

Turn Down the Volume: Improved Federal Regulation of Shipping Noise Is Necessary to Protect Marine Mammals

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ABSTRACT

The public is beginning to recognize the true impacts of ocean noise on marine mammal behavior. In particular, the shipping industry, consisting of thousands of large vessels and tankers, contributes significant noise pollution by emitting loud, constant, droning, low-frequency sounds. The scientific literature has revealed the importance of reducing these noise impacts to ensure the survival of numerous depleted marine mammal populations. Under the Marine Mammal Protection Act, the Endangered Species Act, and the National Environmental Policy Act, the current legal regime is capable of addressing noise impacts from shipping activities, but these laws have not yet been utilized to regulate the industry. Despite the apparent ability to treat shipping noise as a “take” under the MMPA and ESA, NOAA Fisheries has not taken regulatory actions to enforce those take prohibitions against the shipping industry. While the availability

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of the MMPA and NEPA as tools for enforcement through litigation depend on the existence of a federal agency action, the ESA can be enforced directly against shipping vessels that disturb marine mammals through noise production. This paper proposes that legal action against shipping companies under the ESA for a “take” through ocean noise could force the federal government to initiate enforcement of the shipping industry under its delegated authority. Alternative advocacy positions exist as well, including lobbying Congress to add a citizen suit provision to the MMPA or enact a new statute requiring certain vessel design standards intended to reduce noise output. However, given the modern Congressional gridlock, ESA litigation appears to be the most viable strategy available to advance the regulation of shipping noise.

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I.

INTRODUCTION

Marine mammals across the world face numerous threats from human activities. Historically, whaling and harvesting dramatically reduced populations of many species, some to the point of extinction.¹ While direct extractions are no longer as significant, mammals are still routinely caught as bycatch of fishing activities or found entangled in fishing nets or other manmade debris.² Ships often collide with marine animals, which results in serious injuries and mortalities. Together, these threats place significant stressors on the survival of many depleted marine mammal populations.

Noise pollution from anthropogenic activity is increasingly being recognized as a serious concern for the health and survival of marine mammals.³ The most harmful acoustic noises, originating from high-frequency active sonar, have recently caused numerous

1. *See Our Whaling Pasts*, NAT'L OCEANIC & ATMOSPHERIC ADMIN., <http://sanctuaries.noaa.gov/maritime/whaling.html> [https://perma.cc/4YCS-CHET] (last visited May 5, 2017).

2. *See, e.g.*, COMM. ON POTENTIAL IMPACTS OF AMBIENT NOISE IN THE OCEAN ON MARINE MAMMALS, NAT'L RESEARCH COUNCIL, OCEAN NOISE AND MARINE MAMMALS 67–68 (2003) (identifying that bycatch from commercial fishing operations exceeds sustainable levels for 13 marine mammal species).

3. *See generally* MICHAEL JASNY ET AL., NAT. RES. DEF. COUNCIL, SOUNDING THE DEPTHS II: THE RISING TOLL OF SONAR, SHIPPING AND INDUSTRIAL OCEAN NOISE ON MARINE LIFE (2005), <https://www.nrdc.org/sites/default/files/sound.pdf> [https://perma.cc/3DRT-WLSK] (discussing generally the problem of anthropogenic noise on marine mammal survival and potential legal and policy solutions).

events of mass mortalities and strandings on beaches for marine mammals with sensitive hearing.⁴ This has generated important public outcry and increased awareness of the need to silence our oceans from acutely harmful noises.

However, less attention has been directed toward the constant droning produced by other anthropogenic sources of noise, including shipping activities. Although it does not cause acute physical harm, this form of low-frequency noise can have adverse behavioral repercussions for marine mammals occupying habitat in the vicinity of populated shipping traffic lanes.⁵ In many cases, these behavioral impacts may be detrimental to the survival and prosperity of key marine mammal populations. Shipping noise is a widespread and significant source of noise pollution throughout the world's oceans.⁶ Numerous federal tools exist to regulate noise impacts from the shipping industry, yet to date they have largely gone unused by the administering agencies or the general public.

This paper analyzes the deficiencies of three federal statutes that can be used to regulate marine mammals and provides recommendations for advocacy positions that can overcome the current limitations in applying these laws to regulate shipping noise. Section II provides background information about the scientific literature regarding behavioral impacts from anthropogenic noise, the extent of noise pollution generated by the shipping industry, and available mitigation measures to reduce the effects of that noise on marine mammals. Section III describes key provisions in the Marine Mammal Protection Act ("MMPA"), the Endangered Species Act ("ESA"), and the National Environmental Policy Act ("NEPA"), documenting how shipping noise is currently treated under those statutes and analyzing the potential avenues for advocacy under the current regime for each law. Section IV recommends positions for which environmental organizations should advocate to improve the legal regime in a manner

4. See Joel R. Reynolds, *Submarines, Sonar, and the Death of Whales: Enforcing the Delicate Balance of Environmental Compliance and National Security in Military Training*, 32 WM. & MARY ENVTL. L. & POL'Y REV. 759, 760–70 (2008).

5. See *infra* Part II.A.

6. See *infra* Part II.B.

that further advances the cause of reducing shipping noise impacts on marine mammals. Section V concludes that litigating shipping noise impacts to endangered or threatened species under the ESA may be a viable starting point to force the federal government to engage in regulatory action sooner than later.

II.

BACKGROUND

Before delving into the legal tools available to limit noise pollution from shipping activities, it is necessary to provide some factual information to illuminate the importance of reducing the amount of ambient, low-frequency noise in the ocean environment. This section discusses the effects of anthropogenic ocean noise on marine mammal survival, documents the magnitude and extent of ambient noise pollution from shipping activities, and explains mechanisms for mitigating the amount of noise produced by shipping vessels.

A. *Ocean Noise Can Be Highly Disruptive to Marine Mammals*

The ocean is a dark place, especially in the deep-water habitats beyond the reach of light penetration. To compensate for the visual limitations of their environment, many ocean-dwelling species rely primarily on their sense of hearing because of the efficient propagation of sound through water.⁷ Marine mammals in particular have evolved to develop physiological features capable of enhanced detection and exploitation of sound.⁸ Based on known and predicated data, the hearing sensitivity and frequency range of marine mammals varies greatly among different species.⁹ This

7. JASNY ET AL., *supra* note 3, at 1–2; see also L.S. Weilgart, *The Impacts of Anthropogenic Ocean Noise on Cetaceans and Implications for Management*, 85 CAN. J. ZOOLOGY 1091, 1092 (2007) (stating that cetaceans “are highly dependent on sound not only as their principal sense, but in critical areas of their social and sensory biology”).

8. JASNY ET AL., *supra* note 3, at 2.

9. See NAT’L MARINE FISHERIES SERV., TECHNICAL GUIDANCE FOR ASSESSING THE EFFECTS OF ANTHROPOGENIC SOUND ON MARINE MAMMAL HEARING: UNDERWATER ACOUSTIC THRESHOLDS FOR ONSET OF PERMANENT AND TEMPORARY THRESHOLD SHIFTS 10 (July 2016) [hereinafter NOAA FINAL ACOUSTIC GUIDANCE], <http://www.nmfs.noaa.gov/pr/acoustics/Acoustic%20>

means that almost every kind of underwater sound likely could be detected by some animal.

Accompanying these physiological adaptations are behavioral traits. Cetaceans produce various sounds for hunting, communication, navigation, and avoiding predators.¹⁰ Toothed whales such as dolphins are adept at using echolocation through high-pitched clicks to catch prey and identify objects in the water column.¹¹ Larger baleen whales utilize lower-frequency sounds, which can propagate across long distances in the ocean, to communicate with each other.¹² In general, the largest marine mammals can produce the lowest frequency sounds.¹³

The scientific literature documenting the impacts of anthropogenic noise pollution on marine mammals is extensive.¹⁴ It is generally settled that high-frequency and mid-frequency sonar from military vessels can cause acute physical harm to marine mammals, including mortalities.¹⁵ However, low-frequency ocean noise can have significant effects on mammal behaviors as well.¹⁶ Excess noise can drive mammals away from important habitat or breeding grounds, which has been repeatedly observed with gray whales off the coast of Baja California, Mexico.¹⁷ Some

Guidance%20Files/opr-55_acoustic_guidance_tech_memo.pdf
[<https://perma.cc/CU8W-QN87>].

10. See JASNY ET AL., *supra* note 3, at 2 (also noting that many species of fish have developed similar behaviors by utilizing tiny hair cells or organs that can detect low-frequency sound).

11. *Id.*; Peter L. Tyack, *Implications for Marine Mammals of Large-Scale Changes in the Marine Acoustic Environment*, 89 J. MAMMALOGY 549, 550 (2008).

12. Tyack, *supra* note 11, at 551.

13. Weilgart, *supra* note 7, at 1094.

14. For an overview of the available scientific knowledge two decades ago regarding the auditory and behavioral impacts of underwater noise on marine mammals, see W. JOHN RICHARDSON ET AL., *MARINE MAMMALS AND NOISE* (1995).

15. See, e.g., Reynolds, *supra* note 4, at 760–70 (describing several mass marine mammal stranding events associated with military sonar activities and detailing the types of harm that marine mammals can experience from exposure to high-intensity sound).

16. See Christopher W. Clark et al., *Acoustic Masking in Marine Ecosystems: Intuitions, Analysis, and Implication*, 395 MARINE ECOLOGY PRESS SERIES 201, 203 (2009).

17. See JASNY ET AL., *supra* note 3, at 11.

species are known to cease vocalizing during periods of low-frequency noise or modify their calls to be heard more easily.¹⁸ Others alter the amount of time spent diving underwater, which may impact their feeding capabilities.¹⁹ Individuals with increased stress levels caused by high-intensity sounds may even be prone to aggressive behavior that can cause self-inflicted physical injuries.²⁰

Auditory masking is another increasingly recognized danger of chronic ocean noise. Masking occurs when interference from other unwanted noises “masks” the ability of an individual to detect a particular noise it wishes to perceive.²¹ This can take the form of energetic masking, where the interfering sound occupies the same frequency as the target sound, or informational masking, where the sound is still audible but cannot be “disentangled” from similar interfering sounds.²² A study of empirical data regarding the communication frequencies of right whales, fin whales, and humpback whales in New England revealed significant masking potential, particularly for right whales, when in the presence of commercial shipping vessels.²³ While the true cost of auditory masking to the survival of an individual marine mammal is not fully known, it is not a stretch to conclude that communication between individuals can be vital for locating food sources and mating partners.²⁴

Many of these behavioral impacts occur when ships or boats are in the vicinity. Mammals will often swim miles away or dive down to avoid a ship, while others like dolphins may ride in the vessel’s wake and potentially expose itself to harmful levels of noise.²⁵ One study provides evidence that ship noise increases stress levels in right whales occupying habitat near heavily-used shipping traffic lanes.²⁶ Some species may be displaced from

18. *Id.* at 11–12.

19. *Id.* at 12.

20. *Id.*

21. Clark et al., *supra* note 16, at 202.

22. *Id.*

23. *See id.* at 216–20.

24. *See id.* at 219.

25. JASNY ET AL., *supra* note 3, at 38.

26. *See* Rosalind M. Rolland et al., *Evidence that Ship Noise Increases Stress*

important habitat or breeding grounds as a result of increases in shipping traffic.²⁷ Masking may be a problem if shipping noise occupies the same frequency wavelengths utilized by a marine mammal species for communication.²⁸ Therefore, shipping activities in particular pose a significant threat to marine mammal survival based on its widespread occurrence throughout the world's oceans.²⁹

Cumulatively, the impacts of all anthropogenic ocean noise, regardless of the source or frequency, may have significant repercussions for the long-term survival of depleted marine mammal species.³⁰ Yet, it is quite difficult, if not outright impossible, to assess the true nature of these impacts given the tremendous challenges associated with surveying and collecting data from many marine mammal populations.³¹ Nevertheless, the scientific community has been prolific in researching the relationship between anthropogenic ocean noise and marine mammal survival and behavior.³² Identifying and reducing the impacts of noise pollution is of critical importance for ensuring the continued survival of marine mammal populations and species that have dwindled to insufficient numbers.

in Right Whales, 279 PROC. ROYAL SOC'Y B 2363 (2012).

27. See JASNY ET AL., *supra* note 3, at 38. A frequently-cited example is the displacement of gray whales from primary breeding lagoons in Baja California, Mexico. See Tyack, *supra* note 11, at 550.

28. See JASNY ET AL., *supra* note 3, at 38; see also generally Scott Veirs et al., *Ship Noise Extends to Frequencies Used for Echolocation by Endangered Killer Whales*, 1657 PEERJ 1 (2016) (presenting data on source spectrum levels for ships at frequencies important to killer whales).

29. See discussion *infra* Part II.B.

30. See JASNY ET AL., *supra* note 3, at 12 (noting that unobserved behavioral effects may be equivalent to a "death of a thousand cuts" that could even be more harmful than strandings to some populations).

31. See Weilgart, *supra* note 7, at 1092 (noting that monitoring efforts in 2007 would be unable to detect serious declines in cetacean populations up to 90% of the time).

32. See generally R. Williams et al., *Impacts of Anthropogenic Noise on Marine Life: Publication Patterns, New Discoveries, and Future Directions in Research and Management*, 115 OCEAN & COASTAL MGMT. 17 (2015) (chronicling existing literature on the topic and analyzing current research projects being pursued).

B. *Anthropogenic Ocean Noise Pollution Is Abundant*

There are numerous sources of natural ambient noise in the ocean, which vary from earthquakes, wind and wave activity, rainfall, and thermal agitation.³³ Bio-acoustic noise, produced by oceanic organisms such as marine mammals and snapping shrimp, can also contribute to the ambient noise spectrum.³⁴ Marine mammals have evolved to adapt to these potentially loud sources of natural noise in order to prevent harmful physical effects and preserve their ability to communicate.³⁵

Unfortunately for marine mammals, humans have not been silent in exploiting the abundant resources the ocean has to offer. Many types of anthropogenic ocean activity produce significant quantities of noise, both intentionally and as an unintended byproduct.³⁶ Underwater explosives are utilized for a variety of purposes, including seismic surveys, military activities, or even to deter marine mammals from entering a particular area.³⁷ Explosions generate high levels of sound energy across a broad spectrum of frequencies, and sound waves from larger blasts can travel for great distances.³⁸ Oil exploration involves arrays of air-guns that release highly pressurized quantities of air underwater, generating an intense local noise.³⁹ Sonar of all frequencies, produced by many sources of human activity, has received plenty of worldwide attention as a threat to marine mammals.⁴⁰ Other industrial activities, such as oil drilling, construction projects, and offshore energy farms, produce high levels of low-frequency noise.⁴¹

Arguably the most pervasive source of anthropogenic noise is

33. John A. Hildebrand, *Anthropogenic and Natural Sources of Ambient Noise in the Ocean*, 395 MARINE ECOLOGY PROGRESS SERIES 5, 5–6 (2009).

34. See Tyack, *supra* note 11, at 552–53; Weilgart, *supra* note 7, at 1093.

35. See Tyack, *supra* note 11, at 552–53; Weilgart, *supra* note 7, at 1095.

36. See Hildebrand, *supra* note 33, at 7.

37. *Id.*

38. See *id.*

39. *Id.* at 8.

40. See *id.* at 8–9; see also Reynolds, *supra* note 4, at 760–70 (highlighting public concern and media reports about the impact of noise pollution on marine life).

41. See Hildebrand, *supra* note 33, at 10.

from industrial shipping activities. Vessel noise is continuous and primarily occupies lower frequency bands (below 200 Hertz), with peak levels between 10 and 50 Hz.⁴² The intensity of shipping noise can reach 190 decibels or higher at these low frequencies.⁴³ Shipping vessels utilize large underwater propellers for movement; as the blades rotate, the tips create sufficient negative pressure to create underwater air bubbles.⁴⁴ These bubbles collapse and produce significant sound energy at low frequencies, a process known as cavitation.⁴⁵ Vessels produce sounds from other machinery, such as engines, generators, fans, and on-board navigational sonar, the combination of which gives each ship its own unique acoustic signature.⁴⁶ However, it is generally acknowledged that “[m]achinery and other structure-borne noise is typically a secondary concern” for noise production when compared to cavitation.⁴⁷ Acoustic output from vessels is proportional to its volume; as a result, larger ships carrying significant cargo will produce higher intensity sounds.⁴⁸

As the global human population has dramatically increased in the last century, commercial shipping activities have similarly seen increases in rates. In fact, ambient ocean noise levels have doubled every decade for the past several decades, a trend likely

42. *See id.* at 9. Smaller boats generally produce sounds of higher frequency, but at lower intensities than large, fast-moving shipping vessels. *See id.* at 10.

43. JASNY ET AL., *supra* note 3, at 4.

44. *See id.* at 36; *see also* Hildebrand, *supra* note 33, at 9 (stating that the propulsion systems of commercial ships are a “dominant source of radiated underwater noise at frequencies <200 Hz”).

45. Hildebrand, *supra* note 33, at 9; COMM. ON POTENTIAL IMPACTS OF AMBIENT NOISE IN THE OCEAN ON MARINE MAMMALS, *supra* note 2, at 49; JASNY ET AL., *supra* note 3, at 36.

46. *See* Hildebrand, *supra* note 33, at 9; Weilgart, *supra* note 7, at 1094; COMM. ON POTENTIAL IMPACTS OF AMBIENT NOISE IN THE OCEAN ON MARINE MAMMALS, *supra* note 2, at 51; JASNY ET AL., *supra* note 3, at 36.

47. BRANDON L. SOUTHALL & AMY SCHOLIK-SCHLOMER, NAT’L OCEANIC AND ATMOSPHERIC ADMIN., FINAL REPORT OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) INTERNATIONAL SYMPOSIUM: POTENTIAL APPLICATION OF VESSEL-QUIETING TECHNOLOGY ON LARGE COMMERCIAL VESSELS 10 (2008); *see also* Weilgart, *supra* note 7, at 1108 (noting that cavitation is the source of most ship noise).

48. *See* JASNY ET AL., *supra* note 3, at 36.

due primarily to increases in commercial shipping.⁴⁹ Much of this noise is produced in areas of high shipping traffic, including near large industrial ports and in numerous defined shipping lanes.⁵⁰ As of 2015, the global number of merchant ships, excluding passenger ships and fishing vessels, was estimated at just over 50,000 vessels.⁵¹ If the current trends continue in the same direction without any measures in place to reduce the sound output from anthropogenic sources, the ocean will become an even louder, more hostile environment to the marine mammal species that rely on hearing for survival.

C. *Mitigation of Shipping Noise Is Feasible*

The good news is that noise from shipping vessels is, for the most part, merely an unnecessary byproduct of routine ship operations.⁵² Numerous measures for reducing noise from shipping vessels exist but have not yet been incorporated into domestic regulation of the industry in a sufficient manner to prevent harm to marine mammals. This section discusses mitigation of shipping noise falling into three broad categories: geographic mitigation, source-based mitigation, and operational mitigation.⁵³ The ultimate goal of advocacy efforts should be to

49. See Weilgart, *supra* note 7, at 1092. Supertankers, merchant vessels, and fishing vessels add approximately 3.8×10^{12} Joules of wave energy into the ocean environment every year. *Id.* at 1094.

50. COMM. ON POTENTIAL IMPACTS OF AMBIENT NOISE IN THE OCEAN ON MARINE MAMMALS, *supra* note 2, at 50. Mapping of cumulative noise production from shipping impacts can be a useful tool to indicate the sound landscape in particular areas of high traffic. See Christine Erbe et al., *Mapping Cumulative Noise from Shipping to Inform Marine Spatial Planning*, 132 J. ACOUSTIC SOC. AM. EL423, EL427 (2012).

51. See *Number of Ships in the World Merchant Fleet as of January 1, 2016, by Type*, STATISTA, <http://www.statista.com/statistics/264024/number-of-merchant-ships-worldwide-by-type/> [<https://perma.cc/7B3D-82X7>] (last visited May 5, 2017). Almost 17,000 of those vessels are bulk carriers, accounting for close to a third of the fleet. *Id.*

52. See BRANDON L. SOUTHALL, NOAA FISHERIES ACOUSTICS PROGRAM, FINAL REPORT OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) INTERNATIONAL SYMPOSIUM: SHIPPING NOISE AND MARINE MAMMALS: A FORUM FOR SCIENCE, MANAGEMENT, AND TECHNOLOGY 7 (2005) (statement by Kathy Metcalf, Chamber of Shipping of America).

53. JASNY ET AL., *supra* note 3, at 19.

successfully implement binding requirements for these mitigation measures where beneficial and appropriate.

1. Geographic Mitigation

Geographic mitigation occurs when shipping vessels avoid areas of critical concern for certain marine mammal populations.⁵⁴ These areas can include critical habitat, locations of high abundance of marine mammals, and other locations where the geography makes mammals particularly susceptible to adverse impacts from noise.⁵⁵ There is likely sufficient scientific data available to be able to classify many such high-risk areas throughout the oceans of the United States.⁵⁶ These areas could even be listed as national marine sanctuaries as part of the National Marine Sanctuary System,⁵⁷ or as marine protected areas under state laws.⁵⁸

If high-risk areas for ocean noise are identified, mitigation could consist of year-round or seasonal restrictions of shipping traffic within a certain distance of those areas.⁵⁹ Shipping vessels would be prohibited from entering waters within a certain distance of the designated areas or would be required to reduce their noise output according to a noise buffer zone.⁶⁰ Alternatively, ships could be required to move slower near these areas, as reductions in speed correspond to reductions in engine noise.⁶¹ However, reducing ship speeds corresponds to longer travel times, and therefore the duration over which noise is

54. *Id.* at 18–19.

55. *Id.* This can include bays, channels, or canyons where acoustic noise can become concentrated. *Id.* at 19.

56. Critical habitat plans have already been developed for some endangered species and populations of marine mammals. *See* 50 C.F.R. §§ 226.201–226.224 (2012).

57. *See* Marine Protection, Research, and Sanctuaries Act of 1972, Pub. L. No. 92-532, tit. III, § 302, 86 Stat. 1052, 1061–62 (codified at 16 U.S.C. § 1433 (2012)).

58. *See* Weilgart, *supra* note 7, at 1109. For instance, California’s Marine Life Protection Act provides for a statewide network of marine protected areas. *See* CAL. FISH & GAME CODE § 2853 (1999).

59. JASNY ET AL., *supra* note 3, at 18–19.

60. *See* Weilgart, *supra* note 7, at 1109.

61. *See id.* at 1108.

produced will increase.⁶² Conversely, shipping traffic could be rerouted to pre-determined “cold spots” of less concern for marine mammals to minimize the number of encounters with animals and reduce the impacts of the vessels’ noise.⁶³ Monitoring and enforcement would be quite simple under these methods, as any violations could be easily detected based on ship trajectories. Passive acoustic monitoring could also be utilized to detect any noise output that exceeds the intensity allowed for within a buffer zone.⁶⁴

Geographic mitigation might be the most effective means of reducing the impacts of shipping noise on marine mammals.⁶⁵ However, without other mitigation measures, the net output of noise from vessels into the ocean remains largely the same as before. Nevertheless, for particular species facing severe threats from shipping noise, advocates should pursue geographic restrictions on shipping activities to the maximum extent possible.

2. Source-Based Mitigation

Source-based mitigation, or reducing the output of noise straight from the source, can be achieved through technological advances in propulsion mechanics.⁶⁶ The shipping industry is largely in favor of adopting source-based mitigation measures, since cavitation and other noise production from normal vessel operations indicates inefficiencies in engineering.⁶⁷ However, cost efficiency is a substantial consideration for determining which technological improvements are appropriate for certain classes of vessels.

Non-cavitating propellers that pierce the surface are already technologically achievable, and eliminating or significantly reducing the amount of cavitation from vessel engines will

62. SOUTHALL & SCHOLIK-SCHLOMER, *supra* note 47, at 17.

63. JASNY ET AL., *supra* note 3, at 20, 39.

64. Weilgart, *supra* note 7, at 1108.

65. *See id.* at 1109.

66. JASNY ET AL., *supra* note 3, at 20.

67. *Id.*

correspond to a significant reduction in noise production.⁶⁸ Cavitation can also be minimized through the use of larger propellers, which reduces tip speed and therefore reduces the amount of air bubbles produced.⁶⁹ Larger propellers, however, are more expensive and may not be feasible for all vessels.⁷⁰

Other technologies can be incorporated in vessel design to dampen the sound output from on-board mechanical structures.⁷¹ Many improvements are cost-affordable, and others can further provide additional savings or operational benefits.⁷² Operators can also improve engine maintenance procedures, which not only has the potential to minimize engine noise but will also provide benefits in the form of increased engine efficiency, reduced fuel consumption, and a less-frequent need for engine repairs.⁷³ Quieter engines exist as well, including electric-powered generators that have been incorporated in some cruise ship designs.⁷⁴ However, it may be cost-prohibitive to attempt to swap out engines on existing shipping vessels,⁷⁵ so new engine designs would be restricted to newly-constructed ships. Sound containment mechanisms, such as fabric curtains or blasting mats, can be installed to dampen sound output, but these devices have primarily been used for stationary sources of ocean noise such as pile driving.⁷⁶ Additionally, a German company has developed the innovative “skysail,” which is a large kite that can be fastened to the bow of a large shipping vessel to generate additional propulsion from wind, in order to improve engine efficiency and decrease engine noise output.⁷⁷

The above measures, as well as future technologies not yet

68. Weilgart, *supra* note 7, at 1108. *See also* JASNY ET AL., *supra* note 3, at 38 (describing various methods of abating cavitation).

69. *See* SOUTHALL & SCHOLIK-SCHLOMER, *supra* note 47, at 17.

70. *Id.* at 19.

71. *See id.* at 17–18, 30–32; Weilgart, *supra* note 7, at 1108.

72. *See* SOUTHALL & SCHOLIK-SCHLOMER, *supra* note 47, at 19–20, 30–32.

73. Weilgart, *supra* note 7, at 1108.

74. *See* JASNY ET AL., *supra* note 3, at 38.

75. *Id.*

76. *Id.* at 19.

77. *See SkySails Propulsion for Cargo Ships: Advantages*, SKYSAILS GMBH, <http://www.skysails.info/english/skysails-marine/skysails-propulsion-for-cargo-ships/advantages/> [<https://perma.cc/PGK5-GU53>] (last visited May 5, 2017).

developed, will be instrumental in ensuring a quiet ocean environment for all marine mammals that rely on sound for survival. Systematic source technology improvements could effect widespread beneficial change around the world and would surely be the most productive outcome from any advocacy efforts. Therefore, source-based mitigation must be a vital component of any long-term policy to reduce shipping noise.⁷⁸

3. Operational Mitigation

Operational mitigation consists of particular measures during the operation of shipping vessels that seek to reduce impacts to any marine mammals actually observed in the vicinity. For instance, a vessel operator could establish a safety zone where crewmembers scan for marine mammals and temporarily reduce the vessel's engine power if an animal gets within a prescribed distance of the ship.⁷⁹ However, it is not simple to determine what is a safe distance for the safety zone and what is a safe power level once a marine mammal is spotted.⁸⁰ Further, some species, such as beaked whales, are difficult to detect because of their diving patterns.⁸¹ Another option is to temporally restrict the time of day during which a vessel can operate in order to improve monitoring for nearby marine mammals or to align operations with marine mammal behavioral patterns more efficiently.⁸²

A creative way to use the vessel itself as mitigation is to warn marine mammals of the impending noise production so that they swim away before the noise becomes too loud.⁸³ The primary warning technique actively utilized by sources is "ramp-up," where the operator initiates the source of noise at lower power and gradually increases the power over time.⁸⁴ However, this technique has not been fully tested, and mammals might not

78. See JASNY ET AL., *supra* note 3, at 20.

79. *Id.*

80. See Weilgart, *supra* note 7, at 1107.

81. *Id.*

82. JASNY ET AL., *supra* note 3, at 9.

83. *Id.* at 19–20.

84. *Id.*

actually swim away from the source during the ramp-up.⁸⁵ Alternatively, vessel operators could restrict their maximum power output, either temporarily or permanently, to reduce the sound energy contributed to the environment.⁸⁶

Operational measures do not necessarily reduce the overall noise produced by shipping vessels, but they have meaningful potential to reduce impacts on individual animals. When utilized in combination with geographic restrictions or source-based improvements, operational mitigation could be a viable method for getting the shipping industry to reduce its noise impacts on marine mammals occupying habitat near shipping routes.

III.

FEDERAL STATUTORY AUTHORITY OVER MARINE MAMMALS

Threats to marine mammals, such as the potential impacts of shipping noise described above,⁸⁷ are subject to regulation by various federal laws. This section outlines the primary federal statutory provisions that can be utilized to reduce harm to marine mammals and discusses their potential utility to advocates wishing to reduce noise impacts from shipping activities.

A. *Marine Mammal Protection Act*

1. Relevant MMPA Provisions and Regulations

The Marine Mammal Protection Act of 1972 is a comprehensive law that seeks to eliminate marine mammal deaths caused by human activities.⁸⁸ Recognizing the significant bycatch of marine mammals from fishing activities, Congress enumerated an objective to reduce the incidental killing of

85. *Id.*; Weilgart, *supra* note 7, at 1107.

86. JASNY ET AL., *supra* note 3, at 19.

87. *See* discussion *supra* Part II.

88. *See* Marine Mammal Protection Act of 1972, Pub. L. No. 92-522, 86 Stat. 1027. Congress acknowledged in its findings and declaration of policy that “certain species and population stocks of marine mammals are, or may be, in danger of extinction or depletion as a result of man’s activities.” 16 U.S.C. § 1361(1) (2012).

marine mammals from commercial fishing operations “to insignificant levels approaching a zero mortality and serious injury rate.”⁸⁹

To achieve Congress’s ambitious zero-mortality goal, Section 101 of the MMPA establishes a moratorium on all takes or importations of marine mammals by all persons.⁹⁰ The prohibition on takings under the MMPA applies not only in domestic waters but also on the “high seas.”⁹¹ “Take” is defined as to harass, hunt, capture, or kill any marine mammal, or to attempt any of those actions.⁹² Congress has carved out several exceptions to the taking moratorium, including for scientific research or public display,⁹³ if incidental to commercial fishing operations,⁹⁴ or if waived by the Secretary of Commerce, who oversees the National Oceanic and Atmospheric Administration (“NOAA”).⁹⁵ Takes under these exceptions are allowed only with a permit issued by the relevant agency, either the National Marine Fisheries Service (colloquially referred to as “NOAA Fisheries”) or the U.S. Fish and Wildlife Service (“FWS”).⁹⁶ Permits are also available for “economic hardship” that last up to a year after the act was passed.⁹⁷ Violations of the MMPA carry heavy civil penalties, while knowing violations are subject to

89. 16 U.S.C. § 1371(a)(2).

90. *Id.* § 1371(a). The term “moratorium” is defined as “a complete cessation of the taking of marine mammals and a complete ban on the importation into the United States of marine mammals and marine mammal products,” subject to the exceptions outlined in the rest of the act. *Id.* § 1362(8).

91. *Id.* § 1372(a).

92. *Id.* § 1362(13).

93. *Id.* § 1371(a)(1).

94. *Id.* § 1371(a)(2).

95. *Id.* § 1371(a)(3)(A); § 1362(12).

96. *See id.* §§ 1371(a)(1), 1374. These agencies were delegated the responsibility of administering the MMPA by the NOAA Secretary, and each agency has authority over certain species of marine mammals. *See Marine Mammals*, NOAA FISHERIES, <http://www.nmfs.noaa.gov/pr/species/mammals/> (last updated May 21, 2015). The agencies issued a regulation establishing a permitting system to implement the provisions of the MMPA within a year after the statute was enacted. *See Marine Mammal Protection Act*, Report to the Secretary of Commerce, 38 Fed. Reg. 20,564, 20,565 (Aug. 1, 1973).

97. *See* 16 U.S.C. § 1371(c) (1976).

criminal punishment.⁹⁸

Additionally, the MMPA directs the Secretary to maintain a list of depleted marine mammal species or populations.⁹⁹ A depleted species is defined as one that is “below its optimum sustainable population,”¹⁰⁰ and any species designated as endangered or threatened under the ESA are automatically “depleted” for the purposes of the MMPA.¹⁰¹ Permits cannot be issued for the taking of depleted marine mammals except for scientific research, photography, or enhancing the population’s survival.¹⁰² NOAA Fisheries currently has a list of nine depleted species or populations.¹⁰³

In 1981, Congress amended the MMPA to include provisions regarding incidental takes of marine mammals.¹⁰⁴ Section 101(a)(5)(A) requires the Secretary to issue permits to citizens of the United States, upon their request, for incidental (but not intentional) takes of small numbers of marine mammals if the Secretary determines that the takes will have a negligible impact on the species.¹⁰⁵ These permits are limited to a period of five consecutive years, and the permitted activity must be “within a specified geographical area.”¹⁰⁶ For all permits under this section, the Secretary is responsible for issuing regulations that set forth permissible methods of taking for the permitted activity, any mitigation measures that must be imposed to ensure “the least practicable adverse impact” on marine

98. See 16 U.S.C. § 1375 (2012) (providing for civil penalties up to \$10,000 for each violation and imprisonment or criminal fines up to \$20,000 for each knowing violation). Vessels utilized in these violations were also subject to seizure and forfeiture and additional civil fines. *Id.* § 1376(a)-(b).

99. See *id.* § 1371(a)(3)(B).

100. *Id.* § 1362(1)(A).

101. *Id.* § 1362(1)(C).

102. *Id.* § 1371(a)(1).

103. See 50 C.F.R. § 216.15 (2012).

104. See Marine Mammal Protection Act Amendments of 1981, Pub. L. No. 97-58, 95 Stat. 979.

105. See 16 U.S.C. § 1371(a)(5)(A) (2012). NOAA Fisheries regulations further define some of these ambiguous terms. See 50 C.F.R. §§ 216.103, 216.3 (2012).

106. 16 U.S.C. § 1371(a)(5)(A).

mammals, and monitoring and reporting requirements.¹⁰⁷ In accordance with this new Small Take Program, many industry actors sought permits, or letters of authorization (“LOAs”), for possible noise effects on marine mammals during the following decade.¹⁰⁸

Dissatisfaction with the MMPA permitting process led to additional amendments in 1994.¹⁰⁹ This set of amendments defines the term “harassment” based on two different severities of a take.¹¹⁰ “Level A” harassment means direct physical injury, stated as “any act of pursuit, torment or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild.”¹¹¹ “Level B” harassment means behavioral disturbances, or “any act of pursuit, torment or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.”¹¹² This new definition comes with a provision for a “General Authorization” of Level B harassment by any scientific research activities.¹¹³

Additionally, the 1994 amendments allow for further authorizations for incidental takes of marine mammals by harassment, entitled Incidental Harassment Authorizations

107. *Id.* § 1371(a)(5)(A)(i)(II).

108. See Elena McCarthy & Flora Lichtman, *The Origin and Evolution of Ocean Noise Regulation Under the U.S. Marine Mammal Protection Act*, 13 OCEAN & COASTAL L. J. 1, 13–14 (2007); 50 C.F.R. § 216.106 (2012). The regulation for LOAs was originally numbered as 50 C.F.R. § 228.6. See Regulations Governing Small Takes of Marine Mammals Incidental to Specified Activities, 47 Fed. Reg. 21,248, 21, 255–56 (May 18, 1982).

109. See Marine Mammal Protection Act Amendments of 1994, Pub. L. No. 103–238, 108 Stat. 532; McCarthy & Lichtman, *supra* note 108, at 14–16.

110. See 16 U.S.C. § 1362(18)(A) (2012).

111. *Id.* § 1362(18)(A)(i), (C).

112. *Id.* § 1362(18)(A)(ii), (D). The MMPA was amended again in 2003 to redefine Level B harassment in the military readiness and federal government research contexts, requiring that the behavioral disturbance be “to a point where such behavioral patterns are abandoned or significantly altered.” *Id.* § 1362(18)(B)(ii).

113. *Id.* § 1374(c)(3)(C); see also 50 C.F.R. § 216.45 (providing procedural requirements for scientific researchers to benefit from the General Authorization, including the submittal of a letter of intent to the NMFS).

(“IHAs”).¹¹⁴ These IHAs are issued on an expedited timeline; following a 30-day public review period, NOAA Fisheries must issue or deny the permit within 45 days.¹¹⁵ Unlike LOAs, which can last up to five years, IHAs are valid for a maximum of one year but can be renewed annually.¹¹⁶ The NOAA Fisheries website provides estimated timelines for pursuing either form of authorization, indicating that the LOA issuance process is substantially longer than the IHA process.¹¹⁷

2. Treatment of Shipping Noise under the MMPA

Noise from shipping vessels falls squarely under the definition of Level B harassment. Anthropogenic noise is undoubtedly an “act” that has the potential to “annoy” marine mammals in a manner that affects their behavioral patterns.¹¹⁸ The explicit statutory language, therefore, seems to cover any type of noise produced by large shipping vessels in the vicinity of marine mammals. Accordingly, a vessel should need to acquire an IHA or LOA from NOAA Fisheries for its incidental takes of marine mammals through noise.

Nevertheless, noise from shipping activities is not actively regulated as a “take” under the MMPA by NOAA Fisheries, despite the seemingly significant impacts Level B harassment may have on marine mammal behavior.¹¹⁹ Since the inception of

114. See 50 C.F.R. § 216.107 (2012); McCarthy & Lichtman, *supra* note 108, at 17.

115. 50 C.F.R. § 216.107(a), (c).

116. *Id.* § 216.107(e).

117. See *Incidental Take Authorizations under the MMPA*, NOAA FISHERIES, <http://www.nmfs.noaa.gov/pr/permits/incidental/> [<https://perma.cc/4KHD-RY5G>] (last updated Sept. 2, 2016) [hereinafter *NOAA Fisheries Incidental Take Authorizations*].

118. See *supra* Part II.A.

119. See COMM. ON LOW-FREQUENCY SOUND & MARINE MAMMALS OCEAN STUDY BD., LOW-FREQUENCY SOUND AND MARINE MAMMALS: CURRENT KNOWLEDGE AND RESEARCH NEEDS 5 (1994) (“[T]he noise from passing marine traffic, including supertankers, is not regulated as harassment or as a ‘take.’”). An update to this report stated:

The Committee also suggests that activities that are presently unregulated, but which are major sources of sound to the ocean (e.g., commercial shipping) be brought into the regulatory framework of the MMPA. Such a change should increase protection of marine mammals by providing a comprehensive regulatory

the MMPA, NOAA Fisheries has never issued a permit for the operation of large shipping vessels. The NOAA Fisheries website does not even list shipping traffic as a type of activity that may result in an incidental take.¹²⁰

That being said, NOAA Fisheries has been utilizing interim sound threshold guidelines in its issuance of IHAs and LOAs under the MMPA.¹²¹ These guidelines specify two distinct thresholds for a Level B harassment: 160 dB for short, impulsive noises, and 120 dB for non-pulse noises.¹²² NOAA Fisheries has fairly consistently adhered to these figures when issuing LOAs and IHAs for incidental harassments through noise production.¹²³ However, these thresholds are not sufficiently protective against noise from shipping vessels, as large tankers traveling at 20 miles per hour can generate around 190 dB of low-frequency sound over long distances.¹²⁴

In 2005, NOAA Fisheries issued a notice proposing to develop acoustic threshold criteria of a more precise definition to

regime for acoustic impacts on marine mammals, eliminating what amounts to an exemption on regulation of commercial sound producers[.]

COMM. TO REVIEW RESULTS OF ATOC'S MARINE MAMMAL RESEARCH PROGRAM, MARINE MAMMALS AND LOW-FREQUENCY SOUND: PROGRESS SINCE 1994, at 72 (2000).

120. See *NOAA Fisheries Incidental Take Authorizations*, *supra* note 117.

121. See *Interim Sound Threshold Guidance*, NOAA FISHERIES, http://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/threshold_guidance.html [<https://perma.cc/2AJM-AFPE>] (last visited February 28, 2017) [hereinafter *NOAA Fisheries Interim Sound Threshold Guidance*].

122. See *id.* Note that it is unclear from the NOAA Fisheries website when these standards were developed, or whether they are exclusive to the "West Coast Region" under which the webpage is classified.

123. See, e.g., Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Naval Activities, 63 Fed. Reg. 66069, 66072 (Dec. 1, 1998) (identifying the 160-dB criterion as being based on a potentially significant behavioral response to a single pulse); Marine Mammals; Incidental Take During Specified Activities; Proposed Incidental Harassment Authorization, 79 Fed. Reg. 58,796, 58,798 (Sept. 30, 2014) (applying the interim thresholds to incidental takes of sea otters); Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to a Marine Geophysical Survey in the South Atlantic Ocean, January to March 2016, 81 Fed. Reg. 2174, 2184–85 (Jan. 15, 2016) (identifying the threshold for Level B harassment as 160 dB for an IHA for seismic surveys in the South Atlantic Ocean).

124. JASNY ET AL., *supra* note 3, at 4.

determine when a “take” occurs under the MMPA from anthropogenic noise.¹²⁵ Over eight years later, the agency released its first draft guidance addressing only noise that can cause physical injury.¹²⁶ After three rounds of public comments, NOAA Fisheries announced and published its final Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (“Final Guidance”) on August 4, 2016.¹²⁷ The Final Guidance identifies noise thresholds “at which individual marine mammals are predicted to experience changes in their hearing sensitivity” for both impulsive and non-impulsive sounds across five different hearing groups of marine mammals.¹²⁸

The Final Guidance makes no attempt to define any similar thresholds for behavioral effects from Level B harassment.¹²⁹

125. See Endangered Fish and Wildlife; Notice of Intent to Prepare an Environmental Impact Statement, 70 Fed. Reg. 1871, 1871–72 (Jan. 11, 2005).

126. See Draft Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammals—Acoustic Threshold Levels for Onset of Permanent and Temporary Threshold Shifts, 78 Fed. Reg. 78,822, 78, 822–23 (Dec. 27, 2013).

127. See Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing—Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts, 81 Fed. Reg. 51,694, 51,694–98 (Aug. 4, 2016).

128. See NOAA FINAL ACOUSTIC GUIDANCE, *supra* note 9, at 6, 10.

129. See, e.g., *id.* (identifying behavioral impact thresholds as a separate tool from the Final Guidance). In its revised draft technical guidance document released in 2015, NOAA Fisheries stated that it was “currently . . . in the process of developing updated threshold levels for the onset of behavioral effects,” but that language was removed and does not appear in the Final Guidance. NAT’L OCEANIC & ATMOSPHERIC ADMIN., DRAFT GUIDANCE FOR ASSESSING THE EFFECTS OF ANTHROPOGENIC SOUND ON MARINE MAMMAL HEARING: UNDERWATER ACOUSTIC THRESHOLD LEVELS FOR ONSET OF PERMANENT AND TEMPORARY THRESHOLD SHIFTS 40 (July 23, 2015) [hereinafter NOAA DRAFT ACOUSTIC GUIDANCE], <http://www.nmfs.noaa.gov/pr/acoustics/draft%20acoustic%20guidance%20July%202015.pdf> [<https://perma.cc/US86-H2UJ>]. NOAA Fisheries also released the Ocean Noise Strategy Roadmap in September 2016, which is “is designed to support the implementation of an agency-wide strategy for addressing ocean noise over the next 10 years.” NAT’L OCEANIC & ATMOSPHERIC ADMIN., OCEAN NOISE STRATEGY ROADMAP 1 (Sept. 2016), available at http://cetsound.noaa.gov/Assets/cetsound/documents/Roadma/ONS_Roadmap_Final_Complete.pdf [<https://perma.cc/L5TJ-PFMP>]. The roadmap does not explicitly represent the development of behavioral impact thresholds as an objective but declares that NOAA Fisheries “aims to identify and [sic] agency actions to better address the

Still, guidance documents are non-binding; NOAA Fisheries states that the Final Guidance is “intended for use by NMFS analysts/ managers and other relevant action proponents/stakeholders, including other federal agencies, when seeking to determine whether and how their activities are expected to result in impacts to marine mammal hearing via acoustic exposure.”¹³⁰ Thus, even if NOAA Fisheries were to release a finalized guidance document that provided thresholds for behavioral effects from Level B harassment, it would not impose a binding legal requirement for NOAA Fisheries to prosecute any sources of noise above those levels. A guidance document is of particularly little use if NOAA Fisheries does not apply it to shipping activities in the first place.

3. Role of Advocates under the MMPA: Is Massachusetts v. EPA a Feasible Basis for Suit?

Importantly, the MMPA does not contain a “citizen suit” provision like many other environmental statutes. Instead, sole enforcement obligations are vested in the Secretary of Commerce.¹³¹ This means that advocates wishing to pursue a claim under the MMPA against shipping noise cannot bring a lawsuit against shipping companies directly. Advocates would only be able to challenge the agency’s issuance of a permit as “arbitrary and capricious” under the Administrative Procedure Act (“APA”).¹³² Such a claim against an IHA or LOA issued by NOAA Fisheries is certainly plausible.¹³³ But as long as NOAA

acute, direct physical and behavioral effects of noise exposures to [marine mammal] individuals and their ultimate effects on the populations.” *Id.* at 7. However, it is unclear whether these efforts will ultimately lead to the production of behavioral impact thresholds.

130. NOAA FINAL ACOUSTIC GUIDANCE, *supra* note 9, at 6. The NOAA Fisheries website adds that the Final Guidance serves the purpose of “improv[ing] consistent implementation across the array of relevant laws that protect marine mammals.” *See Technical Acoustic Guidance FAQs*, NOAA FISHERIES, <http://www.nmfs.noaa.gov/pr/acoustics/faq.htm> [<https://perma.cc/ZPR5-E28G>] (last updated Aug. 11, 2016).

131. *See* 16 U.S.C. § 1377(a) (2012).

132. *See* 5 U.S.C. § 706(2)(A) (2012).

133. In one key case, plaintiffs were successful in a challenge of NOAA Fisheries regulations seeking to govern unintended takings of marine mammals

Fisheries continues its longstanding practice of failing to regulate ocean noise impacts through IHAs or LOAs, the absence of a requisite agency action provides advocates with no foundation upon which to file a typical APA claim.

Despite this hurdle, advocates may be able to pursue a legal challenge under the APA for NOAA Fisheries' *failure* to issue permits to shipping vessels for ocean noise according to its regulatory responsibilities under the MMPA. Such a claim would be premised on the landmark Supreme Court decision of *Massachusetts v. EPA*.¹³⁴ There, states, local governments, and environmental organizations brought a challenge under the APA against the EPA for its denial of a rulemaking petition to regulate greenhouse gases under the Clean Air Act ("CAA").¹³⁵ The Supreme Court first noted that an agency typically "has broad discretion to choose how to best marshal its limited resources and personnel to carry out its delegated responsibilities."¹³⁶ This is especially so when deciding whether to bring an enforcement action, the refusal of which is "not ordinarily subject to judicial review."¹³⁷ However, the Court differentiated a refusal to initiate rulemaking, which is "more apt to involve legal as opposed to factual analysis" and would be subject to the procedural formalities of administrative law.¹³⁸ Accordingly, the Court held that refusals to promulgate rules following a petition to initiate rulemaking are subject to "extremely limited" and "highly deferential" judicial review.¹³⁹ The Court applied this standard of review to conclude that the EPA, despite its substantial discretion, acted unlawfully by refusing to make an endangerment finding for greenhouse

due to noise impacts from the Navy's operation of a low-frequency active sonar array. *See Nat. Res. Def. Council v. Evans*, 232 F. Supp. 2d 1003 (N.D. Cal. 2002).

134. 549 U.S. 497 (2007).

135. *Id.* at 510–14.

136. *Id.* at 527 (citing *Chevron U.S.A. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 842–45 (1984)).

137. *Id.*

138. *Id.* (quoting *Am. Horse Prot. Ass'n, Inc. v. Lyng*, 812 F.2d 1, 3–4 (D.C. Cir. 1987)).

139. *Id.* at 527–28 (quoting *Nat'l Customs Brokers & Forwarders Ass'n of Am., Inc. v. United States*, 883 F.2d 93, 96 (D.C. Cir. 1989)).

gases under the CAA.¹⁴⁰

Courts attempting to apply the Supreme Court's ruling in *Massachusetts v. EPA* have since rebuked challenges to agency decisions declining to take a particular action.¹⁴¹ This indicates that judges are largely unwilling to mandate when an agency has to act and reserve that power for extraordinary circumstances. To illustrate, in *Massachusetts v. EPA* the Court in part based its holding on the plethora of scientific evidence suggesting a link between greenhouse gases and climate change.¹⁴² The agency's failure to support its decision not to regulate greenhouse gases through sufficient proof of scientific uncertainty led the Court to conclude that the agency had no reasoned basis to deny the rulemaking petition.¹⁴³

Applying the Supreme Court's standards to rulemaking under the MMPA could prove difficult for advocates wishing to force NOAA Fisheries to regulate ocean noise. There has not been a

140. *Id.* at 534–35.

141. In one case, the Second Circuit reversed a district court ruling that held the Food and Drug Administration acted arbitrarily and capriciously by refusing to proceed with hearings to determine whether to withdraw approval for the use of penicillin and tetracyclines in animal feed. *See Nat. Res. Def. Council, Inc. v. U.S. Food & Drug Admin.*, 760 F.3d 151, 172–76 (2d Cir. 2014) (distinguishing *Massachusetts v. EPA* on the grounds that the applicable statute only required the agency to take a particular action “when, after a hearing, it has made certain findings, without imposing any absolute requirement that the agency investigate the need for withdrawing approval of animal drugs under any particular circumstance.”). In another appellate case, the Fifth Circuit reversed a lower court ruling that the EPA could not decline to make a necessity determination under the Clean Water Act regarding nitrogen and phosphorous pollution in the Mississippi River Basin and Gulf of Mexico. *See Gulf Restoration Network v. McCarthy*, 783 F.3d 227, 242–44 (5th Cir. 2015) (holding that a court's analysis of a *Massachusetts v. EPA* claim of inaction is limited to whether the agency “has provided some reasonable explanation as to why it cannot or will not exercise its discretion” to make a determination required by statute). Most recently, a district court denied a challenge to the Food Safety and Inspection Services' denial of a rulemaking petition that sought to ban force-fed foie gras from the food market as unsafe for human consumption. *See Animal Legal Def. Fund v. U.S. Dep't of Agric.*, No. 2:12-cv-04028-ODW(PJWx), 2016 WL 7235624, at *6–*10 (C.D. Cal. Dec. 14, 2016) (finding the agency's scientific justifications for not initiating rulemaking reasonable and within the bounds of the applicable statutory authority).

142. *See Massachusetts v. EPA*, 549 U.S. at 534–35.

143. *See id.*

petition for rulemaking filed with NOAA Fisheries regarding shipping noise and marine mammals, and without such a petition the agency has not made a formal decision not to regulate that could be subject to judicial review. Even if such a petition were to be filed, it is unlikely that the Secretary's denial of the petition would be held arbitrary and capricious. The statutory language of the MMPA is not as strict as the language in the CAA, which the Supreme Court interpreted to foreclose the EPA's attempt not to regulate greenhouse gases. In Section 103(a) of the MMPA, the Secretary is directed to issue regulations "with respect to the taking and importing of animals from each species of marine mammal . . . as he deems necessary and appropriate to insure that such taking will not be to the disadvantage of those species and population stocks."¹⁴⁴ This gives the Secretary significant discretion regarding whether to issue regulations at all, even assuming current noise production from shipping vessels constitutes a "take." The Secretary's decision not to enforce the MMPA against shipping vessels would likely be found subject to the Secretary's sole discretion and therefore unreviewable.¹⁴⁵ Lastly, while plenty of scientific evidence is available that all but confirms a link between shipping noise and behavioral harm to marine mammals,¹⁴⁶ the full extent of the impacts of noise on marine mammals is not as fully developed as the scientific evidence of global warming.¹⁴⁷ For these reasons, a challenge against NOAA Fisheries for failing to promulgate a regulation that requires permits from shipping activities, or for failing to enforce the MMPA against shipping vessels, is unlikely to be successful at the present time.

Even so, filing a petition for rulemaking with NOAA Fisheries regarding ocean noise impacts could prove beneficial for advocates. It would indicate to the Secretary that the existing

144. 16 U.S.C. § 1373(a) (2012).

145. *See supra* note 137 and accompanying text.

146. *See* discussion *supra* Section II.A.

147. *See Massachusetts v. EPA*, 549 U.S. at 504–09, 534 (documenting the extensive scientific evidence of global warming and declaring that the fact that the EPA "would prefer not to regulate greenhouse gases because of some residual uncertainty . . . is irrelevant" to its obligation to form a reasoned scientific judgment).

regulation and enforcement regime is insufficient and would broaden the dialogue of harmful impacts of shipping noise to include shipping vessels, an industry largely overlooked by current agency activities. A petition for rulemaking on ocean noise could have a meaningful impact on public awareness and could drive further interest in scientific research. A petition could also be used as a tool to obtain negotiation leverage with NOAA Fisheries in order to advance productive dialogue with both the agency and the shipping industry.

In the event that NOAA Fisheries *does* initiate a program to issue LOAs or IHAs for noise pollution to actors in the shipping industry, advocates would have a meaningful role to play in the permitting process. Since the issuance of an IHA is preceded by a thirty-day public review period,¹⁴⁸ advocates could submit comments that seek to alert NOAA Fisheries to potential Level B harassment from noise production. Commenters can also suggest particular mitigation measures that may be important for reducing the noise effects from a particular activity. NOAA Fisheries may incorporate these mitigation measures as binding conditions to achieve compliance with the permit.¹⁴⁹ Accordingly, any IHA review processes for an activity that may involve substantial vessel activity could be a good target for advocates to push for some of the mitigation measures described earlier in this paper.¹⁵⁰ However, unless a shipping vessel operator applies for an IHA,¹⁵¹ advocates will be unable to get NOAA Fisheries to impose mitigation measures on the shipping industry.

Until NOAA Fisheries develops a comprehensive method of applying the MMPA to behavioral impacts from shipping activities, advocates may be unable to effectively monitor these significant sources of ocean noise and enforce the laws intended to protect marine mammals from all sources of harm. It would surely be difficult for NOAA Fisheries to attempt to enforce the

148. 50 C.F.R. § 216.107 (2012).

149. *See, e.g., id.* § 217.155(a)(3)(iii) (requiring a recipient of an IHA for liquefied natural gas development in the Gulf of Mexico to use a sound attenuation measure for pile driving activities).

150. *See supra* Part II.C.

151. *See* 50 C.F.R. § 216.104(a).

MMPA take prohibition against every commercial tanker that enters U.S. waters on an individual basis.¹⁵² One agency with a limited budget would have significant logistical trouble attempting to issue a large number of permits to these vessels on a continual basis. But thus far, there has not been significant progress toward the development of concrete, binding standards for the threshold of noise required to encompass a Level B harassment.

B. *Endangered Species Act*

1. Relevant ESA Provisions

Congress passed the ESA in 1973 to ensure greater protection for species at risk of extinction throughout the country.¹⁵³ Congress directed the FWS, through the Secretary of the Interior, to list species as threatened or endangered if one of several conditions exists.¹⁵⁴ Concurrently with this designation, the Secretary must identify critical habitat for the species “to the maximum extent prudent and determinable.”¹⁵⁵ All federal agencies must consult with the Secretary to “insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence” of a listed species.¹⁵⁶ The Secretary is also directed to develop and implement recovery plans that seek to allow the endangered population to recover to a sufficient size such that it no longer

152. See JASNY ET AL., *supra* note 3, at 43.

153. See Endangered Species Act of 1973, Pub. L. No. 93-205, § 2, 87 Stat. 884, 884–85 (codified at 16 U.S.C. § 1531 (2012)).

154. 16 U.S.C. § 1533(a)(1). An endangered species is one “in danger of extinction throughout all or a significant portion of its range,” while a threatened species is one which is “likely to become an endangered species within the foreseeable future.” *Id.* § 1532(6), (20).

155. *Id.* § 1533(a)(3)(A).

156. *Id.* § 1536(a)(2). The term “action” includes issuing regulations or granting permits. See 50 C.F.R. § 402.02 (2012). An action “jeopardizes” the continued existence of a species if it “reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.” *Id.*

needs to be listed.¹⁵⁷

Like the MMPA, the ESA contains a broad prohibition against the taking, importing, possessing, or selling of threatened or endangered species by all persons.¹⁵⁸ However, a “take” under the ESA is more broadly defined: “The term ‘take’ means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.”¹⁵⁹ The term “harm” is further defined in agency regulations as “an act which actually kills or injures wildlife,” including habitat modification or degradation that significantly impairs behavioral patterns.¹⁶⁰ “Harass” is defined to mean an action that “creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns,” which includes breeding, feeding, and sheltering.¹⁶¹ The Supreme Court has upheld agency regulations that purport to extend the definition of take to include actions such as significantly modifying or degrading habitat that actually kills or injures listed species.¹⁶² A take has generally been accepted to include noise and sound production in close proximity to endangered species of marine mammals.¹⁶³

Individuals can apply for exemptions to the ESA takings prohibition in a similar manner as one would apply for a LOA or IHA under the MMPA. Following consultation with the appropriate federal and state agencies, the Secretary must issue an incidental take statement (“ITS”) to the agency or applicant involved if he or she concludes that the proposed action will not jeopardize the continued existence of a listed species or offers

157. *See* 16 U.S.C. § 1533(f).

158. *Id.* § 1538(a). This taking prohibition applies not only to within the United States territories but also on the high seas. *Id.* § 1538(a)(1)(C).

159. *Id.* § 1532(19).

160. *See* 50 C.F.R. § 17.3.

161. *Id.*

162. *See* *Babbitt v. Sweet Home Chapter of Communities for a Greater Oregon*, 515 U.S. 687 (1995).

163. *See, e.g.,* *Native Village of Chickaloon v. Nat’l Marine Fisheries Serv.*, 947 F. Supp. 2d 1031, 1062 (D. Alaska 2013) (analyzing the sufficiency of the agency’s analysis under an incidental take statement based on the taking of beluga whales from seismic surveys assuming that noise from those activities constitutes a take).

reasonable and prudent alternatives.¹⁶⁴ An ITS must be issued under these circumstances, even if an incidental taking of listed species will occur.¹⁶⁵ The ITS takes the form of a written statement that describes the impact of incidental takings on the species, the reasonable and prudent measures necessary to minimize the impact, and terms and conditions with which the agency must comply.¹⁶⁶ When marine mammals are involved, the ITS must also specify measures necessary to comply with Section 101(a)(5) of the MMPA in order to promote cohesiveness between the two statutes.¹⁶⁷ An ITS is usually accompanied by a biological assessment that identifies how the agency action is anticipated to affect a listed species or its habitat.¹⁶⁸

Actors other than federal agencies can also obtain a permit to be exempt from the ESA taking prohibition. The statute provides an explicit exemption for takings for scientific purposes or those that enhance the propagation or survival of a listed species.¹⁶⁹ Otherwise, individuals who wish to obtain a permit for the takings of listed species incidental to lawful activities must apply to the Secretary and submit a habitat conservation plan.¹⁷⁰ These plans must specify the impact on listed species, mitigation measures, and alternative actions considered with an explanation for why they were not adopted.¹⁷¹ Applicants are responsible for funding the habitat conservation plan, a necessary condition for the plan's approval.¹⁷² Violations of the ESA or the terms of a permit issued under the ESA can expose the violator to both civil and criminal penalties.¹⁷³

164. 16 U.S.C. § 1536(b)(4)(A).

165. *Id.* § 1536(b)(4)(B).

166. *Id.* § 1536(b)(4)(i)-(ii), (iv).

167. *Id.* § 1536(b)(4)(iii).

168. *See id.* § 1536(b)(3)(A).

169. *Id.* § 1539(a)(1)(A).

170. *Id.* § 1539(a)(1)(B), (2).

171. *Id.* § 1539(a)(2)(A).

172. *See id.* § 1539(a)(2)(B)(iii).

173. *See id.* § 1540(a)-(b). Civil penalties may be assessed as high as \$25,000 per violation of the ESA depending on the violation, *see id.* § 1540(a)(1), while criminal penalties include a fine of up to \$50,000 and imprisonment for up to one year. *Id.* § 1540(b)(1).

2. How Shipping Noise Is Treated under the ESA

Like the MMPA, the ESA has a clear directive to prevent the take of any endangered or threatened marine mammal species. The ESA's seemingly broader definition of "take" should be even more protective of listed marine mammals and should apply to all types of disturbances or annoyances. Ocean noise, including from shipping vessels, fits within this definition.¹⁷⁴ The FWS definition of "harass" further supports treating shipping noise as a take under the ESA, because ocean noise can significantly impact marine mammals' ability to feed, communicate, and occupy crucial habitats.¹⁷⁵ The NOAA Fisheries website identifies 31 endangered or threatened marine mammals under its jurisdiction,¹⁷⁶ and the FWS has jurisdiction over eight others.¹⁷⁷ Accordingly, any shipping noise that disturbs populations of these species should be required to obtain an ITS permit under the ESA.

Unfortunately, as with the MMPA, there is no active regulation of shipping noise under the ESA. No case has been brought against a shipping vessel or company alleging a take from noise production. An ITS for an endangered marine mammal would also require a permit under the MMPA, so NOAA Fisheries utilizes the same permitting process for both listed and non-listed marine mammals, though the additional ESA review makes the process longer.¹⁷⁸ NOAA Fisheries has not yet issued an MMPA permit for shipping activities,¹⁷⁹ nor has it permitted such activities under the ESA.

174. See *supra* note 118 and accompanying text.

175. See 50 C.F.R. § 17.3 (2012). See also *supra* Part II.A.

176. See *Endangered and Threatened Marine Species under NMFS' Jurisdiction*, NOAA FISHERIES, <http://www.nmfs.noaa.gov/pr/species/esa/listed.htm> (last updated May 10, 2016).

177. See *Marine Mammals*, U.S. FISH & WILDLIFE SERV., <https://www.fws.gov/international/animals/marine-mammals.html> [<https://perma.cc/56DL-EKYP>] (last visited May 5, 2017) (identifying additional FWS species not listed under the ESA but which are regulated under the MMPA).

178. See *Marine Mammal Permits and Authorizations*, NOAA FISHERIES, http://www.nmfs.noaa.gov/pr/permits/mmpa_permits.html [<https://perma.cc/BV97-JKC7>] (last updated Dec. 16, 2015).

179. See *supra* Part II.A.2.

NOAA Fisheries relies on the same interim sound threshold levels for its consultations with other agencies under the ESA.¹⁸⁰ The NOAA Fisheries Final Guidance on hearing sensitivity is intended to apply to “take” determinations, but merely in an advisory capacity.¹⁸¹ However, there is no indication that NOAA Fisheries intends to apply the noise thresholds in the Final Guidance to shipping activities that disturb marine mammal species listed under the ESA. Like with the MMPA, the failure of NOAA Fisheries to regulate shipping noise under the ESA is likely to be immune from judicial review as a discretionary enforcement decision.

3. Potential ESA Litigation Against Shipping Noise

Unlike the MMPA, the ESA does contain a “citizen suit” provision that grants any person the ability to “enjoin any person, including the United States and any other governmental instrumentality or agency [], who is alleged to be in violation of any provision of [the ESA] or regulation.”¹⁸² This provides advocates the opportunity to directly sue shipping companies to enjoin them from harassing marine mammals through the considerable noise their vessels produce.

Advocates aiming to make a shipping company apply for an

180. See *NOAA Fisheries Interim Sound Threshold Guidance*, *supra* note 121.

181. See NOAA FINAL ACOUSTIC GUIDANCE, *supra* note 9, at 8. The revised draft guidance released in 2015 more fully explained the agency’s intended purpose of using the guidance as an effective tool for determining when Level A harassment is likely to occur, but cautioned that the draft merely expressed the agency’s current practices in treating Level A harassment. See NOAA FINAL ACOUSTIC GUIDANCE, *supra* note 129, at 43–45.

182. 16 U.S.C. § 1540(g)(1)(A) (2012). Note that while the ESA’s citizen suit provision explicitly allows for lawsuits against the Secretary of the Interior for failing to act according to its legal duties, those suits are limited to non-discretionary obligations regarding the determination of endangered and threatened species under 16 U.S.C. § 1533. See 16 U.S.C. § 1540(g)(1)(C). Because the scope of these legal challenges does not extend to the taking prohibition, a lawsuit regarding the failure to act to prevent the taking of endangered or threatened species would need to be brought under the APA. See *supra* note 132 and accompanying text. Plaintiffs suing under the ESA’s citizen suit provision also must meet the constitutional requirements for standing, see *Lujan v. Defenders of Wildlife*, 504 U.S. 555 (1992), the analysis of which can be complex and is beyond the scope of this paper.

ITS may not be able to obtain a court judgment requiring the company to do so, and instead might be forced to rely on the civil violations provided by statute.¹⁸³ Further, the statutory language of the ESA appears to foreclose the availability of monetary remedies to private plaintiffs.¹⁸⁴ Therefore, the primary relief available to citizens would be an injunction barring the offending action causing a take of an endangered species, or in the alternative, declaratory relief.

If a district court were to impose such an injunction against a shipping company for noise pollution, it would have a significant impact on the public perception of shipping noise impacts, regardless of whether it is ultimately upheld. Shipping companies likely have significant resources to vigorously litigate these claims, but simply generating further awareness of the impacts could have beneficial effects from an advocacy perspective. If an injunction is imposed, shipping companies would likely apply for an ITS to preserve their ability to traverse the world's oceans, thereby providing a jurisdictional hook for advocates to sue agencies under both the MMPA and the ESA.

One oft-cited example of an endangered species threatened by impacts from shipping activities is the North Atlantic right whale ("NA right whale").¹⁸⁵ The entire NA right whale

183. The Ninth Circuit has indicated that "applying for an incidental take statement is not mandatory," suggesting that it would not be at liberty to order that action as a remedy for failing to comply with the ESA take prohibition. *See* *Forest Conservation Council v. Rosboro Lumber Co.*, 50 F.3d 781, 783 (9th Cir. 1995).

184. *See* 16 U.S.C. § 1540(a)(1) (stating that all civil penalties may be assessed "by the Secretary"). Indeed, the citizen suit provision explicitly declares that any injunctive relief obtained "shall not restrict any right which any person (or class of persons) may have under any statute or common law," *id.* at § 1540(g)(5), indicating that private plaintiffs could seek other civil remedies through alternative litigation channels instead. However, successful plaintiffs filing a citizen suit may be awarded attorney and expert witness fees. *Id.* § 1540(g)(4).

185. *See, e.g.*, Rolland et al., *supra* note 26, at 2365–67 (identifying the relationship between shipping noise and right whale stress levels which may have adverse behavioral and physiological impacts); Lora L. Nordtvedt Reeve, *Of Whales and Ships: Impacts on the Great Whales of Underwater Noise Pollution from Commercial Shipping and Proposals for Regulation under International Law*, 18 OCEAN & COASTAL L.J. 127, 127–35 (2012) (discussing the Rolland study and its implications for international management of

population currently consists of an estimated 300–350 individuals off the eastern coast of North America.¹⁸⁶ This is significantly lower than historical levels, which consequentially may have reduced genetic variability to a point that the existing population may be less capable of reproducing.¹⁸⁷ Further, the population exhibits a lower proportion of juvenile individuals than expected, suggesting potential interferences with mating or high juvenile mortality.¹⁸⁸ NOAA Fisheries identified continued threats to the NA right whale from human activities, including habitat degradation from dredging activities, ship strikes, disturbance from whale-watching boats and other vessels, and entanglement in fishing gear.¹⁸⁹ However, at the time of the proposed listing in 2006, NOAA Fisheries stated that the impacts of noise on NA right whale behavior was unclear.¹⁹⁰ Accordingly, the NA right whale was listed by the Secretary of the Interior as an endangered species under the ESA.¹⁹¹

There appears to be a colorable claim that any vessels producing excessive noise near the critical habitat of the NA right whale is violating the ESA's take prohibition without a permit. Advocates could bring a lawsuit under the ESA's citizen suit provision to enforce the ESA in this manner. This claim would need to be supported by sufficient evidence to meet the

shipping noise); Regina Asmutis-Silvia, *A Multi-Faceted Approach Is Necessary to Protect Endangered Species: A Case Study of the Critically Imperiled North Atlantic Right Whale*, 36 B.C. ENVTL. AFF. L. REV. 483, 492–94 (2009) (categorizing the threat of strikes from shipping vessels as a primary concern for right whale populations).

186. See Int'l Union for Conservation of Nature & Nat. Res., *Eubalaena glacialis*, IUCN RED LIST OF ENDANGERED SPECIES, <http://www.iucnredlist.org/details/41712/0> [<https://perma.cc/E58F-8FP7>] (last visited May 5, 2017).

187. Endangered and Threatened Species; Endangered Status for North Pacific and North Atlantic Right Whales, 73 Fed. Reg. 12,024, 12,028 (Mar. 6, 2008).

188. *Id.*

189. See Endangered And Threatened Species; Proposed Endangered Status for North Atlantic Right Whales, 71 Fed. Reg. 77,704, 77,708–11 (Dec. 27, 2006).

190. *Id.* at 77,711.

191. See Endangered Status for North Pacific and North Atlantic Right Whales, 73 Fed. Reg. at 12,028-29; 50 C.F.R. § 224.101 (2012); *id.* § 226.203 (identifying critical habitat for the NA right whale).

standard for obtaining an injunction, which requires a showing that 1) the plaintiff is likely to succeed or has succeeded on the merits of the underlying claim, 2) the plaintiff is likely to suffer irreparable harm in the absence of an injunction, 3) the balance of equities tips in the plaintiff's favor, and 4) the injunction would be in the public interest.¹⁹²

The key requirement subject to dispute seems to be a showing of irreparable harm. First, the plaintiff would need to provide sufficient scientific evidence to support the notion that NA right whales would be irreparably harmed if current shipping levels were to continue indefinitely. While there is scientific evidence indicating increased stress levels in NA right whales in the presence of shipping traffic,¹⁹³ the full effects of increased stress on the behavior and physiology of the species are not fully documented.¹⁹⁴ Nevertheless, the scientific literature is rapidly expanding,¹⁹⁵ and a federal judge may find the existing evidence sufficient to warrant a finding that NA right whales are irreparably harmed by noise pollution from shipping activities.

Second, there may be causation issues regarding the connection between the particular defendant's activities and the effects on the NA right whale population. The defendant would have to be responsible for a sufficient proportion of shipping activities to infer that removing those activities from the environment would eliminate the likelihood of irreparable injury. But threats to the species are a cumulative problem; there are many individual fishermen casting nets in the ocean, a

192. *Winter v. Nat. Res. Def. Council*, 555 U.S. 7, 20 (2008). The Supreme Court acknowledged that the standard for a permanent injunction is essentially the same as that for a preliminary injunction, except requiring actual success on the merits instead of merely a "likelihood" of success at an early stage in the court proceedings. *See id.* at 32 (quoting *Amoco Prod. Co. v. Vill. of Gambell*, 480 U.S. 531, 546 n. 12 (1987)).

193. *See* Rolland et al., *supra* note 26.

194. *See id.* at 2366 ("Definitively linking chronic stress responses to detrimental health effects in large whales is extremely difficult because of the logistics of studying free-swimming whales and the inability to conduct a controlled study. However, a large body of literature has demonstrated that chronic stress, assessed by persistently elevated GCs, can lead to detrimental effects on health and reproduction across a variety of vertebrate taxa.").

195. *See supra* Part II.A.

significant number of whale-watching vessels, and multiple shipping tankers operating in the same traffic lane on a daily basis. Therefore, it may not be tenable to argue that one individual defendant, or even multiple joint defendants operating the vast majority of shipping traffic in the area, is causing the irreparable harm to the NA right whales.

Despite the uncertain nature of potential litigation under the ESA, the time appears ripe to mobilize a legal challenge against the shipping industry. Regardless of the outcome of litigation, merely elevating the issue in the public eye might further drive the agency agenda to concretely regulate shipping vessels for noise pollution. A successful case would be an instrumental catalyst to force NOAA Fisheries, and to a lesser extent the FWS, to engage in the permitting process for shipping vessels and take the threat of shipping noise seriously. In the absence of any unilateral action by NOAA Fisheries to apply the laws it administers to this vast industry, private action under the ESA is an available tool for advocates to advance the narrative of harmful shipping noise to the next level.

C. *National Environmental Policy Act*

1. Relevant NEPA provisions

NEPA was passed in 1969 to set a national policy across all federal agencies that requires due consideration of environmental issues.¹⁹⁶ Congress intended that the federal government “use all practicable means” to protect the environment for future generations, assure safe and healthful surroundings for all Americans, and optimize the beneficial uses of the environment without degradation.¹⁹⁷

Despite this ambitious policy language, NEPA is procedural in nature and does not impose any substantive obligations. Section 102(C) states that every “major Federal action significantly affecting the quality of the human environment” must be accompanied with a detailed statement with analysis of

196. See National Environmental Policy Act of 1969, Pub. L. No. 91-190, § 2, 83 Stat. 852, 852 (codified at 42 U.S.C. § 4321 (2012)).

197. 42 U.S.C. § 4331(b)(1)-(3).

- (i) the environmental impact of the proposed action,
- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.¹⁹⁸

These reports are called environmental impact statements ("EISs").¹⁹⁹ Agencies are required to consult with any other relevant federal agencies with jurisdiction before conducting the environmental analysis.²⁰⁰ NEPA also established the Council on Environmental Quality ("CEQ"), serving under the President, to "formulate and recommend national policies to promote the improvement of the quality of the environment."²⁰¹

The CEQ has issued regulations that provide uniform procedures for all agencies when complying with NEPA.²⁰² For an action not normally requiring an EIS, an agency first conducts an environmental assessment ("EA") if it suspects that there will be significant environmental impacts.²⁰³ If the agency determines there will be no significant environmental impacts, the agency prepares a finding of no significant impact ("FONSI").²⁰⁴ If the agency does decide that a full EIS is required, it must first engage in a "scoping" process to determine the scope of the environmental issues that are relevant for the proposed action.²⁰⁵ Then it must issue a draft EIS and invite comments from other agencies, interested parties, and members

198. *Id.* § 4332(C).

199. *See* 40 C.F.R. § 1508.11 (2012).

200. 42 U.S.C. § 4332(C).

201. *Id.* § 4342.

202. *See* Implementation of Procedural Provisions, 43 Fed. Reg. 55,978, 55,978 (Nov. 29, 1978).

203. 40 C.F.R. §§ 1501.4(b), 1508.9.

204. *Id.* §§ 1501.4(e), 1508.13.

205. *Id.* § 1501.7.

of the public.²⁰⁶ The final EIS must include comments submitted as an attachment and must substantively respond to each comment.²⁰⁷

2. Treatment of Shipping Noise under NEPA

Given that NEPA only applies to major federal agency actions, the only way this statute could be utilized to regulate shipping noise is if some federal agency engages in regulatory action that affects the shipping industry. Once again, NOAA Fisheries has not yet initiated any regulation of shipping activities under the substantive MMPA or ESA statutes.²⁰⁸ The regulatory definition of “major federal action” includes “where the responsible officials fail to act and that failure to act is reviewable by courts or administrative tribunals under the Administrative Procedure Act or other applicable law as agency action.”²⁰⁹ However, inaction by NOAA Fisheries in the context of regulation under the MMPA and ESA is likely not judicially reviewable under the APA.²¹⁰ Therefore, NEPA’s availability as a secondary procedural safeguard is largely not accessible in the context of NOAA Fisheries absent the issuance of regulations or permits governing the shipping industry.

At least one other relevant federal agency overseeing the shipping industry could be found to engage in major federal actions significantly affecting the environment under NEPA.²¹¹ The Federal Maritime Commission (“FMC”) has authority over many aspects of the shipping process, including approval over business agreements between ocean common carriers or marine terminal operators²¹² and licensing of ocean transportation

206. *Id.* § 1503.1.

207. *Id.* § 1503.4(a)-(b).

208. *See supra* Parts III.A.2, B.2.

209. *See* 40 C.F.R. § 1508.18.

210. *See supra* notes 132, 134, 169 and accompanying text.

211. Numerous states have enacted laws similar to NEPA requiring environmental impact reports from state agencies, one such example being the expansive California Environmental Quality Act. *See* Cal. Pub. Res. Code §§ 21000–21189.3 (2012). However, analysis of these provisions pertaining to ocean noise and shipping regulation is outside the scope of this paper.

212. *See* 46 U.S.C. §§ 40301, 40304 (2012). An “ocean common carrier” is

intermediaries.²¹³ Licenses for intermediaries last for three years, at which point the applicant can enter a license renewal process to receive another three-year license.²¹⁴ The FMC has substantial enforcement duties over the provisions of the shipping codes and can bring complaints, hold hearings, and issue orders against violators.²¹⁵ Additionally, the FMC has the authority to promulgate regulations to carry out any of its duties or powers.²¹⁶

The FMC already has regulations in place providing additional guidance for how it conducts NEPA review.²¹⁷ The FMC makes every one of its actions not categorically exempt from NEPA subject to an EA.²¹⁸ For significant environmental impacts requiring an EIS, the FMC divides the potential actions into three general categories: adjudicatory proceedings, rulemaking or legislative proposals, or other actions.²¹⁹ The FMC identifies two “major decision points” in the EIS process: the issuance of an initial decision in an adjudicatory process that will be heard by an administrative law judge, or the issuance of a final decision or report on an action.²²⁰ Any NEPA documents are supposed to be preceded by a notice in the federal register to

defined as a vessel operator that provides transportation of passengers or cargo between the United States and a foreign country, and assumes responsibility during the transportation phase. *Id.* §§ 40102(6)(A)(i)-(ii), (17). A “marine terminal operator” manages and operates a wharf, dock, warehouse, or other terminal facilities in connection with common carrier transportation activities. *Id.* § 40102(14).

213. *Id.* § 40901(a). An “ocean transportation intermediary” either dispatches shipments from the United States via ocean common carriers and arranges space for those shipments, or is a common carrier that does not operate the ocean vessels. *Id.* § 40102(16), (18)-(19). Note that these statutes have been re-codified since their original enactment, and include the Shipping Act of 1984, the Foreign Shipping Practices Act of 1988, the Merchant Marine Act of 1920, and other provisions from separate laws. See *About the Federal Maritime Commission*, FED. MAR. COMM’N, http://www.fmc.gov/about/about_fmc.aspx [<https://perma.cc/7APX-B3GE>] (last visited May 5, 2017).

214. See 46 C.F.R. § 515.14(c)-(d) (2012).

215. See 46 U.S.C. §§ 41301-04.

216. *Id.* § 305.

217. See 46 C.F.R. §§ 504.1-504.10.

218. *Id.* § 504.5(a).

219. See *id.* § 504.7(a)(2)(i)-(iii).

220. *Id.* § 504.7(a)(3)(i)-(ii).

allow for public comments.²²¹ Despite these procedures in place, the FMC has rarely, if ever, initiated NEPA review of its actions.²²²

3. *Role of Advocates under NEPA*

It would be a creative challenge to claim that the FMC's controls over the shipping process are "major" enough to require environmental review under NEPA. Each individual vessel that receives a license or authorization to conduct business in the United States has an environmental impact based on its disruption of marine mammals. Therefore, the FMC's affirmative authorization of those vessels could constitute a major federal action under NEPA. The fact that the FMC already has guidelines for environmental review in place, though not actively being utilized, may provide further support for the claim that some of the FMC's actions have significant environmental impacts and must go through NEPA review. However, the FMC may process numerous agreements and licenses every year, making it less likely that one individual authorization would be considered major.²²³ Additionally, the cumulative impacts of all these shipping vessels may be significant, but courts may not be favorable toward an argument that one individual vessel could have significant impacts.²²⁴ These legal arguments have never been raised in court, so their efficacy is difficult to predict. However, if litigation is a desirable instrument for an advocate wishing to initiate regulation of shipping activities for environmental impacts, the FMC may prove to be a viable potential target for suit.

Despite the potential lack of major federal actions directly regulating the shipping industry, advocates still have the opportunity to participate in the public comment period for

221. *See id.* §§ 504.5(b), 504.7(b)(3).

222. No postings in the Federal Register by the FMC were identified that contained a reference to NEPA or environmental review documents.

223. The FMC website identifies over 5,000 different licensed non-vessel ocean common carriers. *See Ocean Transportation Intermediaries (OTI) List*, FED. MAR. COMM'N, <https://www2.fmc.gov/oti/NVOCC.aspx> [<https://perma.cc/T4HN-A6TJ>] (last visited May 5, 2017).

224. *See supra* Part III.B.3.

NEPA review already being conducted for projects that may have an impact on the intensity of vessel activity in a particular region. For example, in 2012 the Federal Energy Regulatory Commission (“FERC”) developed an EA for a proposal to site, construct, and operate facilities for the export of liquefied natural gas at an existing terminal in Louisiana.²²⁵ One environmental group commented on the EA and claimed that increased shipping traffic could have environmental justice impacts on neighboring communities, including increased noise pollution from the shipping traffic and operation of the facility.²²⁶ However, no group raised concerns about the impacts of this noise pollution on marine mammals that may inhabit the area. FERC received a similar application for the operation of liquefied natural gas activities at an existing terminal in Maryland, and for that EA there were multiple comments raising concerns about noise from increased shipping traffic.²²⁷ However, no comments raised concerns about the protection of marine mammals.

As these examples show, many developers are actively pursuing offshore energy projects in front of FERC, and any future environmental review could be used by advocates as a platform for ensuring due consideration of the impacts of vessel noise on marine mammals. Surely other federal agency projects requiring NEPA review, such as port expansions or other coastal development, allow for ample opportunity to submit comments raising concerns about noise impacts to marine mammals.

IV.

RECOMMENDATIONS FOR ADVOCACY

As explained above, only the ESA currently provides the possibility of a substantive legal claim against the shipping

225. *See* Sabine Pass Liquefaction, LLC & Sabine Pass LNG, L.P., 139 F.E.R.C. 61,039, ¶¶ 1, 33 (Apr. 16, 2012), 2012 WL 1312891.

226. *Id.* ¶ 100.

227. Dominion Cove Point LNG, LP, 148 F.E.R.C. 61244, ¶¶ 1, 153 (Sept. 29, 2014), 2014 WL 4854467.

industry for noise impacts on marine mammals.²²⁸ The utility of the MMPA and NEPA is contingent on federal agency action regarding shipping, whether it be the issuance of a permit or some other regulatory action.²²⁹ In the absence of any such agency action, advocates still have the opportunity to submit public comments in proceedings under these statutes for projects that may result in increased vessel activity.²³⁰ However, that approach is limited to short-term consideration of environmental effects at a smaller scale.

Advocates wishing to reduce the magnitude of noise pollution from shipping activities have other avenues available for obtaining the relief they seek. Below are legal options advocates can pursue in order to advance the protection of marine mammals from shipping noise.²³¹

A. Lobby Agencies to Engage in Rulemaking or Issue Guidelines Regarding Noise from Shipping Vessels

Current regulations from NOAA Fisheries and other relevant agencies are insufficient to address noise pollution from shipping vessels. Advocates should consider lobbying these agencies to engage in their delegated rulemaking authority to promulgate either binding regulations or enforcement guidelines that establish a comprehensive scheme for environmental regulation of the shipping industry.

NOAA Fisheries has embarked on this process through its issuance of draft guidelines for hearing sensitivity thresholds but has not yet conducted any procedures regarding guidelines for behavioral impacts of noise.²³² Practically, these guidance documents would not be useful for advocates if NOAA Fisheries

228. *See supra* Part III.B.3.

229. *See supra* Parts III.A.3, III.C.3.

230. *See id.*

231. Certainly there are numerous non-legal initiatives available to advocate groups, such as direct negotiations with shipping companies to mitigate noise impacts, public pressure on shipping companies in the event that negotiations are unsuccessful, public awareness campaigns regarding the impacts of shipping noise on marine mammals, and increased funding for scientific research. However, these options are beyond the scope of this paper.

232. *See supra* Part III.A.2.

still refuses to apply them to regulate shipping activities.²³³

Instead, NOAA Fisheries should promulgate a rule specifically for the shipping industry that outlines how vessels can comply with the MMPA and ESA.²³⁴ The rule should specify sound thresholds, mitigation requirements, and monitoring obligations, the observance of which would be treated as sufficient measures to avoid enforcement by the agency. The rules can be narrowly tailored to particular species or populations of marine mammals, especially those listed under the ESA, and it can include broader, generally-applicable requirements for all vessels. A mixture of these two strategies would best serve the interests of the marine mammal community and would provide notice to shipping vessel operators to be diligent in monitoring their individual noise output during the entirety of the voyage.

NOAA Fisheries could then narrow its focus on enforcing its own regulations against shipping vessels that do not adhere to the standards set forth in the rule. This would alleviate NOAA Fisheries' concerns about having sufficient resources to enforce the MMPA against shipping vessels. These actions would be beneficial even if they come in the form of non-binding guidance. NOAA Fisheries retains sole enforcement obligations over the MMPA,²³⁵ and binding regulations would do nothing more than define when an enforcement action against a shipping vessel may be warranted. The same effects can be achieved through internal guidance documents. Therefore, any action from NOAA Fisheries that results in specifically defined enforcement objectives would be a momentous achievement for the regulation of shipping noise.

Politically, agency regulation may be difficult to achieve at the present time. NOAA Fisheries has been reluctant to enforce the law against shipping companies, and it is unlikely that the agency would suddenly be willing to do so on a whim.²³⁶ A

233. *See id.*

234. NOAA Fisheries has rulemaking authority pursuant to the MMPA over any takings of marine mammals. *See* 16 U.S.C. § 1373(a) (2012).

235. *See id.* § 1377.

236. This presents concerns of industry capture, which may be an obstacle necessary to overcome in order to get the agency to act. *See* JASNY ET AL., *supra* note 3, at 49–50.

change in political administration could make this option more feasible given the potential for new agency appointees that are more receptive to the agenda of shipping regulation. Ultimately, pressure from advocacy groups and greater public awareness of the environmental impacts of the shipping industry may eventually drive progress. NOAA Fisheries should act pursuant to its delegated authority to ensure that the shipping industry, with its substantial impacts on marine mammal health and behavior, does not continue to go unregulated.

B. Lobby Congress to Impose Binding Mitigation Measures for All Shipping Vessels

Although the increasing partisanship in recent years makes Congressional action unlikely in the near future, Congress is another potential target of advocacy efforts. In the event that Congress becomes amenable to enacting further environmental protections, environmental advocates should vigorously lobby for expanding MMPA, ESA, and NEPA provisions that explicitly require the application of those laws to the shipping industry.

One way Congress can achieve this goal—without any significant increases in obligations on the part of NOAA Fisheries or other federal agencies—is to impose mandatory mitigation measures for all shipping vessels that enter United States territory. These can take the form of geographical restrictions on vessel operations to avoid habitats considered to be of high importance to marine mammals, operational standards to require more careful operation of shipping vessels, or design standards to reduce noise production straight from the source.²³⁷ Any vessels that fail to adhere to these standards could be subject to enforcement by NOAA Fisheries in a non-discretionary manner. Congress could even make the application of IHAs or other permit authorizations unavailable for these activities to prevent the agency from allowing unnecessary impacts on marine mammals.

Of the three categories of mitigation measures, vessel design standards would be the most challenging to achieve. The United

237. *See supra* Part II.C.

States can require American-registered ships to adhere to certain standards regardless of where they travel, but less than half of the shipping vessels owned by Americans are domestically registered.²³⁸ However, while foreign-registered ships may not have to adopt American design standards for foreign travel, any ships that enter United States territory would be subject to federal laws.²³⁹ Therefore, Congress could effectively require any foreign shippers wishing to engage in commerce with the United States to have particular protections for marine mammals in their vessel designs.²⁴⁰ This is analogous to the Oil Pollution Act of 1990—passed after the disastrous Exxon-Valdez oil spill—in which Congress required all oil tankers to adopt a double-hull design to prevent future catastrophes.²⁴¹

Congressionally-imposed design standards to mitigate shipping noise may have severe consequences on United States commerce, at least in the short-term. It might be infeasible or cost-prohibitive to retrofit older shipping vessels to incorporate required technology. Any shippers that are unable or unwilling to comply with the standards could cease operations near United States waters or stop conducting business with American entities. This would be undesirable for many reasons, including the generation of heavy opposition to mitigation measures from the shipping industry and those that rely on it. Accordingly, design standards should be cost-effective for shipping vessels—while simultaneously offering sufficient protections for marine mammals—to warrant Congressional intervention in the first place.²⁴²

It is unclear what degree of advocacy initiatives would be

238. JASNY ET AL., *supra* note 3, at 39.

239. *Id.*

240. *Id.*

241. See Oil Pollution Act of 1990, Pub. L. 101-380, § 4115, 104 Stat. 484, 517–22 (codified at 46 U.S.C. § 3703a (2012)).

242. Note that the International Maritime Organization, a subsidiary of the United Nations, is the principal regulator of international ship design standards. See JASNY ET AL., *supra* note 3, at 39. The applicability of international laws and regulations to shipping noise, while highly relevant, are outside the scope of this paper.

necessary to drive Congress to regulate shipping noise in this manner. Given that shipping noise tends to cause long-term adverse behavioral impacts on marine mammals instead of acute harm or mortalities, it appears unlikely that any kind of catastrophic noise event from shipping tankers could occur that would rapidly propel these concerns to the forefront of the environmental discussion. The NA right whale may be a key indicator species of adverse impacts from shipping noise.²⁴³ If scientists can definitively link shipping noise to that species' deterioration and failure to recover to sufficient levels, then perhaps Congress would be motivated to intervene. To the extent that Congress would be receptive to a discussion about mitigating shipping noise, advocates should lobby the legislature to elevate this issue or at the very least give it due consideration.

C. Advocate for an Amendment to the MMPA to Adopt a Citizen Suit Provision

One other statutory deficiency is the lack of a citizen suit provision in the MMPA to allow for environmental organizations to enforce the taking prohibition themselves.²⁴⁴ As articulated above, given current failures to include shipping activities within the regulatory framework, NOAA Fisheries cannot be trusted with sole MMPA enforcement obligations. Adding a citizen suit provision is not a new recommendation,²⁴⁵ but given the abundance of scientific evidence regarding noise impacts on marine mammals developed in the last decade,²⁴⁶ agency regulation is clearly lagging.

Adding a citizen suit provision to the MMPA would be necessary to harmonize the statute with the ESA, which does authorize private actions against the taking of listed species.²⁴⁷ It makes little sense to allow a lawsuit against a shipping company for the taking of a NA right whale under the ESA but

243. See discussion *supra* notes 185–191 and accompanying text.

244. See *supra* Part III.A.3.

245. See JASNY ET AL., *supra* note 3, at 51.

246. See *supra* Part II.A.

247. See *supra* note 182 and accompanying text.

not under comprehensive legislation specifically designed to protect marine mammals. To be sure, a citizen suit provision would allow for advocates to use the MMPA to challenge the disturbance of *any* marine mammal species, not just endangered or threatened ones, which may expose noise polluters to excessive liability. But the failure of NOAA Fisheries to regulate these impacts themselves counsels for a precautionary approach to ensure marine mammals have adequate environmental conditions for survival.

A citizen suit provision would also be necessary to give meaning to the statutory definition of Level B harassment.²⁴⁸ Although Congress explicitly categorized behavioral impacts as a prohibited taking under the MMPA, NOAA Fisheries has not applied that definition to arguably the most significant contributors of Level B harassment. If NOAA Fisheries continues to exercise its enforcement obligations according to current methods, Congress's intent to protect marine mammal species from Level B harassment will be disregarded.

Finally, allowing private parties to enforce the taking prohibition will alleviate resource constraints that may be hindering NOAA Fisheries' application of the MMPA to the shipping industry. Given that some of the nation's leading environmental advocacy organizations already have extensive campaigns to reduce ocean noise,²⁴⁹ these groups would actively enforce the MMPA through litigation to ensure that all significant sources of ocean noise take appropriate measures to reduce their impacts. In the wake of overwhelming litigation stemming from a citizen suit provision, NOAA Fisheries would be compelled to enact regulations that provide clearer definitions for a taking in the shipping context to limit the number and types of suits that can be brought by private parties. This might

248. See 16 U.S.C. § 1362(18)(A)(ii).

249. See, e.g., *Protect Marine Mammals from Ocean Noise*, NAT. RES. DEF. COUNCIL, <https://www.nrdc.org/issues/protect-marine-mammals-ocean-noise> [<https://perma.cc/KY9C-89JX>] (last visited May 5, 2017) (seeking to enforce environmental laws against major noise polluters in the U.S. military and the oil and gas industry); *Ocean Noise*, CTR. FOR BIOLOGICAL DIVERSITY, http://www.biologicaldiversity.org/campaigns/ocean_noise/ [<https://perma.cc/T8CF-T3RF>] (last visited May 5, 2017).

be a desirable result in order to concentrate the enforcement of the MMPA on only those shipping vessels that continue to discharge significant unmitigated quantities of sound energy into the ocean environment.

Nevertheless, it is unreasonable to expect that a citizen suit provision under the MMPA could be adopted in the near future. The current lack of Congressional unity makes it near impossible to achieve any type of legislation reform—and certainly not in the environmental context—until there is sufficient turnover of the nation’s legislators. Further still, all industries that produce ocean noise as part of normal operations will vigorously resist an amendment that could subject them to significant litigation with uncertain outcomes.

Enacting a citizen suit provision in the MMPA may also have additional negative and unintended consequences. Fearing the threat of litigation, any actors expected to produce ocean noise will apply to NOAA Fisheries for permit authorizations, which will exacerbate the agency’s underfunding woes. Private parties may also use the citizen suit provision to excessively limit important commercial or governmental activities in or around the ocean based on vague connections to marine mammal health. It seems likely that Congress, or NOAA Fisheries through regulations, would need to limit the utility of citizen suit provisions to clearly defined taking violations.

Although politically unpalatable, and regardless of whether it may confer excessively broad enforcement powers to private parties, an MMPA citizen suit provision is a crucial advocacy objective to establish uniform application of the statute’s taking prohibition across all ocean noise polluters, including the shipping industry. The absence of such a provision is a significant obstacle to ensuring that shipping vessels take available precautions to limit their impacts on marine mammals.

V.

CONCLUSION

The current legal regime governing marine mammals may seem like a capable system for reducing noise impacts from the shipping industry, but lackadaisical enforcement has hindered

any meaningful progress. Instead of sitting idly by, environmental advocates should continue to proactively engage with the federal government to better protect marine mammals from these threats. Amendments to the applicable statutes, or the issuance of regulations by NOAA Fisheries, would resolve many of the issues surrounding enforcement, but these are ambitious goals that may not materialize in the near future.

Instead, litigation pursuant to the Endangered Species Act appears to be the most productive avenue to force agencies to engage with the shipping industry's noise impacts. Noise pollution is likely classified as a "take" under the ESA, and the availability of private enforcement makes a lawsuit against the shipping industry for noise impacts an available advocacy device. If such a lawsuit were to be successful, it would ignite a fire under NOAA Fisheries to begin to treat shipping noise seriously under all applicable statutes.

Taking action now is important to ensure that anthropogenic activities utilize mitigation measures that are presently available to reduce the growing impacts on marine mammals. The survival of many populations may depend on reducing current volumes of noise; not only does this mean we must limit any growth in noise production, but we must also seek to reduce current levels of noise pollution as well. Forcing the federal government to acknowledge this pervasive problem through litigation or other outlets of advocacy may, over time, lead to the requisite foundational changes in enforcement to protect marine mammals from the threat of shipping noise.