature law "has the power to drive long-term change", but to do so it is necessary to develop the law in a way that is going to encourage and facilitate community acceptance.⁴⁷ In considering the rights of nature movement, it is important to really understand what is being talked about with these news laws in terms of personhood and rights granted and the effects on existing practices. Without these considerations it will not be possible to address the concerns or questions people have about this novel type of law, as well as how to ensure effective implementation. It isn't enough to simply pass a law. It is also essential to be able to implement that law so that the population to whom it applies can both understand it and abide by it, and that those in charge of implementation have a mechanism by which to do so.

In order for the rights of nature laws to be effective, they must develop from the legal tradition in a particular community.⁴⁸ The movement is not one-size-fits-all. The underlying principles of the rights of nature movement are two-fold. First, it is a legal and policy mechanism for protecting the environment and human rights related to the environment, including indigenous rights.⁴⁹ However, it is also a worldview—a way of thinking

^{44.} Dana Zartner, *Internalization of International Law*, OXFORD RSCH. ENCYC. (Sept. 28, 2020), https://oxfordre.com/internationalstudies/view/10.1093/acrefore/9780190846626.001.0001/acrefore-9780190846626-e-225?print=pdf.

^{45.} Zartner, supra note 43.

^{46.} Jeremy Lurgio, *Saving the Whanganui*, GUARDIAN (Nov. 29, 2019), https://www.theguardian.com/world/2019/nov/30/saving-the-whanganui-can-personhood-rescue-a-river.

^{47.} *Id*.

^{48.} Shelton, supra note 14.

^{49.} Id.

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about the natural world and the human-nature relationship. Successfully realizing the rights of nature within a community, whether on a local- or global-level, requires consideration of both of these facets. We need to understand the cultural context that exists in a place and surrounds the natural entity in question to create the best legal mechanisms, within current structures, to protect the rights of nature. We must also take into account the legal culture and worldviews of a community, their understandings of the human-nature relationship, and the historical treatment of nature, both within and without the law. We need to consider the legal tradition and belief systems present in a place and draw on these to craft legal mechanisms that will work effectively within that community.

IV. AOTEAROA & TE AWA TUPUA

A. The Living River

*"The River flows from the mountain to the sea I am the River and the River is me."*⁵⁰

Te Awa Tupua has garnered significant international attention since its enactment in 2017.⁵¹ The legislation recognizes the river as "an indivisible and living whole, comprising the Whanganui River from the mountains to the sea, incorporating all its physical and metaphysical elements."⁵² Within this recognition are four intrinsic values of the river (Tupua te Kawa).⁵³ These values are ultimately what the guardians of the river will stand for and uphold in any actions taken on the Whanganui's behalf.⁵⁴

In recognizing the River as an indivisible and living whole, Te Awa Tupua creates for it a legal personality, including all the "rights, powers, duties, and liabilities of a legal person." ⁵⁵ Now codified as national legislation, Te Awa Tupua is on equal legal footing with other laws such as the Resources Management Act.⁵⁶ It "sits alongside other statutes," but it doesn't invalidate existing laws. ⁵⁷ Correspondingly, other laws cannot

^{50.} *Our Story*, NGÃ TÂNGATA TIAKI O WHANGANUI, https://www.ngatangatatiaki.co.nz/our-story/ (last visited Nov. 29, 2020).

^{51.} Anna M. Gade, *Managing the Rights of Nature for Te Awa Tupua*, EDGEEFFECTS (Oct. 12, 2019), https://edgeeffects.net/te-awa-tupua/.

^{52.} Te Awa Tupua Act, s 12.

^{53.} Id. s 13.

^{54.} Interview with Gerrard Albert, in Whanganui, N.Z. (Apr. 10, 2019).

^{55.} Te Awa Tupua Act, s 14.

^{56.} Resource Management Act 1991, s 6 (N.Z.).

^{57.} Albert, supra note 54.

invalidate consideration of Te Awa Tupua and the interests of the Whanganui.58

It is understandable why Te Awa Tupua and the Whanganui River have become the face of the rights of nature movement. The Whanganui is a majestic river, running through a national park, farmland, and out to the Tasman Sea. But it is more than that—it is a dynamic, living part of the ecosystem through which it wends, sustaining local communities in many ways. In recognizing this, the detailed piece of legislation crafted through collaboration of the Māori, the Crown, and other local stakeholders, is a model for the creation of new laws of this sort. While still relatively untested in terms of implementation and enforcement, there is much to be learned from Te Awa Tupua.

B. The Long Road to Te Awa Tupua

Te Awa Tupua is often written about, particularly in the international press, as the development of contemporary legislation codifying the rights of nature.⁵⁹ Most often, there is little mention that the Te Awa Tupua is a culmination of 150 years Māori efforts to correct the wrongs inflicted by colonialism, the Treaty of Waitangi, and decades of government policies and gain Crown acknowledgment of their rights and relationship to the river.

The Treaty of Waitangi came into existence in 1840.⁶⁰ It delineated the relationship between the Māori and the Pākehā (White settlers), as well as determined the sovereignty over the land and resources of New Zealand.⁶¹ While long heralded by the New Zealand government as an example of positive indigenous-settler relationships, the treaty, for the Maori people, has been a point of contention and a mechanisms used to divest them of their lands, and spiritual and cultural connection to the natural ecosystems of Aotearoa. Beginning in the last third of the 20th century, after decades of efforts by Māori, a slow turnaround by the Crown on this issue began.⁶² This led to the creation of the Waitangi Tribunal and a series of claims, settlements, apologies, and reparations.⁶³ A full discussion of the history surrounding this treaty is outside the scope of this article, but it is important to highlight that from the beginning there were questions concerning the

^{58.} Id.

^{59.} See Pecharroman, supra note 14, at 7 (describing how the Whanganui River gained legal rights).

^{60.} Id.

^{61.} Sandra Morrison & Ingrid L.M. Huygens, Explainer: The Significance Of The Treaty Of Waitangi, CONVERSATION, (Feb. 5, 2019), https://theconversation.com/explainer-the-significance-of-thetreaty-of-waitangi-110982.

^{62.} Id. 63. Id.

language of the treaty, the translation of the treaty from English to te reo Māori, and the different understandings of the terms of the treaty that were held between the Māori chiefs and the Crown representatives.⁶⁴ There is even historical evidence of a discussion between William Hobson, Governor of New Zealand and co-author of the treaty, and missionary William Colenso during the February 6, 1840 signing ceremony, where Colenso questioned whether the Māori understanding of the terms of the treaty was the same as that of the Crown.⁶⁵ Hobson admitted that it was not.⁶⁶

One provision in particular, that has been at issue in the decades of debate and protest over the terms of the treaty is Article 2, which states in the English version:

Her majesty the Queen of England confirms and guarantees to the Chiefs and Tribes of New Zealand and to the respective families and individuals thereof the full exclusive and undisturbed possession of their Lands and Estates, Forests, Fisheries, and other properties which they may collectively or individually possess so long as it is their wish and desire to retain the same in their possession...⁶⁷

Records of what the Māori chiefs understood at the time of signing in regard to this provision show that they believed the *Rangatiranga* and the mana of the land remained with the Māori peoples:

To Māori signing the Treaty, its confirmation of Rangatiranga was undoubtedly crucial, 'Rangatiranga' is a complex word for which there is no exact English equivalent ('possession' is the word in the English text). In 1840, it stood for Māori authority and autonomy. ... Māori no doubt thought that the mana of the land – the chiefs' authority over its resources and their allocation – would be retained....⁶⁸

This, of course, was not how the Crown interpreted the provisions of the treaty.⁶⁹ In the view of the government, the Māori ceded control over their lands and resources, and the government was free to dispose of them in any

^{64.} *See generally* CLAUDIA ORANGE, THE STORY OF A TREATY (2nd ed, Bridget Williams Books 2013) (discussing the history, language, and issues surrounding the Treaty of Waitangi).

^{65.} Id. at 28.

^{66.} Id.

^{67.} *Id.* at 39.

^{68.} Id. at 44.

^{69.} See The Story of the Treaty: Part 2, STATE SERV. COMM'N 21(2005), https://nzhistory.govt.nz/files/documents/The_Story_Part_2.pdf (describing the original intent of interpretation of the Crown).

manner they saw fit. Over time, the legacy of the Treaty of Waitangi led to the marginalization of the Māori population, though perhaps not as significantly as found in fellow former British colonies like Canada, Australia, and the United States.⁷⁰

The Māori, however, soon began to protest the terms of the Treaty of Waitangi and the corresponding impacts of Crown policies on their use of, and connection to, their lands.⁷¹ In the case of the Whanganui River, petitions to the New Zealand Parliament to regain *Rangatiranga* with the river began as early as the 1870s.⁷² It continued until Parliament finalized the Deed of Settlement in 2014, and the Te Awa Tupua legislation passed in 2017.⁷³ During this 140-plus year period, Māori efforts included:

The pursuit of one of the longest running cases in New Zealand legal history concerning the ownership of the bed of the River between 1938 and 1962; litigation concerning the operation of, and diversion of waters by, the Tongariro Power Scheme; claims to, and a report in 1999 from, the Waitangi Tribunal; and extensive efforts in negotiation with the Crown over a long period.⁷⁴

The Whanganui River and corresponding recognition of the Māori's relationship with the river was also part of one of the longest protests in New Zealand's history. In 1995, a 79-day occupation of Pakaitore (Moutoa Gardens) occurred in Whanganui, with protesters, comprised of members of many local hapū, who sought to regain control over their traditional spaces, including the river.⁷⁵

These actions had an effect and led to the opening of different negotiations between Māori communities and the Crown. Discussions about

^{70.} Dominic O'Sullivan, *Why the Indigenous in New Zealand Have Fared Better Than Those in Canada*, CONVERSATION (Oct. 15, 2017), https://theconversation.com/why-the-indigenous-in-new-zealand-have-fared-better-than-those-in-canada-84980; *Why New Zealand's Māori do Better than Australia's Aboriginals*, ECONOMIST (Dec. 1, 2018), https://www.economist.com/international/2018/12/01/why-new-zealands-maori-do-better-than-australias-aboriginals.

^{71.} ORANGE, supra note 64.

^{72.} Innovative Bill Protects Whanganui River with Legal Personhood, N.Z. PARLIAMENT (Mar. 28, 2017), https://www.parliament.nz/en/get-involved/features/innovative-bill-protects-whanganui-river-with-legal-personhood/.

^{73.} Treaty Settlement Ruruku Whakatupua Te Mana O Te Awa Tupua, Iwi-N.Z., (Aug. 5, 2014), https://www.govt.nz/assets/Documents/OTS/Whanganui-Iwi/Whanganui-River-Deed-of-Settlement-Ruruku-Whakatupua-Te-Mana-o-Te-Awa-Tupua-5-Aug-2014.pdf.

^{74.} *Id.; See also* WHANGANUI RIVER MAORI TR. BD., THE WHANGANUI RIVER REPORT 195-232 (1999), http://www.wrmtb.co.nz/pages/claim.html (explaining the history of the legal dispute over ownership of Whanganui Riverbed).

^{75.} *Moutoa Gardens Protest*, NEW ZEALAND HISTORY, https://nzhistory.govt.nz/media/photo/moutoa-gardens-protest (last visited Nov. 29, 2020).

the Whanganui were part of this process and led to, after decades of protests and social movements, the creation of Te Awa Tupua.

C. What does Te Awa Tupua Say?

The passage of the Te Awa Tupua (Whanganui River Settlement Agreement 2017) Act did not happen overnight. Nor was it drawn up on a whim. This legislation, with its recognition of values and legal personhood of the Whanganui River, is the culmination of years of efforts by the local Māori to regain what was lost to them in 1840.

The legislation, which was finalized and received Crown Assent on March 30, 2017, is comprised of two main sections.⁷⁶ The first of these, and the section on which this article focuses, centers on the values and personhood of the Whanganui River and the institutional frameworks created to manage the implementation and enforcement of this legislation.⁷⁷ The second focuses on apology and reparations under Treaty of Waitangai negotiations.⁷⁸

In the first section of the Te Awa Tupua legislation there are a number of key subparts, some focusing on the values and living nature of the River, and others establishing the representative frameworks that will ensure the protection of these values and rights.⁷⁹ These two parts of the legislation roughly correspond to the legal culture and legal institution components of legal tradition described in the previous section, both of which, as mentioned, are necessary for effective legal change and community acceptance.

It is important to understand what Te Awa Tupua actually says regarding the River and what mechanisms are included in the legislation to ensure its effectiveness. Much of the recent news about this new law gives the impression that it simply grants rights to the Whanganui and provides punishment for those who violated those rights, but there is so much more to it than that.⁸⁰ The care, collaboration, and detail with which Te Awa Tupua was drafted make it a leading example of the rights of nature law. This is very different from the way in which the Lake Erie Bill of Rights was written, which was one of the challenges that the LEBOR faced.

^{76.} Te Awa Tupua Act.

^{77.} Id. ss 3–68.

^{78.} Id. ss 69–128; ORANGE, supra note 64.

^{79.} Id. ss 3-68.

^{80.} See generally Kennedy Warne, A Voice For Nature, NAT'L GEO. (Apr. 2019), https://www.nationalgeographic.com/culture/2019/04/maori-river-in-new-zealand-is-a-legal-person/ (explaining in the new legislation, the Crown issued an apology for its historical wrong-doing, acknowledging that it breached the treaty, undermined the ability of Whanganui tribes to exercise their customary rights, and responsibilities in respect of the river, and compromised their physical, cultural, and spiritual well-being).

D. Legal Status of the River

The text of the legislation recognizes that: "Te Awa Tupua is an indivisible and living whole, comprising the Whanganui River from the mountains to the sea, incorporating all its physical and metaphysical elements."⁸¹

The legislation goes on to state, in one of its most oft-quoted sections that:

Te Awa Tupua is a legal person and has all the rights, powers, duties, and liabilities of a legal person.⁸² The rights, powers, and duties of Te Awa Tupua must be exercised or performed, and responsibility for its liabilities must be taken, by Te Pou Tupua on behalf of and in the name of, Te Awa Tupua, in the manner provided for in this Part⁸³

These provisions both codify the legal personhood of the river, as well as define what is encompassed in this concept of personhood. They also provide for the mechanism by which the River will be represented in its personhood through Te Pou Tupua.

E. Values of the River

As members of Ngā Tāngata Tiaki, the body responsible for supporting the care of the river, are careful to point out, the recognition codified into the legislation is not just about legal personhood and protections, it is also about publicly recognizing the Whanganui River for the living entity that the Māori have always known it to be.⁸⁴ This is encompassed in the River's four values (Tupua te Kawa).⁸⁵

The first of these values states that the "River is the source of spiritual and physical sustenance...that supports and sustains both the life and natural resources within the Whanganui River and the health and well-being of the iwi, hapū, and other communities of the River."⁸⁶ While this value recognizes the "inalienable relationship of responsibility of hapū and iwi and the River," it is not exclusive. It does not say that the Māori are the only ones with such

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^{81.} Te Awa Tupua Act, s 12.

^{82.} Id. s 14, subs 1.

^{83.} Id. s 14, subs 2.

^{84.} Albert, *supra* note 54.

^{85.} Linda Te Aho, Ruruku Whakatupua Te Mana o te Awa Tupua – Upholding the Mana of the Whanganui River, MĀORI L. Rev. (2014).

^{86.} Te Awa Tupua Act, s 13, subs a.

a connection to the River, but that their connection is cultural, historical, and fundamental and therefore careful consideration must be paid.⁸⁷

The second value brings forward the understanding that the "great River flows from the mountains to the sea," and recognizes that "Te Awa Tupua is an indivisible and living whole from the mountains to the sea, incorporating the Whanganui River and all of it physical and metaphysical elements."⁸⁸ This value is designed to ensure that, even when all the different stakeholders along the River have a voice, the underlying consideration in any decision is the River in its entirety.⁸⁹

The third value codifies the now famous statement, "I am the River and the River is me," which means the "iwi and hapū of the Whanganui River have an inalienable connection with, and responsibility to, Te Awa Tupua and its health and well-being."⁹⁰ This does not mean that the Māori are the only ones who have a relationship to the River, rather it recognizes that their relationship is longstanding and deep, and therefore they have an important role in any actions involving the River.⁹¹

Finally, the fourth value recognizes "the small and large streams that flow into one another form one River," highlighting that "Te Awa Tupua is a singular entity comprised of many elements and communities, working collaboratively for the common purpose of the health and well-being of Te Awa Tupua."⁹² These many elements work together for the health of the River, which "becomes a common obligation" of all members of the community.⁹³

These values together reflect the beliefs and normative practices of the Māori, who recognize the River as an ancestor that should be accorded the same respect, protection, and love of any ancestor. It is these values that provide the cultural support for this legislation and create the understanding of the relationship between human beings and the natural world that is necessary for successfully recognizing the rights of nature. As stated by Gerrard Albert, lead negotiator for the Whanganui Iwi and Chair of Ngā Tāngata Tiaki o Whanganui Trust and recently appointed Chair of Te Kōpuka nā Te Awa Tupua,⁹⁴ regarding the river's values:

^{87.} Albert, *supra* note 54.

^{88.} Te Awa Tupua Act, s 13, subs b.

^{89.} Albert, supra note 54.

^{90.} Te Awa Tupua Act, s 13, subs c.

^{91.} Albert, *supra* note 54.

^{92.} Te Awa Tupua Act, s 13, subs d.

^{93.} See id. ("Te Awa Tupua is a singular entity comprised of many elements and communities, working collaboratively for the common purpose of the health and well-being of Te Awa Tupua.").

^{94.} *See* Te Awa Tupua Act, sch 4, cl 3 (requiring appointment of a chairperson at the first meeting of each term of Te Kōpuka); *See generally id.* ss 29–32 (explaining the nature, purpose, functions, general powers, and membership of Te Kōpuka).

[W]e put those in because we wanted to have the community understand our indigenous values . . . Not in a way that they necessarily have to uphold them in the exact way that we do, but that they recognize that there is validity and power to those values as a community. That's been real change.⁹⁵

These four values reflect the recognition the Māori iwi of the region have always accorded the River.⁹⁶ The codification of the values into the Te Awa Tupua legislation is important because it "provides an acknowledgment of a common view of the river," which serves as a framework for the rest of the legislation.⁹⁷ This "really does rely on the general community having the capacity to recognize that the river is both physical and spiritual."⁹⁸

F. Legal Framework to Uphold the Law and Protect the River

The recognition of the rights, values, and legal personhood of the River is monitored by a number of institutional entities established through the legislation. These include the Guardians of the River (Te Pou Tupua), as well as both an advisory group and a strategy group.⁹⁹

1. Te Pou Tupua

Te Pou Tupua is the "human face of the Te Awa Tupua and act[s] in the name of Te Awa Tupua," and "has full capacity and all the powers reasonably necessary to achieve its purpose and perform and exercise its functions, powers, and duties in accordance with [Te Awa Tupua]."¹⁰⁰ The functions of Te Pou Tupua include speaking on behalf of the River; upholding the values of the River; promoting the health and well-bring of the River; performing landowner functions on behalf of the River; and "any other action reasonably necessary to achieve its purpose and perform its functions."¹⁰¹ In carrying out these functions, Te Pou Tupua must "[a]ct in the interests of Te Awa Tupua and consistently with Tupua te Kawa," must develop appropriate engagement and reporting mechanisms for the iwi and hapū with interests in the

^{95.} Albert, supra note 54.

^{96.} Id.

^{97.} Id.

^{98.} Id.

^{99.} See Te Awa Tupua Act, ss 27–33 (N.Z.) (creating the advisory group, Te Karewao, and strategy group, Te Kōpuka.); *The Rise of the Rights of Nature*, RAPID TRANSITION ALL. (Mar. 11, 2019), https://www.rapidtransition.org/stories/the-rise-of-the-rights-of-nature/.

^{100.} Te Awa Tupua Act, s 18, subs 2–3.

^{101.} Id. s 19, subs 1.

Whanganui River "as a means of recognising the inalienable connection" with the River, and develop engagement and reporting functions for other interested and relevant parties.¹⁰²

There are two representatives of the River that make up Te Pou Tupua. One is nominated by the Crown and one is nominated by the iwi with interests in the Whanganui River.¹⁰³ There should be consultation among the parties on the nominations and nominees must possess the "mana, skills, knowledge, and experience" necessary to "achieve the purpose and perform the functions of Te Pou Tupua."¹⁰⁴ The first two guardians of Te Pou Tupua are Dame Tariana Turia and Mr. Turama Hawira.¹⁰⁵ While still relatively untested, this appointment structure is a "relatively innovative way to hold the Crown to account," which has not always been easy to do.¹⁰⁶

2. Advisory Board and Strategy Group

In addition to Te Pou Tupua, Te Awa Tupua creates a number of other groups to allow for participation by all members of the community. The first of these is Te Karewao, which is an advisory group "established to provide advice and support to Te Pou Tupua in the performance of its functions."¹⁰⁷ The advisory board consists of three members: one appointed by Te Pou Tupua, one appointed by iwi with interests in the Whanganui River, and one appointed by relevant local authorities.¹⁰⁸ Te Karewao "in providing advice and support to Te Pou Tupua ... must act in the interests of Te Awa Tupua" and consistently with the values of the River.¹⁰⁹

The third group is Te Kōpuka nā Te Awa Tupua, which is a strategy group for Te Pou Tupua.¹¹⁰ Representatives of Te Kōpuka include "persons and organisations with interests in the Whanganui River, including iwi, relevant local authorities, departments of State, commercial and recreational users, and environmental groups."¹¹¹ The purpose of this group is to "act collaboratively to advance the health and well-being of Te Awa Tupua" through a number of functions, including: develop and approve the strategy (Te Heke Ngahuru) for the River; monitor its implementation; provide

^{102.} Id. s 19, subs 2.

^{103.} Id. s 20, subs 1-2.

^{104.} Id. s 20, subs 3-5.

^{105.} Christopher Finlayson & Gerrard Albert, *First Te Pou Tupua Appointed*, SCOOP INDEP. NEWS (Sept. 4, 2017), https://www.scoop.co.nz/stories/PA1709/S00132/first-te-pou-tupua-appointed-4917.htm. 106. Albert, *supra* note 54.

^{107.} Te Awa Tupua Act, s 27, subs 1.

^{108.} Id. s 28.

^{109.} Id. s 27, subs 2.

^{110.} Id. s 29, subs 1.

^{111.} Id. s 29, subs 2.

periodic review of the strategy; and provide a forum for discussion of issues related to the health and well-bring of the River. ¹¹² Members of Te Kōpuka include one member appointed by the guardians; up to five members appointed by iwi with interests in the River; up to four members appointed by the relevant local authorities; and one member each appointed by the Director-General of Conservation, the New Zealand Fish and Game Council, Genesis Energy Limited, environmental and conservation interests, tourism interests, recreational interests, and the primary industries sector.¹¹³ This is designed to be a collaborative body to provide strategy for interests in the Whanganui, while upholding the River's health, well-being, and values.

3. Scope and Implementation of Te Awa Tupua

The legal effect of the Whanganui River legislation applies to "persons exercising or performing a function, power, or duty" under Te Awa Tupua.¹¹⁴ The reach of the legislation is not unlimited, however. One of the most important clauses inserted in the legislation in terms of gaining broad public acceptance is that it does not infringe on any existing rights of use regarding the River. The legislation states:

Unless expressly provided for by or under this Act, nothing in this Act— (a) limits any existing private property rights in the Whanganui River; or (b) creates, limits, transfers, extinguishes, or otherwise affects any rights to, or interests in, water; or (c) creates, limits, transfers, extinguishes, or otherwise affects any rights to, or interests in, wildlife, fish, aquatic life, seaweeds, or plants; or (d) affects the application of any enactment.¹¹⁵

While this provision of the legislation may reduce the immediate effectiveness of the legislation in protecting the river from degradation or pollution, it is a key factor in fostering acceptance by the community. As discussed below in relation to the Lake Erie Bill of Rights, blanket statements of liability, even for those who have been using Lake Erie for decades, were part of what led to a decision that the LEBOR was unconstitutional.¹¹⁶

^{112.} Id. s 29, subs 3; See id. s 30 (outlining the functions of Te Kopuka nā Te Awa Tupua).

^{113.} Id. s 32, subs 1.

^{114.} *Id.* s 15.

^{115.} Id. s 16.

^{116.} Tom Henry, *Lawsuit Filed Against Lake Erie Bill of Rights*, BLADE (Feb. 27, 2019), https://www.toledoblade.com/local/environment/2019/02/27/lawsuit-filed-against-lake-erie-bill-of-rights-district-court-lebor/stories/20190227090.

4. Recognition of Te Awa Tupua in the Legal Hierarchy

A final key component of the Te Awa Tupua legislation is that it is national legislation on par with New Zealand's overarching environmental law, the Resource Management Act of 1991.¹¹⁷ This means, when addressing issues pertaining to the rights of the Whanganui, all of the law must be considered in its entirety.

This sets up a vastly different scenario than what is found in other states, where rights of nature law either is the result of a court decision, which then needs to be implemented, or part of a legal push that is subject to a higher law, such as in the case of the Lake Erie Bill of Rights. The provisions of Te Awa Tupua must be read alongside, and considered as important as, provisions of any other law. Correspondingly, other legislation, when potentially affecting the Whanganui River, must follow the consultation procedures outlined in Te Awa Tupua.¹¹⁸

5. Implementation and Enforcement

Even with the years of negotiation, the overall good working relationship between the Māori and the Crown during the drafting, and the general support of the public, the real test of Te Awa Tupua will be its successful implementation and enforcement. Having only been in existence for three years, there has not yet been much time to test the authority of this legislation. There have been a few cases that have come up, however, regarding the use of the Whanganui River that have triggered the legislation's consultation procedures with Te Pou Tupua and provide guidance for the future.

One of the first situations to emerge pertained to the Papaiti abutment for the Upokongaro Cycle Bridge project, which required the removal of power lines and the addition of a bridge over the river.¹¹⁹ Under the terms of Te Awa Tupua "[n]avigation by the public and existing river structures in or above the bed of the river don't need Te Pou Tupua involvement – but any new structure or activity, such as removing power lines, does."¹²⁰ In the case of the power lines, "[a]s effective landowner," Te Pou Tupua must "be made aware of Powerco's measures for public safety as it removed the powerlines" and the company is required to "work with any relevant local hapū."¹²¹ The line removal was delayed twice due to the lack of this required notification,

^{117.} Resource Management Act.

^{118.} Te Awa Tupua Act, s 17.

^{119.} Whanganui River Work Triggers Te Awa Tupua Legislation, WHANGANUI CHRON. (Mar. 15, 2019), https://www.nzherald.co.nz/whanganui-chronicle/news/whanganui-river-work-triggers-te-awa-tupua-legislation/VOU5EVLN457XJ77VQD7R7EEHTU/.

^{120.} Id.

^{121.} Id.

but the appropriate consultations finally occurred and the work was able to proceed.¹²²

The Upokongaro Cycle Bridge is part of the Mountain to Sea cycling trail that runs from Tongariro National Park to the Tasman Sea, covering 200 kilometers of trails.¹²³ Prior to beginning construction, the new bridge required a resource consent variation as the height of the Papaiti abutment needed to be increased by 800mm.¹²⁴ According to the general property manager of the Whanganui District Council, the need to increase the height of the abutment is "to reduce risks to the structure from climate change."¹²⁵ The Whanganui District Council had to apply to the Horizons Regional Council for a variance to the resource consent, and that then should have gone to consultation "under both the Resource Management Act and the Te Awa Tupua (Whanganui River Claims Settlement) Act."126 The requisite consultation with Te Pou Tupua was not sought at first, but this was later remedied and, according to Leighton Toy, the "parties involved in the consultation want to ensure we establish a really good, agreed process under this relatively new legislation."¹²⁷ On March 25, 2020, hours before New Zealand went into COVID-19 lockdown, the new cycle bridge was finally rolled into place across the river.¹²⁸

A future scenario that will likely test the effective functioning of Te Awa Tupua concerns the diversion of the Whanganui River by Genesis Power Company.¹²⁹ Genesis Power "operates the Tongariro Power Scheme that provides 4% of New Zealand's energy."¹³⁰ "The hydropower system diverts the water of the Whanganui River and five of its upper tributaries, including the Mangatepopo."¹³¹ The intake structure "draws 75% of the water, leaving 25% to flow back into the river.¹³² The intake is just outside the park, 15

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^{122.} Id.

^{123.} Mountains to Sea - Ngā Ara Tūhono, VISIT RUAPEHU (last visited Dec. 8, 2020), https://www.visitruapehu.com/things-to-see-and-do/cycling-and-mountain-biking/mountains-to-sea-ngāara-tūhono/

^{124.} WHANGANUI CHRON., supra note 119.

^{125.} Id. (quoting Whanganui District property general manager Leighton Toy).

^{126.} Laurel Stowell, Upokongaro Cycle Bridge Awaits Variation to Consent, WHANGANUI CHRON. (June 25, 2019), https://www.nzherald.co.nz/whanganui-chronicle/news/upokongaro-cyclebridge-awaits-variation-to-consent/Q4C744KPROPNRZKWLQAZCXJAX4/.

^{127.} WHANGANUI CHRON., supra note 119.

^{128.} Laurel Stowell, Finally! Upokongaro Cycle Bridge Launched Across Whanganui River, WHANGANUI CHRON. (Mar. 25, 2020), https://www.nzherald.co.nz/whanganuichronicle/news/finally-upokongaro-cycle-bridge-launched-across-whanganuiriver/JS265O2HQZAKRDAXWYNNT2D2NI/.

^{129.} See Michelle Bryan, Valuing Sacred Tribal Waters Within Prior Appropriation, 57 NAT. RES. J. 139, 173-74 (2017) (discussing the Environmental Court's determination on non-tribal water uses and the iwi).

^{130.} Lurgio, supra note 46.

^{131.} Id.

^{132.} Id.

kilometers from the stream's source and 15km from its confluence with the Whanganui."¹³³ These resource consents are in place for another 20 years.¹³⁴

Reflecting the terms of Te Awa Tupua, many believe that the power scheme causes environmental, spiritual, and cultural damage to the river and the Māori "categorically oppose the extraction of their river's water."¹³⁵ Given this, an extension of Genesis Power's rights beyond the current agreement would trigger consultation under Te Awa Tupua and it is likely the concessions would not be continued.¹³⁶ Te Awa Tupua, however, while giving the river these newfound rights, does not "reverse pre-existing laws, including the consent granting Genesis the rights to divert water for hydroelectric power until 2039."¹³⁷

G. What does Te Awa Tupua Mean for the Rights of Nature?

The questions that arise with all the rights of nature laws being enacted, including Te Awa Tupua, are how are they going to work in practice, and how will they be interpreted and enforced? In the case of Te Awa Tupua, under the law, which is grounded in the Māori cultural, spiritual and historical worldview, the legal personhood provides protection in that the River, in essence, must be part of the discussion. Any new undertaking that might involve the Whanganui must include the river through its representative body, Te Pou Tupua, as well as consultation and participation of other stakeholders.

Te Awa Tupua, however, is not just about adopting new legislation that provides a requirement of consideration of the life and values of the river as an important living entity in its own right. This law also promotes shifts in the view of the human-nature relationship and the place of nature in our worldview. Historically, the "Western" worldview, shared by many people in the developed, industrial democracies, tends to focus on nature as nothing more than a commodity—something that is there for the use of human beings as we see fit.¹³⁸ This is true as well for New Zealand where the "Pākehā view was to see the land as having a utilitarian use and in New Zealand that meant farming."¹³⁹ Traditionally, much environmental law in these types of locales

139. Id.

^{133.} Id.

^{134.} Id.

^{135.} Id.

^{136.} Te Awa Tupua Act, s 69, subs 5.

^{137.} Lurgio, supra note 46.

^{138.} Simon Day, If the Hills Could Sue: Jacinta Ruru on Legal Personality and a Māori Worldview, SPINOFF (Nov. 27, 2017),

https://thespinoff.co.nz/atea/atea-otago/27-11-2017/if-the-hills-could-sue-jacinta-ruru-on-legal-personality-and-a-maori-worldview/.

focuses on how much allowable damage or pollution can be done, rather than on how much protection is owed to a particular natural space or resource.

A key point of significance of Te Awa Tupua is that this legislation enshrines into law the Maori cosmology, which encapsulates a different way of thinking about nature. It is hard to overemphasize how important a step this is. As stated by Gerrard Albert, one of the key negotiators of the legislation: "For the first time, a framework stems from the intrinsic spiritual values of an indigenous belief system."¹⁴⁰

While for the Māori who have long lived in the presence of the river this has always been the view of the river's role and its relationship with other living beings, for many others this is a new approach and one that might be hard for some to accept. In conversations with citizens of Whanganui in April 2019, there were a number of people who commented on how the idea of the River having rights "just doesn't make sense."¹⁴¹ And it can be hard to imagine, in the absence of many concrete examples, how Te Awa Tupua will alter the framework of decision-making along the river. But, as often happens, the change in the law may bring about change in the approach everyone in the community takes towards the River. Sometimes an external push from a law already enacted is just what people need to reconsider how they view the world.

This is clearly already happening for some. While there are those still struggling to accept the idea of personhood for the River, there were more community members who commented that all the discussion leading up to the Te Awa Tupua legislations had, in fact, changed their view of nature and the way they think about their relationship to the river. When the river is taken into account—and thought about in the context of its four underlying values—it impacts the communal view of how activities that involve the river should be considered. These new perspectives have not been tested yet, of course, with a contentious issue involving the river. But, the fact that Te Awa Tupua is causing people to think about their own relationship to their community, including the river, is extremely important. The key change has been the lens through which community and government, both central and local, view the river and its needs.¹⁴²

V. TOLEDO AND THE LAKE ERIE BILL OF RIGHTS

While Te Awa Tupua and the realization of the legal personality and intrinsic values of the Whanganui River has had a generally positive reception, the same cannot be said for the Lake Erie Bill of Rights ("LEBOR"

^{140.} Lurgio, supra note 46.

^{141.} Interview with Citizens of Wanganui, N.Z. (Apr. 2019).

^{142.} Albert, supra note 54.

or "the Bill").¹⁴³ LEBOR was not the first attempt to introduce rights of nature-style laws in the United States. One of the earliest efforts was in Tamaqua Borough, Pennsylvania, where, in September 2006, the town council voted on an ordinance that would recognize and enforce "the rights of residents to defend natural communities and ecosystems."¹⁴⁴ Since then, a number of other municipalities have drafted variations on Tamaqua's ordinance, including Pittsburg, Pennsylvania; Exeter, New Hampshire; and Lafayette, Colorado.¹⁴⁵

A number of indigenous peoples in the U.S. have also codified their longstanding cosmologies about nature into their tribal laws.¹⁴⁶ In these cases, as with the Māori in New Zealand, these laws are not something new, but rather are putting into written legal form the beliefs regarding the place of nature in the world that have been long-held by the indigenous community. One example is the Ho Chunk Nation in Wisconsin, which enshrined the rights of nature into their law stating: "Ecosystems, natural communities, and species within the Ho-Chunk Nation territory possess inherent, fundamental, and inalienable rights to naturally exist, flourish, regenerate, and evolve."¹⁴⁷ In neighboring Minnesota, in November 2018, the White Earth Band recognized the rights of Manoomin (wild rice), a culturally important food for the Anishinaabe people of Minnesota that is in danger from a proposed new pipeline.¹⁴⁸ And in May 2019, the Yurok Tribe in Northern California recognized the rights of the Klamath River.¹⁴⁹

The status of these existing laws referring to the rights of nature is in constant flux.¹⁵⁰ While for the indigenous communities, the rights are recognized within tribal lands, the question of those resources that span tribal

^{143.} Michael Bratton, Lake Erie Bill of Rights Backers Plan to Fight Court Ruling Against it, ABC ACTION NEWS (Mar. 2, 2020),

https://www.13abc.com/content/news/Lake-Erie-Bill-of-Rights-backers-plan-to-fight-court-ruling-made-against-it-568424791.html.

^{144.} Tamaqua Borough, Pennsylvania, CMTY. ENV'T LEGAL DEF. FUND (Aug. 31, 2015), https://celdf.org/2015/08/tamaqua-borough/.

^{145.} CMTY. ENV'T LEGAL DEF. FUND, *supra* note 8.

^{146.} Rights of Nature, HONOR THE EARTH (last visited Dec. 8, 2020), http://www.honorearth.org/indigenous_rights; Press Release: Ho-Chuck Nation General Counsel Approves Rights of Nature Constitutional Amendment, CMTY. ENV'T LEGAL DEF. FUND (Sept. 18, 2016), https://celdf.org/2016/09/press-release-ho-chunk-nation-general-council-approves-rights-natureconstitutional-amendment/; John Ahni Schertow, The Yurok Nation Just Established the Rights of the

Klamath River, CULTURAL SURVIVAL (May 21, 2019), https://www.culturalsurvival.org/news/yurok-nation-just-established-rights-klamath-river.

^{147.} CMTY. ENV'T LEGAL DEF. FUND, supra note 146.

^{148.} Joseph T. Bowen, *White Earth Recognizes the Rights of Wild Rice, Officials Hope Ordinance Bolsters Challenge to Line 3*, BEMIDJI PIONEER (Feb. 20, 2019), https://www.bemidjipioneer.com/4574191-white-earth-recognizes-rights-wild-rice-officials-hope-ordinance-bolster-challenge-line-3.

^{149.} Schertow, supra note 146.

^{150.} CMTY. ENV'T LEGAL DEF. FUND, supra note 8.

and non-tribal territories remains to be seen. Additionally, very few of the situations involving local ordinances have been without complication, and there have been a number of lawsuits filed by governments and corporations against some of these communities.¹⁵¹

It was the effort to enact the Lake Erie Bill of Rights, however, that has garnered the most attention in the United States. Whether this is because Toledo is one of the largest cities to date to try and enact such a law, whether it is because Lake Erie is a shared resource, or whether it is because the opposition by neighboring farmers was so fierce, the effort to pass LEBOR is probably the most well-known attempt in the U.S. concerning rights of nature.¹⁵² The fact that this campaign drew so much attention in itself is important because this has created a conversation around these issues, and there are lessons to be learned from the Lake Erie case that might help the development of rights of nature law in the future.

A. History of the Lake Erie Bill of Rights

The Lake Erie Bill of Rights was the first attempt at a public referendum on such a legal statement of rights for a large, shared body of water.¹⁵³ Lake Erie provides water to over 11 million people, but has increasingly become more polluted and susceptible to toxic algae blooms.¹⁵⁴ In 2014, the level of toxicity in the lake reached such alarming levels that citizens of Toledo were forbidden from drinking the water.¹⁵⁵ In response, a group called Toledoans for Safe Water began organizing a campaign to protect the lake with the

https://www.rollingstone.com/politics/politics-news/rights-of-nature-beats-fracking-in-small-pennsylvania-town-976159/.

^{151.} Chauncey Ross, *Grant Township Ordered to Pay \$103,000 in Legal Fees*, IND. GAZETTE (Apr. 5, 2019) (discussing a ruling against Grant Township, Indiana, awarding an electrical company \$600,000 of court-related expenses), https://www.indianagazette.com/news/grant-township-ordered-to-pay-103-000-in-legal-fees/article_52694630-57ae-11e9-990a-8fc0d7ef9f0e.html; *see also* Fendt, *supra* note 23 (reporting a local attorney opted to pull a complaint against the state of Colorado) ; *but see* Justin Nobel, *Nature Scores a Big Win Against Fracking in a Small Pennsylvania Town*, ROLLING STONE (Apr. 1, 2020) (discussing Pennsylvania Department of Environmental Protection's decision to revoke a permit for an injection well after seven years of community efforts),

^{152.} Rights of Lake Erie Recognized in Historic Vote, CMTY. ENV'T LEGAL DEF. FUND (Feb. 27, 2019), https://celdf.org/2019/02/rights-of-lake-erie/.

^{153.} CMTY. ENV'T LEGAL DEF. FUND, *supra* note 8 ("In 2019, Toledo, Ohio, residents adopted the Lake Erie Bill of Rights, following three years of fighting for the right to vote on the measure. It is the first law in the U.S. to secure legal rights of a specific ecosystem.").

^{154.} Tom Henry, Lake Erie Bill of Rights Gets Approval from Toledo Voters, BLADE (Feb. 26, 2019),

https://www.toledoblade.com/local/politics/2019/02/26/Lake-Erie-Bill-of-Rights-gets-approval-from-Toledo-voters/stories/20190226159; Michael Wines, *Behind Toledo's Water Crisis, a Long-Troubled Lake Erie*, N.Y. TIMES (Aug. 4, 2014), https://www.nytimes.com/2014/08/05/us/lifting-ban-toledo-says-itswater-is-safe-to-drink-again.html.

^{155.} Henry, supra note 154.

assistance of the Community Environmental Legal Defense Fund.¹⁵⁶ It was not an easy task to even get the bill on the ballot. Originally intended for the November 2018 election, the Lucas County Board of Supervisors refused to place the bill on the ballot, even though it had the requisite signatures.¹⁵⁷ This was followed by first a negative court decision,¹⁵⁸ and then a positive one,¹⁵⁹ which finally allowed the City of Toledo to place the measure on the ballot for the special election.

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On February 26, 2019, voters in Toledo, Ohio approved the Lake Erie Bill of Rights. Nine percent of eligible voters cast their ballots in this special election, and of those, 61% voted in favor of the measure.¹⁶⁰ The following day, on February 27, 2019, a lawsuit was filed by Drewes Farm Partnership, LLC ("Drewes" or "the Plaintiff"), claiming the new bill violated its constitutional rights as well as the authority of the State of Ohio and the United States Federal Government.¹⁶¹ One year later, on February 27, 2020, the court agreed, striking down the law in its entirety.¹⁶² While initially indicating an intent to appeal the decision, in May 2020, the City of Toledo voluntarily withdrew its appeal of the ruling for budgetary reasons.¹⁶³

B. What did the Lake Erie Bill of Rights Say?

The Lake Erie Bill of Rights recognized that Lake Erie and the Lake Erie watershed "possess the right to exist, flourish, and naturally evolve."¹⁶⁴ The Bill further provided that the people of Toledo "possess the right to a clean and healthy environment, which shall include the right to a clean and healthy

^{156.} CMTY. ENV'T LEGAL DEF., supra note 8.

^{157.} Matt Reynolds, *Legal Rights for Lake Erie on Ballot in Ohio City*, COURTHOUSE NEWS SERVICE (Feb. 25, 2019), https://www.courthousenews.com/legal-rights-for-lake-erie-on-ballot-in-ohio-city/.

^{158.} State ex rel. Twitchell v. Saferin, 119 N.E.3d 365, 375-76 (Ohio 2018) (Kennedy, J., concurring).

^{159.} State ex rel. Maxcy v. Saferin, 122 N.E.3d 1165, 1172 (Ohio 2018) ("Because the proposed charter amendment was never properly before the board, we cannot say that relators had a clear legal right to their requested relief or that the board had a clear duty to provide it. Therefore, mandamus does not lie against the board, and relators have not sought a writ compelling the city council to submit the proposed charter amendment to the electors by ordinance.").

^{160.} Henry, supra note 154.

^{161.} Henry, supra note 116.

^{162.} Tom Henry, *Lake Erie Bill of Rights Ruled Invalid by Judge Zouhary*, BLADE (Feb. 27, 2020), https://www.toledoblade.com/local/environment/2020/02/27/lake-erie-bill-of-rights-ruled-invalid-judge-jack-zouhary-toledo-lucas-county/stories/20200227155; Eric Heisig, *Federal Judge Strikes Down Toledo's Lake Erie Bill of Rights as Unconstitutional, Says Sweeping Law Too Vague*, CLEVELAND: COURTS AND JUSTICE (Feb. 27, 2020), https://www.cleveland.com/court-justice/2020/02/federal-judge-strikes-down-toledos-lake-erie-bill-of-rights-as-unconstitutional-says-sweeping-law-is-too-vague.html.

^{163.} Caroline Llanes, *Lake Erie Bill of Rights Appeal Dropped*, MICH. RADIO (May 11, 2020), https://www.michiganradio.org/post/lake-erie-bill-rights-appeal-dropped.

^{164.} Kilbert, supra note 27.

Lake Erie and Lake Erie ecosystem."¹⁶⁵ Finally, the Bill recognized both collective and individual rights to self-government by the people of Toledo and to a system of government that protects those rights, along with a statement that all these rights are "self-executing" and enforceable without implementing legislation.¹⁶⁶

Section 2 of the Lake Erie Bill of Right stated that it "shall be unlawful for any corporation or government to violate the rights recognized and secured by this law."¹⁶⁷ This section goes on to invalidate any permit, license or similar authorization issued to a corporate entity that would violate the rights enumerated in the law.¹⁶⁸

Finally, Section 3 of LEBOR focused on enforcement, stating that any "corporation or government that violates any provision of this law shall be guilty of an offense" and that the City of Toledo or any of its residents may enforce the provisions of the Bill.¹⁶⁹ This section also provided that the rights of Lake Erie may be exercised by either the City of Toledo or a resident or residents of the city and brought before the court in the name of the Lake Erie Ecosystem.¹⁷⁰

Other important principles to note that are included in the Bill are a section that strips corporations of their personhood if they are accused of violation the law,¹⁷¹ the application of the law to all actions regardless of whether a preexisting permit existed,¹⁷² and a statement of severability.¹⁷³ The approximately three-page document concluded with a statement regarding the requirement to repeal of any inconsistent provisions of prior laws.¹⁷⁴

C. The Legal Arguments Made Against LEBOR

Drewes Farm Partnership LLC is an Ohio general partnership with legal personhood status pursuant to Ohio Revised Code Chapter 1776.¹⁷⁵ In their complaint filed before the United States District Court for the Western District of Ohio, Drewes argued that, if enacted, LEBOR would infringe on its constitutional rights, including freedom of speech; equal protection; rights

^{165.} Id.

^{166.} Id.

^{167.} Id. (describing Lake Erie Bill of Rights § 2).

^{168.} Id.

^{169.} Id. (describing Lake Erie Bill of Rights § 3).

^{170.} Id.

^{171.} Id. (describing Lake Erie Bill of Rights § 4).

^{172.} Id. (describing Lake Erie Bill of Rights § 5).

^{173.} Id. (describing Lake Erie Bill of Rights § 6).

^{174.} Id. (describing Lake Erie Bill of Rights § 7).

^{175.} Complaint at 3, Drewes Farm P'ship LLC and State of Ohio v. City of Toledo, (N.D. Ohio 2019) (No. 3:19-cv-00434-JZ).

of due process; and 5th Amendment protections against vague laws.¹⁷⁶ The lawsuit also claimed that the Bill infringed on state and federal authority over the Lake.¹⁷⁷ It is interesting to note that nowhere in the Drewe's complaint is an issue taken with the recognition of the rights or legal personhood of Lake Erie, per se, but rather that the Lake Erie Bill of Rights, infringes on the laws outlined above.¹⁷⁸

The lawsuit focused largely on legal institutions and issues of definition and procedure. The Plaintiff argued that, if enacted, this city law would infringe on both federal and state powers.¹⁷⁹ In terms of the former, Lake Erie is governed by treaty law between the U.S. and Canada on transboundary water resources, and Drewes claimed that LEBOR would infringe upon the U.S. government's authority under these agreements.¹⁸⁰ Unlike some other efforts to provide rights to nature that focus on a single natural entity, LEBOR encompasses an ecosystem, and it is an ecosystem that is not within the jurisdiction of a single entity. Lake Erie is shared by two countries (the U.S. and Canada) and four states (Ohio, Michigan, Pennsylvania, and New York). Under laws governing transboundary water resources, actions taken that might impact the shared body of water need to take into account the interests of all parties sharing the resource.¹⁸¹ Since 1909, governance of Lake Erie has been handled under the Boundary Waters Treaty, which is monitored by the International Joint Commission.¹⁸² Additionally, since 1972 the Great Lakes Water Quality Agreement has outlined the commitment of the U.S. and Canada to protect and restore the shared waters of the Great Lakes.¹⁸³ As the enactment of the Lake Erie Bill of Rights has the potential to impact the interests of Canada and the U.S. Federal Government, opponents of the new law argued that this infringed on the power of the U.S. to engage in foreign relations.¹⁸⁴

The plaintiff also argued that LEBOR was too vague and therefore violated both Drewes Farm's rights of due process and equal protection.¹⁸⁵ LEBOR recognized the right of Lake Erie and its ecosystem to "exist,

184. Complaint at 16, Drewes Farm P'ship LLC and State of Ohio v. City of Toledo, (N.D. Ohio 2019) (No. 3:19-cv-00434-JZ).

185. *Id.* at 2–*f*3.

^{176.} Id.

^{177.} Id.

^{178.} Id. at 19.

^{179.} Id. at 3.

^{180.} See generally Boundary Waters Treaty of 1909, INT'L JOINT COMM'N, https://www.ijc.org/en/boundary-waters-treaty-1909 (describing situations where both countries must give notice to the other when proposed actions would impact the water).

^{181.} Id.

^{182.} Id.

^{183.} Great Lakes Water Quality Agreement, Can.-U.S., Apr. 15, 1972, 36 Stat. 2448.

flourish and naturally evolve."¹⁸⁶ It also gave citizens the right to a clean and healthy environment, including a clean Lake Erie, and provided them with the ability to enforce these rights by holding corporations like Drewes liable.¹⁸⁷ For none of these provisions, however, is much more detail provided; none of the key terms or concepts were defined and it was not made clear what kinds of actions could be held to violate the rights that LEBOR was providing for the Lake. This lack of detail as to what the rights enumerated mean, and what would constitute a violation, was argued to be contrary to the prohibition against law that is too vague under the 5th Amendment.¹⁸⁸ Additionally, the lawsuit argued that LEBOR violated the farm's rights to equal protection under the 14th amendments.¹⁸⁹

D. The Judgment of the Court

Arguments in this case were heard in late January 2020 in the U.S. District Court for the Northern District of Ohio (Western Division) in front of Judge Jack Zouhary.¹⁹⁰ The decision by Judge Zouhary was rendered on February 27, 2020, one year to the date that Drewes Farms filed the lawsuit.¹⁹¹

Judge Zouhary focused on two primary points in his decision striking down the Lake Erie Bill of Rights.¹⁹² First, he held that LEBOR violated Drewes Farm's right to due process under the U.S. Constitution because the language of LEBOR was too vague and does not provide clear guidance on to whom the law applies and when such application is triggered.¹⁹³ An essential criterion for any law's legality is that it can be understood and followed by "persons of common intelligence."¹⁹⁴ The judge applied this ruling to the substantive provisions of the Lake Erie Bill of Rights, such as the those providing for the right of the lake to "exist, flourish, and naturally evolve" and the "right to a clean and healthy environment." He also found

^{186.} Kilbert, *supra* note 27, §1.

^{187.} Toledo, No. 3:19-cv-00434-JZ at 9.

^{188.} Id. at 16.

^{189.} Id. at 16-17.

^{190.} Press Release: Lake Eire Bill of Rights and Rights of Nature Argued in US Federal Court, CMTY. ENV'T LEGAL DEF. FUND (Feb. 6, 2020), https://celdf.org/2020/02/press-release-lake-erie-bill-of-rights-and-rights-of-nature-argued-in-us-federal-

court/#:~:text=TOLEDO%2C%20OH%3A%20Last%20week%2C,resIdents'%20right%20to%20clea n%20water.&text="This%20is%20the%20first%20time,in%20a%20U.S.%20federal%20court. 191. Drewes Farms P'ship v. City of Toledo, 441 F. Supp. 3d 551 (N.D. Ohio 2020).

^{91.} Drewes Farms P ship v. City of Toleao, 441

^{192.} *Id.* at 554–55. 193. *Id.* at 555–57.

^{194.} *Id.* at 555.

that, in its entirety, the Bill was "impermissibly vague."¹⁹⁵ Reviewing the case law on the issue of vagueness, Judge Zouhary found the rights enumerated in LEBOR "to be even less clear" and highlighted this lack of clarity in terms of what conduct might infringe on the rights of Lake Erie and its watershed; how would one render a decision on this; as well as what determines the line between a clean and healthy environment and one that is unclean and unhealthy.¹⁹⁶ Judge Zouhary also held that the defendant's argument that the passage of LEBOR was within the Toledoans' right to "self-government in their local community" was "impermissibly vague" as well.¹⁹⁷

Finally, the judge held that, given the substantive provisions are void for vagueness, the entirety of LEBOR must be struck down.¹⁹⁸ Supporters of LEBOR argued that based on the severability provision found in the Bill, even if parts of the law were struck down, the rest must stand. Judge Zouhary disagreed, holding that once the "vague rights are stripped away, the remainder is meaningless."¹⁹⁹ In the end, the Judge stated:

Frustrated by the status quo, LEBOR supporters knocked on doors, engaged their fellow citizens, and used the democratic process to pursue a well-intentioned goal: the protection of Lake Erie. As written, however, LEBOR fails to achieve this goal.²⁰⁰

While the City of Toledo originally filed an appeal in this case, it was subsequently withdrawn.²⁰¹

VI. REALIZING THE RIGHTS OF NATURE: LESSONS TO LEARN FROM TE AWA TUPUA & LEBOR

In the past decade, efforts at realizing the rights of nature have grown around the world, including the cases presented here in New Zealand and the United States. As outlined in the previous sections, however, the results in these two countries are very different. The question then becomes: why do we see such vastly different outcomes in these two cases? In New Zealand and the U.S., the underlying legal systems stem from the same source and are grounded in the common law. In both cases, the "nature" at issue touches many different communities that use the body of water in question in

^{195.} Id. at 556.

^{196.} Id.

^{197.} Id. at 554.

^{198.} Id.

^{199.} Id. at 557.

^{200.} Id. at 557–58.

^{201.} Llanes, supra note 163.
different ways. Yet, the outcomes are so different; we must ask why. Why is the Whanganui River legislation held up around the world as a model of rights of nature law, and in the case of the Lake Erie Bill of Rights, the law was struck down in its entirety only a year after its passage?

This section strives to answer these questions by highlighting some of the key lessons we can learn from these two cases. Drawing on the importance of legal tradition, and the consideration of both legal culture and legal institutions highlighted earlier, there are a number of considerations to take into account for future efforts at realizing the rights of nature.

A. Lesson 1: The Importance of Legal Culture

The importance of recognizing and considering legal culture in efforts to pass rights of nature law is the first lesson to be drawn from the cases presented here. As legal culture is reflective of the beliefs and values of a community, it provides indicators of how that community may respond to new laws, particularly laws presenting novel ideas that require a fundamental shift in worldview. In the case of the rights of nature, it is important to consider the fundamental connection between humans and nature that exists in a particular place, how this connection has been implemented into the law, and whether it leaves room for change. While it is possible to enact legal provisions without grounding the law in communal values and understandings of the world, the law is much more likely to be effective if this legal culture is reflected in its provisions.

In New Zealand, the legal culture certainly incorporates aspects of the secular common law view of law as the mechanism for the protection of individual rights, including property rights, and the idea that nature is a commodity. However, other factors at work in New Zealand's legal culture mitigate the impact of these common law tendencies.

First is the recognition of Māori norms and values within the national legal framework. This is fundamental when considering rights of nature law, as the origins of these legal principles are found in Māori cosmologies. For the Māori, the Whanganui River is an ancestor and a living entity as integral to the ecosystem as any other, and therefore as deserving of respect and life. This is tied to *Kaitiakitanga*, the Māori worldview that means guardian, protection, or preservation.²⁰² *Kaitikitanga* holds that there is "a deep kinship between humans and the natural world. All life is connected. People are not superior to the natural order; they are part of it."²⁰³

^{202.} Te Ahukaramū Charles Royal, Story: Kaitiakitanga – Guardianship and Conservation, TE ARA, https://teara.govt.nz/en/kaitiakitanga-guardianship-and-conservation (last visited Dec. 8, 2020). 203. Id.

Te Awa Tupua is deeply grounded in *Kaitikitanga* and recognizes the values and life of the River, both in its own right and as part of the whole ecosystem. For the Māori communities that have long lived in harmony with the River, this is a natural extension of their underlying normative values and the account they take of the Whanganui in everyday life. For non-Māori communities, the law promotes a shift in the view of the human-nature relationship. Historically, the 'Western' worldview focuses on nature as nothing more than a commodity – something that is there for the use of, and abuse by, human beings. Similarly, a great deal of environmental law focuses on allowable levels of damage or pollution is allowed, rather than on how much protection is owed to a particular natural space or resource. In U.S. environmental law, "when industrial and commercial reality conflicts with environmental ideology, industrial and commercial reality prevails."²⁰⁴

By enacting Te Awa Tupua, a different legal culture, a different way of thinking about the relationship to nature, is enshrined into law; and it is hard to overemphasize how important a step this is. While the Māori have long had a living relationship to the River, for many others in the community this is a new approach that will require acknowledgment and acceptance. It can be hard to imagine, in the abstract, how Te Awa Tupua will alter the framework of decision-making along the Whanganui. But, as often happens, the process of developing the legislation, and the passage of the law, has begun to bring about a change in attitude. Having to take the Whanganui into account—and having to think about the River in the context of its four underlying values —has had an impact on those who live along the River and on their view of how activities that involve the river should be considered. As stated by Marianne Archibald, CEO of the Whanganui Chamber of Commerce, "Te Awa Tupua created a shift in my world view. I learned that the River is... a living, spiritual being in itself."²⁰⁵

In contrast to the consideration and incorporation of legal culture into the rights of nature process in New Zealand, in the case of the Lake Erie Bill of Rights, the law was at odds with the existing legal structures and the widespread legal culture. Cultural views of the role of nature and the humannature relationship in the United States are still largely grounded in beliefs about individual rights, the rights of property, and the spirit of Manifest Destiny.²⁰⁶ Even some of the most sweeping environmental laws in the U.S., such as the Clean Air Act, the Clean Water Act, and the Endangered Species Act, are framed in terms of the freedom to use the environment, except in certain circumstances, rather than protection of the environment, except for

^{204.} Kenneth M. Murchison, Environmental Law in Australia and the United States: A Comparative Overview, 22 BOS. COLL. ENV'T AFFS. L. REV. 503, 508 (1995).

^{205.} Interview with Marianna Archibald, Whanganui, in N.Z., (Apr. 8, 2019).

^{206.} See ZARTNER, supra note 16.

limited cases of sustainable use.²⁰⁷ It is a small shift in language, but one of fundamental importance for how the law is viewed and implemented.

There are indigenous communities in the United States whose worldviews are similar to the Maori when it comes to the human-nature relationship. As mentioned above, some of these have codified this recognition into their own laws. Unlike the New Zealand case, however, where the Whanganui iwi fought hard for decades and then worked in partnership with the Crown to draft Te Awa Tupua in way that realized *Kaitiakitanga*, the relationship between the indigenous peoples in the U.S. and federal and state governments has not been one of cooperation and consultation due to longstanding government policies. 208 While the relationship between the Maori and the New Zealand government is by no means perfect as the legacies of colonialism and the Treaty of Waitangi still linger, it is far better and more constructive than the relationship between the indigenous peoples in the territory that is now the United States and the various governments in this country. This historical separation has lessened the extent to which indigenous views of nature have seeped into the historical values underlying much U.S. law.

The recognition and understanding of indigenous cosmologies relating to nature and the human-nature relationship, while starting to gain more understanding among the general population in certain areas of the U.S., is still very limited. The recognition of the independent life force of nature by indigenous communities such as the Ho Chunk Nation in Wisconsin, the White Earth Band in Minnesota, the Ponca Tribe of Indians in Oklahoma, and the Yurok Tribe in Northern California has not become a common thread among members of non-indigenous communities, which means that drawing on this as a cultural basis for rights of nature law is not yet a strong possibility.²⁰⁹

One of the reasons for the failure of the Lake Erie Bill of Rights, therefore, is that it did not develop out of the legal culture present in Toledo, or in the U.S. more broadly. There was no inherent cultural, spiritual, or historical connection present in the Lake Erie Bill of Rights to ground the proposed law in the appropriate relationship between humans and the natural entity, in this case the Lake Eerie ecosystem. Lacking this cultural connection, gathering support for a new law or legal change is difficult, even if, as in the case of the public referendum on the Bill, you have the legal processes in place. Proposing such a novel idea as the rights of natural entities

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^{207.} Clean Air Act, 42 U.S.C. §§ 7401-7671; Clean Water Act, 33 U.S.C. §§ 1251-1387; Endangered Species Act, 16 U.S.C. §§ 1531-1544.

^{208.} The United States Government's Relationship with Native Americans, NAT'L GEO., https://www.nationalgeographic.org/article/united-states-governments-relationship-native-americans/ (last visited Dec. 8, 2020).

^{209.} GLOB. ALL. FOR RTS. NATURE, supra note 7.

and ecosystems, without grounding it in the legal culture of a place, will make enactment much more challenging. This is evident even with the vote on LEBOR because, while it is true that 61% of the voters in the February 2019 special election voted in favor of the Bill, only about 9% of eligible voters turned out for the election.²¹⁰ This means that around 16,000 people out of a possible 180,000 eligible voters voted in favor of the measure.²¹¹ This is far from the kind of support that would be needed among a community to enact this kind of law codifying such a fundamental change in the view of nature and its place in U.S. society.

Unlike in New Zealand where Māori worldviews are better known and understood by the public at large, and Māori participation in the process of drafting Te Awa Tupua led to a cultural understanding of the values of the river prior to the law's enactment, this did not happen in the case of Lake Eire. But, it does not mean that this can't happen. In fact, even though it was ultimately struck down by the Court, the efforts surrounding the Lake Erie Bill of Rights have increased awareness of rights of nature movement and moved the idea of natural entities being in equal relationship with human beings, and therefore deserving legal protections, to more mainstream discussion. This is an important first step in changing cultural beliefs about nature, and subsequently, the law.

B. Lesson 2: Build Relationships and Ensure Community Participation

In addition to the differences in legal culture in the two efforts to enact rights of nature law, the differences in the resulting outcomes for the two pieces of law described here are also encapsulated by the institutional process through which each was created. As discussed in Section II, both legal culture and legal institutions, which include the processes by which new laws are created, must be considered when seeking legal change. LEBOR was put forward by a citizen group and voted on in an election. Te Awa Tupua resulted from extensive negotiation that brought together multiple stakeholders, drew on existing law, and offered community inclusion. Both of the primary negotiators of Te Awa Tupua, Gerrard Albert, Chairman of the Ngā Tāngata Tiaki o Whanganui, representing the Maori in the process,²¹² and Christopher Finlayson, Former Member of the New Zealand Parliament and Minister of Treaty Negotiations who represented the Crown in

^{210.} See Toledo Votes Yes on Laker Erie Bill of Rights, WKSU (Feb. 26, 2019), https://www.wksu.org/post/toledo-votes-yes-lake-erie-bill-rights#stream/0 (showing Toledo voters approved ballot amendment to include Laker Erie Bill of Rights).

^{211.} Tom Henry & Ryan Dunn, *Polls Close With 9 Percent Turnout in Special Election*, BLADE (Feb. 26, 2019), https://www.toledoblade.com/local/politics/2019/02/26/polls-open-tuesday-special-election-in-toledo-turnout/stories/20190226102.

^{212.} NGÃ TÂNGATA TIAKI O WHANGANUI, supra note 50.

negotiations, emphasize the collaborative conversations between relevant stakeholders as key to the success of the legislation.²¹³ This type of shared process was missing in LEBOR, which is evident in the difficulties putting the initiative on the ballot as well as the immediate lawsuit.²¹⁴ This is not to say the Whanganui process is the only way to enact rights of nature law, but it does demonstrate the importance of considering both legal culture and legal institutions in such an effort.

The Te Awa Tupua legislation took a long time. In fact, the Whanganui iwi argued for recognition of the river for over 100 years.²¹⁵ The drafting of the actual legislation also took over a decade as the parties moved from outlining terms of negotiation from 2003-2012, to drafting the Deed of Settlement in 2014, and finally, creating the Tw Awa Tupua legislation in 2017.²¹⁶ Moreover, it was a process that included not only the Whanganui Iwi and the Crown, but also provided opportunity for members of the communities along the river, including businesses, local governments, and individual citizens to voice their opinions in the process.²¹⁷ While certainly too long a wait for the iwi to have their relationship to the Whanganui officially recognized, the time it took to draft the legislation allowed for the development of deep working relationships between the parties involved, which, ultimately, according to all sides, was a crucial component of the legislation's success.

In the end, both the communities in the Whanganui region and members of the government were left with positive impressions of the collaboration and its impact on the future of the law. According to Whanganui lawyer John Unsworth, the Te Awa Tupua process left communities along the River with a general feeling of "let's work together to make things positive for everyone" and that the local iwi were "very keen to work with the community."²¹⁸ Similarly, a Ministry for the Environment spokesperson

https://www.govt.nz/assets/Documents/OTS/Whanganui-Iwi/Regulatory-Impact-Statement-Te-Awa-Tupua-Whanganui-River-framework.pdf.

^{213.} Albert, *supra* note 54; Interview with Christopher Finlayson, in Wellington, N.Z. (Apr. 3, 2019).

^{214.} Michael Bratton, *Lake Erie Bill of Rights Backers Call on Toledo City Council to Include Ordinance in Special Election*, 13 ABC ACTION NEWS (Nov. 28, 2018), https://www.13abc.com/content/news/Lake-Erie-Bill-of-Rights-backers-call-on-Toledo-City-Council-to-include-ordinance-in-special-election-501503271.html.

^{215.} ORANGE, supra note 64.

^{216.} Whanganui Iwi (Whanganui River) Deed of Settlement Summary, N.Z. GOV'T (Aug. 5, 2014), https://www.govt.nz/assets/Documents/OTS/Whanganui-Iwi/Whanganui-Iwi-Whanganui-River-Deed-of-Settlement-Summary-5-Aug-2014.pdf.

^{217.} Regulatory Impact Statement: Te Awa Tupua (Whanganui River) Framework, OFF. OF TREATY SETTLEMENTS (Apr. 6, 2016),

^{218.} Interview with John Unsworth, Whanganui, N.Z. (Apr. 10, 2019).

reiterated this idea that relationships among iwi and the many stakeholders involved are key.²¹⁹

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This same kind of process did not happen in the case of the Lake Erie Bill of Rights. There were efforts by the proponents of LEBOR to hold community conversations on the Bill and several years were spent attempting to convince the State of Ohio to take action on the toxic algae blooms Given the lack of state action on the algae blooms, subsequent collaborative efforts were unsuccessful. Additionally, from inception of the idea of LEBOR, there was strong resistance not only from the corporations and farms that feared negative impacts from the legislation, but also from government entities. Whereas Te Awa Tupua was done in a spirit of partnership with the government, and under the framework of the Treaty of Waitangi negotiations set up for this very purpose, no institutional support was present in the case of LEBOR. As with legal culture, having this support is an important step to achieve a positive outcome for new rights of nature law.

C. Lesson 3: Language Matters

In addition to considering existing cultural perception of law and legal processes, it is also important when drafting rights of nature legislation to carefully consider the language used, as it is with the creation of any new law. As discussed above, however, there are particular difficulties that can emerge when ideas about "rights" are involved because there can be so many strongly held views about what this entails. In crafting legal personhood through the law for a non-human entity, providing specificity can facilitate the acceptance and internalization of the subsequent law and avoid the oftheard response of "how can nature have the same rights as people?"

Te Awa Tupua very clearly defines its terms. In fact, the entire first section of the legislation provides definitions and clarification as to the meaning of the terms used throughout the law.²²⁰ This level of detail is carried forward through all the subsequent sections, some of which are highlighted in the description of Te Awa Tupua in Section IV of this article. It is not just about providing clear definition, however. It is also important to provide enough detail and context that those responsible for the law can actively and effectively work to implement it. Te Awa Tupua goes to great lengths, not only to outline the different groups and committees responsible for overseeing the implementation and enforcement of the law, but also to provide provisions to assist people in knowing when and how the law might apply to them.

^{219.} Interview with Ministry for the Env't, in Wellington, N.Z. (Apr. 4, 2019).

^{220.} Te Awa Tupua Act, s 7.

All of this is absent in the Lake Erie Bill of Rights, and, as discussed in Section V(D) above, this lack of specificity and clarity was the primary basis on which Judge Zouhary struck down the Bill. While disappointing for those who had worked so hard to bring LEBOR to life, Judge Zouhary's decision was not surprising. The Lake Erie Bill of Rights was not written in a way that was likely to withstand judicial scrutiny given the current state of the law in the United States. It did not provide any detail or explanation that would have allowed those to whom it applied to understand its implications, or for those who would enforce it to understand when or how it was to be enforced.

One of the main features that distinguishes the Whanganui legislation from LEBOR is its clarity regarding legal institutions. Te Awa Tupua establishes institutional bodies for implementation and enforcement, including guardians who serve as the "human face of the river," an advisory body that supports them and a strategy group of community, business, political and Māori representatives that serves as a forum for recommendations concerning the River.²²¹ Members of the community know their existing rights vis-à-vis the River are not in danger, and processes are spelled out for approval of new activities or projects involving the river. The Lake Erie Bill provided none of that. Had more detail and greater specificity of language been used in drafting the Lake Erie Bill of Rights perhaps it would have received a different outcome. One could argue Judge Zouhary was even making this suggestion in his decision for at one point he states:

With careful drafting, Toledo probably could enact valid legislation to reduce water pollution. ... LEBOR was not so carefully drafted. Its authors ignored basic legal principles and constitutional limitations, and its invalidation should come as no surprise.²²²

Judge Zouhary may deny this was his intent, but this text in the second to last paragraph of his decision could be read as a suggestion for future iterations of a law such as the Lake Erie Bill of Rights. To effectively realize rights of nature laws in existing legal systems, we must work with the legal culture and institutions in place. Even if the long-term goal is ultimately to revamp the entire legal system and push great shifts in cultural norms about the human-nature relationship, enacting such laws in the short-term today requires drafting language that will be useful to the community and withstand the scrutiny of the courts.

^{221.} Dan Cheater, I am the River, and the River is Me: Legal Personhood and Emerging Rights of Nature, WEST COAST ENV'T L. (Mar. 22, 2018),

https://www.wcel.org/blog/i-am-river-and-river-me-legal-personhood-and-emerging-rights-nature.

^{222.} City of Toledo, 441 F.Supp.3d at 557.

VII. CONCLUSION

Many are heralding the rights of nature movement as the next wave of environmental protections and a new way of thinking that is necessary if we are going to address the daunting environmental problems facing us as a global community. Certainly, the last decade has seen a proliferation of rights of nature laws around the world. In many of these instances, however, the passage of the law has not necessarily led to its internalization and enforcement, which ultimately means it is not achieving its goals of better environmental protections, nor is it necessarily creating shifts in cultural understandings about the values underlying the laws.

Given the potential for rights of nature laws, however, to both change how we think about nature and the human-nature relationship and provide concrete legal protections for natural entities, understanding how to craft such laws effectively is crucial. In order to do so, it is important to take into account both the legal culture and the legal institutions present in a given society or community and build the law from those foundations. This article has provided two cases of communities and their efforts at crafting such laws. In the first case, New Zealand, the new legislation built on the existing legal traditions within the state and came away with what is largely held to be the most successful example of rights of nature law to date, Te Awa Tupua.

In the second, the United States, neither the legal culture nor the legal institutions of the U.S. legal tradition appear to have been carefully considered when drafting the Lake Erie Bill of Rights. While based on important values regarding the rights of nature to exist and flourish, the text of the Lake Erie Bill of Rights pushed too far ahead of the cultural understandings in the U.S. when it comes to the place of nature. The law also lacked the legal clarity required by existing legal institutions within the U.S., leading to its ultimate defeat.

In both of these examples, however, are lessons for other communities around the world interested in creating rights of nature laws. These include drawing on the legal culture and institutional structures present in the community; ensuring that the law is clear in its intent, purpose, and operation; and working to ensure that all members of a community are able to be part of the discussion. Rights of nature law requires, for many, new ways of thinking, not just about nature, but about rights and the law. The more that people are invited to be part of the process, the more likely the underlying values embedded in the law will become part of the underlying values of the community and the rights of nature will achieve more effective implementation and gain widespread support.

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LASTING PROTECTION: EQUIPPING FEDERAL TOXICS REGULATIONS FOR THE LONG HAUL

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ABSTRACT

The United States Environmental Protection Agency (EPA) recently took actions allowing for continued or even expanded use of asbestos and chlorpyrifos-two hazardous substances that are strictly prohibited for use in numerous countries around the world. Many have accused the Trump Administration's EPA of going too far in rolling back federal regulations of these toxic substances, which are known to pose substantial threats to public health and the environment. The EPA's actions, which appear to have been influenced by private special interests, are emblematic of a growing inability for the federal government to reliably protect the public from highly hazardous chemicals. This Article describes the existing federal regulatory structure governing toxic substances and how that structure has recently devolved in potentially dangerous ways. The Article then uses basic public choice theory and behavioral economics principles to highlight how political rent-seeking and myopic behavior are contributing to these challenges. Ultimately, this Article describes specific policy strategies that could fortify federal restrictions on toxic substances and better insulate them against shortsighted political influence. Making it more difficult for a single presidential administration to significantly loosen restrictions on these types of substances would help to ensure that these important laws continue to adequately protect Americans' health and safety far into the future.

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INTRODUCTION

"If the Bill of Rights contains no guarantee that a citizen shall be secure against lethal poisons distributed either by private individuals or by public officials, it is surely only because our forefathers, despite their considerable wisdom and foresight, could conceive of no such problem."

-Rachel Carson¹

In 2016, President Obama signed the Frank R. Lautenberg Safety for the 21st Century Act into law, creating new safeguards against toxic substances for millions of Americans.² The Act amended provisions in the Toxic Substances Control Act of 1976 (TSCA) to further strengthen federal restrictions on uses of several types of toxic chemicals.³ The enactment of TSCA in the 1970s was an important shift toward greater federal defenses against toxic substances and their potential impacts on public health and safety.⁴ In the decades since the TSCA's enactment, Congress and state legislatures have gradually strengthened statutory protections against known carcinogenic and mutagenic chemicals.

However, in April of 2019, the United States Environmental Protection Agency (EPA) began a process to reverse the nation's longstanding trend toward stronger protections against hazardous substances by issuing a Significant New Use Rule (SNUR) that potentially expanded opportunities for U.S. companies to manufacture and sell new asbestos-containing products.⁵ Under the SNUR, the EPA would merely require any person who intended to manufacture or process asbestos for any of 14 listed possible uses to notify the Agency at least 90 days in advance so that the Agency could review the proposed use.⁶ Supporters of the SNUR claimed that imposing an outright ban on asbestos would harm the nation's economy by potentially

6. *Id*.

^{1.} RACHEL L. CARSON, SILENT SPRING 12–13 (Houghton Mifflin Co. 1962).

^{2.} Jessica Miller, Note, Spread Too Thin: How the Preemption Provisions in the 2016 Amendments to TSCA Weakened the Federal Government's Regulation of Chemical Manufacturing, 9 GEO. WASH. J. ENERGY & ENV'T L. 162, 166 (2019).

^{3.} Mitchell L. Guc, Note, TSCA and the Lautenberg Act: Bloated Regulation, or Effective Legislation?, 49 U. TOL L. REV. 461, 473–74 (2018).

^{4.} Valerie J. Watnick, *The Lautenberg Chemical Safety Act of 2016: Cancer, Industry Pressure, and A Proactive Approach*, 43 HARV. ENV'T L. REV. 373, 377 (2019).

^{5.} Gary Pasheilich, Asbestos Receiving Renewed Attention in Light of Additional US EPA Assessments under TSCA and Potential Ban by Congress, NATL L. REV. (June 10, 2019), https://www.natlawreview.com/article/asbestos-receiving-renewed-attention-light-additional-us-epa-assessments-under-tsca.

affecting domestic chlorine production.⁷ The rule did seemingly create some constraints against new asbestos-containing products by expressly requiring that the EPA review any new proposed uses of asbestos upon notification.⁸ However, the SNUR drew heavy criticism from environmental groups, public health professionals, and lawmakers for giving too much discretion to the EPA and not placing adequate restrictions on such a highly hazardous substance.⁹

Only a few months later, in July of 2019, the EPA took another step toward loosening an important federal toxic substance restriction when it announced that the Agency would likewise not ban chlorpyrifos—a pesticide linked to severe health risks, including neurological damage in children.¹⁰ The EPA's announcement was a reversal of the Agency's proposal for a total federal ban on the chemical introduced in 2015 under the Obama Administration.¹¹ The EPA banned chlorpyrifos for household use in 2000 because of the risk of neurotoxicity to consumers, but it is still widely used for commercial agricultural applications.¹² The Agency's decision not to ban chlorpyrifos was a victory for the chemical industry, which had argued that the pesticide was thus crucial to the nation's agricultural sector because of its effectiveness at controlling insect populations.¹³ However, the decision also marked a second major setback within a few months for federal protections against hazardous substances.

This Article argues that the EPA's recent efforts to loosen asbestos and chlorpyrifos restrictions are signs that industry influence and myopic political decision-making are dangerously eroding government protections against toxic substances and identifies specific strategies for reversing this trend and preventing it from reemerging in future years. Parts I and II of this

^{7.} See Bergeson & Campbell, P.C., *Final SNURs Will Break New Ground under Amended TSCA*, NAT'L L. REV. (Apr. 1, 2019), https://www.natlawreview.com/article/final-snurs-will-break-new-ground-under-amended-tsca (mentioning a commentator who encouraged EPA to use its discretion while considering all relevant factors, including cost).

^{8.} Rachel Sasser, *Inadequate New EPA Rule Far From Complete Asbestos Ban*, MESOWATCH (June 23, 2019), https://mesowatch.com/inadequate-new-epa-rule-far-from-complete-asbestos-ban/.

^{9.} *Id*.

^{10.} Dan Nosowitz, *Trump's EPA Decides Not to Ban Chlorpyrifos*, MODERN FARMER (Aug. 6, 2019), https://modernfarmer.com/2019/08/trumps-epa-decides-not-to-ban-chlorpyrifos/.

^{11.} See Thomas O. McGarity & Wendy E. Wagner, *Deregulation Using Stealth "Science"* Strategies, 68 DUKE L. J. 1719, 1736 (2019) (explaining why the EPA under the Obama Administration proposed to revoke all tolerances for chlorpyrifos based on the requirements of the 1996 Food Quality Protection Act).

^{12.} See Philip J. Landrigan et al., *Pesticides and Inner-City Children: Exposures, Risks, and Prevention*, 107 ENV'T HEALTH PERSP. 431, 432 (1999) (explores children's vulnerability to pesticides, particularly inner-city children, with an emphasis on developmental toxicity of chlorpyrifos).

^{13.} See Lisa Friedman, E.P.A. Won't Ban Chlorpyrifos, Pesticide Tied to Children's Health *Problems*, N.Y. TIMES (July 18, 2019), https://www.nytimes.com/2019/07/18/climate/epa-chlorpyrifospesticide-ban.html (discussing the EPA's decision not to widely ban the pesticide chlorpyrifos and comparing the different EPA approaches to the pesticide under Obama and Trump).

article examine the background and history of federal legislation and regulation surrounding asbestos and chlorpyrifos, including recent regulatory rollbacks involving these chemicals. Part III applies certain public choice concepts to analyze the federal government's recent struggles to regulate toxic substances effectively. Part IV describes some specific strategies capable of preventing special interests from further eroding the nation's federal restrictions on hazardous substances. Among other things, this Article argues for major revisions to the TSCA, the U.S. federal statute that governs toxics, suggesting that the TSCA should model after the European Union's Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH) regulation.¹⁴ This would be to create greater transparency, place burdens of proof on manufacturers to demonstrate chemical safety, and impose more stringent and robust standards.

I. BACKGROUND AND REGULATORY HISTORY

The EPA's recent loosening of federal restrictions on asbestos and chlorpyrifos and the potential for similar future rollbacks are creating new and unjustifiable risks for citizens across the U.S. The EPA is the federal executive administrative agency chiefly responsible for developing and enforcing environmental and public health policies. ¹⁵ Congress has specifically charged the EPA with protecting the public from the adverse health risks of asbestos and with ensuring that only safe chlorpyrifos products find their way into the nation's economy. ¹⁶ For decades, the EPA has faithfully fulfilled this duty, gradually increasing some restrictions on these and other harmful substances as scientific knowledge of their impacts have advanced over time.

The EPA's longstanding stewardship over federal toxic chemical regulation appeared to take a sharp turn in 2019 when the agency promulgated a SNUR, creating the possibility for asbestos-containing products to find their way back into U.S. markets and with the agency's subsequent reversal of its position on banning chlorpyrifos.¹⁷ The following subsections provide a brief history of asbestos and chlorpyrifos regulation in

^{14.} See generally Richard A. Denison, A Primer on the New Toxic Substances Control Act (TSCA) and What Led to it, ENV'T DEF. FUND, 2, 4 (Apr. 2017),

https://www.edf.org/sites/default/files/denison-primer-on-lautenberg-act.pdf (summarizing the TSCA and giving an overview of the reforms made to TSCA by the Frank R. Lautenberg Chemical Safety for the 21st Century Act).

^{15.} Our Mission and What We Do, U.S. ENV'T PROT. AGENCY (Jan. 21, 2017), https://19january2017snapshot.epa.gov/aboutepa/our-mission-and-what-we-do_.html (last visited Sept. 6, 2020).

^{16.} See Denison, supra note 14, at 2 (stating TSCA grants EPA broad authority to regulate chemicals found to present an unreasonable risk to health or environment).

^{17.} Pasheilich, *supra* note 5; Friedman, *supra* note 13.

the U.S., describe the potential environmental and health dangers of these products, and highlight the EPA's recent changes in its approach to regulating their use.

A. Asbestos Regulatory History

Congress enacted the Clean Air Act (CAA) in 1970, empowering the federal government to protect the public from hazardous airborne contaminants.¹⁸ Pursuant to the CAA, a newly-formed EPA soon issued National Emissions Standards for Hazardous Air Pollutants (NESHAP) to help limit public exposure to a long list of contaminants.¹⁹ Under NESHAP's framework, hazardous air pollutants include compounds that are known or suspected to cause cancer or other serious health effects.²⁰ On March 31, 1971, the EPA identified asbestos as one such hazardous air pollutant.²¹

In the 1970s, Congress enacted multiple bills calling for expanded federal restrictions on the use, distribution, and manufacture of asbestos and other harmful chemicals.²² The TSCA of 1976 was crucial in this legislative movement because it gave the EPA the authority to regulate new and existing commercial chemicals that posed an "unreasonable risk" of injury to health or the environment.²³ The TSCA provides the EPA the authority to require reporting, record-keeping and testing requirements, and to place restrictions relating to chemical substances.²⁴

In the years following the TSCA's enactment, the EPA imposed increasingly strict regulations on asbestos and asbestos-containing products.²⁵ This era of rulemaking eventually culminated with an attempt to impose an outright ban on almost all asbestos-containing products in 1989.²⁶

^{18.} See Learn about Asbestos, EPA, https://www.epa.gov/asbestos/learn-about-

asbestos#asbestos (last updated Sept. 17, 2018) (stating that asbestos exposure occurs only when the asbestos material is disturbed or damage therefore releasing particles into the air causing health risks). 19. Asbestos Laws and Regulations, EPA, https://www.epa.gov/asbestos/asbestos-laws-and-

regulations#reg (last updated Sept. 25, 2020).

^{20.} Id.

^{21.} Overview of the Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP), EPA, https://www.epa.gov/asbestos/overview-asbestos-national-emission-standards-hazardous-air-pollutants-neshap (last updated Jan. 30, 2020).

^{22.} See Cristin Dale Mustillo, Comment, Persistently Present, Inconsistently Regulated: The Story of Asbestos and the Case for A New Approach Toward the Command and Control Regulation of Toxics, 2013 MICH. ST. L. REV. 257, 263–64 (2013) (mentioning the passage of eighteen acts by Congress between 1970 and 1980).

^{23.} See Guc, supra note 3, at 465.

^{24. 15} U.S.C. § 2601 (1976); Denison supra note 14, at 8-9.

^{25.} See Corrosion Proof Fittings v. E.P.A., 947 F.2d 1201, 1207–08 (5th Cir. 1991) (finding EPA failed to consider and reject less burdensome alternatives before imposing a complete ban); See also EPA Actions to Protect the Public from Exposure to Asbestos, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/asbestos/epa-actions-protect-public-exposure-asbestos (last updated Mar. 20, 2020) (detailing EPA regulatory history for asbestos).

^{26.} Corrosion Proof Fittings v. E.P.A., 947 F.2d at 1207-08.

Industry stakeholders-including asbestos mining companies and product manufacturers-responded to this effort with a lawsuit against the EPA's ban. These opponents of the ban cited that feasible alternatives to asbestos in certain industries were cost prohibitive.²⁷

In 1991, the Fifth Circuit Court of Appeals held that the EPA had violated the TSCA by not adequately demonstrating that its asbestos ban was the "least burdensome" action that could achieve an acceptable level of risk.²⁸ The Court reasoned that the TSCA required the EPA to regulate asbestos in a way that imposed the smallest burden necessary on regulated parties.²⁹ In essence, the Court held that the EPA had not correctly balanced the risk of banning asbestos against public health benefits and had failed to provide a reasonable basis for its asbestos ban because there was arguably no viable substitute for asbestos in the marketplace.³⁰ The Court further found that the EPA had failed to prove its proposed asbestos alternatives were safe and that the agency had adequately considered the potential risks and costs of flatly banning asbestos products.³¹ Regardless, the Court's holding enabled asbestos-containing products to remain in U.S. commerce, and policymakers never successfully enacted an outright ban on asbestos and asbestoscontaining products.

Despite this judicial defeat of an outright asbestos ban, numerous legislative bills aimed at preventing asbestos from harming citizens and the environment continued to appear in Congress. In particular, 30 years after the enactment of the TSCA, President Obama signed the Frank R. Lautenberg Chemical Safety for the 21st Century Act into law in 2016.³² The Act amended the TSCA, granting the EPA additional authority to evaluate the hazards posed by new and existing commercial chemicals.³³ The Act mandated that the EPA conduct risk assessments of hazardous chemicals and regulate them according to the results of these assessments and studies.³⁴ Shortly after the Act became law, the EPA identified asbestos as one of the first ten chemicals it would assess under its provisions.³⁵

^{27.} Id. at 1218-19.

^{28.} Id. at 1215.

^{29.} Id. at 1215-16.

^{30.} Id. at 1229.

^{31.} Id. at 1230.

^{32.} Frank R. Lautenberg Chemical Safety For The 21st Century Act, Pub. L. No. 114-182, 130 Stat. 448 (2016).

^{33.} Id.

^{34.} Id.

^{35.} See Eric Lipton, The Chemical Industry Scores a Big Win at the E.P.A., N.Y. TIMES (June 7, 2018), https://www.nytimes.com/2018/06/07/us/politics/epa-toxic-chemicals.html (discussing EPA's evaluation of potentially toxic chemicals and EPA's decision to focus on harm caused by direct contact as opposed to contact through air, water, and soil).

In April of 2019, after the EPA had completed much of its new asbestos risk assessment, the Agency proposed a SNUR to govern future manufacturing, importing, and processing of asbestos and asbestos-containing products and materials in the U.S.³⁶ Among other things, the SNUR proposed to require asbestos importers and manufacturers to receive approvals from the EPA before starting or resuming asbestos importation or production. However, the rule left the door open for significant continued use of asbestos within the U.S. Although the EPA had not yet released its final draft assessment as of early 2020, its proposed SNUR has already drawn intense criticism from policymakers, scientists, and environmentalists.³⁷

Partially in response to the EPA's proposed SNUR for asbestos, a new bill was introduced in Congress in 2019 aimed at further strengthening restrictions on the substance. The Alan Reinstein Ban Asbestos Now Act of 2019 (H.R. 1603) sought to further amend the TSCA and flatly prohibit the manufacture, processing, and distribution of asbestos and asbestos-containing mixtures and articles.³⁸ If enacted, this prohibition would have taken effect within one year, with specific exemptions for national security purposes. H.R. 1603 was introduced in March 2019 with 26 sponsors and passed through the Energy and Commerce Committee's Environment and Climate Change Committee in November 2019 with bipartisan support, thereby advancing for consideration by the full House of Representatives.³⁹

However, certain powerful industry stakeholders soon began advocating for changes aimed at weakening provisions of H.R. 1603. For instance, Michael P. Walls, the Vice President of Regulatory and Technical Affairs of the American Chemistry Council (ACC), voiced strong opposition to the bill.⁴⁰ Specifically, he argued that the provision in the original version of H.R. 1603 would endanger public health by leading to significant shortages of chlorine and forcing chlor-alkali manufacturers to operate without viable alternatives in the short term.⁴¹

^{36.} Pasheilich, *supra* note 5.

^{37.} See Sasser, *supra* note 8 (stating how the president of a non-profit responded to the EPA rule, calling it disappointing); *see infra* Section II.B. (discussing the controversy surrounding the EPA's recent ruling).

^{38.} H.R. 1603, 116th Cong. (2019) (extending the phase-out for the chlor-alkali industry, clarifying the timing and content of required reports, and which non-asbestiform varieties of winchite and richterite are covered by the ban, adopting an impurity threshold for construction materials, and instructing the EPA to enter into a contract with the National Academy of Science to produce a report on legacy asbestos and associated exposures); Pasheilich, *supra* note 5.

^{39.} Pasheilich, supra note 5.

^{40.} Ban Asbestos Now: Taking Action to Save Lives and Livelihoods: Hearing on H.R. 1603 Before the H. Comm. On Energy and Comm.'s Subcomm. On Env't and Climate Change, 116th Cong. 3 (2019) (statement of Michael P. Walls, Vice President, Regulatory and Technical Affairs American Chemistry Council).

^{41.} Id.

Despite this industry opposition, H.R. 1603 has enjoyed considerable support as it waits to advance through Congress. In July of 2019, 18 state attorney generals called on Congress to pass the ban.⁴² And in October 2019, two former EPA administrators published a high-profile opinion piece expressing their support for it.⁴³

B. The Chlor-alkali Industry

The chlor-alkali industry, which has long relied heavily on asbestos in its manufacturing process, is the principal opponent to new asbestos regulation in the U.S.⁴⁴ In 2018, the chlor-alkali industry was responsible for all domestic consumption of asbestos minerals.⁴⁵ Much of the industry relies on asbestos to assist in a chemical process used to produce chlorine and sodium hydroxide, both of which are widely used in various materials and products.⁴⁶ In particular, chlorine is critically important to the nation's construction and agricultural industries.⁴⁷ Most of the nation's chlorine is used in the production of four plastics: polyvinyl chloride (PVC), epoxies, polycarbonate, and polyurethane.⁴⁸ About 54% of U.S.-produced chlorine is used to make PVC worldwide.⁴⁹

The largest U.S. chlorine producers use either mercury or asbestos in the production process.⁵⁰ In Europe, a small number of large chlor-alkali plants are exempt from a regulation that prohibits asbestos and thus continue to use asbestos to produce chlorine, but most others use mercury.⁵¹ In the Americas, about 45% of chlorine plants, including 8 of the 12 largest operating plants,

^{42.} Xavier Becerra et al., *Re: H.R. 1603, the Alan Reinstein Ban Asbestos Now Act of 2019*, MD. ATT'Y. GEN. (July 12, 2019), http://www.marylandattorneygeneral.gov/News%20Documents/071219_Ban_Asbestos Now Act.pdf.

^{43.} Gina McCarthy & William Reilly, *Asbestos Kills Nearly 40,000 Americans a Year. Ban It.*, N.Y. TIMES (Oct. 15, 2019), https://www.nytimes.com/2019/10/15/opinion/asbestos-epa-trump.html?searchResultPosition=1.

^{44.} See Tim Povtak, Chloralkali Industry Wants Exception to Proposed US Asbestos Ban, MESOTHELIOMA CTR. (June 25, 2019), https://www.asbestos.com/news/2019/06/25/chlor-alkali-asbestos-ban/ (demonstrating the chlor-akali industry's reliance on asbestos import in 2018).

^{45.} DANIEL M. FLANAGAN, U.S. GEOLOGICAL SURV., MINERAL COMMODITY SUMMARIES 2019 26 (2019), https://prd-wret.s3-us-west-2.amazonaws.com/assets/palladium/production/atoms/files/mcs2019_all.pdf.

^{46.} *Id*.

^{47.} *Chlorine*, CHEMICALSAFETYFACTS.ORG, https://www.chemicalsafetyfacts.org/chlorine (last visited Nov. 29, 2020).

^{48.} JIM VALLETTE, HEALTHY BLDG. NETWORK, CHLORINE AND BUILDING MATERIALS: A GLOBAL INVENTORY OF PRODUCTION TECHNOLOGIES, MARKETS, AND POLLUTION 2 (2018) (describing how PVC is used in pipes, siding, flooring, roofing, and other construction materials). PVC is 60% chlorine by weight. *Id.* Chlorine is also an essential feedstock for epoxies used in adhesives and flooring topcoats, and for polyurethane used in flooring and insulation. *Id.*

^{49.} *Id.*

^{50.} Id.

^{51.} Id. at 10.

use asbestos-based technologies.⁵² Seven of these eight plants are located on the U.S. Gulf Coast; the eighth plant is in Brazil, which will soon totally phase out asbestos mining.⁵³ With the closing of the Brazilian asbestos mines, U.S. firms may soon depend almost exclusively on Russian asbestos mines to supply the substance.⁵⁴

In addition to utilizing tons of asbestos, chlorine processing plants inflict significant other environmental and public health risks. ⁵⁵ Chlor-alkali facilities in the U.S. and Canada release over 400 tons of chlorine gas into the atmosphere per year.⁵⁶ Despite heavy regulation, these plants ultimately also dispose some asbestos into the environment, contaminating surroundings and imposing risks on employees and others.⁵⁷

C. Asbestos and Public Health Risks

The substantial environmental and health risks associated with asbestos exposure have been documented for over half a century. ⁵⁸ The EPA recognizes three serious medical conditions associated with asbestos exposure: lung cancer, mesothelioma, and asbestosis. ⁵⁹ Although most people exposed to asbestos will not develop mesothelioma, asbestos exposure accounts for 70%–80% of documented mesothelioma cases.⁶⁰ Each year, nearly 40,000 people in the U.S. die from preventable asbestos-caused diseases.⁶¹

Occupational exposure to asbestos is likely the most prevalent incidence of human contact with asbestos. Many industries have made commercial uses of asbestos for over 100 years.⁶² Nearly 125 million people worldwide are

^{52.} Id. at 3.

^{53.} Id.

^{54.} Id.

^{55.} Id.

^{56.} Id.

^{57.} See 29 C.F.R. §§ 1910, 1915, 1926 (1994) (regulating occupational safety and health standards).

^{58.} John R. Balmes, *Asbestos and Lung Cancer: What We Know*, 188 AM. J. RESPIRATORY & CRITICAL CARE MED. 8, 9 (2013).

^{59.} Overview of the Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP), EPA, https://www.epa.gov/asbestos/overview-asbestos-national-emission-standards-hazardous-air-pollutants-neshap (last updated Jan. 30, 2019).

^{60.} Joseph R. Testa et al., *Mesothelioma*, NAT'L ORG. FOR RARE DISEASES (2017) https://rarediseases.org/rare-diseases/mesothelioma/.

^{61.} McCarthy and Reilly *supra* note 43; *see Asbestos Frequently Asked Questions*, SAN FRANCISCO DEP'T OF PUB. HEALTH 1, 3, https://www.sfdph.org/dph/files/EHSdocs/ehsAsbestos/AsbestosFAQ.pdf (last visited Dec. 12, 2020) (explaining that drinking-water can be contaminated by asbestos through the erosion of natural deposits, leeching from asbestos waste in landfills, from the deterioration of asbestos-containing cement pipes used to carry drinking water, or from the filtering of water supplies through asbestos-containing filters).

^{62.} Daniel King, *History of Asbestos*, MESOTHELIOMA CTR., https://www.asbestos.com/asbestos/history/ (last modified Feb. 3, 2020).

occupationally exposed to asbestos each year, with construction workers, shipbuilders, miners, electricians, and other blue-collar workers at high risk.⁶³ Asbestos inhalation and ingestion are the primary routes of exposure that may lead to cancer and mesothelioma.⁶⁴ Laborers commonly inhale and ingest asbestos during mining and milling operations for the substance, the manufacture or use of asbestos-containing products, construction or automobile manufacturing activities involving asbestos, or the transportation or disposal of asbestos-containing wastes.⁶⁵ Although federal and state regulations have helped to reduce asbestos exposure in the U.S. in recent years, that progress could quickly be lost if the government were to unduly loosen asbestos restrictions.⁶⁶

D. What is Chlorpyrifos?

Like asbestos, chlorpyrifos is a highly hazardous chemical that has long been subject to strict regulations within the U.S. Chlorpyrifos is an organophosphate pesticide belonging to a class of chemicals that includes nerve gas agents such as sarin gas. ⁶⁷ Chlorpyrifos and other organophosphates can adversely affect the human nervous system and brain development.⁶⁸

Chlorpyrifos was first registered with the EPA as a permitted pesticide in 1965.⁶⁹ Although chlorpyrifos was initially approved to treat food and feed crops, by 1987 nearly half of all the chlorpyrifos produced in the U.S. was being used in non-agricultural settings.⁷⁰ In the early 1990s, chlorpyrifos was commonly used in households to eradicate cockroaches and termites.⁷¹ At its peak, chlorpyrifos was one of the most common pesticides in the U.S.,

66. *Id.* at 11.

^{63.} Asbestos: Elimination of Asbestos-Related diseases, WORLD HEALTH ORG. (Feb. 15, 2018), https://www.who.int/news-room/fact-sheets/detail/asbestos-elimination-of-asbestos-related-diseases; Christopher Gerry, When Politics Trumps Science: Why Asbestos is Still Legal in the USA, HARVARD UNIV. SITN: BLOG, SCI. POLICY (Aug. 20, 2018), http://sitn.hms.harvard.edu/flash/2018/asbestos-still-legal-usa/.

^{64.} Daniel King, Occupational Asbestos Exposure, MESOTHELIOMA CTR., https://www.asbestos.com/occupations/ (last modified Sept. 23, 2020).

^{65.} See INT'L AGENCY FOR RSCH. ON CANCER, ARSENIC, METALS, FIBRES, AND DUSTS: A REVIEW OF HUMAN CARCINOGENS 45 (2012), https://www.ncbi.nlm.nih.gov/books/NBK304375/pdf/Bookshelf_NBK304375.pdf, (explaining how human actions can release asbestos fibers into the air).

^{67.} See Patrick Paul, Ninth Circuit Upholds EPA Pesticide "Action", 32 NAT. RES. & ENV'T 58, 59 (2018) (describing legislation that classifies chlorpyrifos as a nerve agent pesticide).

^{68.} Lori Cuthbert, *EPA Must Ban Dangerous Insecticide Chlorpyrifos: What is it?*, NAT'L GEO. (Aug. 10, 2018), https://www.nationalgeographic.com/environment/2018/08/chlorpyrifos-insecticides-pesticides-epa-organophosphates/ (arguing why EPA should ban chlorpyrifos).

^{69.} Paul, supra note 67.

^{70.} OFF. OF PESTICIDE PROGRAMS, U.S. ENV'T PROT. AGENCY, EPA-738-R-01-007, INTERIM REREGISTRATION ELIGIBILITY DECISION FOR CHLORPYRIFOS at viii (2002).

^{71.} Landrigan et al., supra note 12.

appearing in over 400 registered products.⁷² However, in 1997, the EPA started to reduce residential exposure to chlorpyrifos by banning its use in household products.⁷³ In 2000, in response to a growing catalog of evidence about the potential health hazards of chlorpyrifos, the EPA agreed to phase out nearly all residential applications of the substance.⁷⁴

Today, chlorpyrifos is still among the most common pesticides in the U.S.⁷⁵ Its primary use is for the control of foliage- and soil-borne insects in food and feed crops.⁷⁶ Approximately 10 million pounds of the chemical are applied annually in the U.S. in agricultural settings.⁷⁷ The EPA reports that the agricultural sector uses over 5 million pounds of chlorpyrifos annually in the production of corn alone.⁷⁸ However, the EPA's chlorpyrifos tolerances cover numerous other agricultural products as well, including soybeans, fruit trees, and citrus crops, and certain non-agricultural uses such as golf course maintenance and non-structural wood treatment.⁷⁹

Chlorpyrifos works by disrupting the nervous system of pests when they come in contact with the chemical.⁸⁰ Manufacturers can produce chlorpyrifos in numerous forms, including liquids, granular products, and flowable concentrates. Chlorpyrifos can be applied either using ground-based or aerial equipment.⁸¹ Once the chemical is introduced to the nervous system of an insect, acute poisoning suppresses a vital enzyme called cholinesterase.⁸² This process causes an overactivation of nerve impulses that eventually lead to death.⁸³

^{72.} U.S. ENV'T PROT. AGENCY, supra note 70, at 3.

^{73.} *Id.* 74. *Id.*

^{75.} See Xindi Hu, The Most Widely Used Pesticide, One Year Later, SCI. NEWS, HARVARD UNIV. (Apr. 17, 2018), http://sitn.hms.harvard.edu/flash/2018/widely-used-pesticide-one-year-later/ (stating Chlorpyrifos as the most widely used pesticide on crops because it is a highly effective pest-management tool).

^{76.} U.S. ENV'T PROT. AGENCY, EPA-738-F-01-006, CHLORPYRIFOS FACTS 1 (2002), https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_PC-059101_1-Feb-02.pdf.

^{77.} *Id.* 78. *Id.*

^{79.} *Id.*; Hu, *supra* note 75.

See Hu, supra note 75 (mentioning that pesticide works by attacking insect nervous systems).
 See U.S. ENV'T PROT. AGENCY, supra note 76, at 2 (mentioning concerns of exposure for humans from ground, arial, and water application).

^{82.} See Joseph G. Allen, This Pesticide is Closely Related to Nerve Agents Used in World War II. Trump's EPADoesn't Care. WASH. POST (July 25. 2019) https://www.washingtonpost.com/opinions/2019/07/25/this-pesticide-is-closely-related-nerve-agentsused-world-war-ii-trumps-epa-doesnt-care/ (stating Acetylcholinesterase, or cholinesterase, serves the function of breaking down acetylcholine, a neurotransmitter); see also William C. Wagner, Common Pesticide to be Pulled From Market, 10 No. 7 IND. ENV'T COMPLIANCE UPDATE 3 (2000) (stating a buildup of acetylcholine causes an overactivation of its targets such as muscle fibers, sweat glands, the digestive system, and heart and brain cells).

^{83.} U.S. ENV'T PROT. AGENCY, supra note 76, at 2.

Unfortunately, while chlorpyrifos is effective at controlling its target insects, it can also be very toxic to non-target insects, other wildlife, and humans.⁸⁴ A growing number of scientific studies have determined that chlorpyrifos exposure is highly toxic to humans, especially infants and children. Human exposure can occur through residues on food, contaminated drinking water, and toxic spray drift from pesticide applications.⁸⁵ Farmworkers are routinely exposed to the chemical when handling and applying the pesticide and when entering into fields where chlorpyrifos has recently been applied.⁸⁶ In adults, exposures to the chemical can cause nausea, dizziness, confusion, delayed nervous system damage, and potentially even death by suffocation due to loss of respiratory muscle control.⁸⁷

Initially, EPA "tolerances" or limits on chlorpyrifos concentrations and uses were determined based on the assumption that the pesticide would be safe as long as exposure levels were so low that they did not suppress the production of specific nervous system enzymes by 10% or more.⁸⁸ However, the EPA's understanding of relevant chemical pathways at that point was primarily based on chlorpyrifos exposure studies involving adult animals.⁸⁹ These EPA assumptions failed to take into account the particular susceptibility of fetuses, infants, and children to the substance.⁹⁰ Numerous subsequent studies have concluded that pre- and post-natal exposure at levels that cause less than 10% enzyme inhibition still directly correlate with adverse brain development and cognitive impairments in children.⁹¹ The

^{84.} See Chlorpyrifos: General Fact Sheet, NAT'L PESTICIDE INFO. CTR., OR. STATE UNIV. 1, 4 (2010), https://npic.orst.edu/factsheets/chlorpgen.pdf (stating multiple ways humans, pets, and other animals are exposed).

^{85.} See Virginia Rauh et al., Impact of Prenatal Chlorpyrifos Exposure on Neurodevelopment in the First 3 Years of Life, 118 PEDIATRICS e1845, e1856 (2006) (using magnetic resonance imaging concluded that neurodevelopmental effects observed in children exposed to chlorpyrifos persist until adolescence, suggesting that cognitive and motor impairments may be irreversible. Two other studies, conducted at the University of California-Berkley and Mount Sinai School of Medicine and focused on organophosphate pesticides more generally, concluded that prenatal exposure to these types of pesticides is directly linked to significant and potentially irreversible adverse neurodevelopment); see also U.S. ENV'T PROT. AGENCY, supra note 76 (mentioning different manners of exposure for humans).

^{86.} Hu, *supra* note 75.

^{87.} Wagner, supra note 82.

^{88.} Chlorpyrifos; Tolerance Revocations, 80 Fed. Reg. 69080, 69082 (Nov. 6, 2015) (to be codified at 40 C.F.R. pt. 180).

^{89.} U.S. ENV'T PROT. AGENCY, EPA-HQ-OPP-2008-0850-0025, CHLORPYRIFOS: PRELIMINARY HUMAN HEALTH RISK ASSESSMENT FOR REGISTRATION REVIEW 2–3 (2011),

https://www.regulations.gov/contentStreamer?documentId=EPA-HQ-OPP-2008-0850-0025&contentType=pdf.

^{90.} See NAT'L RSCH. COUNCIL, PESTICIDES IN THE DIETS OF CHILDREN AND INFANTS 77 (Nat'l Acad. Press 1993) (explaining that children frequently put their hands in their mouths and, relative to adults, consume more fruits and vegetables and drink more water and juice in proportion to their weight); see also Landrigan et al., supra note 12 (explaining common sources of pesticide exposure to children).

^{91.} See Rauh et al., *supra* note 85, at e1846 (citing works suggesting irreversible impairment of children exposed to chlorpyrifos, and a causal link between parental exposure and child exposure).

EPA has been aware of these newer studies highlighting the inadequacy of the EPA's benchmark for chlorpyrifos tolerance since at least 2000.⁹²

1. History of Chlorpyrifos Regulation

In light of the mounting evidence that children and adults are susceptible to significant harms from pesticides and other toxic chemicals, President Clinton signed the Food Quality Protection Act (FQPA) into law in 1996.⁹³ The FQPA amended two existing acts, the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food Drug and Cosmetic Act (FFDCA), both of which directly affect chlorpyrifos regulation.⁹⁴ One stated purpose of the FQPA was to develop better methodologies and refine pesticide risk assessments to "better reflect real-world situations."⁹⁵ These amendments fundamentally changed the EPA's regulation of pesticides.

a. The FFDCA

As amended in 1996, FFDCA required the EPA to reassess chlorpyrifos and all other currently registered pesticide tolerances.⁹⁶ Under the FFDCA, any food containing excessive pesticide residue is deemed unsafe and consequently barred from interstate commerce.⁹⁷ The Act gives the EPA limited authority to establish and adjust levels of pesticide "tolerances" in both raw agricultural commodities and processed foods.⁹⁸ Tolerance is a measure of the maximum residue of a pesticide permitted to remain on a food product.⁹⁹ Only food products containing pesticide residue levels that stay within set tolerance levels are permitted within interstate commerce.¹⁰⁰

Today, registered pesticides must satisfy the FQPA's new safety standard to be eligible for reregistration. Section 346a(b)(2) states that the

^{92.} See generally OFF. OF PESTICIDE PROGRAMS, U.S. ENV'T PROT. AGENCY, HUMAN HEALTH RISK ASSESSMENT: CHLORPYRIFOS (2000),

https://archive.epa.gov/scipoly/sap/meetings/web/pdf/hed_ra.pdf (conducting an overview of cumulative risk assessments of pesticides on human health).

^{93.} Summary of the Food Quality Protection Act, U.S. ENV'T PROT. AGENCY,

https://www.epa.gov/laws-regulations/summary-food-quality-protection-act (last updated July 28, 2020).

^{94.} Id.

^{95.} Id.

^{96.} Id.

^{97. 21} U.S.C. § 346a(a)(1).

^{98. 21} U.S.C. § 346a(a)(2).

^{99.} Pesticide Residue Monitoring Program Questions and Answers, U.S. FOOD & DRUG ADMIN., https://www.fda.gov/food/pesticides/pesticide-residue-monitoring-program-questions-and-answers (last updated Sept. 15, 2020); see also Stephanie H. Jones, Greater Than the Sum of its Parts: The Integration of Environmental Justice Advocacy and Economic Policy Analysis, 26 N.Y.U. ENV'T L.J.

^{402, 433 (2018) (}stating the EPA definition of tolerances).

^{100. 21} U.S.C. § 346a(l)(5).

EPA may leave in effect a tolerance of a currently registered pesticide if the EPA determines that the pesticide residue tolerance is "safe."¹⁰¹ The statute defines "safe" as "a reasonable certainty that no harm will result from aggregate exposure to the pesticide chemical residue."¹⁰² In establishing, modifying, leaving in effect, or revoking pesticide tolerances, the EPA must consider all "available" information concerning a pesticide's toxic effects, human risks, dietary consumption patterns, cumulative effects, and aggregate exposure levels.¹⁰³ Under the FQPA, the EPA must also specifically take into account special considerations for infants and children.¹⁰⁴

The FQPA further established a schedule for review, requiring the EPA to reassess all currently registered pesticides.¹⁰⁵ In addition to this statutorilymandated review process, the FFDCA also allows any person to file a petition with the EPA to establish, modify, or revoke a tolerance or exemption for an existing pesticide chemical residue.¹⁰⁶

b. FIFRA

FIFRA, another federal statute affecting chlorpyrifos, requires that all pesticides sold in the U.S. pass through an EPA registration process.¹⁰⁷ Existing pesticide registrations are subject to intermittent review processes by the EPA; FIFRA requires that all registration reviews under the applicable safety standards be completed by the later of 15 years after the pesticide's first registration date, or October 1, 2022.¹⁰⁸ The registration review process requires a finding by the EPA that the use of the pesticide will not cause

^{101. 21} U.S.C. § 346a(b)(2)(A)(ii).

^{102. 21} U.S.C. § 346a(b)(2)(A)(ii).

^{103.} Chlorpyrifos; Tolerance Revocations, 80 Fed. Reg. at 69081.

^{104.} Chlorpyrifos; Tolerance Revocations, 80 Fed. Reg. at 69081; 21 U.S.C. § 346a(b)(2)(C) (providing that the EPA must assess the risk to infants and children separately taking appropriate action based on "available information" about: (1) food consumption patterns; (2) increased susceptibility of infants and children; and (3) the cumulative effects on infants and children of pesticide residue and other chemical substances with a mechanism of toxicity. In addition, EPA is required to assess tolerance levels in children by applying an additional tenfold margin of safety, unless, based on reliable data, the EPA can conclude that a different margin of data is applicable to children).

^{105.} See 21 U.S.C. § 346a(q) (stating EPA is required to review pesticide tolerances and exemptions in accordance with the following schedule provided in section 364a(q)(1): (A) 33 percent of tolerances and exemptions within 3 years of August 3, 1996; (B) 66 percent of tolerances within 6 years; and (C) 100 percent of tolerances within 10 years).

^{106. 21} U.S.C. § 346a(d) (providing of a list of requirements that a petition must meet and once the EPA determines that a proper petition has been filed, the EPA must publish notice of the petition complete with a summary within 30 days); see also 21 U.S.C. § 346a(d)(3)-(4) (mentioning that after notice has been publish, the EPA "shall, after giving due consideration to a petition" take one of three actions provided for in section 346a(d)(4) that The EPA shall: (i) issue a final regulation; (ii) issue a proposed regulation on its own initiative and thereafter issue a final regulation; or (iii) deny the petition).

^{107.} See 7 U.S.C. § 136a(c)(1) (describing the procedure for registration).

^{108. 7} U.S.C. § 136a(g)(1)(A)(iii).

"unreasonable adverse effects on the environment." ¹⁰⁹ This standard includes, among other requirements, human dietary risks from pesticide residues.¹¹⁰

2. History of Chlorpyrifos Registration and Residue Tolerances Review

In the late 1990s, after FQPA's enactment and in light of new scientific research highlighting the health concerns associated with chlorpyrifos, the EPA began to limit its use even further.¹¹¹ In 1998, the EPA conducted its first registration review of chlorpyrifos, finding unreasonable risks associated with residential uses of the substance.¹¹² Accordingly, in 2000 the EPA executed an agreement with the registrants, Dow Chemical, banning most residential applications of chlorpyrifos.¹¹³ However, the EPA continued to allow the use of chlorpyrifos in agricultural settings.¹¹⁴

In 2001, the EPA issued an interim decision that allowed reregistration of existing chlorpyrifos uses and specified chlorpyrifos residue tolerances.¹¹⁵ However, the EPA required registrants seeking approval to implement "risk reduction measures."¹¹⁶ Although the EPA approved most of the existing chlorpyrifos residue tolerances, the Agency did reduce tolerance levels for certain crops such as apples and grapes, and eliminated tolerances for tomatoes.¹¹⁷ Still, in spite of these changes, chlorpyrifos remained one of the most common pesticides used in the agricultural industry.¹¹⁸ A 2006 EPA memorandum perpetuated this approach, determining under a cumulative risk assessment that numerous pesticides, including chlorpyrifos, were eligible for reregistration and that established tolerance levels would remain unchanged.¹¹⁹

^{109. 7} U.S.C. § 136a(d)(3).

^{110. 7} U.S.C. § 136a(d)(3).

^{111.} See Chlorpyrifos, U.S. ENV'T PROT. AGENCY, https://www.epa.gov/ingredients-used-pesticide-products/chlorpyrifos (last updated Dec. 4, 2020) (mentioning the passage of the 1996 Food Quality Protection Act which set more stringent standards for chlorpyrifos).

^{112.} See id. (stating chlorpyrifos has been undergoing registration review since 1965 and that the EPA identified the need to modify the standard of safety for chlorpyrifos to address health and environmental risks); U.S. ENV'T PROT. AGENCY, *supra* note 70.

^{113.} Glenn Hess, *US EPA and Dow Agree to Ban on 'Dursban' Consumer Products*, INDEP. COMMODITY INTEL. SERV. (Aug. 6, 2000), https://www.icis.com/explore/resources/news/2000/06/08/113949/us-epa-and-dow-agree-to-ban-ondursban-consumer-products/.

^{114.} In re Pesticide Action Network N. Am., Nat. Res. Def. Council v. U.S. Env't Prot. Agency, 798 F.3d 810, 811 (9th Cir. 2015).

^{115.} See U.S. ENV'T PROT. AGENCY, supra note 70 (describing the interim decision).

^{116.} In re Pesticide Action Network, 798 F.3d at 811.

^{117.} Id. at 814.

^{118.} *Id.*; Brief for Petitioners at 2, League of Lat. Am. Citizens v. Wheeler, 940 F.3d 1126 (9th Cir. 2019) (No. 17-71636) [hereinafter Brief for Petitioners].

^{119.} FIFRA Scientific Advisory Panel (2008), *Scientific Issues Associated with Chlorpyrifos and PONI*, https://www.regulations.gov/docketBrowser?rpp=50&po=0&D=EPA-HQ-OPP-2008-0274.

Then, in 2007, the Pesticide Action Network North America and Natural Resource Council (PANNA) filed the first administrative petition against chlorpyrifos with the EPA.¹²⁰ The petition challenged the EPA's reregistration of the chemical and sought to revoke all chlorpyrifos residue tolerances.¹²¹ The EPA reasoned that while chlorpyrifos was unsafe for household use, its application in agricultural settings can continue.¹²² PANNA cited numerous human and epidemiological studies linking low levels of chlorpyrifos exposure to adverse neurodevelopmental effects on children.¹²³ The EPA's 2006 reregistration of chlorpyrifos had failed to include these studies in their risk assessment.¹²⁴

In response to the allegations in the petition, the EPA issued multiple assessments and proposed rules regarding the adverse effects of chlorpyrifos exposure from 2007 to 2016.¹²⁵ In those releases, the EPA repeatedly concluded that chlorpyrifos exposure was harmful to children's brain development, that damage occurred at tolerance levels below the existing tolerances, and that the Agency's current benchmark determining tolerances was insufficient.¹²⁶

124. In re Pesticide Action Network, 798 F.3d at 814.

125. Brief for Petitioners, *supra* note 118, at 12–26; *See* ENVTL. PROT. AGENCY, supra note 111 (outlining the timeline of EPA actions around chlorpyrifos).

126. In re Pesticide Action Network, 798 F.3d., at 814; In 2008, the EPA's Health Effect's Division released a statement analyzing the effects of chlorpyrifos exposure recognizing the "growing body of literature on the effects of chlorpyrifos in the developing brain which indicate that gestational and early postnatal exposure can lead to neurochemical and behavioral alterations into adulthood." See Brief for the States of N.Y., Cal., Wash., Md., Vt., Or., Commonwealth Mass., and D.C. at 16-18, League of Lat. Am. Citizens v. Wheeler, 940 F.3d 1126 (9th Cir. 2019) (No. 19-71979 and No. 19071982) [hereinafter Brief for States]. The EPA noted that cholinesterase suppression and significantly lower levels than previously accounted for can cause these effects. Id. at 12-15. Later that same year, the EPA convened the FIFRA Scientific Advisory Panel. Id. 17-18. Between 2010 and 2012, the EPA continued to collect and analyze scientific studies linking early chlorpyrifos exposure to adverse health effects in children. Id. at 18-20. The panel reviewed and agreed with the earlier 2008 statement linking chlorpyrifos exposure to long term neurodevelopmental effects. Id. at 19-20; FIFRA, supra note 119. In 2011, the agency issued a Preliminary Human Health Risk Assessment highlighting the cholinesterase suppressing ability of chlorpyrifos. ENVTL. PROT. AGENCY, DP No. D388070, CHLORPYRIFOS PRELIMINARY HUMAN HEALTH RISK ASSESSMENT 8 (2011), https://www.regulations.gov/document?D=EPA-HQ-OPP-2008-0850-0025. In this assessment the EPA cited numerous epidemiological studies and requested peer-review from the scientific advisory panel (SAP). Id. at 29-34. In 2012, the SAP determined that further inquiry is necessary, acknowledging the vast array of evidence suggesting "chlorpyrifos can affect neurodevelopment at levels lower than those associated with cholinesterase inhibition." Brief for States, supra note 126, at 19; See U.S. Envtl. Prot. Agency, SAP Minutes No. 2012-04 (2012), https://www.epa.gov/sites/production/files/2015-06/documents/041012minutes.pdf (illustrating that the panel also noted that the overall evidence across all of these studies is persuasive in indicating that low levels of exposure to chlorpyrifos can have adverse effects on neurodevelopment).

^{120.} In re Pesticide Action Network, 798 F.3d at 812.

^{121.} Id. at 812.

^{122.} Id. at 811.

^{123.} See Esther Yu Hsi Lee, Federal Appeals Court Won't Stop EPA From Using Controversial Pesticide, THINK PROGRESS (last visited Jan. 18, 2019), https://thinkprogress.org/chlorpyrifos-delay-upheld-6cc940d09379/.

The EPA also expressed increasing concerns about chlorpyrifos in a 2014 Revised Human Health Risk Assessment.¹²⁷ In this revised assessment, the EPA determined that "chlorpyrifos likely played a role" in developmental delays observed in a recent Columbia University study.¹²⁸ This study confirmed adverse effects on brain development in children at exposure rates lower than 10% cholinesterase enzyme inhibition.¹²⁹ The Agency likewise expanded and updated its review of a University of California-Berkley and Mount Sinai School of Medicine studies of the substance.¹³⁰ The EPA noted that all three epidemiological studies were "strong studies" that support the conclusion that "chlorpyrifos played a role in these outcomes."¹³¹

In 2015, the Ninth Circuit Court of Appeals ordered the EPA to respond to PANNA's petition by revoking all chlorpyrifos tolerances or by issuing a proposed or final tolerance revocation.¹³² Based on its newly revised risk assessment and this judicial order, the EPA finally announced a proposal to ban chlorpyrifos in 2015.¹³³ The Agency stated it was unable to "conclude that the risk from aggregate exposure from the use of chlorpyrifos meets the safety standard" of the FFDCA.¹³⁴

The EPA's proposal to ban chlorpyrifos unsurprisingly provoked strong opposition from Dow AgroSciences, which continues even now to advocate for chlorpyrifos and to assert its safety.¹³⁵ Dow argued that the Ninth Circuit had rushed the EPA to act before all scientific analyses were complete and that the EPA's methodology for quantifying the risk posed by chlorpyrifos was inaccurate.¹³⁶ Despite these objections, the Obama EPA had remained firm in its decision to revoke all tolerances for the pesticide.¹³⁷ In November 2016, the EPA concluded that while "uncertainties" remained, numerous scientific studies provided sufficient evidence linking chlorpyrifos exposure

129. Rauh et al., supra note 91, at e1849.

134. Chlorpyrifos; Tolerance Revocations, supra note 133, at 69,080.

^{127.} U.S. ENVTL. PROT. AGENCY, D424485, CHLORPYRIFOS HUMAN HEALTH RISK ASSESSMENT (2014).

^{128.} Id. at 6.

^{130.} Brief for States, *supra* note 126, at 21 ("EPA also expanded and updated its review of the three independent human epidemiological studies, all of which remained ongoing and now provided additional data.").strong

^{131.} Id. at 21.

^{132.} In re Pesticide Action Network N. Am., Nat. Res. Def. Council, Inc., 798 F.3d 809, 813 (9th Cir. 2015).

^{133.} Chlorpyrifos; Tolerance Revocations, 80 Fed. Reg. 69,080 (proposed Nov. 6, 2015) (to be codified at 40 C.F.R. pt. 180); *See* Friedman, *supra* note 13 (describing EPA's proposal banning chlorpyrifos).

^{135.} Hess, *supra* note 113; Britt E. Erikson, U.S. EPA's Chlorpyrifos Decision Spurs Pushback, C&EN (Sept. 11, 2017), https://cen.acs.org/articles/95/i36/US-EPAs-chlorpyrifos-decision-spurs.html.

^{136.} See Dan Charles, EPA Decides Not to Ban a Pesticide, Despite its Own Evidence of Risk, NPR (Mar. 29, 2017), https://www.npr.org/sections/thesalt/2017/03/29/521898976/will-the-epa-reject-a-pesticide-or-its-own-scientific-evidence (describing Dow Agrosciences's position on the scientific methods the EPA used0).

^{137.} Brief for States, supra note 126, at 27.

to adverse neurodevelopmental effects in children to warrant an outright ban.¹³⁸

II. RECENT DEVELOPMENTS IN TOXICS REGULATION

Federal toxics regulators, who for years had gradually strengthened protections for citizens based on advancing scientific knowledge of health risks, have charted a quite different course in recent years under President Donald Trump. During his presidential campaign, President Trump boldly declared, "we're going to get rid of the regulations that are just destroying us."¹³⁹ In the two years after Trump's inauguration as president, his administration has sought to fulfill this promise, overseeing approximately 514 deregulatory rulemakings on a broad range of policy issues.¹⁴⁰ The EPA's enduring efforts to curb asbestos and chlorpyrifos use and exposure have been among those targeted in this effort.¹⁴¹ Unfortunately, the provisions of the TSCA offer relatively weak insulation against this type of executive-branch-driven crusade to roll back safeguards against hazardous chemicals. The following subsections describe how certain shortcomings of the amended TSCA have enabled the Trump EPA to easily loosen asbestos and chlorpyrifos regulations.

A. Problems with the TSCA

The TSCA has proven to be a vulnerable and easily manipulated structure for governing toxic substance uses within the U.S. Prior to TSCA's enactment in 1976, roughly 62,000 chemicals circulated in U.S. commerce.¹⁴² After its enactment, all substances then on the market were permitted to remain unless the EPA determined they posed an "unreasonable risk."¹⁴³ Of the couple hundred chemicals the EPA evaluated pursuant to the

^{138.} Id. at 26-27.

^{139.} Howard Richman, *Trump: We're Going to Get Rid of the Regulations That are Just Destroying Us*, AM. THINKER (Sept. 16, 2015), *https://www.americanthinker.com/blog/2015/09/trump were going to get rid of the regulations that*

are just_destroying_us.html#ixzz6F7sPjWC4 (describing President Trump's pre-election speech about regulations).

^{140.} KEITH BELTON & JOHN GRAHAM, AM. COUNCIL CAP. FORMATION, TRUMP'S

DEREGULATORY RECORD: AN ASSESSMENT AT THE TWO-YEAR MARK 5 (2019), http://accf.org/wpcontent/uploads/2019/03/ACCF-Report_Trump-Deregulatory-Record-FINAL.pdf.

^{141.} See Friedman, supra note 13 (comparing Presidents Trump and Obama's EPA's differing stances on regulation).

^{142.} See Puneet Kollipara, The Bizarre Way the U.S. Regulates Chemicals — Letting Them on The Market First, Then Maybe Studying Them, WASH. POST, (Mar. 19, 2015), https://www.washingtonpost.com/news/energy-environment/wp/2015/03/19/our-broken-congresss-latest-effort-to-fix-our-broken-toxic-chemicals-law/ (explaining the purposes and shortcomings of the TSCA).

^{143.} Id.

statute, only five were deemed to pose an "unreasonable risk" and subsequently banned.¹⁴⁴ Nearly all other chemicals remained on the market, partly because TSCA gives the EPA only 90 days to make an "unreasonable risk" assessment.¹⁴⁵ Within this short window of time, the Agency rarely has enough time to assemble and analyze the data required to make a thorough finding.¹⁴⁶ On this basis, critics of TSCA have argued that its "unreasonable risk" standard is an overly stringent and difficult bar for the EPA to meet.¹⁴⁷

More importantly, the amended TSCA gives the EPA broad discretion to regulate toxic substances, making this area of regulation more susceptible to industry influence. The original TSCA enabled the EPA to require interested parties to notify the Agency if they intended to manufacture or import an article containing a chemical of concern.¹⁴⁸ The purpose of this notification requirement was to prevent an unanticipated or new use of a chemical from proliferating and harming the public.¹⁴⁹ Under the amended TSCA, the EPA must undergo formal rulemaking to compel a chemical manufacturer to conduct research and produce new relevant data assessing the safety and risks of the chemical of concern.¹⁵⁰ Formal rulemaking is an administratively laborious and time-consuming process that could take years.¹⁵¹ This

148. Joel Reynolds, *The Toxic Substances Control Act of 1976: An Introductory Background and Analysis,* 4 COLUM. J. ENVTL. L. 35, 83 (1977) (explaining Section 8, subsection (e) of the Toxic Substances Control Act of 1976).

149. Id.

chemicals-under-tsca (last visited Jan. 18, 2021) (explaining the process of EPA's risk evaluation for chemicals under the TSCA, as amended). The provisions of the amended TSCA provide the Agency with a more straightforward mechanism to require toxicity data. Frank R. Lautenberg Chemical Safety for the 21st Century Act § 3A, 15 U.S.C. § 2603 (2015). If a chemical raises a "red flag" during the "tiered testing" screening process, the EPA may initiate extensive research and testing if the Administrator judges it is necessary. 15 U.S.C. § 2603(a)(2).

151. Watnick, *supra* note 4, at 386; *See also* Major Colin P. Eichenberger, *Improving the Toxic* Substances Control Act: A Precautionary Approach to Toxic Chemical Regulation, 72 A.F. L. REV. 123, 133 (2015) (stating that TSCA requires EPA to engage in formal rulemaking, which is time consuming);

^{144.} Id.

^{145.} Toxic Substances Control Act, 15 U.S.C. § 2605 (1976);, *Regulatory Determinations Made Under Section 5 of the Toxic Substances Control Act (TSCA)*, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/reviewing-new-chemicals-under-toxic-substances-control-act-tsca/regulatory-determinations-made-under (last visited Jan. 18, 2021).

^{146.} Kollipara, supra note 142.

^{147.} Title 1 of the Toxic Substances Control Act; Understanding Its History and Reviewing Its Impact: Hearing Before the H. Comm. On Energy and Commerce (2013) (statement of Daniel Rosenberg, Senior Attorney, Natural Resources Defense Council); See Corrosion Proof Fittings v. E.P.A., 947 F.2d at 1214 ("The test "imposes a considerable burden on the agency and limits its discretion in arriving at a factual predicate. Mobil Oil Corp. v. FPC, 483 F.2d 1238, 1258 (D.C.Cir.1973)."); The Fifth Circuit Court of Appeals invalidated the EPA's finding that asbestos-containing products posed an "unreasonable risk" because the EPA failed to consider the "least burdensome" way to regulate the hazardous substance. Id. at 1215–16. Regardless of its extremely dangerous nature, asbestos minerals and asbestos-containing products have not been banned since. EPA Actions to Protect the Public, supra note 25.

^{150.} See Risk Evaluations for Existing Chemicals Under TSCA, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-evaluations-existing-

approach opens the door more widely for industry stakeholders to argue that uses of known dangerous chemicals should nonetheless be permitted because of their alleged economic importance.

B. Criticisms of the April 2019 SNUR

Although the EPA's April 2019 SNUR addressed some of the shortcomings of its 2018 ruling on asbestos, critics point out that this final rule does not outright ban many obsolete uses subject to the SNUR and thus leaves the door open for these dangerous uses to reemerge in the U.S.¹⁵² Indeed, as critics have emphasized, the SNUR only requires notification to the EPA before these uses are introduced or reintroduced into commerce.¹⁵³ And under the promulgated rule, the EPA can altogether choose not to act when a manufacturer or importer provides the required notice.¹⁵⁴ Accordingly, the April 2019 SNUR provides no certainty as to whether the EPA will restrict any of these formerly banned uses. In fact, the Trump EPA's track record of seemingly ignoring scientific evidence about potentially serious health risks bolsters the risk that at least *some* such uses could reappear.¹⁵⁵

Another criticism of the April 2019 SNUR is that it fails to cover discontinued uses of asbestos in the EPA's ongoing risk evaluation.¹⁵⁶ The fact that the SNUR does not require the Agency to evaluate the risks of obsolete products creates an opportunity for corporations to exploit this gap and seek to reintroduce those uses. Now, any asbestos use that is not found

See Gerry, supra note 63 (noting the EPA has spent 10 years and millions of dollars on asbestos research); This analytical burden proved to be fatal in 1991 when the Fifth Circuit Court of Appeals ruled against the Agency in its attempt to regulate asbestos. See Corrosion Proof Fitting, 947 F.2d at 1226 (holding the EPA failed to find the "least burdensome" restriction on the industry because it did not consider every conceivable way to regulate the mineral).

^{152.} Pasheilich, supra note 5.

^{153.} *Id.*; The EPA states that under the final rule the, "EPA is focused on protecting the public from exposure to asbestos, and as such persons may not undertake any of these activities; they are required to notify EPA at east 90 days before commencing any manufacturing (including importing) or processing of asbestos (including as part of an article) for significant new use may not commence until EPA has conducted a review of the notice, made an appropriate determination on the notice, and taken such actions as are required in association with that determination." Restrictions on Discontinued Uses of Asbestos; Significant New Use Rule, 84 Fed. Reg. 17345, 17346 (pre-publication notice April 17, 2019) (to be codified at 40 C.F.R. pt. 9 and pt. 721)., https://www.epa.gov/sites/production/files/2019-04/documents/prepubcopy_9991-33_19t-0042_fr_document_2019-04-17.pdf.

^{154.} Ten Ways EPA's Significant New Use Rule for Asbestos Fails to Protect the Public from Asbestos, ASBESTOS DISEASE AWARENESS ORG.: BLOG, EDUC., FED., LEGISLATION (Apr. 17, 2019), https://www.asbestosdiseaseawareness.org/newsroom/blogs/8-ways-epas-significant-new-use-rule-for-asbestos-fails-to-protect-the-public-from-asbestos.

^{155.} Earthjustice et. al, Comment Letter on Premanufacture Notices Identified in Certain New Chemicals: Receipt and Status Information for July 2019 (Oct. 7, 2019), https://beta.regulations.gov/comment/EPA-HQ-OPPT-2019-0075-0013.

^{156.} ASBESTOS DISEASE AWARENESS ORG., *supra* note 154.

by the current EPA to pose an "unreasonable risk" may be brought into the market soon after a manufacturer provides notice.

The April 2019 SNUR likewise does not adequately address the treatment of imported asbestos-containing products¹⁵⁷ Since these substances and products are not within the scope of the SNUR, importers can continue to bring them into the U.S. unrestricted.¹⁵⁸ For example, asbestos-containing products such as asbestos cement and woven fabric are currently imported into the U.S.; this regulatory loophole may allow these products and more to be exempt from a possible ban.¹⁵⁹ The SNUR also does not address other forms of asbestos besides the six recognized by the Asbestos Hazard Emergency Response Act (AHERA) of 1986 that are hazardous to human health.¹⁶⁰

C. The EPA's Recent Refusal to Ban Chlorpyrifos

The Trump EPA has similarly refused to ban uses of the chemical chlorpyrifos despite clear evidence that the pesticide causes long term damage to children's brains.¹⁶¹ As described above, regulatory efforts to remove chlorpyrifos from the market have been ongoing for over a decade.¹⁶² These efforts had nearly culminated in success in 2016 when the Obama EPA acknowledged the risks of the pesticide and proposed an outright ban.¹⁶³

However, on March 29, 2017, President Trump's appointed EPA Administrator, Scott Pruitt, abruptly reversed the Agency's position on chlorpyrifos.¹⁶⁴ Under Pruitt, the EPA proposed a rule stating that scientific research would not be accepted unless the raw data behind it was made public.¹⁶⁵ However, many scientists have noted that studies measuring human exposure to chlorpyrifos and other toxic chemicals often rely on confidential health information, and that the proposed rule restricted the Agency's ability to regulate such chemicals.¹⁶⁶

162. See discussion infra Part I, Section D.1 (discussing the history of chlorpyrifos regulation).

163. See McGarity & Wagner, supra note 11, at 1738 (describing the actions of the EPA under the Obama administration).

164. Beitsch, *supra* note 161; Valerie Volcovici, *Trump EPA Allows Use of Controversial Pesticide*, REUTERS (July 18, 2019), https://www.reuters.com/article/usa-epa-pesticide/trump-epa-allows-use-of-controversial-pesticide-idUSL2N24J1SO.

165. Friedman, supra note 13.

166. Id.

^{157.} Id.

^{158.} Id.

^{159.} Id.

^{160.} *Id*.

^{161.} See Rebecca Beitsch, Six States Sue EPA Over Pesticide Tied to Brain Damage, HILL (Aug. 7, 2019), https://thehill.com/policy/energy-environment/456560-epa-sued-over-decision-to-allow-use-of-pesticide-tied-to-brain (stating that several states have sued EPA over their lack of action to ban chlorpyrifos) ("The EPA is egregiously sacrificing our children's health by refusing to make a determination on this dangerous pesticide.").

More recently, the EPA has been named a defendant in several lawsuits because of subsequently-appointed EPA Administrator, Andrew Wheeler's rejection of a petition to revoke all tolerances for chlorpyrifos.¹⁶⁷ In October 2019, the League of United Latin American Citizens (LULAC) and several other environmental and civil rights activist groups sued the EPA with regard to these issues.¹⁶⁸ New York, Maryland, Vermont, Washington, California, Hawaii, Massachusetts, and the District of Columbia filed a separate lawsuit against the EPA. The Ninth Circuit of Appeals ultimately consolidated both cases.¹⁶⁹ The Petitioners asserted, without an affirmative finding of safety, the EPA's final order to leave chlorpyrifos tolerances unchanged violates the FFDCA and must be set aside.¹⁷⁰

Frustrated by the EPA's inactions, several state governments have recently enacted or proposed their own laws or regulations to ban chlorpyrifos use within their borders.¹⁷¹ In 2018, Hawaii became the first state to enact a prohibition against chlorpyrifos, though it will not take effect until 2022.¹⁷² California regulators have also announced plans to ban the sale of chlorpyrifos by 2020.¹⁷³ Corteva AgriScience, formerly DowDuPont, agreed that sales of chlorpyrifos in California would end by February 6, 2020, and that state agricultural growers would not be allowed to possess or use the pesticide after December 31, 2020.¹⁷⁴ New York lawmakers have recently approved a plan to ban the pesticide by 2021.¹⁷⁵ Several states such as Oregon, Connecticut, and New Jersey have also proposed bills to take chlorpyrifos off the market.¹⁷⁶

^{167.} Volcovici, *supra* note 164 (noting the Ninth Circuit Court of Appeals ruled that the EPA had to decide whether to reverse Pruitt's overturn of the ban on chlorpyrifos).

^{168.} See League of United Latin Am. Citizens, 940 F.3d at 1127 (ordering the consolidation of cases challenging the EPA's 2017 order denying a 2007 petition to revoke all tolerances for the pesticide chlorpyrifos).

^{169.} *Id*.

^{170.} *Id*.

^{171.} Brady Dennis & Juliet Eilperin, *California to Ban Controversial Pesticide, Citing Effects on Child Brain Development*, WASH. POST (May 8, 2019), https://www.washingtonpost.com/climate-environment/2019/05/08/62alifornia-ban-controversial-pesticide-citing-effect-child-brain-development/.

^{172.} Id.; Dominique Mosbergen, Hawaii Becomes First State to Ban Widely-Used Pesticide Found to be Harmful to Kids, HUFFPOST (June 14, 2018), https://www.huffpost.com/entry/chlorpyrifos-ban-hawaii-pesticide n 5b21fd3ee4b09d7a3d7a2fd9.

^{173.} Dennis & Eilperin, supra note 171; Richard Gonzalez, California Bans Popular Pesticide Linked to Brain Damage in Children, NPR (Oct. 9, 2019), https://www.npr.org/2019/10/09/768795666/california-bans-popular-pesticide-linked-to-brain-damagein-children.

^{174.} Id.

^{175.} Dennis & Eilperin, supra note 171.

^{176.} Id.

III. THEORETICAL PERSPECTIVE ON FEDERAL TOXICS REGULATION

As demonstrated by the recent actions of the Trump administration, stronger safeguards are needed to protect toxic substance regulation from short-term special interests. As described above, the Trump EPA has already undone many Obama-era policies aimed at eliminating known toxic substances such as asbestos and chlorpyrifos, threatening to allow the reintroduction of some uses of such substances within the U.S.¹⁷⁷ Here, Part III examines the basic policy rationales behind the nation's current toxic substance regulatory regime and makes a case for erecting stronger safeguards to better protect the long-term welfare of the nation from the short-sighted rollbacks of toxics laws.

The EPA has a specific charge to protect human health and the environment. One way the Agency helps to do that is by ensuring the safety of chemicals used within the country.¹⁷⁸ Unfortunately, unless they are sufficiently constrained, EPA officials may sometimes succumb to pressure, focusing too heavily on short-term economic gain or private special interests in their regulation of toxic substances and not enough on health, the environment, or long-term costs. The following materials explain how the government's role in toxic substance regulation is inherently different from other types of executive duties and thus requires special protection. Certain principles of public choice theory and behavioral economics support introducing special restrictions on presidential power to protect toxic substance regulation.

A. Public Choice Theory

Examining the Trump administration's deregulatory stance on toxic substances through the lens of public choice theory provides additional insight into its motivations and into potential ways of addressing deficiencies in the existing federal regulatory structure. Public choice theory seeks to increase humans' understanding of the behavior of public officials and government actors in the political arena.¹⁷⁹ Public choice analysis adopts a

^{177.} See discussion *infra* Part II, Section C (explaining EPA's reversal of the ban and its effect on the potential for hazardous product reintroduction into the U.S. market); Friedman, *supra* note 13; Volcovici, *supra* note 164.

^{178.} Returning EPA to Its Core Mission, U.S. ENVTL. PROT. AGENCY, https://www.epa.gov/home/returning-epa-its-core-mission (last visited Sept. 6, 2020); See also Laurie Kazan-Allen, Asbestos Intransigence, INT'L BAN ASBESTOS SECRETARIAT (Aug. 6, 2018), http://ibasecretariat.org/lka-asbestos-intransigence.php (noting that the U.S. chlorine industry releases 300 plus tons of solid asbestos waste annually).

^{179.} See Michael C. Blumm, Public Choice Theory and The Public Lands: Why "Multiple Use" Failed, 18 HARV. ENVTL. L. REV. 405, 417 (1994) (noting most public choice theory has focused on the legislatures while this article examines land management agencies).

more critical view of democratic policymaking; generally assuming that government actors tend to act in their own rational self-interest rather than to seek to understand and loyally pursue the predominant interests of their constituents.¹⁸⁰ Public choice theory is arguably useful in the context of toxics regulation because it provides an accurate description of certain challenges affecting current policymaking in this important policy area. Section III, A applies basic public choice theory concepts to highlight some possible explanations for the Trump EPA's aggressive deregulation of toxic substances.

1. Concentrated Private Interests

Public choice theory's literature relating to special interests provides a useful perspective on the challenges facing toxic substance regulation. This literature describes in detail how a relatively small number of private stakeholders can be motivated and empowered to exert undue influence on legislative and regulatory processes.¹⁸¹

Some types of legislation create benefits that are heavily concentrated on a few private stakeholders, while spreading the costs of such legislation thinly across the citizenry.¹⁸² This contrast between concentrated benefits and diffused costs can create an unequal dynamic within the political sphere. Concentrated beneficiaries have potentially a great deal to gain and thus are more likely and able to organize to lobby or expend resources to ensure the passage or failure of legislation in their favor.¹⁸³ Noted public choice economist James Gwartney describes this special interest effect as follows:

There will be a strong tendency for politicians to support positions favored by well-organized, easily identifiable special interest groups. When the cost of special interest legislation is spread widely among the voting populace, most non-special interest voters will largely ignore the issue. ... In contrast, special interest voters...will let candidates (and legislators) know how strongly they feel about the issue. ... Given the intensity of special interest voters and the apathy of other voters, politicians will be led as if by an "invisible hand" to promote the positions of special interest.¹⁸⁴

^{180.} William Dubinsky, *Law and Public Choice: A Critical Introduction*, 90 MICH. L. REV. 1152, 1513 (1992).

^{181.} Todd R. Overman, Shame on You: Campaign Finance Reform through Social Norms, 55 VAND. L. REV. 1243, 1250 (2002).

^{182.} Alicia Constant, *A Matter of Incentives: Public Choice and the Great Fiction*, INDEPENDENT (Sept. 23, 2010), https://www.independent.org/students/essay/essay.asp?id=2891.

^{183.} Id.

^{184.} JAMES GWARTNEY, PRIVATE PROPERTY FREEDOM AND THE WEST 39-40 (1985).

In contrast, the broader citizenry that bears most of the costs of such legislation faces entirely different incentives.

Generally, even when the aggregated costs of enacting the legislation at issue are comparatively high, they are spread so thinly across the population that they are hardly felt by most individuals.¹⁸⁵ As a result, the cost bearers of the new legislation have little incentive to organize and actively oppose it.¹⁸⁶ Most citizens residing in this camp are rationally ignorant of the entire process.¹⁸⁷ For obvious reasons, this dynamic tends to favor the concentrated interests, who tend to be more successful in influencing government decisions.

2. Political Rent-Seeking and Federal Toxic Substances Regulation

There is significant evidence suggesting that private stakeholders with concentrated interests have sought to influence the regulation of toxic substances like asbestos and chlorpyrifos in the U.S. through various political rent-seeking strategies. Rent-seeking behavior refers to private stakeholders' actions aimed at increasing wealth, not through productive means, but through exerting influence on government officials to redistribute wealth to those stakeholders.¹⁸⁸ Rent-seeking leads to the disbursement of gains and losses through political competition but generally creates no societal value.¹⁸⁹ Instead, it is a means for private parties to exploit positions of power in their favor.¹⁹⁰ The Trump administration's deregulation of environmental and health and safety protections is arguably an example of such political rent-seeking.

Over 300 tons of asbestos waste are dumped into U.S. landfills each year, and the primary parties responsible for this disposal are large corporations such as Occidental Chemical Corporation (Occidental), Dow Chemical (Dow), and Olin Corporation (Olin).¹⁹¹ Olin (which purchased all of Dow's chlor-alkali and vinyl plants worldwide in 2015) and Occidental are two of the largest chlorine producers in the Americas, and both utilize asbestos diaphragm technology for the majority of their operations.¹⁹² About 75% of Occidental's chlorine is produced using asbestos technology. Combined,

^{185.} Constant, supra note 182.

^{186.} Id.

^{187.} Id.

^{188.} Blumm, supra note 179, at 416-17.

^{189.} Andrew P. Morriss, *Real People, Real Resources, And Real Choices: The Case for Market Valuation of Water*, 38 TEX. TECH L. REV. 973, 993 (2006).

Larry E. Ribstein, Corporate Political Speech, 49 WASH. & LEE L. REV. 109, 152–53 (1992).
 Kazan-Allen, supra note 178.

^{192.} Id.

Occidental and Olin own approximately 83% of asbestos diaphragm chlorine capacity in the Americas.¹⁹³ Incidents of asbestos pollution by three Occidental plants located in Texas and Louisiana and one facility owned by Westlake Chemical in Louisiana are well-documented.¹⁹⁴

Occidental and Olin are members of the American Chemistry Council (ACC), a trade association that represents the interests of American chemical industries.¹⁹⁵ In 2017, EPA personnel met with representatives of chlorine producers, including Occidental, Olin, and the ACC, on several occasions to discuss EPA regulations regarding asbestos.¹⁹⁶ Nancy B. Beck, who was an executive for the ACC from 2012 to 2017, was appointed as Deputy Assistant Administrator of the EPA's Office of Chemical Safety and Pollution Prevention in May 2017.¹⁹⁷ Dr. Beck's appointment to the EPA most likely facilitated access between the chemical industry and the EPA's decision-makers regarding the regulation of asbestos in the U.S. market.¹⁹⁸

In the case of chlorpyrifos and Corteva AgriScience, circumstantial evidence from the period leading up to the EPA's decision to continue to allow chlorpyrifos use is highly suggestive. Dow Chemical donated \$1 million to help fund President Trump's inaugural activities, and its CEO and chairman, Andrew Liveris, was a key advisor to the Trump administration.¹⁹⁹ Dow had also spent over "\$13.6 million on lobbying in 2016 and spent over \$5.2 million in the first quarter of 2017" alone; petitioning the EPA, White House, and both chambers of Congress for numerous policies, including loosened regulations on chlorpyrifos.²⁰⁰ In August 2017, then EPA Administrator Scott Pruitt met with Dow DuPont on dozens of occasions prior to the Agency's 2016 decision to revoke the proposed ban on chlorpyrifos.²⁰¹ Pruitt's chief of staff Ryan Jackson finally said in an email that he had "scare[d]" other staff members into going along with the decision

^{193.} Id.

^{194.} Id.

^{195.} Id.

^{196.} Id.

^{197.} Eric Lipton, Why Has the E.P.A. Shifted on Toxic Chemicals? An Industry Insider Helps Call the Shots, N.Y. TIMES (Oct. 21, 2017), https://www.nytimes.com/2017/10/21/us/trump-epa-chemicals-regulations.html.

^{198.} Id.

^{199.} See How Dow Chemical Influenced the EPA to Ignore the Scientific Evidence on Chlorpyrifos, UNION OF CONCERNED SCIENTISTS, (Oct. 11, 2017), https://www.ucsusa.org/ignoring-scientific-evidence-dangerous-pesticide-chlorpyrifos (discussing Dow Chemical's involvement in the EPA's decision about chlorpyrifos).

^{200.} Id.

^{201.} Michael Biesecker, Associated Press, Scott Pruitt, Trump's EPA Chief Met With Dow Chemical Exec Before Rolling Back a Ban on Pesticides, BUS. INSIDER (Jun. 28, 2017), https://www.businessinsider.com/scott-pruitt-trumps-epa-chief-met-with-dow-chemical-exec-beforerolling-back-a-ban-on-pesticides-2017-6; See also Associated Press, Correction: EPA-Dow Chemical Story, AP NEWS (July 3, 2017), https://apnews.com/article/2350d7be5e24469ab445089bf663cdcb (explaining a correction to the AP's previous story on Administrator Pruitt's meeting).

to revoke the ban, adding "they know where this is headed and they are documenting it well."²⁰²

3. Overly Broad Delegation of Authority

The difficulties that TSCA and its amendments have faced in preventing the erosion of federal toxic substance restrictions in the U.S. are more clearly visible when viewed through the lens of public choice theory. At first glance, TSCA and LCSA should seemingly be capable of ensuring adequate longterm protection against highly toxic substances such as asbestos. However, the language of these statutes and the regulations adopted pursuant to them delegates significant discretion to federal regulators, making it easier for regulators to succumb to the pressures of private stakeholders. Congress may have even preferred such vague regulatory language because of its capacity to balance the pressure from the public to increase chemical safety against countervailing pressures from powerful industry stakeholders.

Public choice theory emphasizes the notion that self-interested legislators are motivated primarily by their desires for reelection.²⁰³ As such, rationally self-interested legislators seek a balance between appeasing important private stakeholders and retaining support from voters with opposing views. In some instances, politicians may seek to pursue that balance by voting in favor of restrictive legislation favored by a majority of voters; yet building enough loose discretionary language into that legislation to empower federal agencies to appease the interests of private stakeholders with concentrated interests.²⁰⁴

It is at least conceivable that TSCA and LCSA are examples of legislation designed to give the impression of advancing broader public interests yet preserve sufficient discretion to allow regulators to do otherwise.²⁰⁵ The TSCA and LCSA were championed as tools to regulate harmful substances and thereby limit human exposure through food, air, cosmetics, drinking water or other means. However, the statutes are loosely drafted and give broad discretion to the EPA and create ways for the agency to justify under-enforcement. For instance, the TSCA forbids the EPA from requiring testing of a chemical without adequate data, yet the EPA cannot request such data from industry stakeholders unless there are reasons to

^{202.} Eric Lipton & Roni Caryn Rabin, E.P.A. Promise 'a New Day' for the Agriculture Industry, Documents Reveal, N.Y. TIMES (Aug. 18, 2017), https://www.nytimes.com/2017/08/18/us/politics/epa-agriculture-industry.html.

^{203.} Dubinsky, supra note 180, at 1513.

^{204.} Id.

^{205.} See Jim Rossi, Public Choice Theory and the Fragmented Web of the Contemporary Administrative State, 96 MICH. L. REV. 1746, 1760–62 (1998) (discussing the use of public choice tools, comparing the administrative agencies to the legislature).
believe chemical presents a risk to public health or environment—a difficult claim to make without data.²⁰⁶ This circular requirement structure has resulted in required testing for only 200 chemicals out of more than 80,000 currently in the TSCA inventory.²⁰⁷

The EPA's challenges in restricting chlorpyrifos can also be partly explained with similar public choice concepts. Like asbestos use restrictions, federally allowed pesticide tolerances are subject to registration and review by the EPA.²⁰⁸ The FFDCA and FIFRA purport to be public health and environmental protection statutes with seemingly high health standards and measures for public petitions. However, the statutes as drafted give the EPA broad authority to determine whether to revoke tolerance or keep them in place.

B. Myopic Policymaking

Myopic behavior also seems to plague much of environmental policymaking, including toxic substance regulation. Behavioral economics describes myopic behavior as behavior that "seek[s] short-term profit regardless of long-term consequences."²⁰⁹ Myopic behavior is commonly evident in the context of a publicly-traded company. Market pressures and the short-sighted demands of shareholders can sometimes cause decisionmakers and managers in such companies to over aggressively pursue short-term gains.²¹⁰ Many experts assert that shareholders with short-term horizons play a large role in causing public companies' myopic behavior.²¹¹ Short-term shareholders anticipate selling their shares in the near future and want to reap the highest possible price.²¹² When markets do not fully incorporate companies' long-term prospects into share prices, short-term shareholders may pressure firms to take actions that maximize stock value in the short-term, even when doing so is detrimental to a company's long-term value.²¹³

^{206.} Watnick, supra note 4, at 385.

^{207.} Id.

^{208.} See generally About Pesticide Tolerances, ENVTL. PROT. AGENCY (last updated Sept. 16, 2016), https://www.epa.gov/pesticide-tolerances/about-pesticide-tolerances (explaining EPA's process for establishing pesticide tolerances) (last visited Jan. 18, 2021).

^{209.} Lynne L. Dallas, *Short-Termism, the Financial Crisis, and Corporate Governance*, 37 J. CORP. L. 265, 267 (2012).

^{210.} See Lynne L. Dallas & Jordan M. Barry, Long-Term Shareholders and Time-Phased Voting, 40 DEL. J. CORP. L. 541, 546–47 (2016) (investigating Time-Phased Voting as a potential remedy for perceived corporate myopia).

^{211.} Id.

^{212.} Id.

^{213.} Id.

Myopic behavior is also arguably visible in the current EPA's emphasis on deregulating uses of chemical substances. Like managers of publicly traded corporations, elected officials generally focus much of their attention on satisfying the short-term interests of their constituents and industry supporters and less on policies that are likely to generate long-term positive outcomes. This type of behavior is common within the political arena in part because political leaders will often expire before the longer-term consequences of their short-sighted policy decisions take effect. The Trump EPA's efforts to soften regulations on toxic substances such as asbestos and chlorpyrifos may provide some limited economic benefits for the nation in the short-term. However, they may also generate longer-term health and environmental effects, and there is little incentive for federal officials currently in office to give adequate weight to those effects.

IV. PROTECTING FEDERAL TOXICS REGULATION AGAINST SPECIAL INTERESTS

In recent years, presidential campaign promises to regulate or deregulate certain industries have become powerful tools for bolstering support.²¹⁴ The executive branch's role in federal regulatory activities is an accepted and valuable element of American democracy. Accordingly, the president's ability to advance his or her political agenda by strengthening or revoking regulations issued by predecessors warrants preservation. On the other hand, it is prudent and in the best long-term interest of the nation to impose some constraints on a given president's ability to reshape federal policymaking.

For reasons articulated above, federal toxics regulation is one area of policy for which constraints on presidential power seem justified. And in the context of toxics regulation, advancing research tends to generally only prompt increased regulation over time as scientific knowledge about the harms of certain substances becomes clearer. Thus, greater constraints on presidential authority are arguably necessary to limit the rapid abandonment of toxics restrictions than to limit excessive increases in such restrictions. Part IV describes certain specific proposals aimed at addressing shortcomings of the TSCA to better guard against such erosion now and in the future.

^{214.} See U.S. Election 2020: Has Trump Delivered on His Promises?, BBC: US & CANADA (Oct. 15, 2020), https://www.bbc.com/news/world-us-canada-37982000 (noting President Trump's campaign promises and their relation to continued voter support).

A. Modeling U.S. Toxics Regulation After the EU's REACH

Placing greater burdens on chemical manufacturers to prove the safety of their products is one potential means of limiting EPA discretion and better fortifying toxics regulation against short-sighted rollbacks. A federal statute governing the registration of toxic substances modeled after the European Union's Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH) applies such an approach, and enacting similar laws in the U.S. could do much to address the vulnerabilities that currently afflict U.S. toxic substance regulation.²¹⁵

The EU enacted its primary chemical regulatory system, REACH, in 2006.²¹⁶ REACH regulates toxics by shifting much of the burden onto manufacturers to ensure chemical safety.²¹⁷ Unlike the TSCA, which acts under a presumption of chemical safety, REACH requires that chemical risks be controlled, eliminated, mitigated, or justified by their manufacturers.²¹⁸ Notably, REACH requires that chemical users submit minimum toxicity and eco-toxicity data for both new and existing substances.²¹⁹ Where there is insufficient toxicity data, firms must carry out new safety tests.²²⁰ Until a manufacturer submits adequate chemical testing and registration data, its products cannot enter the EU market.²²¹

Unlike the TSCA registration and authorization process, REACH imposes strict and concrete guidelines for manufacturers. Under the REACH process, officials identify chemicals of concern and set deadlines for authorization and proof of safety registration.²²² Applicants may only receive extensions of these deadlines by showing that the socio-economic benefits of the chemical outweigh the risk and that there is no suitable alternative.²²³ During the authorization stage, REACH places an affirmative burden on manufacturers to justify their chemical uses and prove safety. Applicants must show that the risk from the use of the substance is adequately controlled to receive authorization.²²⁴ Regulators may also set an effective deadline by

222. Id. at 11047 (providing example of how REACH's policies have stimulated safety data gathering from covered entities).

^{215.} John S. Applegate, Synthesizing TSCA and REACH: Practical Principles for Chemical Regulation Reform, 35 ECOLOGY L. Q. 721, 723 (2008).

^{216.} Id. at 723.

^{217.} Id. at 746.

^{218.} Id.

^{219.} Adam D.K. Abelkop et. al., *Regulating Industrial Chemicals: Lessons for U.S. Lawmakers From the European Union's REACH Program*, 42 ENVTL. L. REP. NEWS & ANALYSIS 11042, 11044 (2012).

^{220.} Id. at 11044.

^{221.} Id. at 11044.

^{223.} Id. at 11047-48, 11059 (explaining that REACH allows extended registration deadlines).

^{224.} See id. at 11059 (explaining the requirements to obtain authorization for a substance's specific use).

which certain chemicals of "very high concern" must be removed from the market pending authorization.²²⁵ Chemicals of "very high concern" must be progressively substituted with identified suitable alternatives.²²⁶

REACH likewise has provisions designed to increase both chemical awareness among downstream users and data transparency. Under REACH, manufacturers must communicate safety information up and down their supply chain.²²⁷ Regulators require manufacturers to disclose who their downstream users are, notify the users of the potential hazards associated with chemical use, and inform the users of chemical management techniques.²²⁸

In summary, there are three notable differences between REACH and TSCA that make REACH more effective at regulating toxic substances: (1) REACH implements a more precautionary approach to chemical regulation; (2) REACH places the burdens of data generation, risk assessment, and risk management on manufacturers; and (3) REACH ultimately imposes stricter requirements on manufacturers in their use of chemicals.

The Trump Administration's recent actions to roll back Obama-era policies demonstrate that current regulations do not provide the necessary protections to prevent such regressive policymaking. A stricter, more precautionary regulatory scheme governing toxics would weaken special interest group influence and disincentivize rent-seeking behavior. This regulatory scheme would make it more difficult for the executive to disregard existing toxics risk evaluations for the benefit of interested corporations. By placing the onus on corporations to prove chemical safety with conclusive research, the U.S. embraces a system that leads with the principle that human safety and health matter more than profits.

B. Developing Alternatives to Asbestos and Chlorpyrifos

Another potential way to help federal lawmakers overcome political influence from private industry stakeholders in the regulation in toxics would be to couple stricter regulations on toxic substances with financial incentive programs to spur the development of alternatives to those substances. For instance, the federal government could offer tax credits, grants, or other benefits for the uses of alternative substances in conjunction with new

^{225.} See id. at 11058–59 (explaining when a substance of very high concern may be phased out under REACH).

^{226.} Id. at 11058.

^{227.} Id. at 11047.

^{228.} *Id.* at 11047 (explaining reporting of end uses); *See generally* THOMAS BRINKMANN ET AL., BEST AVAILABLE TECHNIQUES (BAT) REFERENCE DOCUMENT FOR THE PRODUCTION OF CHLOR-ALKALI (2014), https://publications.jrc.ec.europa.eu/repository/bitstream/JRC91156/cak_bref_102014.pdf (presenting industry reported data on industrial emissions, potential hazards, and techniques used).

restrictions on longstanding uses of chemicals such as asbestos or chlorpyrifos. Such balancing could potentially help to temper resistance from private special interest groups against new restrictions on hazardous substances and thereby make it more politically feasible to enact them.

1. Promoting Integrated Pest Management Practices

Some farmers have successfully implemented Integrated Pest Management Practices (IPM) as an alternative to chlorpyrifos use, so the federal government could potentially couple a ban on chlorpyrifos with new programs designed to subsidize the adoption of IPM or similar alternatives. Every crop grown with chlorpyrifos in the U.S. grows organically in California without the chemical.^{229, 230} By adopting integrated or ecological pest management strategies, farmers can greatly reduce their reliance on harmful pesticides.²³¹

IPM is an ecosystem-based farming strategy focusing on long-term prevention of economically significant pest damage.²³² Growers are encouraged to employ pest management techniques such as habitat manipulation; biological control; cultural practices; adopting disease and insect resistant crop varieties; and mechanical or physical controls.²³³ Growers forego highly toxic pesticides in favor of less-toxic products, such as those approved for organic production.²³⁴ Chemical pesticides are a last resort option and only applied in ways to minimize human health risks.²³⁵

Ecological Pest Management (EPM) uses many IPM techniques but emphasizes building and maintaining healthy soil to maximize plant growth and encourage disease and pest resistance.²³⁶ Growers use a combination of techniques to maintain crop health such as: crop rotation; intercropping; legume and non-legume cover crops; application of organic soil amendments; zero or conservative tillage; and establishment of habitat for predators and pollinators.²³⁷

^{229.} Chlorpyrifos Alternatives in California Factsheet, PESTICIDE ACTION NETWORK N. AM. (June 2017), https://www.panna.org/sites/default/files/CPF-alternatives-2017-CA.pdf.

^{230.} Press Release, Cal. Envtl. Prot. Agency Dep't Pesticide Regul., Agreement Reached to End Sale of Chlorpyrifos in California by February 2020 (Oct. 9, 2020), https://www.cdpr.ca.gov/docs/pressrls/2019/100919.htm.

^{231.} Id.

^{232.} PESTICIDE ACTION NETWORK N. AM., supra note 229.

^{233.} Id.

^{234.} Id.; Organic Materials Review Institute (OMRI) lists all products and materials allowed for organic use. See OMRI Lists, ORGANIC MATERIALS REV. INST., https://www.omri.org/omri-lists (last visited Jan. 20, 2021).

^{235.} PESTICIDE ACTION NETWORK N. AM., supra note 229.

^{236.} Id.

^{237.} Id.

California growers have been particularly successful at employing IPM or EPM systems without the use of chlorpyrifos. Furthermore, EPM may generate significant long-term economic benefits.²³⁸ EPM may allow growers to achieve organic certification leading to substantial benefits through higher market premiums. California organic growers account for approximately 43% of organic products sold in the United States.²³⁹ From 2013 to 2014, California Certified Organic Farmers experienced a 6.4% increase in farmland, including almond and citrus acreage, two of the most chlorpyrifos dependent crops.²⁴⁰

Offering grants or rebates to farmers to reward and encourage their purchase of equipment or materials to implement IPM or EPM methods could help soften the economic blow to them from an outright chlorpyrifos ban. Such programs could also help to address some of the public choice theory-related obstacles described above that might otherwise continue to hinder the advancement of federal chlorpyrifos regulation.

2. Promoting Safer Technologies and Retrofitting Chlor-alkali Plants

Congress could similarly couple stricter bans on asbestos uses with tax credit or grant programs designed to subsidize new uses of more safety-conscious and environmentally-sound chlorine production methods. Today, businesses across the world are increasingly replacing legacy uses of asbestos with safer alternatives.²⁴¹ In the U.S., the chlor-alkali industry is the only active user of raw asbestos minerals in the country.²⁴² According to the EPA, 15 chlorine plants in the US that use asbestos technology in their operations remain.²⁴³ Some smaller plants have already retrofitted and converted their plants to use a membrane-cell process.²⁴⁴ Using the membrane-cell method is more environmentally friendly and safer to operate than using either mercury or asbestos to produce chlorine and sodium hydroxide.²⁴⁵

Additionally, membrane cells generally possess an increased tolerance to power fluctuations and can be more cost-efficient in regions with fluctuating energy prices. For example, a plant in Poland exhibited a 50% reduction in steam consumption and a 5% reduction in electricity consumption; a converted plant in Norway reduced electricity consumption

^{238.} Id.

^{239.} Id.

^{240.} *Id*.

^{241.} FLANAGAN, *supra* note 45, at 26–27.

^{242.} Id.

^{243.} OFF. CHEM. SAFETY & POLLUTION PREVENTION, ENVTL. PROT. AGENCY, EPA-740-R1-7018, PROBLEM FORMULATION OF THE RISK EVALUATION FOR ASBESTOS 25 (2018).

^{244.} See VALLETTE, supra note 48, at 95-100.

^{245.} See generally THOMAS BRINKMANN ET AL., supra note 228 (explaining environmental and safety benefits and disadvantages of the membrane-cell method, using reports from different plants).

of almost 15% and steam consumption of 65%.²⁴⁶ Of course, the costs and time needed to convert older, larger plants remain an obstacle to abandoning the use of asbestos in chlorine production. One estimate stated that it could take 1.5–2.5 years to convert a chlorine plant using traditional asbestos technology and can cost up to \$500–700 per metric ton of chlorine produced.²⁴⁷ Despite the expected considerable upfront cost, there are compelling reasons to convert to a membrane-cell plant. Such reasons are environmental, as well as occupational health and safety concerns; the reduced costs because of energy efficiency; and improved quality of sodium hydroxide produced.²⁴⁸ Converting the remaining chlorine plants would achieve great environmental benefits such as: the prevention of asbestos emissions and generation of asbestos waste; and a reduction of energy consumption. An asbestos-free process would also remove the occupational hazards involved with mining, transporting, storing, use, maintenance, and disposal of asbestos minerals.

The federal governments could potentially help to overcome private stakeholder opposition to stricter asbestos bans and externality problem associated with asbestos use by offering tax credits to support investments designed to remove asbestos uses from the chlorine production process. An externality problem is a market failure that results when a party does not internalize all of the cost of benefits of engaging in a given activity.²⁴⁹ Positive externality problems arguably deter current or potential asbestos users from replacing asbestos-using production methods with safer alternatives because such actions generate many benefits that are not fully internalized by parties taking them.²⁵⁰ One potential means of addressing this positive externality problem would be to enact policies or programs that help those who abandon asbestos uses internalize more of the societal benefits of their actions.²⁵¹

Federal policies and programs that have helped the renewable energy sector to grow in recent decades could potentially be used as templates to accelerate a complete national transition away from asbestos use. The

^{246.} Id. at 159-60.

^{247.} UNEP GLOBAL MERCURY PARTNERSHIP CHLOR-ALKALI AREA, CONVERSION FROM MERCURY TO ALTERNATIVE TECHNOLOGY IN THE CHLOR-ALKALI INDUSTRY 9 (2012), https://worldchlorine.org/wp-content/uploads/2015/08/Partnership-Document-on-the-Conversion-from-Mercury-to-Alternative-Technology-in-the-Chlor-Alkali-Industry.pdf.

^{248.} BRINKMANN ET AL., *supra* note 228, at 17.

^{249.} TROY A. RULE, SOLAR, WIND AND LAND: CONFLICTS IN RENEWABLE ENERGY DEVELOPMENT 2 (2014).

^{250.} See id. at 3 (discussing external benefits of landowner's and developer's decision making).

^{251.} See Mark R. Powell, The 1983-84 Suspensions of EDB Under FIFRA and the 1989 Asbestos Ban and Phaseout Rule under TSCA: Two Case Studies in EPA's Use of Science (AgEcon Search: Research in Agricultural and Applied Economics, Discussion Paper 97-06-REV, 1997), https://ageconsearch.umn.edu/record/10907.

renewable energy investment tax credit program (ITC) has been among of the most impactful federal policies for promoting certain types of renewable energy investment over the past decade.²⁵² Conceivably, Congress could enact a new type of ITC that instead awarded tax credits for qualifying investments in asbestos-replacing technologies and equipment within the chlor-alkali industry. Additionally, loan guarantee programs such as the American Recovery and Reinvestment Act's (ARRA) § 1705 provided federally guaranteed loans for qualified renewable energy developers, reducing lending risks and thereby encouraging private landers to finance solar projects.²⁵³ Federal loan programs, such as the programs enacted by ARRA, could similarly help chlor-alkali industry companies to secure the financing needed to transition fully away from asbestos use. Given the significant impact the chlor-alkali industry has on the U.S. economy, such funding could do much to preserve this important industry while also facilitating the important transition to clean and safe chemical process alternatives.

One additional potential means of accelerating a final and complete transition away from all asbestos use would be to increase federal support for private research focused on developing alternative chlor-alkali production processes that are cost-efficient and asbestos-free. Teams of engineers, scientists, and operators working to develop chemical processes that do not use asbestos or mercury, are lower cost, and leave smaller carbon footprints than currently used industry methods, already exist and are making headway.²⁵⁴ Greater federal grant support for the research and development of such asbestos-free technologies could further expedite the transition to a fully asbestos-free national chlor-alkali industry. Once that transition is complete and cost-effective asbestos alternatives are in place, industry stakeholders will be far less likely to pressure federal government officials in the future to loosen asbestos regulations.

^{252.} See Richard W. Caperton, Good Government Investments in Renewable Energy, CTR. AM.PROGRESS(Jan.10,2012),https://www.americanprogress.org/issues/green/reports/2012/01/10/10956/good-government-

investments-in-renewable-energy/ (calling ITC a "tremendous success").

^{253.} VARUN SIVARAM, AM. ENERGY INNOVATION COUNCIL, THE AMERICAN RECOVERY AND REINVESTMENT ACT AND THE RISE OF UTILITY-SCALE SOLAR PHOTOVOLTAICS: HOW U.S. PUBLIC POLICY DURING THE GREAT RECESSION LAUNCHED A DECADE-LONG SOLAR BOOM 2–10 (June 2020), http://americanenergyinnovation.org/wp-content/uploads/2020/06/The-Successful-Demonstration-of-Utility-Scale-PV.pdf.

^{254.} *See* CHEMETRY: WHY WE DO IT, http://chemetrycorp.com/why-we-do-it/ (last visited Jan. 21, 2021) (focusing on developing economically viable alternatives to chlorine gas that reduce energy consumption, reduce waste water generation, and avoid harmful chemicals such asbestos).

CONCLUSION

The weakening of federal restrictions on asbestos and chlorpyrifos in recent years showcase the potential vulnerabilities of the existing federal regulatory system for toxic substances. Fortunately, it is possible to better fortify this important regulatory structure to better withstand pressures from shortsighted special interests and thereby ensure the long-term safety and health of Americans. By embracing a more precautionary approach comparable to the EU's REACH program that is more data-driven and places larger burdens on private industry actors to prove the safety of the products, the U.S. could finally implement a regulatory system that is both administrable and effective. And offering tax credits and grant programs to help offset the costs to private businesses of transitioning to safer alternatives to substances such as asbestos and chlorpyrifos can make such regulatory changes more politically palatable and sustainable. By embracing these and other strategies aimed at better safeguarding federal toxics regulations against shortsighted special interest influence, Congress can ensure that Americans living today and well into the future are fully protected from highly hazardous substances.

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

Danielle Palermo

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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 497 (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 Batracochytrium dendrobatidis and B.* salamandrivorans in Amphibian Chytridiomycosis Using RNAScope in situ Hybridization, 6 FRONTIERS VETERINARY SCI., Sept. 12, 2019, at 2.

ALTHERR ET AL., *supra* note 2, at 2.
 Brown Univ..

^{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

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

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

^{12.} TheAmazing,AdaptableFrog,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.

^{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 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 ethytind 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.

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

- 30. Mazzoni et al., supra note 2, at 997.
- 31. Id. at 995.

^{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-worstchytrid-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).

^{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.

^{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

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.

^{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.

^{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 guarantines; 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. Farmraised 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 Cattleman 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.Ć. § 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 1), 359 F.Supp.2d 1058, 1063 (D. Mont. 2005); Ranchers Cattleman Action Legal Fund United Stockgrowers of America v. USDA, APHIS (*R*-CALF 11), 415 F.3d 1078, 1084 (9th Cir. 2005); Ranchers Cattleman Action Legal Fund United Stockgrowers of Am. v. USDA (*R*-CALF 111), 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 Spngiform 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 slaughter 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 risked 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 off 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 Powered 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

115. Notice of Inquiry for Injurious Species Listing for Amphibians with Chytrid Fungus, FISH & WILDLIFE SERV. 2,

^{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.

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

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^{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 interested 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 1 (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 warmblooded 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 dogfighting related activities.¹⁶⁴ The public may never gain the opinion that coldblooded 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 wavs: through the initiation of a petition to list a species or through an intraagency 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

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

^{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 finale rule on that species listing status).

^{174.} Id.

^{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/focusarea/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

192. Id.

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

203. Id.

^{189.} Id.

^{190.} See *What is CITES*?, CITES, http://cites.org/eng/disc/what.php (last visited Jan. 17, 2021). 191. Id.

^{193.} CITES, supra note 141.

^{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.

^{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—

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^{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' farmraised 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.

THE STAKES ARE OUT OF THIS WORLD: HOW TO FIX THE SPACE ACT OF 2015

Hunter Sutherland*

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I. INTRODUCTION

Traveling faster than five times the speed of sound, approximately two hundred million miles away from Earth, you will find an asteroid that has not changed since the solar system was formed.¹ Japan's Aerospace Exploration Agency (JAXA) launched Hayabusa-2, a sample return mission, equipped with two small robots to the dark and dry surface of Ryugu.² These robots, no bigger than a temporary spare tire, hop around the low-gravity, half-mile wide surface of the asteroid.³ Ryugu, and asteroids like it, not only hold great scientific value, but their minerals have great monetary value.⁴

The estimated value of Ryugu and four of the other most cost-effective asteroids for mining is \$164 billion.⁵ Other asteroids, albeit further away and less cost-effective to mine, are estimated to be worth more than \$100 trillion.⁶ Private companies, entrepreneurs, the United States, and other countries are preparing to land on and eventually mine resources from space.⁷ Neil DeGrasse Tyson believes that the first trillionaire in the world will be

2. Mike Wall, *Hop, Don't Roll: How the Tiny Japanese Rovers on Asteroid Ryugu Move*, SPACE.COM (Sept. 26, 2018), https://www.space.com/41941-hayabusa2-asteroid-rovers-hopping-tech.html.

Asteroid-Mining-Ventures-Will-Spawn-First-

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^{1.} See Katyanna Quach, Bouncing Robots Land on Asteroid 180M Miles Away Amid Mission to Fetch Sample for Earth, REGISTER (Sept. 21, 2018), https://www.theregister.co.uk/2018/09/21/jaxa_hayabusa2_ryugu_asteroid_landing/ (discussing the asteroid Ryugu's hypothesized unchanged state since the solar system's formation); see also Asteroid 162173 Ryugu (1993 JU3) Information, SKY LIVE, https://theskylive.com/ryugu-info (providing orbital parameters for the referenced asteroid) (last visited Dec. 7, 2020).

^{3.} *Id*.

^{4.} See Ian Webster, ASTERANK, http://www.asterank.com (showing chart approximating value, accessibility, and profits for 600,000 asteroids with data from world markets and scientific papers) (last visited Jan. 25, 2021).

^{5.} *Id.* (inferring from chart which provides each asteroid's estimated profits).

^{6.} *Id.* (showing Ryugu at the top of the chart, indicating that it is the most cost effective and profitable asteroid to mine, with estimated profits at \$30.08 billion).

^{7.} See Tiffany Terrell, Physicist Says Asteroid Mining Ventures Will Spawn First Trillionaire, GLOBE NEWSWIRE (Jan. 30, 2018), https://www.globenewswire.com/newsrelease/2018/01/30/1314279/0/en/Physicist-Says-

Trillionaire.html#:~:text=Astrophysicist%20Neil%20DeGrasse%20Tyson%20says,iron%2C%20nickel %2C%20and%20platinum

⁽stating space innovation is dominated by private companies like Elon Musk's SpaceX); See Anthony Cuthbertson, China to Launch Asteroid-Mining Robot, DIPLOMAT (Sept. 24, 2020), https://www.independent.co.uk/life-style/gadgets-and-tech/asteroid-mining-robot-china-origin-space-b572318.html (describing China's plans to mine resources from space).

someone who mines asteroids.⁸ It is no wonder that the stakes are, quite literally, out of this world.

The Commercial Space Launch Competitiveness Act of 2015 (Space Act)⁹ provides the beginning framework for mining but does not provide enough guidance for private companies and the international community for mining. The following argument addresses the deficiencies of current domestic asteroid mining laws. The United States has given one stick, the right to space resources obtained, out of a bundle of rights that it does not possess. ¹⁰ Further, the Space Act leaves out considerations of the environmental and economic impact of mining resources from asteroids.¹¹ New domestic laws or amendments to the Space Act of 2015 are needed in order to bridge this gap.

The Artemis Accords represent the next iteration of the United States's plan for space exploration and utilization—namely returning to the moon to stay.¹² On October 13, 2020, NASA released the full Accords that highlight the ten principles they hope to "[govern] the civil exploration and use of outer space."¹³ NASA is developing the Accords through a series of bilateral agreements with international partners.¹⁴ The United States established the Accords with like-minded nations, such as Australia, Canada, Japan, Italy, Japan, the United Kingdom, and the United Arab Emirates, but notably not Russia.¹⁵ The Accords show that the United States plans to reaffirm parts of existing international space law, while pushing new interpretations forward in the areas of resource extraction and the development of "safety zones."¹⁶

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^{8.} *Id*.

^{9.} U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114-90, 129 Stat. 704, 704 (2015) (codified at 51 U.S.C. § 10101).

^{10.} See Reed E. Loder, Asteroid Mining: Ecological Jurisprudence Beyond Earth, 36 VA. ENV'T L. J. 275, 277, 287 (2018) (explaining how the terms of the OST prohibit granting or owning property rights in space).

^{11.} See discussion *infra* Sections III.C.4, III.C.5 (arguing the Space Act was intended to allow wealthy, private companies to exploit asteroid resources).

^{12.} See Press Release, Sean Potter & Cheryl Warner, Nat'l Aeronautics & Space Admin., NASA, International Partners Advance Cooperation with First Signings of Artemis Accords (Oct. 13, 2020), https://www.nasa.gov/press-release/nasa-international-partners-advance-cooperation-with-first-signingsof-artemis-accords (last updated Jan. 4, 2021) [hereinafter NASA Press Release] (planning to send "the first woman and next man" to the moon in 2024).

^{13.} NAT'L AERONAUTICS & SPACE ADMIN., THE ARTEMIS ACCORDS § 1, at 1 (Oct. 13, 2020), https://www.nasa.gov/specials/artemis-accords/img/Artemis-Accords-signed-13Oct2020.pdf.; *The Artemis Accords, Principles for a Safe, Peaceful, and Prosperous Future*, NAT'L AERONAUTICS & SPACE ADMIN., https://www.nasa.gov/specials/artemis-accords/index.html (last visited Jan. 26, 2021) [hereinafter *Artemis Principles*].

^{14.} NASA Press Release, *supra* note 12.; NAT'L AERONAUTICS AND SPACE ADMIN., *supra* note 13, at 2.

^{15.} NASA Press Release, *supra* note 12; NAT'L AERONAUTICS AND SPACE ADMIN., *supra* note 13, at 8–18.

^{16.} NAT'L AERONAUTICS & SPACE ADMIN., supra note 13, § 11, at 5–6.

The Accords have an opportunity to mend the inconsistencies between the Space Act and the Outer Space Treaty.

This note will outline the Outer Space Treaty, the Space Act, and the Artemis Accords and will highlight their inconsistencies. Further, it will provide solutions to bridge the gap between the Act, and environmental and economic concerns. Part II (A) discusses the moon, asteroids, and why their resources are so sought after. Part II (B) discusses the various treaties and domestic laws that set out the fundamental guidelines for asteroid mining. Part II (C) addresses the environmental concerns of asteroid mining and the potential benefits of asteroid mining on the Earth. Part III begins the analysis of the Artemis Accords, Space Act, and the Outer Space Treaty, starting with the history and relevant provision of both pieces of law, and concludes with the flaws of the Space Act in Part III (C). Finally, Part IV offers two solutions to reconcile the United States's interest in promoting commercial development of space and its obligations under international law.

II. BACKGROUND

A. Composition of the Moon and Other Asteroids

Asteroids are mainly either Type C (carbonaceous), Type S (stony), or Type M (metal).¹⁷ Each of these types are rich in respective minerals and resources. Type C consist of stone and clay silicate rocks.¹⁸ Type S are made of mainly nickel-iron and silicate.¹⁹ Type M contain metals and are reddish in color.²⁰

The resources derived from asteroids can be used to further human exploration into the solar system.²¹ Water collected from a Type C rock could sustain humans, animals, and plants living or traveling in space.²² Rocket fuel can be produced from asteroid water by separating the hydrogen and oxygen from the water molecules.²³ Water could be used as a shield from radiation on space crafts.²⁴ The biggest benefit from mining asteroids would be the profits from mining Type S and M asteroids, as they contain iron, gold, and

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^{17.} Stephen Shaw, *Asteroid Mining – Know Everything About It*, ASTRONOMY SOURCE (Aug. 21, 2012), https://astronomysource.com/2012/08/21/asteroid-mining-2/.

Victor Kripop, What are Asteroids Made Of, WORLD ATLAS (Mar. 15, 2019), https://www.worldatlas.com/articles/what-are-asteroids-made-of.html.
 19. Id.

^{20.} Id.; Shaw, supra note 17.

^{21.} JOHN S. LEWIS, ASTEROID MINING 101: WEALTH FOR THE NEW SPACE ECONOMY 8 (2015).

^{22.} Id. at 148-49.

^{23.} Id. at 151.

^{24.} Id. at 144, 149.
platinum.²⁵ Extraction of minerals on Earth requires invasive drilling, but on asteroids, similar minerals are close to the surface because of the difference in gravity.²⁶

The moon has many valuable resources available on its surface that would aid extended human residence. Lunar rocks are composed of around 40% oxygen, and with significant development could be used in an oxygenproducing facility.²⁷ Solar wind has deposited hydrogen, helium, and other elements in the lunar soil.²⁸ One of most important resources the moon offers is *water ice.*²⁹ The ice could serve multiple purposes, as drinking water, breathable oxygen, and even rocket propellent.³⁰ The lunar poles also offer areas of both continuous darkness and sunlight. The sunlight can be harnessed to provide heat and electric power.³¹

B. Treaties and Domestic Laws

1. The Outer Space Treaty of 1967

The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, otherwise known as the Outer Space Treaty (OST), is the foundation of space law.³² The OST sets forth that all of humankind's activities in space are to be "for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind."³³ While the OST does not explicitly define "celestial bodies," it refers to asteroids as such.³⁴ Legal commentators are split on whether asteroids should be included as celestial bodies, or if they should be

^{25.} See Denise Chow, Mission to Rare Metal Asteroid Could Spark Space Mining Boom, NBC NEWS (July 10, 2019), https://www.nbcnews.com/mach/science/mission-rare-metal-asteroid-could-spark-space-mining-boom-ncna1027971 (discussing potential value and composition of metallic asteroid under NASA's exploration). But cf. LEWIS, supra note 21, at 154–55, 160–61 (explaining why extracting certain elements from asteroids is only viable as a byproduct activity).

^{26.} LEWIS, *supra* note 21, at 14–16.

^{27.} James D. Burke, *Lunar Resources*, ENCYC. BRITANNICA, https://www.brittanica.com/place/Moon/Lunar-resources (last updated Apr. 8, 2020).

^{28.} Id.

^{29.} Id.

^{30.} *Id.*

^{31.} *Id.*

^{32.} Christopher D. Johnson, *The Outer Space Treaty*, OXFORD RES. ENCYCLOPEDIAS, PLANETARY SCI. (Jan. 24, 2018), https://oxfordre.com/planetaryscience/view/10.1093/acrefore/9780190647926.001.0001/acrefore-

⁹⁷⁸⁰¹⁹⁰⁶⁴⁷⁹²⁶⁻e-43?rskey=FOV6h8&result=1; G.A. Res. 2222 (XXI), annex, Outer Space Treaty, (Dec. 19, 1966) [hereinafter OST].

^{33.} OST, supra note 32, art I.

^{34.} See id. (discussing "the moon and other celestial bodies. . ..").

reclassified as chattels because they are moveable property.³⁵ Classifying asteroids as chattels would simplify property law in outer space.³⁶ These commentators suggest that while planets and moons cannot be moved, asteroids can be captured, slowed down, and relocated—making asteroids worthy of the chattel classification.³⁷

2. The Moon Agreement of 1984

The Moon Agreement gives jurisdiction over celestial bodies to the international community.³⁸ In many ways, it is a failed treaty because the agreement has not been ratified by any state that launches crewed space exploration missions.³⁹ While this treaty is not binding on the United States, it may be useful for framing future legislation, as Article 11, Paragraph 3 provides a barrier to the goal of asteroid mining companies.⁴⁰ It states:

Neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person. The placement of personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the moon, including structures connected with its surface or subsurface, shall not create a right of ownership over the surface or the subsurface of the moon or any areas thereof.⁴¹

In Article 11, Paragraph 6, the agreement requires that States shall inform the United Nations, the public, and the international scientific community of any natural resource discoveries.⁴² Paragraph 7(d) commands that State Parties share the benefits derived from those resources equitably with developing nations and those who have contributed directly or indirectly to the

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^{35.} See, e.g., Andrew Tingkang, These Aren't the Asteroids You Are Looking for: Classifying Asteroids in Space as Chattels, Not Land, 35 SEATTLE U. L. REV. 559, 580 (2012) (providing key reasons to deviate from existing classifications of asteroids).

^{36.} Id. at 563.

^{37.} Id. at 580.

^{38.} G.A. Res. 34/68, annex, arts.1–2 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Dec. 5, 1979) [hereinafter Moon Agreement].

^{39.} Michael Listner, *The Moon Treaty: Failed International Law or Waiting in the Shadows?*, SPACE REV. (Oct. 24, 2011), https://www.thespacereview.com/article/1954/1.

^{40.} Matthew Feinman, *Mining the Final Frontier: Keeping Earth's Asteroid Mining Ventures from Becoming the Next Gold Rush*, 14 PITT. J. TECH. L. & POL'Y 202, 217–18 (2014). *See* Moon Agreement, *supra* note 38, art. 11, ¶ 3 (establishing that equipment placement does not create an ownership).

^{41.} Moon Agreement, *supra* note 38, art. 11, ¶ 3.

^{42.} Id. art. 11, ¶ 6.

exploration of the moon.⁴³ The Moon Agreement is not binding on nonparties.⁴⁴ The United States and other spacefaring nations are not party to the Moon Agreement, thus, not subjecting private mining companies to the restrictions contained within.⁴⁵

3. The Space Act of 2015

The U.S. Commercial Space Launch Competitiveness Act (Space Act) of 2015 attempts to open the door for commercial recovery of space resources by private companies.⁴⁶ The Space Act states:

A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.⁴⁷

The Act goes on to state that the United States "does not... assert sovereignty or sovereign or exclusive rights or jurisdiction over, or the ownership of, any celestial body."⁴⁸ As an initial matter, some scholars contend that the Space Act is inconsistent with the requirements of the OST, discussed *infra* Part III.⁴⁹

4. Space Policy Directive-1: Reinvigorating America's Human Space Exploration Program

The crew of Apollo 17 were the last to leave footsteps on the moon in December 1972.⁵⁰ After 45 years, the United States announced their plans to

^{43.} Id. art. 11, ¶ 7(d).

^{44.} Feinman, *supra* note 40, at 217–18.

^{45.} Listner, supra note 39.

^{46.} *See* U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114–90, 129 Stat. 704, 721 (2015) (codified at 51 U.S.C. § 51302) (outlining commercial-government relationship).

^{47. § 51303, 129} Stat. at 721.

^{48. § 403, 129} Stat. at 722.

^{49.} See Loder, supra note 10, at 287 ("Although the Space Act declares several times that its provisions are in accordance with international law and obligations, saying this, even multiple times, does not make it so. A United States grant of exclusive property rights in extracted space resources (even if not territory itself) is incompatible with the commitments to free access and common benefit that are central to the OST.").

^{50.} Elizabeth Howell, *Apollo 17: The Last Men on the Moon*, SPACE (Oct. 03, 2018), https://www.space.com/17287-apollo-17-last-moon-landing.html.

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return to the moon in Space Policy Directive-1.⁵¹ Under this Directive, the NASA Administrator is to "[1]ead an innovative and sustainable program of exploration with commercial and international partners" to return humans "to

5. Executive Order 13914

the Moon for long-term exploration and utilization"52

Executive Order 13914 builds off the Space Act of 2015 and Space Policy Directive-1.⁵³ The President declared that "Americans should have the right to engage in commercial exploration, recovery, and use of resources in outer space, consistent with applicable law."⁵⁴ Further, President Trump asserted that the United States does not view outer space as a global commons and will encourage international support for the public and private recovery and use of resources in space.⁵⁵ The Order highlights the uncertainty created by the Moon Agreement and states that the Moon Agreement is not an effective or necessary instrument to guide nations in the recovery and use of resources in space.⁵⁶ Finally, the Order instructs the Secretary of State to negotiate joint statements and bilateral and multilateral arrangements with foreign states for safe and sustainable operations of public and private recovery of space resources.⁵⁷

6. The Artemis Accords

The United States has announced a new program to land the first woman and the next man on the moon by 2024.⁵⁸ This endeavor carries the name *Artemis*, the twin sister of Apollo (the name of the first lunar program) and the goddess of the moon in Greek mythology.⁵⁹ NASA released the full Artemis Accords, announcing partnerships with seven nations.⁶⁰ The

^{51.} See Memorandum on Reinvigorating America's Human Space Exploration Program, 2017 DAILY COMP. PRES. DOC. 901 (Dec. 11, 2017) ("[T]he United States will lead the return of humans to the Moon...").

^{52.} Id.

^{53.} Exec. Order No. 13914, 85 Fed. Reg. 20381 (Apr. 6, 2020).

^{54.} Id. sec. 1.

^{55.} Id.

^{56.} Id. secs. 1-2.

^{57.} Id. sec. 3.

^{58.} NAT'L AERONAUTICS & SPACE ADMIN., *supra* note 13, at 1.

^{59.} See Artemis Principles, supra note 13 (describing the Artemis program as the "Twin Sister of Apollo"); Mark Cartwright, Artemis, ANCIENT HIST. ENCYC. (July 24, 2019), https://www.ancient.eu/artemis/.

^{60.} Dennis O'Brien, *The Artemis Accords: Repeating the Mistakes of the Age of Exploration*, SPACE REV. (June 29, 2020), https://www.thespacereview.com/article/3975/1; NAT'L AERONAUTICS & SPACE ADMIN., *supra* note 13, 8–15 (containing agreement and signatures of partnering nations: United Kingdom, United Arab Emirates, Grand Duchy of Luxembourg, Japan, Italy, Canada, and Australia).

Accords highlight the ten principles of what NASA and their partners hope to guide "civil space activities conducted by the civil space agencies of each Signatory."⁶¹ These principles are: (1) Peaceful Purposes; (2) Transparency; (3) Interoperability; (4) Emergency Assistance; (5) Registration of Space Objects; (6) Release of Scientific Data; (7) Protecting Heritage; (8) Space Resources; (9) Deconfliction of Activities; and (10) Orbital Debris and Spacecraft Disposal.⁶² This paper is most interested in the principles of Peaceful Purposes, Release of Scientific Data, Space Resources, and Deconfliction of Activities.

Under the principle of Peaceful Purposes, the Artemis Accords state all activities conducted will be peaceful, per the requirements of the OST.⁶³ Under the principle of Releasing of Scientific Data, all Artemis Accords partners will agree to release their scientific data publicly to ensure that the entire world can benefit from new exploration and discovery.⁶⁴

The Artemis Accords explicitly state that "extraction and utilization of space resources . . . should be executed in a manner that complies with the Outer Space Treaty."⁶⁵ In particular, the Accords state that the extraction of space resources do not inherently constitute national appropriation under Article II of the OST.⁶⁶ The articles of the OST that the Accords implicitly reference cover the non-appropriation of the moon by national parties, the international responsibility for national activities in outer space, and the agreement to inform the UN and the world of the nature, conduct, location, and results of such activities.⁶⁷

Finally, under the principle of Deconfliction of Activities, the Accords state NASA and partner nations will provide public information regarding the location and general nature of operations through the development of "safety zones" to prevent harmful interference.⁶⁸ Mike Gold, the acting associate administrator for international and interagency relations for NASA, defined these zones as areas where there would be notification and coordination between partner nations to protect such zones.⁶⁹

^{61.} NAT'L AERONAUTICS & SPACE ADMIN., *supra* note 13, § 1, at 2.

^{62.} Id. § 3-12, at 3-7.

^{63.} Id. § 3, at 3.

^{64.} Id. § 8, at 4.

^{65.} Id. § 10, ¶ 2, at 4.

^{66.} Id.

^{67.} OST, supra note 32, art. II, VI, XI.

^{68.} NAT'L AERONAUTICS AND SPACE ADMIN., *supra* note 13, § 11, at 5–6.

^{69.} Id.; Mike N. Gold, Artemis Accords – Enabling International Partnerships for Lunar Exploration, U.S. DEP'T. STATE (May 15, 2020, 3:15 PM), https://www.state.gov/briefings-foreign-press-centers/artemis-accords-enabling-international-partnerships-for-lunar-exploration/ (foreign press centers briefing).

C. Environmental Harms and Benefits

1. Ecological Jurisprudence

As space exploration becomes more commonplace, some scholars question whether humans have the right to exploit resources from celestial bodies.⁷⁰ The Space Act assumes that resources in space should be viewed as resources for humans.⁷¹ The Act applies our flawed institutions to an essentially blank slate, where we could expand our ethical framework to prevent humans from causing planetary damage throughout the universe.⁷²

2. Rocket Launches and the Atmosphere

Billions of particles are released into the air when a rocket launches from Earth.⁷³ These include carbon dioxide, water vapor, aluminum oxide, and more dangerously-soot. ⁷⁴ The soot particles from rocket launches negatively impact the quality of air because they enter the stratosphere directly and remain there for many years.⁷⁵ The cumulative combustion emissions from launches can change the composition of the atmosphere and could deplete the ozone layer.⁷⁶ A single solid rocket engine releases billions of aluminum oxide particles into space that can linger for up to two weeks before dispersing and re-entering the atmosphere.⁷⁷ The aluminum oxide particles threaten the potential contamination of other spacecraft.⁷⁸

3. Benefits on the Earth

Scientific studies have estimated the greenhouse gas emissions from asteroid mining operations and compared them with the emissions from Earth-based mining.⁷⁹ The authors based their calculations on greenhouse

^{70.} See, e.g., Loder, supra note 10, at 294 (expressing that space exploration for resource recovery should stop until scientists can create a way to equitably and sustainably mine asteroids, unlike what humans have done with the Earth).

^{71.} Id. at 276.

^{72.} See id. at 296, 312, 317 (cautioning against simply applying earth law to space when a blank slate exists).

^{73.} Erin C. Bennett, To Infinity and Beyond: The Future Legal Regime Governing Near-Earth Asteroid Mining, 48 Tex. Env't L.J. 81, 93 (2018).

^{74.} Id.

^{75.} Id. 76. Id. at 94.

^{77.} OFFICE OF TECH. ASSESSMENT, OTA-BP-ISC-72, ORBITING DEBRIS: A SPACE ENVIRONMENTAL PROBLEM – BACKGROUND PAPER 15 (1990).

^{78.} Id.

^{79.} ANDREAS M. HEIN ET AL., 69TH INT'L ASTRONAUTICAL CONG., IAC-18-D4,5,11, EXPLORING POTENTIAL ENVIRONMENTAL BENEFITS OF ASTEROID MINING 1, 4 (Oct. 5, 2018).

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gases released into the atmosphere from rocket launches and reentries.⁸⁰ Mining one kilogram of platinum from an asteroid would release 150 kilograms of CO₂ in the atmosphere,⁸¹ but when mining one kilogram of platinum from the Earth, 40,000 kilograms of CO₂ are released into the atmosphere.⁸² As technology becomes more advanced, rocket fuel becomes

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greener, and as rockets can be used more times, the amount of CO₂ released from launches and reentries can be reduced by using "green propellants."⁸³

Obtaining resources in space is no longer a question of *if* it will happen, but *when* it will happen. Under the Artemis Accords, the extraction and utilization of resources on the Moon, Mars, and asteroids is no longer hypothetical.⁸⁴ There is a huge incentive to be on the forefront of this blossoming industry. Governmental organizations and private companies are currently researching the feasibility of human and robotic missions to learn more about the composition of asteroids.⁸⁵ Humans could use the abundant resources in space to create tools, which would not need to be transported from Earth, to expand space exploration efforts farther than ever before.⁸⁶ The Space Act of 2015 is the United States's attempt to "make a future where America and her people guide us in our journey to the stars...."⁸⁷

A. The Outer Space Treaty

Over fifty years ago, the "most important and most fundamental source of international space law" was signed in Washington, D.C.; London; and Moscow.⁸⁸ The Treaty on Principles Governing the Activities of States in the

^{80.} Id. at 2.

^{81.} Id. at 4, tbl.2.

^{82.} Id. at 1.

^{83.} *See id.* at 5 (explaining that eco-design principles, like reusable rocket stages, can reduce the environmental impacts of rocket launchers in relation to CO₂ levels and energy consumption).

^{84.} *See generally* NAT'L AERONAUTICS & SPACE ADMIN., *supra* note 13 (presenting principles for space exploration agreed upon by several spacefaring nations).

^{85.} Strategic Mineral Management, MASS. INST. TECH., MISSION 2016, http://web.mit.edu/12.000/www/m2016/finalwebsite/ (last visited Jan. 24, 2020).

^{86.} Sarah Cruddas, *The Truth About Asteroid Mining: Could the Untold Riches in Asteroids and Other Planets Be the Key to Exploring the Wider Universe?*, BBC, FUTURE (Jan. 5, 2016) https://www.bbc.com/future/article/20160103-the-truth-about-asteroid-mining.

^{87. 161} CONG. REC. 7634 (2015) (Statement of Congressman Kevin McCarthy).

^{88.} OST, supra note 32, art. XVII; Loren Grush, How an International Treaty Signed 50 Years Ago Became the Backbone for Space Law, VERGE (Jan. 27, 2017), http://www.theverge.com/2017/1/27/14398492/outer-space-treaty-50-anniversary-explorationguidelines; Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer

Space, Including the Moon and Other Celestial Bodies, U.S. STATE DEP'T (Jan 20, 2017), https://2009-2017.state.gov/t/isn/5181.htm.

Exploration and Use of Outer Space is better known as the Outer Space Treaty.⁸⁹ The OST was the second non-armament treaty (following the Antarctic Treaty) and sought to prevent new colonial competition.⁹⁰ In 1957. the United States was the first to propose the development of an inspection system for testing space objects.⁹¹ However, the Soviet Union, testing their first intercontinental ballistic missile (ICBM), declined the invitation.⁹² Sputnik was sent into orbit, launching the space race.⁹³ In 1960, President Eisenhower addressed the United Nations General Assembly and advocated for the peaceful use of outer space and arms control.⁹⁴ In 1963, the General Assembly adopted a resolution which called on all states to refrain from placing weapons of mass destruction into outer space.⁹⁵ This came after the Soviet Union and the United States stated they had no desire to place nuclear weapons in orbit or on celestial bodies.⁹⁶ Attempting to strengthen the 1963 resolution, both the United States and Soviet Union submitted draft treaties.⁹⁷ The United States focused only on celestial bodies and the Soviet Union focused on the whole outer space environment.⁹⁸ Both countries came to an agreement, the General Assembly adopted the resolution, and opened the Treaty for signature on January 27, 1967.99

The Outer Space Treaty contains seventeen short articles and was not intended to be comprehensive, as it was signed in the early stages of space travel. ¹⁰⁰ OST has served as the foundation for every piece of space legislation drafted since and is open for interpretation as space technology advances.¹⁰¹

^{89.} Johnson, supra note 32.

^{90.} Outer Space Treaty, FED'N AM. SCIENTISTS, http://fas.org/nuke/control/ost/intro.htm (last visited Dec. 8, 2020) [hereinafter OST History].

^{91.} See id. (stating the U.S. proposed an international verification system early in 1957).

^{92.} Id.

^{93.} See generally id. (inferring from chain of events that eventually led to what is currently known as "the space race").

^{94.} See Text of Eisenhower's Address to the 15th Session of U.N. General Assembly, N.Y. TIMES (Sept. 23, 1960), https://www.nytimes.com/1960/09/23/archives/text-of-eisenhowers-address-to-the-15th-session-of-un-general.html (proposing international action regarding space in speech before UN).

^{95.} OST History, supra note 90.

^{96.} See id. (inferring based on the restrictions established in Article IV of the Outer Space Treaty).

^{97.} OST History, supra note 90.

^{98.} Id.

^{99.} See id. ("Differences on the few remaining issues [between the U.S. and Soviet Union] ... were satisfactorily resolved in private consultations during the General Assembly session by December."); G.A. Res. 2222 (XXI), (Dec. 19, 1966) (adopting and commending the OST); OST, *supra* note 32, art. XVII (marking signing of the treaty).

^{100.} See generally OST, supra note 32 (containing articles I-XVII).

^{101.} Grush, *supra* note 88; *See* 51 U.S.C. §§ 51302–03 (2018) (referring to the United States's international obligations under the Outer Space Treaty).

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Article I states, "[o]uter space, including the moon and other celestial bodies, shall be free for exploration and use by all States" and States should explore "for the benefit and in the interest of all countries."¹⁰²

As interests in mining of space resources increase, so do conflicting interpretations of Article II of the OST.¹⁰³ Under Article II, nations cannot appropriate outer space, the moon, or other celestial bodies by claim of sovereignty, use or occupation, or by any other means.¹⁰⁴ On one side, scholars from the International Institute of Space Law (IISL) interpreted Article II to prohibit both national and private appropriation.¹⁰⁵ The Moon Agreement supports this view—under Article 11 of the Agreement, celestial resources are the "common heritage of mankind."¹⁰⁶ By the common heritage approach, there is an absolute bar on both private and state appropriation because celestial resources are for the benefit of all states.¹⁰⁷ On the other side, some posit that a categorical exclusion of property rights on celestial bodies contradicts Article 17 of the Universal Declaration of Human Rights, which guarantees the right to personal property.¹⁰⁸ Legislation introduced by the United States and Luxembourg also supports private companies owning the resources extracted from celestial bodies.¹⁰⁹

Article VI first declares that State Parties bear responsibility for national activities in outer space, whether or not government agencies carry out those activities.¹¹⁰ Second, activities of non-governmental entities shall require authorization and continuing supervision by the host State Party.¹¹¹

Article XV opens the treaty to amendment, stating:

106. See Moon Agreement, supra note 38, art. XI.

107. Kurt Taylor, Fictions of the Final Frontier: Why the United States Space Act of 2015 is Illegal, 33 EMORY INT'L L. REV. 653, 653 (2019).

108. See Austin C. Murnane, Note, *The Prospector's Guide to the Galaxy*, 37 FORDHAM INT'L L. J. 235, 262 (2013) (asserting contradiction with Article 17); G.A. Res. 217 (III) A, Universal Declaration of Human Rights (Dec. 10, 1948) ("Article 17: (1) Everyone has the right to own property as well as in association with others. (2) No one shall be arbitrarily deprived of his property.").

109. See U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114–90, 129 Stat. 704, 721 (2015) (codified at 51 U.S.C. § 51303) ("A United States citizen engaged in commercial recovery of an asteroid resource or a space resource . . . shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid resource or space resource."); Loi du 20 juillet 2017 sur l'exploration et l'utilisation des ressources de l'espace [Law of July 20th 2017 on the Exploration and Use of Space Resources] arts. 1, 3–5, Journal Officiel Du Grand-Duché De Luxembourg, Mémorial A, N° 674 (2017) [hereinafter Luxembourg's Law] Journal Officiel du Grand Duche de Luxembourg [Journal Officiel], *Loi du 20 juillet 2017 sur l'exploration et l'utilisation des ressources de l'espace*, A674-1, A674-1 (N° 674, July 28, 2017) (securing the right of private operators working in the space sector to resource extracted in space).

110. OST, *supra* note 32, art. VI.

111. Id.

^{102.} OST, supra note 32.

^{103.} Grush, supra note 88.

^{104.} OST, supra note 32, art. II.

^{105.} Statement by the Board of Directors of the International Institute of Space Law on Claims to Property Rights Regarding the Moon and Other Celestial Bodies, INT'L INST. SPACE L. (2004), https://www.iislweb.org/docs/IISL_Outer_Space_Treaty_Statement.pdf.

Any State Party to the Treaty may propose amendments to this Treaty. Amendments shall enter force for each State Party to the Treaty accepting the amendments upon their acceptance by a majority of the States Parties to the Treaty and thereafter for each remaining State Party to the Treaty on the date of acceptance by it.¹¹²

This suggests that the OST may be amended if 55 out of 109 State Parties consent to the change.¹¹³

B. The Space Act of 2015

The law in effect today, the Space Act of 2015, got its start as H.R. 2262, the "Spurring Private Aerospace Competitiveness and Entrepreneurship Act of 2015."¹¹⁴ Representative Kevin McCarthy introduced the Act on May 12, 2015 in the House of Representatives.¹¹⁵ The purpose of H.R. 2262 was "to facilitate a pro-growth environment for the developing commercial space industry by encouraging private sector investment and creating more stable and predictable regulatory conditions, and for other purposes." ¹¹⁶ On November 10, 2015, the Senate unanimously passed a reconciled version of the house bill with a new name: "The U.S. Commercial Space Launch Competitiveness Act."¹¹⁷ While the Senate version incorporated the House version, the final bill included a revised version of the space-resource property-right language.¹¹⁸ The House version included language that created a cause of action arising from harmful interference. ¹¹⁹ However, the Congressional Record contains no discussion of harmful interference or why the final draft of the Space Act of 2015 omitted the cause-of-action.¹²⁰

On November 16, 2015, the House approved the reconciled version from

^{112.} Id. art. XV.

^{113.} Comm. on the Peaceful Uses of Outer Space, Rep. of the Legal Subcomm. on Its Fifty-Eighth Session, U.N. Doc. A/AC.105/C.2/2019/CRP.3* (2019).

^{114.} See U.S. Commercial Space Launch Competitiveness Act, Pub L. No. 114–90, 129 Stat. 704, 704-05 (2015) (finalizing the Space Act); 161 CONG. REC. 6477 (2015) (introducing bill in the House).

^{115. 161} CONG. REC. 6477; Press Release, Media Center for Congressman Kevin McCarthy, *House Passes Congressman McCarthy's SPACE Act*, (Nov. 16, 2015), https://kevinmccarthy.house.gov/media-center/press-releases/house-passes-congressman-mccarthys-space-act.

^{116.} U.S. Commercial Space Launch Competitiveness Act, 129 Stat. at 704 .

^{117.} See 161 CONG. REC. 18067-72, 18089 (2015) (showing unanimous consent to pass the amended bill).

^{118.} Id. at 18072; Jeff Foust, U.S. Senate Passes Compromise Commercial Space Bill, SPACE NEWS (Nov. 11, 2015), https://spacenews.com/u-s-senate-passes-compromise-commercial-space-bill/.

^{119. 161} CONG. REC. 7643, 7646.

^{120.} See U.S. Commercial Space Launch Competitiveness Act, 129 Stat. at 721 (omitting subsection on "Civil Action for Relief from Harmful Interference" in final law) (codified at 51 U.S.C. § 51303); 161 CONG. REC. 18072 (omitting subsection on civil action from § 51303 in engrossed senate amendment without debate).

the Senate.¹²¹ This final version of the bill grants rights to resources extracted by commercial entities in the United States on asteroids and other celestial bodies.¹²² President Obama signed the legislation into law on November 25, 2015.¹²³

The Space Act defines an asteroid resource as "a space resource found on or within a single asteroid" and defines a space resource as "an abiotic resource in situ in outer space," which includes water and minerals.¹²⁴

Under § 51302, Congress directed the President to:

(1) facilitate commercial exploration for and commercial recovery of space resources by United States citizens; (2) discourage government barriers to the development in the United States of economically viable, safe, and stable industries for commercial exploration for and commercial recovery of space resources in manners consistent with the international obligations of the United States; and (3) promote the right of United States citizens to engage in commercial exploration for and commercial recovery of space resources free from harmful interference, in accordance with the international obligations of the United States and subject to authorization and continuing supervision by the Federal Government.¹²⁵

This suggests Congress intends to lower as many barriers as possible to enable the private exploration and recovery of space resources.

Under § 51303, rights to asteroid or space resources obtained are granted to:

A United States citizen engaged in commercial recovery of an asteroid resource or a space resource under this chapter shall be entitled to any asteroid resource or space resource obtained, including to possess, own, transport, use, and sell the asteroid

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^{121. 161} CONG. REC. 18147 (concurring in Senate amendment by two-thirds of House); Jeff Foust, *House Passes Commercial Space Bill*, SPACE NEWS (Nov. 16, 2015), https://spacenews.com/house-passes-commercial-space-bill/.

^{122.} See U.S. Commercial Space Launch Competitiveness Act, Public L. No. 114-90, § 51303, 129 Stat. 704, 721 (2015) (detailing entitlement to resource recovery).

^{123.} Id. at sec.403, 129 Stat. at 722; Alyssa Navarro, President Obama Signs Pro-Asteroid Mining Bill into Law, TECH TIMES (Nov. 27, 2015), https://www.techtimes.com/articles/110935/20151127/president-obama-signs-pro-asteroid-mining-billinto-law.htm.

^{124.} U.S. Commercial Space Launch Competitiveness Act, § 51301, 129 Stat. at 721. 125. *Id.* § 51302.

resource or space resource obtained in accordance with applicable law, including the international obligations of the United States.¹²⁶

Notably, this right is granted exclusively to U.S. citizens.

Additionally, the President was to submit a report to Congress specifying: "(1) the authorities necessary to meet the international obligations of the United States, including authorization and continuing supervision by the Federal Government; and (2) recommendations for the allocation of responsibilities among Federal agencies [to facilitate the authorization and continuing supervision]."¹²⁷ On April 4, 2016, John Holdren, the Director of the of White House Office of Science and Technology Policy, submitted a report to Congress proposing a "Mission Authorization" framework that meets the United States' obligations under the OST.¹²⁸ The framework designates that missions will be authorized by the Secretary of Transportation, in coordination with the Secretary of Defense, the Secretary of State, the Secretary of Commerce, the NASA Administrator, the Director of National Intelligence, and any other agencies that the Secretary of Transportation deems appropriate.¹²⁹ Additionally, the Secretary of Transportation is to maintain a registry of Mission Authorizations, where Mission Authorization holders will periodically provide updated information whenever they experience a material change to operations.¹³⁰ At the time of Holdren's report to Congress, it was the Administration's view that it was premature to establish a comprehensive regulatory framework mirroring mature commercial space activities, such as launch services.¹³¹

C. The Flaws of the Space Act of 2015 & the Artemis Accords and Their Incompatibility with the OST

1. Lack of Safety Procedures

The Space Act does not contain any procedures to ensure the safe mining of asteroids.¹³² The only provision of the Act related to safety was the now-

^{126.} Id. § 51303.

^{127.} Id. § 51302.

^{128.} JOHN P. HOLDREN, OFF. OF SCI. AND TECH. POL'Y, REPORT ON ON-ORBIT AUTHORITY, AS REQUIRED BY THE COMMERCIAL SPACE LAUNCH COMPETITIVENESS ACT 1, 1 (Apr. 4, 2016), https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/csla_report_4-4-16_final.pdf [hereinafter HOLDREN LETTER].

^{129.} Id. at 6.

^{130.} Id. at 7.

^{131.} Id. at 4.

^{132.} See U.S. Commercial Space Launch Competitiveness Act, §§ 51301–3, 129 Stat. 704, 721 (2015) (demonstrating no safety measures in Act).

removed portion of § 51303(b): "Safety of Operations: A United States commercial space resource utilization entity shall avoid causing harmful interference in outer space." ¹³³ The proposed bill neglected to define "harmful interference" and seemingly removed the language all together.¹³⁴ The enacted version only referenced harmful interference in Congress's direction to the President to "promote the right of United States citizens to engage in commercial exploration for and commercial recovery of space resources free from harmful interference ….."¹³⁵ The bill's lack of safety specifications led to a debate on the House floor.¹³⁶

In opposition to H.R. 2262, Representative Donna Edwards of Maryland echoed this concern and worried that as the Space Act stood, the aerospace industry could work in a regulation-free environment without any specific safety requirements until 2025.¹³⁷ Without safety procedures, asteroid mining could adversely affect objects in orbit around Earth.¹³⁸ When the surface of an asteroid is disturbed, its gravity is too weak and some surface particles could escape and settle into regions traversed by satellites in geosynchronous orbit.¹³⁹ At first, this escaped debris would not likely present a problem, but as more asteroids are mined and more satellites are launched, it becomes more likely a satellite will be dangerously struck.¹⁴⁰ Without stronger guidance from the government, private entities are left to develop their own containment procedures for mining.¹⁴¹ Deep Space Industries, a private company aiming to mine asteroids, has stated they will plan their targets to minimize the risk of debris and might bag or shroud the asteroid to prevent dust and loose stones from escaping.¹⁴² However, private policies like that of Deep Space Industries are not enough to make up for the lack of guidance in the Space Act of 2015.

^{133.} See 161 CONG. REC. 7646, 7656 (2015) (noting the House in the Committee of the Whole's rejection of the amendment as a substitute by a vote of 173 ayes and 236 noes).

¹³⁴ *Compare id.* at 7646 (instructing U.S. commercial space resource entities to avoid, and including a civil right of action for relief from, "harmful interference"), *with* 161 CONG. REC. 18140 (2015) (promoting the right of citizens to engage in commercial exploration and recovery without "harmful interference" as only a general goal).

^{135.} U.S. Commercial Space Launch Competitiveness Act, § 51302, 129 Stat. at 721.

^{136.} See 161 CONG. REC. 18141–42 (weighing the benefit of a lack of Federal Aviation Administration (FAA) safety regulations for the developing spaceflight industry against the prevention of potential accidents).

^{137.} See 161 CONG. REC. 7634–35 (letter from Joanne Irene Gabrynowicz submitted for the record by Rep. Edwards.) (opposing the bill's extension on postponing FAA authority to regulate safety).

^{138.} See Sarah Scoles, Dust from Asteroid Mining Spells Danger for Satellites, NEW SCIENTIST, (May 27, 2015), https://www.newscientist.com/article/mg22630235-100-dust-from-asteroid-mining-spells-danger-for-satellites/.

^{139.} Id.

^{140.} See id. (asserting risk of asteroid mining will increase as asteroid mining become more widespread).

^{141.} See id. (discussing efforts by one company to contain mining debris).

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The Artemis Accords make an attempt to create safety procedures through the use of Safety Zones.¹⁴³ Seemingly consistent with Articles XI and IX of the OST, NASA and partner nations will provide public information regarding the location and general nature of operations on the moon to prevent harmful interference.¹⁴⁴ This is discussed *infra* in part C.1.

2. Absence of any Licensing System

Nor did the Space Act establish "an interagency review to help identify appropriate roles and responsibilities and a proposed organizational structure for the ... oversight and licensing of commercial space resource exploration and utilization."145 Instead, the Space Act provided that the President shall submit a report to Congress specifying which Federal Agencies are to be responsible for authorizing and continually supervising commercial entities in outer space.¹⁴⁶ Currently, there are three agencies that oversee U.S. commercial space activities: (1) the Federal Aviation Administration (FAA), which authorizes and regulates launch and reentry; (2) the Federal Communications Commissions (FCC), which licenses and regulates communications satellites; and (3) the National Oceanic and Atmospheric Administration (NOAA), which licenses commercial entities operating remote sensing systems in space.¹⁴⁷ In April of 2016, the Executive Branch complied with the reporting requirement of the Space Act and recommended the Department of Transportation, in coordination with the Departments of Defense, State, Commerce, NASA, and the Director of National Intelligence, to authorize and continually supervise space mining activities by United States companies.¹⁴⁸ However, Congress has yet to adopt these recommendations.149

^{143.} See NAT'L AERONAUTICS AND SPACE ADMIN., supra note 13, § 11, at 5–6 (stating "[t]he area wherein this notification and coordination will be implemented to avoid harmful interference is referred to as a 'safety zone.""); Artemis Principles, supra note 13 (stating that state partner nations will "inform the size and scope of safety zones" to avoid harmful interference).

^{144.} See NAT'L AERONAUTICS AND SPACE ADMIN., supra note 13, at 5–6 (committing to provide partner nations with necessary information on the "location and nature of space–based activities").

^{145. 161} CONG. REC. 7634 (statement of Rep. Edwards).

^{146.} See U.S. Commercial Space Launch Competitiveness Act, Public L. No. 114–90, § 51302, 129 Stat. 704, 721 (2015) (discussing the President's reporting requirements).

^{147.} The Commercial Space Landscape: Innovation, Market, and Policy Testimony Before the H. Comm. on Sci., Space, and Tech., Subcomm. on Space, 116th Cong. 1 (2019) [hereinafter Montgomery Testimony] (statement of Laura Montgomery).

^{148.} HOLDREN LETTER, supra note 128, at 6.

^{149.} See id. at 6–7 (listing recommended amendments to U.S.C. title 51, ch. 509); 51 U.S.C.A. §§ 50902, 50919(g) (West, Westlaw through Pub. L. 116–179) (showing no recommended mission authorization amendments); *Chapter 509: Commercial Space Launch Activities*, GOVTRACK, https://www.govtrack.us/congress/bills/uscode/chapter/51/509 (showing no bills in the current Congress regarding the recommended mission authorization amendments) (last visited Dec. 11, 2020).

The OST demands that States Party to the Treaty authorize and continually supervise the activities of non-governmental entities in outer space.¹⁵⁰ Article VI states:

State Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty.¹⁵¹

Legal scholars are split on whether the Space Act conforms with this requirement. $^{\rm 152}$

On one side, scholars argue that Article VI's requirement of authorization and continual supervision does not create an obligation on the private sector because the treaty is not self-executing.¹⁵³ Read narrowly, Article VI grants State Parties discretion to decide what activities require authorization and continuing supervision.¹⁵⁴ In their testimony before the Committee on Science, Space, and Technology, Laura Montgomery urged the United States might need not to regulate asteroid mining at all because it would not cause harm to any human, unlike mining operations on Earth.¹⁵⁵ However, this argument alone is shortsighted and only accounts for the risk in the nearby environment. As stated above, asteroid mining could create debris that could impact satellites in Earth's orbit.¹⁵⁶ Additionally, the cumulative impact from an increase in rocket launches can change the composition of the atmosphere and could deplete the ozone layer.¹⁵⁷

^{150.} OST, supra note 32, art. VI.

^{151.} Id.

^{152.} See 161 CONG. REC. 7634–35 (2015) (letter from Joanne Irene Gabrynowicz submitted for the record by Rep. Edwards expressing that lack of spaceflight oversight in the Space Act does not comply with the OST); *Montgomery Testimony, supra* note 147, at 5–9 (arguing that OST, Art. VI does not apply to private actors and is not legal basis for FAA regulation).

^{153.} Montgomery Testimony, supra note 147, at 5.

^{154.} Id. at 6.

^{155.} *Id.* (comparing mining on Earth, where safety and environmental concerns provide a need for independent oversight, to mining on asteroids, where regulation is not needed because only robots will be present).

^{156.} Scoles, supra note 138.

^{157.} Bennett, supra note 73 at 93.

On the other side, scholars suggest that licensing is necessary to meet the obligations under the OST.¹⁵⁸ It is customary that all commercial space activities require appropriate licensing by an authorized agency.¹⁵⁹ Additionally, both the State Department and the Obama Administration were concerned by the lack of a national regulatory framework regarding private companies' activities on celestial bodies.¹⁶⁰ Specifically, the Obama Administration stated:

While the administration strongly supports the bill's efforts to facilitate innovative new space activities by U.S. companies, such as the commercial exploration and utilization of space resources to meet national needs, the administration is concerned about the ability of U.S. companies to move forward with these initiatives absent additional authority to ensure continuing supervision of these initiatives by the U.S. Government as required by the Outer Space Treaty.¹⁶¹

The United States can ensure compliance with the OST by adopting a licensing regime similar to those employed in every other U.S. commercial space activity.¹⁶² On April 4, 2016, the Obama Administration informed Congress that the Secretary of Transportation, in coordination with other agencies, could authorize missions and maintain a registry of mission authorizations.¹⁶³ The Space Act of 2015 did not initially set up such a regime, and has not yet implemented the Executive's proposal.¹⁶⁴ Instead of a full licensing regime, the Accords reference the Registration Convention to register any relevant space object.¹⁶⁵ Under this provision, the United States is not explicitly able to authorize and continuously supervise private parties

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^{158.} See 161 CONG. REC. 7634–35 (2015) (letter from Joanne Irene Gabrynowicz submitted for the record by Rep. Edwards expressing concern that the Space Act does not meet the OST requirement of "continuing supervision" of spaceflight activities).

^{159.} See id. (stating "[u]nlicensed U.S. commercial space activities are unprecedented in United States space law.").

^{160.} See id. at 7634–35 (stating "[th]e lack of a specific licensing regime also fails to meet the State Department's concern . . . the lack of a national regulatory framework with respect to private sector activities on celestial bodies).

^{161.} See id. at 7634.

^{162.} See DANIEL MORGAN, COMMERCIAL SPACE: FEDERAL REGULATION, OVERSIGHT, AND UTILIZATION R45416 (Nov. 29, 2018) (referencing the preexistence of a licensing regime that underscores commercial space activity).

^{163.} HOLDREN LETTER, supra note 128, at 6.

^{164.} See 51 U.S.C.A. §§ 50902, 50919(g) (West, Westlaw through Pub. L. 116–179) (showing no recommended mission authorization amendments); Space Act, Pub. L. No. 114–90, 129 Stat. 704, 707 (2015) (requiring the Secretary of Transportation to submit a report recommending an approach for future licensing activities).

^{165.} NAT'L AERONAUTICS AND SPACE ADMIN., supra note 13, at 3.

under the requirements of Article VI of the OST.¹⁶⁶ Thus, the Act and the Artemis Accords fail to meet the requirements of Article VI of the OST.

3. No Guidance for Dispute Resolution from Harmful Interference

The United States has opened the door and invited other spacefaring States to adopt similar legislation. In 2017, Luxembourg followed suit by enacting an initiative that allows private companies to claim mineral deposits without violating the OST.¹⁶⁷ This rise in competition could eventually lead to disputes over resources with no obvious resolution framework in place.

Under the OST, State Parties are not to engage in activities that would harmfully interfere with the peaceful use and exploration of space by other states without first undertaking international consultations.¹⁶⁸ Article IX states in pertinent part:

If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities of other State Parties in the peaceful exploration and use of outer space, including the moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A State Party to the Treaty which has reason to believe that an activity or experiment planned by another State Party in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the moon and other celestial bodies, may request consultation concerning the activity or experiment.¹⁶⁹

Scholars have interpreted this notion of "harmful interference" to have two implications: (1) to prevent State Parties from interfering with productive activities of other States engaging in private endeavors; and (2) to limit

^{166.} See HOLDREN LETTER, supra note 128, at 3 (stating "[m]any space-faring States discharge the [OST, Art. VI] obligation through a more general licensing framework for non-governmental space activities.").

^{167.} See JP Casey, Mining-Technology, The History of Space Mining: Five Key Events for Mineral Exploration in Space, MINING-TECH. (Mar. 18, 2019) https://www.mining-technology.com/digitaldisruption/history-of-space-mining/ (comparing the Luxembourg and US laws in a historical perspective).

^{168.} OST, supra note 32, art. IX.

^{169.} Id.

activities that may harm the environment.¹⁷⁰ Proposed versions of the Space Act included a cause of action protecting the right to be free from harmful interference, but it was ultimately dropped from the text of the enacted legislation.¹⁷¹ In the prior versions, if the aggrieved party was: (1) first in time; (2) acted reasonably for exploration and utilization of asteroid resources; and (3) acted in accordance with the international obligations of the United States—there was a cause of action against another party.¹⁷²

The cause of action portion from the proposed bills was likely consistent with the requirements of the OST. The previous House and Senate versions did not conflict with the OST because the bills did not grant jurisdiction to the United States over any asteroid or asteroid resources, but granted the United States jurisdiction to companies that fall under United States jurisdiction.¹⁷³ Essentially, these bills gave the United States jurisdiction to resolve disputes between U.S. companies but not jurisdiction over physical asteroids. Had these proposed versions asserted jurisdiction over territory in space, it could be a claim of sovereignty by other means, which is prohibited under the OST.¹⁷⁴

Under Section 11 of the Accords, a procedure for avoiding disputes arising from harmful interference is laid out. As mentioned above, the Accords provide that harmful interference can be avoided by the designation of safety zones.¹⁷⁵ These safety zones are defined as "the area in which nominal operations of a relevant activity or an anomalous event could cause harmful interference" and their size should reflect the nature of the operations being conducted in the environment.¹⁷⁶ Safety zones are meant to be temporary and are "expected to change over time reflecting the status" of the operation.¹⁷⁷ Christopher Johnson, a respected space lawyer, has noted that the lack of permanence of these safety zones aligns the Accords with the

^{170.} Elliot Reaven, The United States Commercial Space Launch Competitiveness Act: The Creation of Private Space Property Rights and the Omission of the Right to Freedom from Harmful Interference, 94 WASH. UNIV. L. REV. 233, 253 (2016).

^{171.} Compare Stephen DiMaria, Note, Starships and Enterprise: Private Spaceflight Companies' Property Rights and the U.S. Commercial Space Launch Competitiveness Act, 90 ST. JOHN'S L. REV. 415, 417 (2016) (highlighting the stricken language from the OSA that barred harmful interference in outer space recovery), with 161 CONG. REC. 7653–54 (2015) (demonstrating the difference between the proposed and agreed upon language of the Space Act).

^{172.} See 161 CONG. REC. 7653–54 (showing proposed amendment as a substitute adopted causes of action supporting first in time and reasonable use in accordance with international treaties).

^{173.} See id. at 7643, 7646 (original house bill with cause of action for harmful interference);

id. at 18072 (revised senate bill); Reaven, *supra* note 170, at 255–56 (arguing that "the right to freedom from harmful interference is most likely compliant" with the OST).

^{174.} See OST, supra note 32, art. II (explaining that "[o]uter space, including the moon and other celestial bodies, is not subject to national appropriation").

^{175.} NAT'L AERONAUTICS & SPACE ADMIN., supra note 13, § 11, at 5-6.

^{176.} Id. at 11.

^{177.} Id.

requirements of the OST.¹⁷⁸ If the establishment of a safety zone were permanent, it would be akin to national appropriation, which is prohibited under Article II of the OST.¹⁷⁹

4. Environmental Jurisprudence was Overlooked

As an initial issue, some argue that asteroids should not be exploited by humans simply because they are able to.¹⁸⁰ One expert in property law urges that asteroid use should be limited to water extraction necessary to maintain human life; asteroid use should be justified through equitable resource distribution among nations and people.¹⁸¹ However, the Space Act of 2015 already hinders the ability to apply a new legal approach to the nearly pristine environment of space.¹⁸²

Examining the text of the Senate's proposed bill, which was ultimately incorporated in the Space Act of 2015, sheds light on how efforts to protect the space environment from exploitation are hindered.¹⁸³ Although the proposed bill is not law, it shows the drafters' intent behind enacted legislation. Under the proposed bill, "any asteroid resources obtained in outer space are the property of the entity that obtained such resources, which shall be entitled to all property rights thereto."¹⁸⁴ Further, under the civil-action section of the proposed bill, a plaintiff who was "first in time" conducting resource utilization could prevail over another entity, provided other requirements were met.¹⁸⁵ The proposed bill stated:

"CIVIL ACTION FOR RELIEF FROM HARMFUL INTERFERENCE.—A United States commercial space resource utilization entity may bring a civil action for appropriate legal or equitable relief, or both, under this chapter for any action by another entity subject to United States jurisdiction causing harmful

^{178.} Christopher Johnson, A First Look at the Artemis Accords, LINKEDIN (Oct. 14, 2020), https://www.linkedin.com/pulse/first-look-artemis-accords-christopher-johnson/.

^{179.} Id.

^{180.} See generally, Loder, supra note 10, at 295 (lamenting that humans have an exploitative nature that often overlooks the necessity of ecological protections).

^{181.} Id. at 297.

^{182.} *Id*.

^{183.} See 161 CONG. REC. 7646 (2015) (identifying the different legal approach in the proposed House bill that was rejected but made its way into the final language).

^{184.} *Id.*

interference to its operations with respect to an asteroid resource utilization activity in outer space."¹⁸⁶

The notion of "first in time" has its origin in the General Mining Law of 1872, through the westward expansion of the United States and the exploitation of water and mineral rights.¹⁸⁷

The Mining Law rewarded those who were the first to prospect and discover valuable minerals.¹⁸⁸ The Prior Appropriation Doctrine also grew out of this westward expansion-rewarding water rights to the first person to make use of the water.¹⁸⁹ By using "first in time," the Senate implicitly suggested the doctrine that governed westward expansion should similarly govern the exploitation of resources in space. Although this provision does not appear in the Space Act of 2015, its presence in the legislative history, along with § $51302(a)(2)^{190}$ suggests the purpose of the Space Act is to allow the exploitation of resources in space by U.S. companies. The Trump Administration has further strengthened the association between American expansionism and space exploration. On July 6, 2020, the White House tweeted an image of the President and Vice President watching the first launch of American astronauts from American soil since 2011.¹⁹¹ This image had the word "DESTINY" laid across it with the caption: "Americans are the people who pursued our Manifest Destiny across the ocean, into the uncharted wilderness, over the tallest mountains, and then into the skies and even into the stars."¹⁹² The language we use to describe space travel matters-using themes of American expansionism pairs the nation's future in space with racist beliefs of the past that drove Indigenous people from their homes in the name of White entitlement.¹⁹³ This language is contrary to the notion of Environmental Jurisprudence and paints a picture that space is for the benefit of the United States, not all humankind.

^{186.} See id. ("the activity is reasonable for the exploration of and utilization of asteroid sources.").

^{187.} See generally General Mining Law of 1872, 30 U.S.C. § 26 (2018) ("The locators... shall have exclusive right of possession and enjoyment of all the surface included within the lines of their locations..."); Lauren E. Shaw, Asteroids, the New Western Frontier: Applying Principles of the General Mining Law of 1872 to Incentivize Asteroid Mining, 78 J. AIR L. & COM. 121, 143–44 (2013).

^{188.} Shaw, *supra* note 187; *see also* General Mining Law of 1872, 30 U.S.C. § 26 (supporting the "first in time" notion, as well as rewards for discovering valuable minerals).

^{189.} John G. Wrench, Non-Appropriation, No Problem: The Outer Space Treaty is Ready for Asteroid Mining, 51 CASE W. RSRV. J. INT'L L. 437, 457 (2019).

^{190.} See U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114–90, 129 Stat. 704, 704 (2015) (presenting the current language of the act); 161 CONG. REC. 7646 (2015) (showing past language of the act).

^{191.} The White House 45 Archived (@WhiteHouse45), TWITTER (July 6, 2020, 10:02 PM), https://twitter.com/WhiteHouse45/status/1280321140326633472.

^{192.} Id.

^{193.} Marina Koren, *No One Should 'Colonize' Space*, ATLANTIC (Sept. 17, 2020), https://www.theatlantic.com/science/archive/2020/09/manifest-destiny-trump-space-exploration/612439/.

5. Economic Impacts Were Overlooked

Another issue that the Space Act of 2015 overlooked was the economic impact of asteroid mining. Ryugu, the asteroid host to the two small hopping robots mentioned above, is valued to be \$82.76 billion, with \$30.08 billion in profit.¹⁹⁴ This particular asteroid is rich in nickel, iron, cobalt, and water.¹⁹⁵ It is ranked as one of the most accessible asteroid in our solar system, meaning its orbital characteristics and its relatively consistent distance from the sun makes it fairly easy to get to.¹⁹⁶ While the technology to access more valuable asteroids does not exist yet, it is only a matter of time before private companies are landing on asteroids valued in the quadrillions.¹⁹⁷ As these ventures are still in their nascent stages, we must ask ourselves whether we want asteroid mining to make the rich richer or if we want it to benefit all of humanity.

Although the Space Act of 2015 entitled the right to possess, own, transport, use, and sell asteroid resources to all United States citizens,¹⁹⁸ only a select few companies have the ability to do so.¹⁹⁹ Namely, Planetary Resources and Deep Space Industries have plans to begin asteroid mining in the future.²⁰⁰ While the influx of minerals from space would not likely tank the economy, the wealth inequality would become more extreme, exacerbating rather than alleviating existing problems on Earth.²⁰¹

Article I of the OST provides: "The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind."²⁰² The Space Act of 2015 failed to consider this crucial flaw in the plan to develop asteroids for the benefit of all humanity and, in doing so, could be in breach of the OST. Legal scholars suggest the question of ownership in space needs to be decided internationally to avoid exasperating

^{194.} Wall, *supra* note 2; Webster, *supra* note 4.

^{195.} Webster, *supra* note 4 (stating Ryugu is composed of nickel, iron, cobalt, water, nitrogen, hydrogen, and ammonia).

^{196.} Id. (locating Ryugu relatively close to the top of the list of "most accessible" asteroids).

^{197.} Matt Davis, *Will Asteroid Mining be an Outer-Space Gold Rush*?, BIG THINK (Sept. 28, 2018) https://bigthink.com/technology-innovation/economic-impact-of-asteroid-mining.

^{198.} See U.S. Commercial Space Launch Competitiveness Act, Pub. L. No. 114–90, 129 Stat. 704, 721 (2015) (codified at 51 U.S.C. § 51303) (outlining rights to United States citizens).

^{199.} Davis, supra note 197.

^{200.} Jeff Foust, *The Asteroid Mining Bubble Has Burst*, SPACE REV. (Jan. 7, 2019), http://www.thespacereview.com/article/3633/1.

^{201.} Davis, *supra* note 197 (suggesting space resources would be treated similarly to the diamond market, where just enough diamonds are released to satisfy demand to ensure continued profits); Morgan Saletta & Kevin Orrman-Rossiter, *Can Space Mining Benefit All of Humanity?: The Resource Fund and Citizen's Dividend Model of Alaska, the 'Last Frontier'*, 43 SPACE POL'Y 1, 3 (2018).

^{202.} OST, supra note 32, art. 1.

the already unequal distribution of wealth around the word.²⁰³ One way to facilitate this is through the establishment of an international organization with the right to lease asteroids and other celestial bodies.²⁰⁴ This concept is explored in the section IV.

The Artemis Accords seemingly take a different approach to benefit all humankind—through knowledge, not economics. Under the principle of Releasing Scientific Data, NASA and partners have agreed to release their scientific data publicly to ensure that the entire world can benefit from the Artemis journal of exploration and discovery.²⁰⁵ The exploration of outer space for the benefit and in the interest of all countries is the core tenant of the OST. The framework proposed by the Accords would include the world in the scientific benefits.²⁰⁶ Due to the nature of the bi-lateral and multi-lateral agreements set up under the Accords, many countries would be left behind economically.

IV. SOLUTIONS

A. Creation of an International Space Licensing Agency

A new international organization, developed from an amendment to the OST or through a new treaty, would lease asteroids and charge royalties on production.²⁰⁷ This would solve the U.S.'s dilemma of balancing the growth of private industry with the obligation under the OST to benefit all of humanity. One terrestrial model this new organization could look to is the Alaska Permanent Fund.²⁰⁸

The Alaska Permanent Fund is a universal cash-transfer program, established through revenues on oil and gas leases.²⁰⁹ It has been successful because of the vast oil reserves in Alaska, which are unlike anywhere else in the country except Texas and North Dakota.²¹⁰ The Alaska Permanent Fund is truly meant for the citizens—an independent trust corporation was set up in order to shield the fund from politicians.²¹¹ The dividend is calculated

206. Id.

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^{203.} Saletta, supra note 201, at 4.

^{204.} Id.

^{205.} NAT'L AERONAUTICS & SPACE ADMIN., supra note 13, § 8, at 4.

^{207.} Saletta, supra note 201, at 3.

^{208.} Id.

^{209.} Dylan Matthews, *The Amazing True Socialist Miracle of the Alaska Permanent Fund*, VOX (Feb. 13, 2018), https://www.vox.com/policy-and-politics/2018/2/13/16997188/alaska-basic-income-permanent-fund-oil-revenue-study.

^{210.} See *id.* (expressing that Alaska has a relatively unique substantial number of oil reserves that lead to the program's success).

^{211.} ALASKA PERMANENT FUND CORP., AN ALASKAN'S GUIDE TO THE PERMANENT FUND 31 (12th ed. 2009).

based on the number of eligible Alaskan applicants in a dividend year, and on half of the statutory net income averaged over the five most recent fiscal years.²¹²

Under Alaska Statute § 43.23.005, to be eligible to receive one permanent fund dividend, an individual:

(1) applies to the department;

(2) is a state resident on the date of application;

(3) was a state resident during the entire qualifying year;

(4) has been physically present in the state for at least 72 consecutive hours at some time during the prior two years before the current dividend year;

(5) is

(A) a citizen of the United States;

(B) an alien lawfully admitted for permanent residence in the United States;

(C) an alien with refugee status under federal law; or

(D) an alien that has been granted asylum under federal law;

(6) was, at all times during the qualifying year, physically present in the state or, if absent, was absent only as allowed [by law]; and (7) was in compliance during the qualifying year with military selective service registration requirements . . . if those requirements were applicable to the individual, or has come into compliance after being notified of the lack of compliance.²¹³

A similar structure could be implemented in the leasing of outer space resources and would likely be consistent with the needs of the OST and private companies.²¹⁴ Some scholars suggest by using the revenue from mineral leasing rights in outer space to pay dividends to all residents on Earth, the Treaty would provide legal clarity while ensuring the exploitation of the common province of all mankind.²¹⁵ For example, to be eligible for the hypothetical SPACE-FUND, an individual must:

(1) apply to the United Nations Space Fund Department;

(2) be a resident of a State Party to the Outer Space Treaty of 1967 on the date of application;

(3) was a resident of a State Party to the Outer Space Treaty of 1967 during the entire qualifying year;

^{212.} Alaska Stat. § 43.23.025(a)(1)-(3) (2019).

^{213.} Alaska Stat. § 43.23.005 (2019).

^{214.} Saletta, supra note 201, at 4.

^{215.} Id.

(4) has been physically present in the State Party to the Outer Space Treaty of 1967 for at least 72 consecutive hours at some time during

the prior two years before the current dividend year;

(5) is

(A) a citizen of a State Party to the Outer Space Treaty of 1967;

(B) an alien lawfully admitted for permanent residence in a State Party to the Outer Space Treaty of 1967;

(C) an alien with refugee status under applicable State Party law; or

(D) an alien that has been granted asylum under applicable State Party law;

(6) was, at all times during the qualifying year, physically present in the Member State, or if absent, was absent only because the individual:

(A) was receiving secondary or postsecondary education;

(B) was receiving vocational, professional, or other specific education on a full-time basis;

(C) was receiving continuous medical treatment recommended by a licensed physician;

(D) was providing care for the individuals terminally ill family member;

(7) or any additional requirements made by amendment to this section.

An international regime would be consistent with the OST, while still incentivizing private companies to pursue ventures in asteroid mining.

B. Modeling Luxembourg's Expansive View

Inspired by the United States' push into conferring property rights in outer space resources to private entities, Luxembourg was the second country to pass space resource legislation.²¹⁶ Like the Space Act, Luxembourg's law states that space resources are capable of being appropriated.²¹⁷ However, unlike the Space Act, Luxembourg's law lays out an extensive administrative process, including: (1) the establishment of an Authorization Ministry; (2) the factors to be considered in authorization; (3) the requirement for risk

^{216.} Luxembourg's Law, *supra* note 109, art. 1; Lorenzo Gradoni, *What on Earth is Happening to Space Law*?, EJIL:TALK! (Sept. 5, 2020, 4:30pm), https://www.ejiltalk.org/what-on-earth-is-happening-to-space-law-anew-space-law-for-anew-space-race/.

^{217.} Luxembourg's Law, supra note 109, art. 1.

assessment and regular audits; and (4) fee ranges.²¹⁸ As stated above, the Space Act only confers property rights to U.S. citizens, but the Luxembourg law confers property rights to companies with any registered office in the country.²¹⁹ Compared to the United States' view, Luxembourg's deliberate recognition of any company with a registered office in county to claim property rights for space resources is move in harmony with the OST.²²⁰

The core of the OST, embodied in Article I, is that "[o]uter space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind."²²¹ To take advantage of the many benefits of space resources, all a company would have to do is set up and register an office within Luxembourg. In fact, the government in Luxembourg offers "incentives for private sector companies seeking to develop space mining opportunities and start-ups investing capital to support their growth."²²² However, in the United States, only U.S. citizens are recognized to have property rights in space resources, which severely limits compliance with Article I.²²³

The United States should take note of Luxembourg's more expansive model and should amend the Space Act of 2015 to recognize property rights of any private company that has a registered office in the United States. This change would not only comply with the OST but would likely reduce conflict between companies' claims to the same asteroid resources, conferred on them by different legal regimes from separate countries.

V. CONCLUSION

The Space Act of 2015 does not provide enough of the right guidance for private companies and the international community to operate without problems arising down the line. The Artemis Accords mend some of the inconsistencies between the Space Act of 2015 and the OST but still leave out a licensing regime, and environmental and economic considerations. On its face, the Accords assert all activities will be in compliance with the

^{218.} Id. arts. 2, 10, 13.

^{219.} Compare Loder, supra note 10 (explaining how the terms of the OST prohibit granting or owning property rights in space), with Luxembourg's Law, supra note 109, arts. 1–2, 4 (authorizing private companies to explore or use space resources).

^{220.} *Compare* Luxembourg's Law, *supra* note 109, arts. 1–2, 4 (authorizing private companies to explore or use space resources), *and* Space Act, *supra* note 9, § 51303 (allowing U.S. citizens to "possess, own, transport, use, and sell the asteroid or space resource") *with* OST, *supra* note 32, art. I ("The exploration and use of outer space . . . shall be for exploration and use by all States . . .).

^{221.} OST, supra note 32, art. I.

^{222.} Space Resources: Frequently Asked Questions, LUX. SPACE AGENCY, https://space-agency.public.lu/en/space-resources/faq.html (last updated Sept. 29, 2019).

^{223.} See U.S. Commercial Space Launch Competitiveness Act, Public L. No. 114–90, § 51303, 129 Stat. 704, 721 (2015) (identifying only a United States citizen's right to appropriate).

obligations under the OST. The moon and asteroids have plenty of resources that are worth the time to collect, but the United States must monitor exploitation within existing international frameworks. The Space Act of 2015, the Artemis Accords, and the Outer Space Treaty could all be amended to provide further guidance and to provide a dividend for all humankind.