NEITHER COVERED NOR EXCLUDED: IMPACTS OF SPECIESISM ON AQUATIC ANIMAL EXPERIMENTATION UNDER THE ANIMAL WELFARE ACT

By
Sophia Pastorini*

Despite significant scientific evidence affirming their capacity for pain and pleasure, aquatic animals in laboratory settings receive limited federal protection. The Animal Welfare Act leaves aquatic animals entirely adrift; they are neither included in the list of protected animals nor explicitly excluded. They inhabit a realm so marginalized that they are not even mentioned in the Act. The urgency of safeguarding aquatic animal welfare is a matter of moral imperative, scientific integrity, and justice. By employing a multifaceted approach that combines ethical considerations and legal frameworks, this Article seeks to catalyze change in the treatment of aquatic animals in research settings. It underscores the importance of aligning our regulatory and ethical frameworks with evolving scientific insights and moral imperatives, ultimately paving the way for more compassionate and just treatment of all sentient beings—whether terrestrial or aquatic—while challenging the underlying speciesism that has long persisted in our society.

* J.D. Candidate, 2024, University of Miami School of Law. The author would like to thank Kathy Hessler for inspiring this topic, as well as Rebecca Critser and Dr. Paul Locke for their guidance in developing this piece.

I. INTRODUCTION

Aquatic animals are neither specifically listed beneath the protective canopy of the Animal Welfare Act (AWA) nor explicitly excluded from its purview.[1] This liminal status relegates aquatic animals to a legal no-man's-land where their welfare stands unguarded. The complexity of aquatic animals challenges a fundamental premise within the AWA—the definition of "animal" as "warm-blooded."[2] This premise fails to acknowledge scientific realities uncovered since the Act's creation in 1966.[3] This Article will shed light on the outdated definition of "warm-blooded" and advocate for its revision, highlighting the need for a more inclusive legal framework that encompasses the welfare of non-marine mammal aquatic animals.

The fundamental premise of this Article is grounded in the scientific understanding that aquatic animals have the capacity to experience pain and pleasure.[4] As sentient beings, they share with terrestrial animals the ability to perceive and respond to their surroundings, to

---

[1] *See* APHIS Specifications for the Humane Handling, Care, Treatment, and Transportation of Marine Mammals, 9 C.F.R. §§ 3.100–3.118 (2023) (providing explicit coverage of marine mammals in the AWA).

[2] Animal Welfare Act, 7 U.S.C. § 2132(g) (2014) ("The term 'animal' means any live or dead dog, cat, monkey (nonhuman primate mammal), guinea pig, hamster, rabbit, or such other warm-blooded animal, as the Secretary may determine is being used, or is intended for use, for research, testing, experimentation, or exhibition purposes, or as a pet. . .").

[3] *See* Armando Ubeda, *Shark Bits: Warm-Blooded Sharks – The Lamnidae Family*, UNIV. OF FLORIDA BLOGS (Sept. 15, 2022), https://blogs.ifas.ufl.edu/sarasotaco/2022/09/15/shark-bits-warm-blooded-sharks-the-lamnidae-family/ (accessed Jan. 29, 2024) (describing the Lamnidae shark family's unique ability "to elevate their internal body temperatures above that of their surrounding environment," which challenges the conception that fish are invariably cold-blooded animals); Nicholas Wegner et al., *Whole-body Endothermy in a Mesopelagic Fish, the Opah, Lampris Guttatus*, 348 SCI. 786, 786, 788 (2015) (discussing the opah fish's evolutionary adaptation that allows it to warm its entire body and thrive in the deep ocean).

[4] Culum Brown, *Fish Intelligence, Sentience and Ethics*, 18 ANIMAL COGNITION 1, 14 (2015); Nathan Runkle, *Scientists Show Fish Feel Pleasure and Pain*, MERCY FOR ANIMALS

form social bonds, and to experience suffering when subjected to harm.[5] The scientific certainty of sentience in several species of aquatic animals underscores the ethical imperative to extend protection to aquatic animals used in research.

So, why does the exclusion of aquatic animals from the purview of the AWA exist? It is not merely an issue of legislative oversight. Rather, it is a reflection of deeply ingrained social biases. Speciesism—favoritism towards certain species at the expense of others—has a legacy rooted in hierarchical classifications and the ranking of species in terms of importance or value to humans.[6] This historical framework has contributed to particular biases against aquatic animals in the political landscape.[7]

This Article unpacks some of the consequences of speciesism for aquatic animals under the Animal Welfare Act. It illustrates how this bias not only skews welfare considerations but also leaves a significant gap in regulatory protection, thereby creating an inconsistency in the application of ethical principles. Part II of this Article offers an analysis of the AWA and its limitations, expounding the categories of animals explicitly mentioned in the Act and the gap in coverage for aquatic animals. Part III explores the concept of speciesism within the context of aquatic animal welfare, tracing its roots and detailing how it influences the treatment of aquatic animals in research settings. Part IV shifts the focus to the sentience and ethical considerations surrounding aquatic animals by emphasizing the need for comprehensive ethical arguments to guide our treatment of these beings. Part V offers potential pathways for reform by presenting international perspectives, which provide a stronger understanding of the issue, and proposing practical solutions for legislative change. Finally, Part VI concludes by underlining the urgent need to address speciesism in regulations that govern the use of animals in research.

II. BACKGROUND

Countless animal species inhabit aquatic environments.[8] Certain aquatic animals, such as fish, reside exclusively underwater throughout

(Mar. 16, 2011), https://mercyforanimals.org/blog/scientists-show-fish-feel-pleasure-and-pain/ (accessed Feb. 24, 2024).

[5] Brown, *supra* note 4, at 14.

[6] Robert Sanders, *Speciesism, like Racism, Imperils Humanity and the Planet*, BERKELEY NEWS (Jan. 9, 2023), https://news.berkeley.edu/2023/01/09/speciesism-like-racism-imperils-humanity-and-the-planet (accessed Jan. 30, 2024).

[7] *See* Brown, *supra* note 4, at 1–3 (arguing, in part, that the pervasive belief that fish are lacking in intelligence and the capability to suffer explains the "lack of political or social will to promote fish welfare").

[8] *See* Camilo Mora et al., *How Many Species Are There on Earth and in the Ocean?*, PLOS BIOLOGY, 1, 5 (Aug. 2011) https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.1001127 (accessed Jan. 31, 2024) (estimating that 91% of marine species remain unidentified).

their entire life cycle.[9] Other species, like toads and salamanders, may utilize surface waters as juveniles or exclusively during breeding seasons.[10] Some aquatic species, those dwelling in the deep ocean for example, complete their entire life cycle in the depths; whereas others, such as water striders, navigate along the water's surface throughout their lives.[11] Ultimately, aquatic species encompass a range of animals, including: "finfish, amphibians, marine mammals, crustaceans, reptiles, mollusks, aquatic birds, aquatic insects, and even animals like starfish, sponges, and coral."[12]

The number of fish species surpasses the combined total of all other vertebrate species.[13] Fish are among the most utilized species in scientific research.[14] In research laboratory settings, aquatic animals encounter challenges distinct from their terrestrial counterparts.[15] Captive environments must carefully replicate the intricate conditions of their natural habitats, including water quality, temperature, salinity, and oxygen levels.[16] The social dynamics and behaviors of aquatic animals, closely tied to their ecosystems, must also be considered.[17] Disruptions to these complex structures can lead to chronic stress, underscoring the need for meticulous care and attention to the well-being of aquatic animals in research settings.[18]

Addressing speciesism as a form of discrimination in animal welfare laws works to honor and protect the inherent worth of animals. It allows legislators to enact and enforce laws that acknowledge sentience in animals and protect their welfare interests. Laws and regulations that emphasize the innate worth of nonhuman animals send a message: these beings have interests that deserve protection, for their own benefit.[19] Eradicating speciesism in animal welfare laws challenges the

---

9 Louis A. Helfrich et al., *What Is Aquatic Biodiversity; Why Is It Important?*, VIRGINIA COOP. EXTENSION (2019), https://www.pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/420/420-520/CNRE-77.pdf (accessed Jan. 30, 2024).

10 *Id.*

11 *Id.*

12 Kathy Hessler & Amy P. Wilson, *Tipping the Scales: How Law and Policy Fail Aquatic Animals*, CTR. FOR ANIMAL L. STUD., LEWIS & CLARK L. SCH. (Jan 27, 2021), https://law.lclark.edu/live/news/45101-tipping-the-scales-how-law-and-policy-fail-aquatic (accessed Jan. 30, 2024).

13 Brown, *supra* note 4, at 1.

14 *Id.*

15 Christian Lawrence et al., *Aquatics*, *in* MGMT. ANIMAL CARE & USE PROGRAMS RSCH,, EDUC., & TESTING, 559, 575 (R.H. Weichbrod et al. eds., 2d ed. 2018).

16 *Id.* at 560-75.

17 *See* Brown, *supra* note 4, at 9–11 (providing examples of diverse fish species' social capabilities, which vary widely depending on the species' ecological role and habitat).

18 Pamela Prentice et al., *Exploiting Animal Personality to Reduce Chronic Stress in Captive Fish Populations*, FRONTIERS VETERINARY SCI.,1, 2, 10 (Dec. 2022) https://www.frontiersin.org/articles/10.3389/fvets.2022.1046205/full (accessed Jan. 31, 2024).

19 *See* TIERSCHUTZGESETZ [TSCHG] [ANIMAL WELFARE ACT] Dec. 16, 2005, SR 455, art. 3 (Switz.) ("dignity means the inherent worth of the animal that must be respected when dealing with it").

notion that certain species exist for human use and elevates nonhumans to the status of individuals with their own intrinsic value. Dismantling speciesist ideologies embedded in legal frameworks encourages society to embrace the idea that humans and other animals both possess the capacity for experiences, emotions, and the ability to perceive pain and joy.[20]

A new legal system that explicitly addresses speciesism may provide a basis for holding individuals and entities accountable for their mistreatment or exploitation of animals. The significance of addressing speciesism is intimately tied to meeting and, ideally, exceeding public expectations, which often evolve in response to changing ethical and cultural norms.[21] As awareness grows regarding the ethical considerations associated with speciesism, the public might increasingly expect institutions, businesses, and policymakers to take measures that promote the fair and humane treatment of sentient beings.

III. THE ANIMAL WELFARE ACT AND ITS LIMITATIONS

A. OVERVIEW OF THE ANIMAL WELFARE ACT'S PURPOSE AND PROVISIONS

The Animal Welfare Act is a federal statute governing the humane care and handling of certain animals.[22] When enacted by Congress on August 24, 1966, it was originally referred to as the Laboratory Animal Welfare Act.[23] The primary intent of the legislation was to thwart the sale of stolen household cats and dogs to laboratories for research purposes.[24] It also aimed to guarantee that both dealers and research facilities adhered to humane treatment and care standards when utilizing animals.[25] Today, within the AWA, the term "research facilities" encompasses entities engaged in "research, tests, or experiments" involving live animals.[26] Research facilities undergo periodic inspections, maintain records, submit annual reports to the Animal and Plant Health

---

[20] *See generally Animal Sentience*, RSPCA, https://science.rspca.org.uk/sciencegroup/sentience (accessed Jan. 29, 2024) ("The RSPCA and others are hoping that there will soon be legislation enshrining the concept of animal sentience in law, so that all government departments would have to pay proper regard to (i.e. consider the impact on) the welfare of sentient animals when developing any policies in any area of life"); *see also infra* Section V (discussing the capacity for sentience and other range of emotions demonstrated in reptiles).

[21] *See generally* Lucius Caviola et al., *The Moral Standing of Animals: Towards a Psychology of Speciesism*, 116 J. PERSONALITY & SOC. PSYCH., 1011, 1018-19 (2018) ("Similarly, because speciesist attitudes predominate in society, we predicted that actively open-minded people, people who are more willing to change their beliefs [ ] and think beyond the currently accepted norms, are more likely to endorse anti-speciesism").

[22] Animal Welfare Act of 1966, 7 U.S.C. § 2131 (2015).

[23] National Agricultural Library, *Animal Welfare Act Timeline*, U.S. DEPT. OF AGRIC., https://www.nal.usda.gov/collections/exhibits/awahistory/list (accessed Jan. 31, 2024).

[24] *Id.*

[25] Act of 1966, Pub. L. No. 89-544, 80 Stat. 352 (current version at 7 U.S.C. § 2143).

[26] 7 U.S.C. § 2132(e).

Inspection Service (APHIS), and provide training on humane practices to personnel involved in animal care and treatment.[27] Further, research facilities must secure registration, a process requiring compliance with AWA regulations and completion of an optional pre-registration inspection.[28] Since 2021, once research facilities complete the process and receive approval, registration lasts indefinitely.[29] Agricultural research institutions, elementary schools, and secondary schools are exempt from registration requirements.[30]

Each research facility often establishes one Institutional Animal Care and Use Committee (IACUC), responsible for reviewing the facility's compliance with AWA regulations and reporting certain violations to APHIS (for nonfederal facilities) or the head of the federal agency (for federal research facilities).[31] The House and Senate Agriculture Committees maintain the primary legislative oversight regarding the AWA and its amendments; APHIS is the regulatory agency responsible for administering the Act.[32] Administration includes: (1) formulating and updating regulations, (2) licensing, registration, inspection, and investigation of potential violations, and (3) the enforcement of AWA provisions for the relevant authorities.[33] APHIS's regulatory standards have drawn criticism for being both lax and obsolete, prompting concerns from the House and Senate Agriculture Committees regarding the persistent mishandling of APHIS's Animal Care program.[34] Instances of extended and unexplained delays by APHIS in responding to clear violations of the AWA have resulted in sickness and fatalities of numerous animals under its jurisdiction.[35] A number of Congressional leaders have written letters to APHIS advocating for heightened supervision and enforcement measures for licensees and registrants.[36]

---

27 7 U.S.C. § 2140; 7 U.S.C. § 2143; 7 U.S.C. § 2146.

28 7 U.S.C. § 2136; Animal and Plant Health Inspection Service, *Animal Welfare Inspections*, U.S. DEPT. OF AGRIC., https://www.aphis.usda.gov/aphis/ourfocus/animalwelfare/awa/ct_awa_inspections (accessed Feb. 11, 2024).

29 CONG. RSCH. SERV., R47179, THE ANIMAL WELFARE ACT: BACKGROUND AND SELECTED ISSUES 4 (July 14, 2022) [hereinafter CRS AWA 2022].

30 *Id.*

31 *Id.* at 6.

32 *Id.* at 1.

33 *Id.*

34 *Id.* at 9; CONG. RSCH. SERV., R47179, THE ANIMAL WELFARE ACT: BACKGROUND AND SELECTED ISSUES 4 (Feb. 8, 2023); *see* Animal and Plant Health Inspection Service, *About Animal Care*, U.S. Dept. of Agric., https://www.aphis.usda.gov/aphis/ourfocus/animalwelfare/usda-animal-care-overview (last modified Sept. 14, 2023) (Animal Care is the APHIS body that undertakes the regulatory duties of the AWA).

35 CRS AWA 2022, *supra*, note 29, at 9.

36 *See* Letter from Mark Warner & Tim Kaine, U.S. Senators, to Kevin Shea, APHIS Adm'r (Mar. 31, 2022) ("Congress has provided USDA with broad authority to apply penalties to violators of the Animal Welfare Act. To our knowledge, APHIS has not yet exercised such authority despite Envigo's repeated failures in providing adequate care to the 5,000 dogs entrusted to its care… In the face of repeated, serious violations by the facility, it is our strongly-held belief that USDA must pursue aggressive enforcement

In 2021, a total of 122 APHIS animal welfare inspectors were tasked with overseeing nearly 12,000 AWA licensees and registrants.[37] The reported number of inspections by the U.S. Department of Agriculture (USDA) was 7,670, indicating that around 35% of AWA licensees and registrants were not inspected during that period.[38]

B. CATEGORIES OF ANIMALS EXPLICITLY MENTIONED IN THE ACT

The original 1966 legislation specifically targeted six types of live animals used in research: dogs, cats, nonhuman primates, guinea pigs, hamsters, and rabbits.[39] Amendments in 1970 expanded the definition of "animal" to any "warm-blooded animal, as the Secretary may determine is being used, or is intended for use, for research, testing, experimentation, or exhibition purposes."[40] The amendments also outlined specific warm-blooded animals that would be exempt from the Act's protection, namely "horses not used for research purposes and other farm animals" involved in food and fiber production.[41] In 2002, Congress amended the definition of "animal" to explicitly place birds not bred for research, and not otherwise excluded from regulation, under the protection of the AWA.[42] Presently, the AWA extends its coverage to any live or deceased warm-blooded animal—as determined by the USDA—including: dogs, cats, nonhuman primates, guinea pigs, hamsters, and rabbits for purposes of research, exhibition, or as pets.[43] The Act's statutory definition of "animal" excludes birds, as well as rats and mice, bred for research.[44]

The 1976 House Congressional Record exposes the dialogue Congress engaged in regarding the AWA's emphasis on specific warm-blooded animals susceptible to exploitation.[45] The discussion considered events like the Annual National Hard Crab Derby in Crisfield, Maryland; the chairman of the Committee on Agriculture explicitly stated that because crabs were neither mammals nor warm-blooded, they were not

---

actions"); *see also* Letter from Mike Quigley, U.S. Representative, to Kevin Shea, APHIS Adm'r (Apr. 27, 2020) ("The massive public attention to 'Tiger King' has demonstrated that there is substantial interest among Americans in holding animal abusers accountable, and we believe the federal government must use this moment to do just that. As we continue our work in Congress to strengthen protections for animals, we urge your agency to uphold those that are already federal law.").

37 CRS AWA 2022, *supra* note 29, at 10.

38 *Id.*

39 Act of 1966, Pub. L. No. 89-544, 80 Stat. 350 (current version at 7 U.S.C. § 2132).

40 Animal Welfare Act of 1970, Pub. L. No. 91-579, 84 Stat. 1560-61 (current version at 7 U.S.C. § 2132).

41 Animal Welfare Act of 1970, Pub. L. No. 91-579, 84 Stat. 1561 (current version at 7 U.S.C. § 2132).

42 Farm Security and Rural Investment Act of 2002, Pub. L. No. 116 Stat. 107–171.

43 7 U.S.C. § 2132(g) (2013).

44 7 U.S.C. § 2132(g) (2013).

45 122 Cong. Rec. 2855-2856 (1976).

considered animals per the AWA.[46] The chairman again emphasized the protection of warm-blooded animals when asked whether the practice of shipping oysters and clams for exhibition purposes would be subject to the Act.[47] He confirmed that the Act did not cover "seafood" nor any "aquatic life except that which consists of warm-blooded animals or mammals."[48]

i. The "Warm-blooded" Issue

Warm-blooded organisms, scientifically termed homeotherms, internally adjust their body temperature to a specific thermal set-point using adaptations that balance heat loss and gain.[49] In contrast, cold-blooded organisms, scientifically termed poikilotherms, do not produce internal heat.[50] Essentially, being cold-blooded denotes that the animal's body temperature mirrors that of their environment.[51] There has been a prevailing belief that, apart from marine mammals, all aquatic animals have cold blood.[52] However, for more than five decades, scientists have been aware that not all fishes are cold-blooded.[53] A notable example is the opah, or moonfish, the first fish discovered with warm blood.[54] Opah effectively regulate their body temperature by employing countercurrent heat exchange, similar to warm-blooded mammals.[55] Scientists have also identified other aquatic species that employ regional endothermy. For instance, sharks within the Lamnidae family employ specialized structures called rete mirabile, a network of parallel arteries and veins.[56] This network facilitates the exchange of heat

---

46 *Id.*

47 *Id.* at 2856.

48 *Id.*

49 P. Frappell & K. Cummings, *Homeotherms*, *in* 3 ENCYCLOPEDIA ECOLOGY 429, 429 (Brian Fath ed., 2nd ed. 2019); *Warm-bloodedness,* ENCYCLOPEDIA BRITANNICA, https://www.britannica.com/science/warm-bloodedness (last accessed Feb. 12, 2024).

50 Ilo Hiller, *Warm- And Cold-Blooded Animals*, TEX. PARKS & WILDLIFE DEPT.: YOUNG NATURALIST, https://tpwd.texas.gov/publications/nonpwdpubs/young_naturalist/animals/warm_and_cold_blooded_animals (accessed Feb. 12, 2024).

51 *Id.*

52 *See* Chelsea Harvey, *Scientists Have Discovered the First Fully Warm-Blooded Fish*, WASH. POST (May 14, 2015, 6:30 PM), https://www.washingtonpost.com/news/energy-environment/wp/2015/05/14/scientists-have-discovered-the-first-warm-blooded-fish (accessed Feb. 12, 2024) ("It's one of the most basic biology facts we're taught in school growing up: Birds and mammals are warm-blooded, while reptiles, amphibians, and fish are cold-blooded.").

53 Lucy Harding, *We Solved the Mystery of Why Some Fish Are Warm-Blooded*, THE CONVERSATION (July 5, 2021, 5:17 AM), https://theconversation.com/we-solved-the-mystery-of-why-some-fish-are-warm-blooded-163774 (accessed Feb. 12, 2024).

54 Chelsea Harvey, *supra* note 52; *Opah Seafood Recommendation*, MONTEREY BAY AQUARIUM SEAFOOD WATCH, https://www.seafoodwatch.org/recommendation/opah/opah-992 (accessed Feb. 24 2024).

55 Wegner et al., *supra* note 3.

56 *Are Sharks Warm-Blooded?*, OCEANS RSCH. NEWS (Feb. 28, 2023), https://www.oceansresearch.com/are-sharks-warm-blooded (accessed Feb. 12, 2024); Francis G. Carey et al., *Warm-Bodied Fish,* 11 AM. ZOOLOGIST 135, 137 (1971).

between warm blood generated by muscle activity and cooler blood returning from the gills.[57] Many species of tuna also display regional endothermy, utilizing a vascular heat exchanger akin to that seen in sharks.[58]

ii. Health Research Extension Act of 1985

Live vertebrate animals, including those not covered under the AWA like rodents and fish, fall under the jurisdiction of the Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals (PHS Policy).[59] The Health Research Extension Act of 1985 provides the statutory basis for the PHS Policy.[60] Integral to the PHS Policy is the requirement for an oversight committee dedicated to animal research.[61] Institutions conducting live vertebrate animal research are subject to the PHS Policy and must maintain an Animal Welfare Assurance with the Office of Laboratory Animal Welfare (OLAW) at the National Institutes of Health (NIH), the principal federal sponsor of biomedical research.[62] Dealing with the welfare of vertebrate animals used by PHS agencies, the PHS Policy is applicable to the NIH, the Centers for Disease Control and Prevention (CDC), U.S. Food and Drug Administration (FDA), and others within the Department of Health and Human Services.[63] Through interagency agreements, the PHS Policy extends its reach to research supported by the Department of Veterans Affairs (VA), the National Science Foundation, and the National Aeronautics and Space Administration (NASA).[64] The PHS Policy also applies to research facilities that receive federal funding from a PHS agency.[65]

Institutions governed by the PHS Policy must establish an IACUC, which plays a role in reviewing and inspecting animal research and facilities within the institution.[66] The IACUC ensures that research

---

57 OCEANS RSCH. NEWS, *supra* note 56.

58 *Id.;* Robert Edward Shadwick, *How Tunas and Lamnid Sharks Swim: An Evolutionary Convergence*, AM. SCIENTIST, https://www.americanscientist.org/article/how-tunas-and-lamnid-sharks-swim-an-evolutionary-convergence (accessed Feb. 13, 2024).

59 CONG. RSCH. SERV., ANIMAL USE IN FED. BIOMEDICAL RSCH: A POL'Y OVERVIEW (2021); U.S. DEP'T OF HEALTH & HUM. SERVICES & OFFICE OF LAB. ANIMAL WELFARE NAT'L INST. OF HEALTH, No. 15-8013, PUBLIC HEALTH SERVICE POLICY ON HUMANE CARE AND USE OF LABORATORY ANIMALS 7-8 (2015) [hereinafter PHS Policy].

60 PHS Policy, *supra* note 59, at 7-8.

61 *Id.* at 11.

62 ANIMAL USE IN FED. BIOMEDICAL RSCH., *supra* note 59; *see* Office of Laboratory Animal Welfare, *Obtaining an Assurance, Nat'l Inst. Of Health*, https://olaw.nih.gov/guidance/obtaining-an-assurance.htm (last visited Mar. 19, 2024) ("OLAW oversees PHS-funded animal activities by the authority of the Health Research Extension Act of 1985 and the PHS Policy on Humane Care and Use of Laboratory Animals (Policy)").

63 *Id.*

64 *Id.*

65 *Id.*

66 PHS Policy, *supra* note 59, at 11-12.

proposals align with AWA requirements, minimize animal discomfort, provide adequate veterinary care, and maintain suitable living conditions.[67] Additionally, IACUCs must assure program uniformity with the Guide for the Care and Use of Laboratory Animals (The Guide) and adhere to the American Veterinary Medical Association's euthanasia guidelines.[68] The Guide sets the standard for laboratory animal and research management practices and provides suggestions based on the procedure and animal type.[69] The PHS Policy mandates that institutions structure their animal care and use programs in accordance with The Guide.[70] A number of research institutions create unified IACUCs to meet the criteria of both the AWA and PHS Policy regulatory frameworks.[71] Ultimately, the PHS Policy only covers vertebrates and applies to institutions that receive federal funding from a PHS agency, and therefore it does not resolve the issue of the AWA's exclusion of aquatic animals in its definition of animal. Unlike the AWA, which has APHIS as an enforcement agency, the PHS Policy fails to include an enforcement agency for routine inspections.[72] It trusts that the grantees themselves will comply with the PHS Policy.[73] Further, there is no citizen suit provision, so external enforcement is not an option.[74]

C. IMPLICATIONS OF EXCLUDING NON-MARINE MAMMAL AQUATIC ANIMALS UNDER THE AWA

First, research facilities engaged in the use of aquatic animals operate within a framework distinct from facilities handling regulated animals under the AWA. In the absence of specific legal requirements, these research facilities face no regulatory constraint in animal welfare.[75] They are not required to establish internal oversight bodies like Animal Care Committees or to evaluate animal care, use, and research practices.[76] Unlike their counterparts working with covered animals, they are not obligated to report AWA violations to the appropriate federal agency.[77] They are not compelled to implement measures to minimize pain and distress in animals, consult with a veterinarian when planning potentially distressful practices, nor adhere to minimum standards for handling, housing, feeding, sanitation, and veterinary

---

67 ANIMAL USE IN FED. BIOMEDICAL RSCH., *supra* note 59.

68 *Id.*

69 *Id.*

70 *Id.*

71 *Id.*

72 Henry Cohen, *The Animal Welfare Act*, 2 J. ANIMAL L. 12, n. 9 (2006).

73 *Id.*

74 Kathy Hessler, *Animal Welfare Act: Excluded Animals*, 25 ANIMAL L. 203, 219 (2019); Pamela Frasch, *Gaps in US Animal Welfare L. for Laboratory Animals: Perspectives from an Animal Law Attorney*, 57 ILAR J. 285, 287 (2016).

75 *See generally* 7 U.S.C § 2131-2132 (omitting mention of aquatic animals).

76 7 U.S.C § 2143.

77 7 U.S.C § 2143.

care.[78] Unlike covered animals, aquatic animals may be used in more than one major operative experiment without the necessity of scientific justification.[79] These facilities are exempt from routine inspections by APHIS and are not subject to penalties such as warnings, animal confiscation, fines, cease-and-desist orders, license suspension, and license revocation as outlined in 7 U.S.C. 2149.[80] Finally, they are not required to count or report the animals to the USDA.[81]

IV. SPECIESISM WITHIN THE CONTEXT OF AQUATIC ANIMAL WELFARE

Speciesism is a pervasive and insidious bias that stands as an enduring barrier to justice. It is rooted in a hierarchy that places those in positions of power over those who are marginalized.[82] It is defined as a prejudice favoring the interests of one's own species over those of others.[83] The thought pattern of speciesists is identical to the thought pattern of other biased humans:

> Racists violate the principle of equality by giving greater weight to the interests of members of their own race when there is a clash between … [interests]. Sexists violate the principle of equality by favoring the interests of their own sex. Similarly, speciesists allow the interests of their own species to override the greater interests of members of other species.[84]

A. HISTORICAL ROOTS

Humanity has yet to liberate itself from the enduring impact of beliefs that held sway over Western thought for centuries.[85] The biblical story of creation tells us that man was meant to rule over all the fish in the sea.[86] While there are sporadic tales in the Old Testament that promote kindness toward nonhumans, there is no substantial challenge to the notion that humans are considered the apex of God's creation, designed to dominate all other species.[87] Another historical tradition within Western philosophical thinking about animals emerges from

---

78 7 U.S.C § 2143.

79 7 U.S.C § 2143.

80 7 U.S.C § 2144; 7 U.S.C. § 2149.

81 7 U.S.C § 2146(a).

82 Sanders, *supra* note 6.

83 *Speciesism*, Merriam-Webster.com, https://www.merriam-webster.com/dictionary/speciesism (accessed Feb. 11, 2024).

84 Peter Singer, Animal Liberation: The Definitive Classic of the Animal Movement 9 (4th ed. 2009) [hereinafter Singer Fourth Edition].

85 Peter Singer, Animal Liberation Now: The Definitive Classic Renewed 209 (2023) [hereinafter Singer Renewed].

86 *Genesis* 1:26 (Pentateuch and Haftorahs).

87 Singer Renewed, *supra* note 85, at 211–12.

Greece.[88] Aristotle maintained that animals exist to serve humans.[89] He formalized the notion of the great chain of being, where humans exist at the top of a hierarchy of complexity, followed by (other) apes, then reptiles, then amphibians, then fish.[90] Aristotle himself performed experiments on living animals.[91]

Christianity, which became dominant under the Roman Empire, eventually merged Hebrew and Greek perspectives on animals.[92] It reinforced, in the Roman world, the concept of the special position of the human species in creation, emphasized by the belief in the afterlife exclusively reserved for human beings.[93] Consequently, Christianity also brought forth the notion that human life alone is sacred.[94] This same doctrine exacerbated the submissive status assigned to nonhumans in Hebrew scriptures.[95] The act of killing human beings in the Roman games was condemned under the rule of Christianity, but the moral standing of murdering and torturing nonhumans continued unaffected.[96] Although a number of early Christians—including St. Francis of Assisi—voiced concern for the welfare of nonhumans, mainstream Christian thought remained speciesist.[97] St. Thomas Aquinas, one of the most influential Christian thinkers, wrote that it does not matter "how man behaves to animals, because God has subjected all things to man's power."[98]

René Descartes, a 17th century French philosopher, is now considered to be one of the founders of modern Western philosophy.[99] He argued that animals were mere machines, lacking the ability to experience thought and feeling.[100] In addition to his philosophical pursuits, Descartes engaged in scientific experiments involving vivisections, during which he removed the hearts of live fish to observe their ability to

---

88 *Id.* at 212.

89 *Id.*

90 Sean Nee, *The Great Chain of Being*, 435 NATURE 429, 429 (2005); William F. Bynum, *The Great Chain of Being After Forty Years: An Appraisal*, *in* 13 HISTORY OF SCIENCE 1, 3–4 (1975).

91 Rachel Hajar, *Animal Testing and Medicine*, 12 HEART VIEWS 42, 42 (2011).

92 Singer Renewed, *supra* note 85, at 213.

93 *Id.* at 215.

94 *Id.*

95 *Id.*

96 *Id.* at 216–17.

97 *Id.* at 218–20; ST. FRANCIS OF ASSISI: HIS LIFE AND WRITINGS AS RECORDED BY HIS CONTEMPORARIES 140–41 (Leo Sherley-Price trans., 1959).

98 ST. THOMAS AQUINAS, SUMMA THEOLOGICA 2445 (Fathers of the English Dominican Province trans., Benziger Bros. ed. 1947) (c. 1265–1274).

99 Justin Skirry, *René Descartes (1596—1650)*, INTERNET ENCYCLOPEDIA PHIL., https://iep.utm.edu/rene-descartes/#:~:text=René%20Descartes%20(1596—1650),of%20the%20new%2C%20mechanistic%20sciences (accessed Feb. 1, 2024).

100 Raymond Giraud, *Rousseau and Voltaire: The Enlightenment and Animal Rights,* BETWEEN SPECIES 4, 4 (1985).

beat longer than those of terrestrial animals after removal.[101] In the 18th century, the Enlightenment displayed glimmers of hope for animals, where philosophers like Voltaire condemned the savagery of live animal experimentation.[102] Alexander Pope also rejected the practice of cutting open conscious animals for experimental purposes.[103] Still, the prevailing belief remained that animals were a means to an end for humans.[104] Hence, when conversations regarding the bestowal of legal rights upon animals emerged in the 19th century, they were greeted with ridicule.[105] It was not until Charles Darwin's *The Descent of Man* that humans began to seriously understand our relationship with other animals, as descendants from them, and our modern understanding of nature emerged.[106] But still today, not much has changed in the actual treatment of nonhuman animals, where humans largely advocate for their interests only when they do not conflict with human interests.[107]

B. HOW SPECIESISM AFFECTS THE TREATMENT OF AQUATIC ANIMALS

Unlike terrestrial animals, who have a more visible presence, aquatic animals can be viewed as invisible victims of speciesism due to their environment and difficulties in observing their behavior. The generally negative perception of fish is ingrained in scientific dogma, tracing back to the early days of Western scientific investigation.[108] There has been an anthropocentric narrative that portrays vertebrate evolution linearly, culminating in humans at the apex, asserting increasing complexity and behavioral advances at each evolutionary stage.[109] Fish, considered "primitive" vertebrates, are characterized as having simple brains with limited neural circuits controlling basic behavior.[110]

Fish have been utilized in experiments for at least 200 years.[111] Acute toxicity tests with fish were first reported in 1863.[112] The main purpose of the static acute toxicity test is to ascertain the median

---

101 Letter from René Descartes to Plempius (1683), in *Selected Correspondence of Descartes* 59, 60 (Jonathan Bennett ed. 2017) (1638-1640).

102 Giraud, *supra* note 100 at 4–6, 9.

103 Andreas-Holger Maehle, *Literary Responses to Animal Experimentation in Seventeenth- and Eighteenth-Century Britain,* 34 MED. HIST. 27, 41 (1990).

104 Singer Renewed, *supra* note 85, at 230.

105 *Id.*

106 *Id.* at 232.

107 *Id.* at 238.

108 Brown, *supra* note 4, at 4.

109 *Id.*

110 *See id.* (explaining that fish are undeniably the most ancient vertebrates, but the term "primitive" only applies in the context of their extensive existence on Earth for over 500 million years, with all other vertebrates tracing their evolution back to a shared fish-like ancestor around 360 million years ago).

111 JOSEPH B. HUNN, U.S. FISH & WILDLIFE SERV., HISTORY OF ACUTE TOXICITY TESTS WITH FISH, 1863–1987 1 (1989).

112 *Id.*

concentrations of chemicals that prove lethal to aquatic organisms.[113] The minnow species, chosen for its susceptibility to "disturbing influences," and the goldfish species, selected for its "tenacity for life," were early victims of experiments assessing the impacts of chemicals commonly used in dye works.[114] In 1925, the two species were used to determine the toxicity of runoff from lead and mine tailings.[115] From early experiments, researchers identified six characteristic signs of poisoning in fish: irritation, inactivity, erratic swimming behavior, oxygen hunger, loss of equilibrium, and increased or decreased respiration rate.[116] One such toxicity test serves as an example of the toll exacted on aquatic animals: 150 goldfish were confined in individual glass jars and faced relentless exposure to various quantities of sodium selenite.[117] They initially rejected food and, if consumed, regurgitated it.[118] Such behavior was succeeded by pronounced anorexia lasting for several days.[119] As the poisoning progressed, the fish descended into states of heightened lethargy and feebleness.[120] Prior to death, the fish lost coordination and suffered body spasms.[121] The initial fatality occurred on the eighteenth day, with subsequent fish enduring the toxicity for up to forty-six days, essentially spending their entire lives under the persistent influence of poison.[122]

The arrival of organochloride insecticides brought in a new age of aquatic toxicology in the 1940s.[123] In 1948, the U.S. Public Health Service established its own Aquatic Biology Section laboratory to study toxic pollutants in fresh water.[124] During the early 1950s, scientists poisoned brook trout, brown trout, rainbow trout, bluegill, yellow perch, and goldfish with more than 4,000 chemicals to screen for toxicity.[125] A significant rise in the number of federal agencies engaged in aquatic toxicological research occurred in the late 1950s.[126] By 1959, the U.S. Fish & Wildlife Service established the Fish Control Laboratory and the Fish-Pesticide Laboratory.[127]

---

113 *Id.*

114 *Id.*

115 Kathleen Carpenter, *On the Biological Factors Involved in the Destruction of River-Fisheries by Pollution Due to Lead-Mining*, 12 ANNALS APPLIED BIOLOGY 1, 12 (1925).

116 David L. Belding, *Toxicity Experiments with Fish in Reference to Trade Waste Pollution*, 57 TRANSACTIONS AM. FISHERIES SOC'Y 100, 106–07 (1927).

117 M. M. Ellis et al., *Selenium Poising in Fishes*, 36 PROC. SOC'Y FOR EXPERIMENTAL BIOLOGY & MED. 519, 519. (1937).

118 *Id.*

119 *Id.*

120 *Id.*

121 *Id.* at 520.

122 *Id.* at 519.

123 Hunn, *supra* note 111, at 2.

124 *Id.*

125 *Id.* at 3.

126 *Id.*

127 *Id.* at 4.

In addition to toxicology testing, biomedical research relies on the use of nonhumans to understand diseases for the benefit of humans without exposing humans to potential risks.[128] Although mammals have largely been the subjects of experiments in this field of research, efforts to reduce research costs and increase efficiency led to a transition to invertebrate and fish species.[129] Zebrafish, a tropical freshwater species, were introduced in the late 1960s as a vertebrate model system and have since been experimented on in the fields of "developmental biology, pharmacology and toxicology, ecotoxicology, veterinary sciences, evolution biology, nanotechnology and nanomedicine, human disease, vaccination, and food safety."[130] Researchers regularly refer to zebrafish as "tools" to learn more about human beings.[131]

The application of welfare concepts to fish has received less attention than that paid to mammals.[132] Humans tend to anthropomorphize terrestrial animals—attributing human-like traits and emotions to them—but fail to do the same for aquatic animals due to phylogenetic differences, which leads to a lack of empathy and neglect.[133] Furthermore, the public tends to view aquatic animals as less sentient and less important than terrestrial animals, which has resulted in less concern for their welfare, despite the fact humans and fish interact in greater numbers compared to humans and mammals.[134] This is significant because public opinion influences public policy.[135]

V. AQUATIC ANIMALS: SENTIENCE AND ETHICAL CONSIDERATIONS

A. CURRENT UNDERSTANDING OF AQUATIC ANIMAL SENTIENCE

Defining and measuring sentience is a challenging endeavor and has sparked ongoing debates among scientists and philosophers.[136] In an ethical context, sentience can be described as the capacity to undergo both pleasure and pain.[137] Researchers have also described sentience as

---

128 ZEBRAFISH IN BIOMEDICAL RESEARCH 3 (Yusuf Bozkurt, ed. 2020).

129 *Id.*

130 Aryelle Canedo Pareira et al., *Zebrafish (Danio Rerio) Meets Bioethics: The 10Rs Ethical Principles in Research*, 23 CIÊNCIA ANIMAL BRASILEIRA e-70884 (2022).

131 Kanandra Taisa Bertoncello & Carla Denise Bonan, *Zebrafish as a Tool for the Discovery of Anticonvulsant Compounds from Botanical Constituents,* 908 EUR. J. PHARMACOLOGY 174342, 174350 (2021); Jeroen Vierstraete et al., *Zebrafish As An In Vivo Screening Tool To Establish PARP Inhibitor Efficacy* 97 DNA REPAIR 103023, 103024 (2021).

132 *Guidelines On: The Care and Use of Fish in Research, Teaching, and Testing*, CANADIAN COUNCIL ON ANIMAL CARE, 13 (2005).

133 Brown, *supra* note 4, at 1–2.

134 *Id.* at 1.

135 *Id.*

136 *Id.* at 4.

137 *Id.*

encompassing all felt experiences, including "feelings of warmth, comfort, fatigue, hunger, thirst, boredom, excitement, distress, anxiety, pain, pleasure and joy."[138] A being's ability to reflect on their own feelings or the feelings of others is not a requirement for sentience.[139] In sum, "to be sentient is simply to have feelings."[140] Relatedly, fish experience pain in a comparable manner to other vertebrates.[141] Unequivocal evidence supports the presence of all the necessary components associated with pain perception, also known as nociception, in fish.[142] They exhibit an ability to rapidly learn and associate specific objects, smells, and contexts with potential harm and avoid these stimuli in the future.[143] Additionally, reptiles are cold-blooded vertebrate animals—some of which are aquatic or semi-aquatic—that demonstrate a range of emotions and states indicative of sentience, including "anxiety, stress, distress, excitement, fear, frustration, pain, and suffering."[144] There is also evidence of sentience in amphibians.[145]

Sentience among aquatic animals extends beyond vertebrates. The difficulty in measuring sentience in invertebrates stems from the differences in their brain structures compared to vertebrates.[146] However, it would be scientifically unsound to dismiss invertebrate sentience solely based on the distinct organization of their brains compared to vertebrates.[147] To measure sentience in invertebrates, scientists have relied on behavioral and cognitive criteria, including the existence of nociceptors, integrative brain regions, connective neural pathways, responses to anesthetics, motivational tradeoffs, self-protective behavior, and associative learning.[148] There is evidence that certain decapod crustaceans, including crabs, lobsters, and crayfish, are sentient beings.[149] There is also very strong evidence of sentience in certain cephalopod mollusks like octopuses, as well as substantial evidence of sentience in squid and cuttlefish.[150]

---

138 Andrew Crump et al., *Sentience in Decapod Crustaceans: A General Framework and Review of the Evidence*, 32 ANIMAL SENTIENCE 1, 2 (2022).

139 *Id.* at 2.

140 Jonathan Birch et al., REVIEW OF THE EVIDENCE OF SENTIENCE IN CEPHALOPOD MOLLUSCS AND DECAPOD CRUSTACEANS 12 (LONDON SCH. ECON. & POL. SCI., 2021).

141 Brown, *supra* note 4, at 14.

142 *Id.* at 12.

143 *Id.* at 13.

144 Helen Lambert et al., *Given the Cold Shoulder: A Review of the Scientific Literature for Evidence of Reptile Sentience*, 9 ANIMALS 821, 825 (2019).

145 *See* Helen Lambert et al., *Frog in the Well: A Review of the Scientific Literature for Evidence of Amphibian Sentience*, 247 APPLIED ANIMAL BEHAV. SCI. 10559, 10563(2022) (Findings of study show an increasing trend in scientific articles that are discovering that amphibians have sentience).

146 Crump, *supra* note 138, at 3.

147 Birch, *supra* note 140, at 15.

148 *Id.* at 17.

149 Crump, *supra* note 138, at 10, 24.

150 Birch, *supra* note 140, at 22.

B. ETHICAL AND LEGAL ARGUMENTS FOR CONSIDERING AQUATIC ANIMAL WELFARE

Granting a basic principle of equality to nonhuman animals does not mean that we must treat nonhumans in exactly the same way as humans.[151] Rather, the basic principle of equality demands equal consideration.[152] The concerns of every being impacted by an action should be taken into account and assigned equal significance to similar concerns of any other being.[153] This principle of equality implies that the consideration we extend to others—and our willingness to contemplate their interests–should not be contingent on their characteristics or abilities.[154] The specific actions prompted by our concern may vary based on the features of those affected.[155] The fundamental element involves acknowledging the interests of the being, regardless of the nature of those interests.[156] This consideration must be granted equally to every being with an interest, regardless of their species.[157] It is within the framework of this principle that speciesism, including the form that prioritizes the interests of certain nonhuman animals of a particular species over animals with similar interests but of different species, must be denounced.[158]

Sentience is assigned in part to guide decisions on the treatment and regulation of animals and to limit the actions humans can take with regard to sentient beings.[159] Sentient beings possess interests, and failing to give due consideration or neglecting these interests would be unethical.[160] Certainly, this principle forms the foundation of animal welfare legislation, supporting the well-established notion that it is ethically unacceptable to treat dogs as if they lack interest in shelter, food, water, and comfort.[161]

While the United States does not have any federal laws that recognize animal sentience, AWA regulations recognize the ability of animals to experience pain and distress; it requires experimenters to minimize such states.[162] Yet legal frameworks have not adapted to recognize and address the welfare of aquatic animals in laboratory settings, despite the compelling evidence of their ability to experience pain and distress.

---

151 Singer Fourth Edition, *supra* note 84, at 30.

152 *Id.*

153 *Id.* at 33.

154 *Id.* at 34.

155 *Id.* (Singer gives the examples of teaching a child to read and allowing pigs to roam freely with adequate food as demonstrating concern for the well-being of both).

156 *Id.*

157 *Id.*

158 *Id.* at 35.

159 Birch, *supra* note 140, at 14; James William Yeates, *Ascribing Sentience: Evidential and Ethical Considerations in Policymaking*, 12 ANIMALS 1893, 1897 (2022).

160 Birch, *supra* note 140, at 14.

161 *Id.*

162 Institutional Animal Care and Use Committee (IACUC) 9 C.F.R. § 2.31(b)(3)(i)-(ii).

Even for aquatic animals with less robust evidence of sentience, insisting on absolute certainty about their sentience as a prerequisite for incorporating their interests into legislation in the face of significant welfare risks would be unreasonable.[163]

VI. REFORM

A. INTERNATIONAL PERSPECTIVES ON AQUATIC ANIMAL WELFARE LAWS

The United States has faced criticism for lagging behind other Western countries in providing adequate protection for aquatic animals used in research.[164] Many Western nations have taken substantial strides to address the ethical concerns surrounding the use of aquatic animals in research settings based on evidence of their sentience. Canada was the first country in the world to provide protection for cephalopods used in research in 1991.[165] The European Union's (EU) Directive on the protection of animals used for scientific purposes covers all vertebrates and places cephalopods on equal footing with other animals used for research based on the scientific evidence of the species' ability to "experience pain, suffering, distress and lasting harm."[166] In 2013, each EU member state implemented the Directive into national laws.[167] The Directive makes clear that the welfare of animals will be improved via higher protective standards in line with the latest scientific developments.[168] It shows no preference for animals with warm blood over those with cold blood.[169]

The United Kingdom also has a piece of legislation dedicated solely to the protection of animals used in scientific procedures.[170] The Animals (Scientific Procedures) Act covers all vertebrates and cephalopods, and the Secretary of State reserves the right to extend the definition of animals to include invertebrates beyond cephalopods.[171] In Switzerland, the Swiss Animal Welfare Ordinance, which covers animals used in scientific research, protects vertebrates, decapods, and cephalopods.[172]

---

163 Birch, *supra* note 140, at 15.

164 Frasch, *supra* note 74, at 285.

165 *Petition Seeks to Expand Research Animal Protections in U.S*, UNIV. OF LETHBRIDGE (June 18, 2020), https://www.ulethbridge.ca/unews/article/petition-seeks-expand-research-animal-protections-us#:~:text="In%201991%2C%20cephalopods%20were%20protected,States%20still%20have%20no%20protection (accessed Feb. 4, 2024).

166 Directive 2010/63, of the European Parliament and of the Council of 22 September 2010 on the Protection of Animals Used for Scientific Purposes, 2010 O.J. (L 276) 33, 34.

167 *EU Regulations on Animal Research*, EARA https://www.eara.eu/animal-research-law (accessed Feb. 4, 2024).

168 Directive 2010/63, *supra* note 166, at 33.

169 *Id*. at 134.

170 Animals (Scientific Procedures) Act 1986, (Eng.) c. 14 § 1.

171 Animals (Scientific Procedures) Act 1986, (Eng.) c. 14 § 1-2.

172 *See* TIERSCHUTZGESETZ [TSCHG] [ANIMAL WELFARE ORDINANCE (AWO)] Apr. 23, 2008, SR 455.1, art. 112 (Switz.).

Norway implemented the EU's directive on the use of animals for scientific purposes.[173] Researchers in Norway must have respect for animals' dignity, meaning they must "respect animals' worth, regardless of their utility value, and for animals' interests as living, sentient creatures."[174] The Australian Code of Practice for the care and use of animals for scientific purposes applies to all live vertebrates and cephalopods.[175] Finally, New Zealand's Animal Welfare Act recognizes the sentience of animals, defined as any mammal, bird, reptile, fish, octopus, squid, crab, lobster, or crayfish (including freshwater crayfish).[176]

B. POTENTIAL PATHWAYS

The most obvious pathway for reform would involve the formal recognition of all aquatic animals *as animals* by including them in the Animal Welfare Act's definition of animal. Currently, proof of sentience is not a prerequisite for including terrestrial animals in the AWA, so making this change is not necessarily preconditioned by proof of sentience for aquatic animals.[177] Protecting aquatic animals whose capacity to feel pain is lacking conclusive evidence would also recognize that future research may unveil such a capacity. Once it is accepted that all "aquatic animals are in fact animals," determinations can be made about "which provisions or protections ought to apply to them."[178] At the very least, they should be listed in mandates that require basic welfare protections related to "proper nutrition, housing, veterinary care, and general handling."[179] Record-keeping requirements for all animals used in research, regardless of AWA coverage, should be mandated in the U.S.

The AWA does not even cover the most common species of animals used in labs.[180] To address these shortcomings, the United States could look to other countries with legislation dedicated solely to governing scientific research performed on animals–including non-marine aquatic

---

173 *Norwegian Legislation on Animal Experimentation*, NORCEPA, https://norecopa.no/legislation/norway (accessed Feb. 4, 2024).

174 *Ethical Guidelines for the Use of Animals in Research*, NAT'L RSCH. ETHICS COMM. (Aug. 7, 2019), https://www.forskningsetikk.no/en/guidelines/science-and-technology/ethical-guidelines-for-the-use-of-animals-in-research/ (accessed Feb. 4, 2024).

175 Australian Code of Practice for the Care and Use of Animals for Scientific Purposes (2013), Introduction (Austl.).

176 Animal Welfare Act (New Zealand) 1999 § 2(1) (NZ).

177 Alison Anderson, *The Impossibility Of Quantifying Captive Aquatic Animal Populations,* FAUNALYTICS (Jul. 20, 2022), https://faunalytics.org/the-impossibility-of-quantifying-captive-aquatic-animal-populations/ (accessed Feb. 3, 2024).

178 Hessler & Wilson, *supra* note 12.

179 *Id.*

180 Daniel Engber, *Some Animals Are More Equal Than Others*, SLATE (Apr. 11, 2016), https://slate.com/technology/2016/04/the-animal-welfare-act-may-be-50-but-its-still-ignoring-some-of-the-most-important-lab-animals.html (accessed Feb. 3, 2024).

animals.[181] The United States could also follow the lead of other countries that incorporate ethical principles and updated scientific data into the regulation of animals used for research purposes.[182]

While statutory and regulatory changes are crucial, they are time-consuming and vulnerable to political concessions that may limit their implementation. Immediate steps can be taken to improve the lives of aquatic animals used for research. Collaboration with veterinarians and utilization of scientific data can inform efforts to enhance their lives.[183] Advocates can initiate petitions "asking the USDA to engage in rulemaking to protect" aquatic animals.[184] An alternative approach that merits exploration would be a test lawsuit challenging whether the warm-bloodedness of certain aquatic animals qualifies them for AWA protection.

VII. URGENCY OF ADDRESSING SPECIESISM IN ANIMAL WELFARE LAWS

Aquatic animals represent a vast and diverse group of sentient animals. From an ethical and moral perspective, they deserve protection under laws such as the AWA, yet their use is the least regulated.[185] We are simply failing our societal responsibility to them under the primary federal legislation regarding animals in the United States.[186] Several Western countries have acknowledged the inherent value of aquatic animals, recognizing their dignity and capacity to experience pain, pleasure, and suffering.[187] On the other hand, the United States, in one of its primary laws safeguarding animals used for scientific research, has yet to formally categorize them as animals.[188] This is further evidenced by the NIH as it funds efforts to turn octopuses into the next model organism.[189] Given what is known about the sentience and welfare needs

---

181 *See* Animals (Scientific Procedures) Act 1986, *supra* note 170 (Protected animals under the ASPA include all living vertebrates, except humans or cephalopods, used for "a regulated procedure," which would include scientific experimentation); *see also* Directive 2010/63, *supra* note 166 (The EU's 2010 Directive on the protection of animals used for scientific purposes builds off of previous EU legislation that explicitly seeks to protect "vertebrate animals").

182 *See* TIERSCHUTZGESETZ [TSchG], *supra* note 172 (The Swiss Animal Welfare Act recognizes dignity in animals); *see also* Directive 2010/63, *supra* note 166 (The EU's legislation on animals used in research incorporates the latest scientific developments in animal welfare).

183 Hessler, *supra* note 74 at 221.

184 *Id.* at 222.

185 *Id.* at 216.

186 *Id.*

187 *Supra* Section VI A; Hessler & Wilson, *supra* note 12.

188 *Id.*

189 Rachel Nuwer, *An Octopus Could Be the Next Model Organism*, SCI. AM. (Mar. 1, 2021) https://www.scientificamerican.com/article/an-octopus-could-be-the-next-model-organism/# (accessed Feb. 3, 2024); *See* NATIONAL INSTITUTES OF HEALTH (NIH), REQUEST FOR INFORMATION (RFI) ON PROPOSED GUIDANCE TO ASSURED INST. ON CEPHALOPOD CARE AND

of aquatic animals used in research, as well as the ethical and moral standards that are applicable to them, it is imperative that the AWA be reformed in at least two ways. First, aquatic animals must be added to the definition of animal under the statute. Second, laboratory animal practices that ensure the welfare of aquatic animals must be adopted.

USE (Sept. 7, 2023) (The NIH appears to be acknowledging that at least certain aquatic animals are not receiving the protections they deserve.).