THE PRECAUTIONARY PRINCIPLE IN MARINE FISHERIES CONSERVATION AND THE U.S. SUSTAINABLE FISHERIES ACT OF 1996

INTRODUCTION

> There are alternatives to degrading the sea, but they require changes in the ways that we think and act. Focusing solely on species . . . has proven to be insufficient in the sea, as it is on land. Ecosystem protection and management are essential complements to species protection and management . . . . [t]he goal should be to ensure that living things do not become endangered . . . to *maintain the integrity of life* . . . . Saving our planet is not a luxury that can be left to someone else. It is an imperative that requires us to make a fundamental change in our course by building conservation into the decision-making process . . . .[1]

The precautionary principle reflects the old maxim: better safe than sorry. This principle advises decision-makers to protect public health and the environment in an anticipatory manner; thus, in the absence of scientific certainty about the threats to the environment, harms do not occur in the first place. As another old adage goes, an ounce of prevention is worth a pound of cure.

One scholar, Dr. Talbot Page, formulated an early example of the principle.[2] Page noted that a scientific false negative could cost lives, while a false positive, such as banning a benign chemical, would have only minor economic consequences.[3] Because of the disparity between the consequences, it is prudent to err on the side of preventing false negatives at the expense of some false positives.[4] In other words, the risk of harsh consequences resulting from false negatives outweighs the risk of false positives when implementing the precautionary principle.

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1. GLOBAL MARINE BIOLOGICAL DIVERSITY: A STRATEGY FOR BUILDING CONSERVATION INTO DECISION MAKING xxx (Elliott A. Norse ed., 1993) [hereinafter STRATEGY FOR BUILDING CONSERVATION].

2. *See generally* Talbot Page, *A Generic View of Toxic Chemicals and Similar Risks*, 7 ECOLOGY L.Q. 207 (1978) (discussing new environmental risk problems that differed from more familiar problems).

3. *See id.* at 219-20. An example of a scientific false negative is a scientific conclusion that precautionary action should not occur, when in fact, precautionary action should occur to avoid harmful consequences. On the other hand, a scientific false positive is a conclusion that precautionary action needs to occur when it is not necessary. Page's false positive analysis is hotly debated. *See, e.g.*, Frank B. Cross, *Paradoxical Perils of the Precautionary Principle*, 53 WASH. & LEE L. REV. 851 (1996). For example, a chemical banned because of a false positive result may, in fact, have great benefits that are lost once the ban takes place.

4. *See* Page, *supra* note 2, at 219-20. *Cf.* Cross, *supra* note 3, at 851 (asserting that false positives can present a greater threat to health than false negatives).

In 1995, the parties to the Convention on Biological Diversity (Biodiversity Convention), agreed on a program implementing the Convention with respect to marine and coastal biodiversity: the Jakarta Mandate on Marine and Coastal Biological Diversity.[5] This mandate demonstrates the importance of the Biodiversity Convention as a legal tool in promoting the conservation of marine and coastal biodiversity. The mandate further illustrates the emergence of a new approach to marine fisheries management, the precautionary principle.[6] This approach has gained increasing international recognition.[7] Part I of this Note discusses the origins of the precautionary principle and how it relates to biological diversity. Part II explores United States fishery management and the most prominent piece of legislation in the last couple of decades, the Magnuson Fishery Conservation and Management Act.[8] Part III discusses the most recent amendment to the Magnuson Act and whether it implements the precautionary principle. Finally, this Note concludes that in light of recent fishery collapses, fishery management would benefit from using the precautionary principle more prominently.

I. BACKGROUND

The precautionary principle increasingly emerges as an instrument in environmental policy and law.[9] Scholars attach various meanings to this principle.[10] The salient definition is the understanding that governments, decision-makers or individuals, must take precautionary measures (or avoid certain conduct and projects) when there is an expectation that a relevant activity may create adverse environmental interference, even in the absence of conclusive evidence displaying a relationship between cause and alleged effects.[11] In other words, it would be ill-advised to postpone preventative

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5. *See Report of the Second Meeting of the COP to the Convention on Biological Diversity*, Annex II, Decision II/10, U.N. Doc. UNEP/CBD/COP/2/19 (1995) [hereinafter *Jakarta Mandate*].

6. *See* Charlotte de Fontaubert et al., *Biodiversity in the Seas: Implementing the Convention on Biological Diversity in Marine and Coastal Habitats*, 10 GEO. INT'L ENVTL. L. REV. 753, 838 (1998); LYNNE M. JURGIELEWICZ, GLOBAL ENVIRONMENTAL CHANGE AND INTERNATIONAL LAW 62-63 (1996).

7. *See* JONAS EBBESSON, COMPATIBILITY OF INTERNATIONAL AND NATIONAL ENVIRONMENTAL LAW 119 (1996). *See also* David Freestone, *The Precautionary Principle*, *in* INTERNATIONAL LAW AND GLOBAL CLIMATE CHANGE 21, 21-30 (Robin Churchill & David Freestone eds., Int'l Envtl Law & Policy Series, 1991).

8. 16 U.S.C. §§ 1801-82 (1994).

9. *See* EBBESSON, *supra* note 7, at 119. *See also* Freestone, *supra* note 7, at 21-30.

10. *See* EBBESSON, *supra* note 7, at 119. Ebbesson notes that in various national settings there are at least seven different, but closely linked understandings of the precautionary principle. *See id.* at 119 n.73 (citations omitted). For a discussion and analysis of different interpretations of the principle in international law, see Freestone, *supra* note 7, at 21-30.

11. *See* EBBESSON, *supra* note 7, at 119-20. *See id. citing* 1992 Baltic Convention, article 3(2);

measures until 100 percent proof is demonstrated.[12] When the principle is applied, the estimated risk and effects if the risk materializes are balanced against the cost of eliminating such risks.[13] The application of the precautionary principle may result in stricter protective measures when compared to measures that only consider recognized effects.[14]

Although the appearance of the precautionary principle is on the rise, some question whether the principle has become a rule of general international law.[15] The principle covers a wide range of possible obligations and actions.[16] The Bergen Ministerial Declaration on Sustainable Development contains a weak formulation of the principle:

> In order to achieve sustainable development, policies must be based on the precautionary principle. Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, *lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.*[17]

Stronger formulations usually reverse the burden of proof, so that before action occurs the potential actor must prove that the activity will not cause harm.[18] The most commonly used definition of the precautionary principle

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1992 North-east Atlantic Convention, article 2 (2a); 1992 Climate Convention, article 3(3). The precautionary principle can also mean that regulatory action should be required where scientific evidence indicates harm to the environment. *See* EBBESSON, *supra* note 7, at 120 n.74.

12. *See* EBBESSON, *supra* note 7, at 120. 100 percent proof cannot be attained scientifically because there is always a margin of error. Thus, waiting for 100 percent proof would result in an eternal wait, resulting in unnecessary damage. *See id.*

13. *See id.* For example, if the precautionary principle is applied to the production of a pesticide, the estimated risk and effects of producing the pesticide, e.g., environmental damage, health risks, and reduction of insects causing crop damage, are weighed against the cost to society of not producing the pesticide, e.g., crop loss and no economically beneficial pesticide sales.

14. *See id.*

15. *See* Freestone, *supra* note 7, at 30; JURGIELEWICZ, *supra* note 6, at 62.

16. *See* Freestone, *supra* note 7, at 30.

17. *Ministerial Declaration on Sustainable Development in the ECE Region*, U.N. Economic Comm'n for Europe Conference on Action for a Common Future, UN Doc. A/CONF.151/PC10 (1990) (emphasis added), *quoted in* JURGIELEWICZ, *supra* note 6. Some authors note that this formulation would be difficult to distinguish from the preventative principle, which is already commonly known in international environmental law. The preventative principle is concerned with the prevention of harm or risks that are known and have been scientifically proven. *See* Freestone, *supra* note 7, at 30; DR. JUR. HARALD HOHMANN, PRECAUTIONARY LEGAL DUTIES AND PRINCIPLES OF MODERN INTERNATIONAL ENVIRONMENTAL LAW THE PRECAUTIONARY PRINCIPLE: INTERNATIONAL ENVIRONMENTAL LAW BETWEEN EXPLOITATION AND PROTECTION 334 (Stanley P. Johnson & Gunther Handl eds., Int'l Envtl. Law & Policy Series, 1994).

18. A commonly cited international convention that uses this formulation is the Oslo Commission

likely falls somewhere between these two examples.[19] In light of the increasing recognition of the precautionary principle, decision-makers should consider a more prominent application to environmental laws and policies in the United States.

A. Origins of the Precautionary Principle

Historically, most human societies assumed that new activities, e.g., manufacturing a new product or chemical, did not pose a threat to the environment.[20] New activities were carried out without contemplating possible adverse effects.[21] The disadvantages of this lack of foresight became apparent because of the increase and expansion in industrial production and human population growth.[22] Unforeseen consequences resulting from industrial growth and the assumption of the lack of a threat to the environment are dangerous and increasing.[23] Various industrial chemicals applied as pesticides or used for other purposes are proving to have far-reaching damaging effects on human health and other organisms.[24]

Members of the international community, in recognizing the error of this old approach, endorsed a new approach that implements the precautionary principle.[25] The origin of the principle lies in the German law *Vorsorgeprinzip*, which is one of the most important principles of German environmental policy.[26] A number of international forums adopted the

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Prior Justification Procedure which allows dumping of industrial wastes in the North Sea only if it is shown that no harm will be caused to the environment. *See* JURGIELEWICZ, *supra* note 6, at 63; Freestone, *supra* note 7, at 30.

19. *See* Freestone, *supra* note 7, at 30.

20. *See* de Fontaubert et al., *supra* note 6, at 838.

21. *See id.*

22. *See id.*

23. *See id.*

24. *See id.* In *Silent Spring*, Rachel Carson was perhaps the first to recognize these far-reaching effects of pesticides on the environment as a result of her study of the effects of DDT and other pesticides on bird populations. She noted:

> [o]ver increasingly large areas of the United States, spring now comes unheralded by the return of the birds, and the early mornings are strangely silent where once they were filled with the beauty of bird song. This sudden silencing of the song of birds, this obliteration of color and beauty and interest they lend to our world have come about swiftly, insidiously, and *unnoticed by those whose communities are as yet affected.*

RACHEL CARSON, SILENT SPRING 103 (1962) (emphasis added).

25. *See* de Fontaubert et al., *supra* note 6, at 838.

26. *See* Freestone, *supra* note 7, at 21. *Vorsorgeprinzip* is the German national law that covers environmental policy. This law is an example of an environmental law which prominently utilizes the precautionary principle. *See id.* at 21-22.

precautionary principle; however, the meaning of the concept is not clear and somewhat elusive.[27]

In the early 1980s, when many raised concerns about the pollution in the Wadden Sea, which borders the North Sea coast of the Netherlands, Germany, and Denmark, a German council recognized the precautionary principle. The German Council of Experts on Environmental Matters described a precautionary approach in its report on environmental problems in the North Sea:

> A successful environmental policy has to be guided by the principle of precautionary action . . . . Mechanisms which determine the limits of environmental capacity are still largely unknown. Environmental policy therefore has to prevent adverse ecological developments, without having the opportunity to be guided only by already established impacts on the marine environment when specific measures have to be taken . . . .
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> > Three levels of measure are conceivable:
> > -by developing a preventive defence to protect the marine ecological system against ecological dangers;
> > -by taking emission-related measures;
> > -by prohibiting operations seriously affecting the natural environment especially the introduction of substances alien to the environment.[28]

This construction of the principle surpasses simple preventative or protective action to encompass positive actions to prevent damage to natural systems.[29]

Prior to the adoption of the precautionary principle, people concerned with the effects of a proposed project needed to gather evidence in order to prove that the project threatened the environment before any protective action occurred.[30] In contrast, under the precautionary principle, the burden of proof

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27. *See id.* at 21. Freestone notes the full implications of the precautionary principle are still uncertain. *See id.*

28. *Id.* at 21-22.

29. *See id.* at 22. The protective principle, not to be confused with the precautionary principle, imposes on the States an obligation to prevent known or foreseeable harm outside their jurisdiction. *See* HOHMANN, *supra* note 17, at 334. Although the protective principle is concerned with the prevention of harm or risks that are known and have been scientifically proven, the precautionary principle runs in advance of these harms and thus covers cases of scientific uncertainty. The significant difference is the requirement under the precautionary principle that action should be taken to control a possible environmental harm in the absence of scientific certainty. *See id.*

30. *See* de Fontaubert et al., *supra* note 6, at 838.

shifts to those who propose a new undertaking; they must demonstrate that the project is environmentally safe and will not cause harm.[31] If the people proposing the project are unable to prove that the suggested undertaking is safe, their actions are halted.[32]

The first international document that explicitly manifested the precautionary principle was the Declarations of the International Conferences on the Protection of the North Sea.[33] The German government played a prominent role in the Conference and argued that there should be an application of the precautionary principle because waiting would likely cause large-scale harmful effects.[34] The Germans used the precautionary principle as a negotiation tool, and referred to *Vorsorgemassnahmen* (the precautionary principle), while the English text spoke only of "timely preventative measures."[35] Nonetheless, the London Declaration issued after the Second International North Sea Conference[36] explicitly stated the precautionary principle in 1987: "[i]n order to protect the North Sea . . . a precautionary approach is necessary which may require action to control inputs of such substances even before a causal link has been established by absolutely clear scientific evidence."[37] Furthermore, the 1990 Hague Declaration issued after the Third North Sea Meeting expressly referred to the precautionary principle.[38]

In recognition of the adoption of the principle at the North Sea Conference, the Paris Convention for the Prevention of Marine Pollution for Land-Based Sources passed a Recommendation in 1989 on the Principle of Precautionary Action.[39] The parties at the same Convention also passed another Recommendation on the use of best available technology.[40] In the second Recommendation, the parties gave undeniable effect to the principle when they agreed that the best available technology should be used to prevent pollution or the risk of pollution.[41] The parties required that in determining what constitutes the best available technology in general or individual cases, "special consideration is given to . . . [*inter alia*] the precautionary

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31. *See id.* Some consider this shifting of the burden of proof to be the most rigorous form of the precautionary principle. *See* Freestone, *supra* note 7, at 25.

32. *See* de Fontaubert et al., *supra* note 6, at 838.

33. *See* Freestone, *supra* note 7, at 22.

34. *See id.*

35. *Id.* at 22.

36. *London Declaration*, Second International North Sea Conference, U.N. Doc. A/45/721 (1987), *quoted in* Freestone, *supra* note 7, at 23.

37. *London Declaration*, *supra* note 36, at VII.

38. *See* Freestone, *supra* note 7, at 22.

39. *See id.* at 24.

40. *See id.*

41. *See id.*

principle."[42] Although these recommendations are not *per se* legally binding on the parties, this wording, taken in combination with the declarations, suggests that a disregard of the principle would be considered a breach of good faith.[43] Further, the Oslo Commission, the regional body implementing the London Declaration relating to dumping and incineration of waste, adopted a binding decision on the reduction and cessation of dumping industrial wastes at sea.[44] The parties developed a procedure which places the burden of proof on the applicant to demonstrate that no harm will be caused to the marine environment.[45]

Another strong application of the precautionary principle occurred at the Third International Conference on the North Sea. Here, in the Preamble to The Hague Declaration, the parties declared that they would "continue to apply the precautionary principle, that is to take action to avoid potentially damaging impacts of substances . . . even where there is no scientific evidence to prove a causal link between emissions and effects."[46] Again, although these declarations do not have legal force *per se*, they can give rise to legal obligations under customary international law if it is clear that the parties acknowledge the obligations, and the wording of the documents evidences an intent to bind themselves in such a manner.[47] However, despite the nonbinding nature of the agreements, the acceptance of the precautionary principle in these situations is unambiguous, and thus it would not be easy for parties to deny its force in subsequent negotiations.[48]

In recent years, a number of different international forums have increasingly adopted the precautionary principle sometimes with reference to specific issues, sometimes in principle, sometimes implicitly, and sometimes explicitly.[49] The Biodiversity Convention,[50] United Nations Convention on

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42. *Id.*

43. *See id.* International law differs from domestic law. It can be "soft," which means it provides guidance to policy makers. It can also be "hard," meaning it is binding and enforceable in international and domestic courts.

44. *See* Freestone, supra note 7, at 24-25.

45. *See id.* at 25. As noted earlier, Freestone considers this shifting of the burden of proof to the applicant to be the most rigorous application of the precautionary principle. *See id.*

46. *Id.* This is a broader acceptance of the principle because it is part of the general preamble and consequently applies to all areas of the work of the Conference.

47. *See id.* The Declarations of the Conferences are not traditional legal instruments, thus the undertakings contained in them do not have legal force *per se*. The Declarations do not by themselves create a binding effect unless there is the requisite intent and practice.

48. *See id.* at 25-26. For example, if Party A agreed to a declaration and denied its effect in a subsequent negotiation, Party A would likely lose credibility and bargaining power in those negotiations as well as those that followed. Party A may also be estopped from denying the declaration.

49. *See id.* at 23.

50. U.N. Conference on Environment and Development: Convention on Biological Diversity (1992), *reprinted in* Principles of International Law IIA, *Documents in International Environmental Law*

the Law of the Sea (UNCLOS),[51] the Rio Declaration on Environment and Development,[52] and Agenda 21 refer specifically to the need for the application of the precautionary approach.[53] In the Preamble, the parties to the Biodiversity Convention note that, "where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat."[54] The other conventions incorporate similar provisions alluding to the precautionary principle.

The most recent example of the precautionary principle is the Jakarta Mandate on Marine and Coastal Biological Diversity (1995),[55] which developed as a result of the Convention on Biological Diversity in Rio de Janeiro in 1992.[56] This Mandate drew heavily on the recommendations of the first meeting of the Convention's Subsidiary Body on Scientific, Technical and Technological Advice, held in Paris in September 1995.[57]

The objectives of the Biodiversity Convention are the conservation of biological diversity (biodiversity), the sustainable use of biodiversity's components, and the equitable sharing of benefits derived from genetic resources.[58] The Convention recognized the intrinsic value of biodiversity and established a framework of general obligations that parties are to elaborate in more detail at the national level.[59] .Among other things, parties are to create national plans for conservation and sustainable use.[60] These obligations allow for flexibility in implementation because of the inherent complexity of biodiversity conservation conditions.[61]

The Biodiversity Convention also provides for an international structure to support the national implementations. This structure consists of a permanent Secretariat; a Subsidiary Body on Scientific, Technical and Technological Advice; and a Clearing-House Mechanism to support scientific

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845, (Phillip Sands et al. eds. 1994 [hereinafter Biodiversity Convention].

51. U.N. CONVENTION ON THE LAW OF THE SEA, U.N. Doc. A/CONF. 61/122, U.N. Sales No. E. 83.V.5. (1982) [hereinafter UNCLOS].

52. *See Report of the U.N. Conference on the Environment and Development*, U.N. Conference on the Env't and Dev., Annex 1: Rio Declaration on Environment and Development, Principle 16 (1992).

53. *See* de Fontaubert et al., *supra* note 6, at 838.

54. Biodiversity Convention, *supra* note 50, at preamble.

55. *See Jakarta Mandate*, *supra* note 5.

56. *See* Biodiversity Convention, *supra* note 50.

57. *See* de Fontaubert et al., *supra* note 6, at 754.

58. *See id.* at 755.

59. *See id.*

60. *See id.*

61. *See id.* Variations in biodiversity call for flexibility in implementation because the variations are not distinguishable based on country boundary lines. It is likely that a country will have a number of ecosystems within its boundaries. A rigid standard would inhibit the objectives of the Biodiversity Convention.

and technical cooperation.[62] The parties meet periodically at Conferences of the Parties (COPs) to discuss issues relating to the Convention.[63] At the COPs, each party submits a report on its implementation efforts to date.[64] There is also a general fund, operated by the Global Environment Facility, that is supported by developed countries to aid in financing developing countries.[65]

Under the Convention, each party must take action to protect coastal and marine biodiversity within its national jurisdiction.[66] In addition, each party must apply the Convention to all activities under that party's jurisdiction or control that occur within its jurisdiction or on the high seas, regardless of when the effects of the activities occur.[67] The Convention further mandates that parties cooperate to achieve conservation and sustainable use of biodiversity outside national jurisdiction, in the high seas and on the deep seabed, as well as other areas of mutual interest.[68] Thus, the reach of the precautionary principle through the Convention is expansive.

At the second COP, held in Jakarta in 1995, the parties outlined a strategy for implementing the Convention with reference to marine and coastal biodiversity.[69] In the declaration, the program was termed the "Jakarta Mandate."[70] The Mandate embodies the recommendations to the Conference from the Subsidiary Body on Science, Technology and Technical Advice (SBSTTA), and additional items agreed upon by the COP.[71] Most of the points were positive additions to the recommendations from the SBSTTA, but the COP noted a minority view concerned about the recommendations.[72] The Jakarta Mandate also identified priorities which included development of Integrated Coastal Area Management;[73] establishment and maintenance of marine protected areas for the conservation and sustainable use of threatened

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62. *See id.*

63. *See id.*

64. *See id.*

65. *See id.* Developed countries are those countries, e.g., the United States, which are advanced in terms of technology and industry. Developing countries are those countries which do not currently have the technological and industrial level of the developed countries but are moving in that direction.

66. *See id.* at 756.

67. *See id.* Under UNCLOS, coastal states can exercise jurisdictional rights over a vast amount of area including inland waters, the territorial sea, the contiguous zone, the exclusive economic zone (EEZ), and parts of the continental shelf. The Biodiversity Convention's obligations apply within these zones. *See id. citing* UNCLOS, *supra* note 51, at art. 55-56.

68. *See* de Fontaubert et al., *supra* note 6, at 756.

69. *See Jakarta Mandate*, *supra* note 5.

70. *See id.*

71. *See id.*

72. *See id.* Some countries believed the SBSTTA placed too much emphasis on fishery issues. *See Jakarta Mandate*, *supra* note 5. Other countries pointed out that the fishery subsidies issue is politically sensitive with trade implications. *See id.*

73. *See* Biodiversity Convention, *supra* note 50.

species, habitats, living marine resources, and ecological processes;[74] sustainable management of fisheries and other living resources systems;[75] insurance that mariculture operations are sustainable;[76] and control or eradication of harmful alien species by preventing their introduction.[77]

B. Biodiversity Principles

In order to understand the Biodiversity Convention, the Jakarta Mandate, and the application of the precautionary principle, one must understand the general basis of biodiversity. The decrease in biodiversity is one of the arguments relied on to suggest an implementation of the precautionary principle. Biological diversity is vital to human existence. Until recently, many studies concentrated on terrestrial conservation in the area of biodiversity protection.[78] Although there is greater species diversity in the ocean, and the ocean covers more than two-thirds of the earth's surface, the legal and institutional framework governing human activities in the marine environment lags behind that for the terrestrial environment.[79] Historically, most people viewed the ocean as a limitless resource, with endless resilience to the activities of man.[80] However, given new understanding, humans should now recognize that the oceans are not limitless, and thus there must be efforts to preserve them.

The Convention on Biological Diversity[81] defines the concept of biological diversity as "the variability among living organisms, from all sources, including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems."[82] In a widely used definition of biodiversity, three levels of biological diversity are considered:

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74. *See* Biodiversity Convention, *supra* note 50, at arts. 8(a), 8(b), 8(e).

75. *See also* Biodiversity Convention, *supra* note 50.

76. *See* de Fontaubert et al., *supra* note 6, at 794. Under this requirement, Parties should conduct environmental impact assessments of siting, design, and cumulative impact of mariculture projects. *See id.*

77. *See id.* This requirement includes measures to minimize the risk of introduction of alien species from ballast water and mariculture. Ballast water is the water kept in boats when the cargo area is empty in order to keep the boat balanced. Typically, this water is dumped prior to the boat reaching its destination.

78. *See* Suzanne Iudicello & Margaret Lytle, *Marine Biodiversity and International Law: Instruments and Institutions That Can Be Used to Conserve Marine Biological Diversity Internationally*, 8 TUL. ENVTL. L. J. 123, 124 (1994).

79. *See id. See also* Norse, *supra* note 1, at xxviii.

80. *See* Iudicello and Lytle, supra note 78, at 124, *citing* Peter Weber, *Abandoned Seas: Reversing the Decline of the Oceans*, WORLDWATCH PAPER 116, Nov. 1993, at 5.

81. *See* Biodiversity Convention, *supra* note 50.

82. *Id.* at art. 2.

genetic, species, and ecosystem diversity.[83] Genetic diversity is the variation in the gene pool of a given population,[84] which is extremely important because populations with higher genetic diversity are more likely to have some individuals that can withstand environmental change.[85] Most people equate biological diversity with species diversity, which is the number of the individual species.[86] Ecosystem diversity includes the species in a community, as well as the physical structures of the ecosystem and the interactions of the species within the community. Marine ecosystems vary widely, e.g., salt marshes, coral reefs, and deep-sea ecosystems. Ecosystem diversity can also occur within these types of habitats. The Biodiversity Convention's definition reflects these three levels of biodiversity. Global awareness of the value of marine resources is demonstrated by this inclusion of marine and aquatic species in the definition.[87]

Marine biodiversity is fundamental to humans. Approximately seventy-one percent of the earth's surface is covered by oceans, which hold about ninety-seven percent of the earth's water.[88] The oceans perform various functions that are vital to the earth's continued existence. For example, the oceans regulate climate, remove carbon dioxide from the atmosphere, and provide protein for human consumption.[89] In Asia, approximately one billion people rely on fish as their primary source of protein, as do other people in island nations.[90] Marine photosynthesis produces one-third to one-half of the world's oxygen supply.[91] In addition, scientists frequently search the sea in the hopes of finding medical cures and compounds. Bone graft material has come from coral, red algae has produced diagnostic chemicals, anti-infection compounds have come from shark skin, and sea sponges have provided anti-leukemia drugs.[92] Losses to marine biodiversity threaten these significant values.

The exact amount of diversity in the ocean is currently unknown, but the actual number of ocean species is likely higher than the number presently

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83. *See* STRATEGY FOR BUILDING CONSERVATION, *supra* note 1, at 9.

84. A population is "a group of individuals of the same species living in a given area at a given time." ROBERT LEO SMITH & THOMAS M. SMITH, ELEMENTS OF ECOLOGY 534 (4th ed. 1998).

85. *See* STRATEGY FOR BUILDING CONSERVATION, *supra* note 1, at 10-13.

86. A species is a group of potentially interbreeding populations reproductively isolated from other populations. Species diversity is a "measurement that relates density of organisms of each type present in a habitat to the number of species in a habitat." SMITH & SMITH, *supra* note 84, at 536.

87. *See* Iudicello & Lytle, *supra* note 78, at 125.

88. *See id.* (citation omitted).

89. *See* STRATEGY FOR BUILDING CONSERVATION, *supra* note 1, at xxviii.

90. *See* Iudicello & Lytle, *supra* note 78, at 125-26 (citation omitted).

91. *See id.* at 126.

92. *See id.*

recorded.[93] Regrettably, human activities are depleting marine and coastal living resources and degrading marine and coastal ecosystems.[94] This degradation will undermine the adaptability of those systems to meet future human needs.[95]

Human exploitation threatens biodiversity in the oceans through alterations of the physical environment, pollution, introduction of alien species, and atmospheric climate change.[96] The oceans are just as susceptible to the same types of degradation as the terrestrial environment.[97] Although the total number of identified marine species is smaller than the number of terrestrial species, scientists are discovering new concentrations of species in the oceans.[98] Coral reefs are among the richest habitats in species diversity on the earth.[99] In addition, the deep-sea bottom is now known to contain innumerable species of small invertebrate animals and new species are now being discovered in the middle depths.[100] Currently, because extinction rates are high, more species are threatened.[101]

In recent reports, the United Nations documented an alarming decline in the world's marine resources.[102] Approximately seventy percent of the world's commercially utilized marine fish are over-fished, overexploited, depleted, or slowly recovering.[103] Although there were once flourishing fishing communities, over time the Canadian maritimes have nearly vanished, and New England fishermen face the possibility of a shutdown of the entire groundfish industry.[104] Two species of the once abundant groundfish, cod and haddock, are now thought to be close to commercial extinction.[105] These species may even be approaching biological extinction.[106]

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93. *See id.* This is probably because of the focus on terrestrial as opposed to the marine environment.

94. *See* de Fontaubert et al., *supra* note 6, at 753.

95. *See id.*

96. *See* Iudicello & Lytle, *supra* note 78, at 126.

97. *See* STRATEGY FOR BUILDING CONSERVATION, *supra* note 1, at xxviii-xxix.

98. *See* de Fontaubert et al., *supra* note 6, at 760.

99. *See id.*

100. *See id.*

101. *See* Iudicello & Lytle, *supra* note 78, at 126.

102. *See Report of the Technical Consultation on High Seas Fishing and the Papers Presented at the Technical Consultation on High Seas Fishing*, U.N. Department of Commerce, U.N. Doc. A/CONF.164/INF/2 (1993).

103. *See id.* at 63-64.

104. *See generally* Bruce N. Shibles, *Implications of an International Standard for Transboundary Management of Gulf of Maine-Georges Bank Fishery Resources*, 1 OCEAN & COASTAL L.J. 1 (1994) (discussing the decline of the Georges Bank fishstocks).

105. *See* Iudicello & Lytle, *supra* note 78, at 127.

106. *See id.*

Another commercial fish, the Atlantic bluefin tuna, has decreased in biomass to between six and twelve percent of the level necessary to produce maximum sustainable yield.[107] The Peruvian anchovy provides another example of overexploitation. During the 1950s and 1960s, the Peruvian anchovy catch was the largest in the world.[108] The fishery then collapsed, took two decades to recover, and is now again declining.[109] There are other implications to the increased dependence on single fish catches, such as decline in seabirds and marine mammals.[110]

These examples demonstrate the traditional notion of management of the seas, *Mare Liberum*, or "freedom of the seas.[111] Overexploitation is further exemplified by a rise in documented fish catch levels from five million tons in 1900, to a peak of eighty-six million tons in 1989, before being forced to decline.[112] Over time, fishermen kept catch amounts climbing by abandoning over exploited stocks and focusing on a new species.[113] This practice resulted in a decline in catches since 1986.[114]

Overexploitation of the world's fish populations is one of the greatest threats to the marine biodiversity.[115] Today, there is an increasing demand for food, proliferation of distant water fleets, and rapidly expanding technology, which aids humans in sweeping more areas while catching many unintended species.[116] Despite the fact that since 1970, the fishing fleet has increased at twice the rate of catches,[117] declines occurred even with more, faster, and

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107. *See* Elizabeth deLone, Note, *Improving the Management of the Atlantic Tuna: The Duty to Strengthen ICCAT in Light of the 1995 Straddling Stocks Agreement*, 6 N.Y.U. ENVTL. L.J. 656, 656 (1998), *citing* U.S. DEP'T OF COMMERCE REPORT TO CONGRESS, HISTORIC RATIONALE, EFFECTIVENESS, AND BIOLOGICAL EFFICIENCY OF EXISTING REGULATIONS FOR THE U.S. ATLANTIC BLUEFIN TUNA FISHERIES 2 (1996).

108. *See* Iudicello & Lytle, *supra* note 78, at 127.

109. *See* Iudicello & Lytle, *supra* note 78, *citing* NAT'L OCEANIC & ATMOSPHERIC ADMIN., OUR LIVING OCEANS, REPORT ON THE STATUS OF U.S. LIVING RESOURCES 82 (1992).

110. *See* Iudicello & Lytle, *supra* note 78, at 127. For example, in the Berring Sea, the Alaska Pollock catch has reached the highest domestic fish catch by volume and is one of the world's largest single species fisheries. Along with this rise in catch, there has been a decline in seabirds and marine mammals which prey on the same species of fish. *See id.* These marine seabirds are an important part of the marine ecosystem, and thus the impact of the loss of the seabirds is incalculable.

111. *See id.* at 129.

112. *See id.*

113. *See id.* at 127-28, *citing* CENTER FOR MARINE CONSERVATION & WORLD WILDLIFE FUND, LIMITING ACCESS TO MARINE FISHERIES: KEEPING THE FOCUS ON CONSERVATION ix (Karyn L. Gimbel ed. 1994) [hereinafter LIMITING ACCESS].

114. *See* Iudicello & Lytle, *supra* note 78, at 128.

115. *See id.*

116. *See id.* These unintended species are referred to as bycatch. Many times, bycatch includes immature fish, marine turtles, mammals, and seabirds, which may sometimes be endangered or threatened species. *See id.* Increasing demand combined with unsustainable practices such as throwing overboard bycatch poses a large threat to biodiversity.

117. *See* Iudicello & Lytle, *supra* note 78, at 128, *citing* LIMITING ACCESS, *supra* note 112, at 4.

bigger boats and gear.[118] Worldwide, seventy billion dollars worth of fish are caught annually, but expenditures on fisheries amount to approximately $125 billion.[119] This asymmetry is likely a result of government subsidies supporting more fishermen than is environmentally sustainable. Moreover, subsidizing catches that occur at a rate not sustainable by the marine environment poses a serious threat to biodiversity. This threat of decreasing marine biodiversity includes not only the fish species themselves, but also sea birds, marine turtles and mammals. The use of the precautionary principle in marine fisheries management may be one way to combat this threat to biodiversity.

II. FISHERY MANAGEMENT

Although historically stringent fishery management did not occur, the present situation and impending crisis suggest that the international community, including the United States, needs to implement new measures. The international community recognized that there is a need to adopt the precautionary principle with reference to marine fisheries conservation in the Jakarta Mandate. In the United States, Congress recognized overfishing and overexploitation as serious issues and recently passed the Sustainable Fisheries Act[120] to implement tighter controls in this area.

A. Traditional Approach

The doctrine of freedom of fishing was the traditional approach for fishing fleet management and remained unchanged for centuries.[121] States, within their jurisdictional waters, exercised control over who fished and how much they caught.[122] Beyond these jurisdictional seas, fishing vessels were only subject to the regulations their flag state imposed.[123] This led to exploitation of resources, which in turn led some coastal states to enter into explicit agreements to conserve and manage fisheries.[124] Although agreements were created, they were essentially unenforceable because the

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118. *See* Iudicello & Lytle, *supra* note 78, at 128-29.

119. *See id.* at 129.

120. Sustainable Fisheries Act, Pub. L. No. 104-297, 110 Stat. 3559 (1996) (amending Magnuson Fishery Conservation and Management Act 16 U.S.C. §§ 1801-82 (1976)).

121. *See* Iudicello & Lytle, *supra* note 78, at 129.

122. *See id.* For most countries these jurisdictional waters consist of a 12-mile band adjacent to the coast.

123. *See id.* A vessel's flag state is the country under whose flag the vessel is flying. For example, a vessel flying a United States flag is subject to United States jurisdiction.

124. *See id.* at 130 (quoting LOUIS B. SOHN & FRISTEN GUSTAFSON, THE LAW OF THE SEA 115 (1984)).

parties that entered the agreement were often unwilling to give the institutions the necessary authority to enforce the rules.[125] Consequently, many of the world's fisheries remained unmanaged.

After World War II, because of increased demands for food and major technological advances that enabled fishing fleets to travel farther, nations began to consider the idea of extending their jurisdictional waters.[126] Once nations began sending their fishing fleets farther and as a result, harvesting larger quantities of fish, coastal states wanted to protect "their" resources.[127] This notion was fueled by the unwillingness of fishermen to enter into agreements with coastal states to manage and enforce catch restrictions.[128]

In 1945, the United States became the first to extend its coastal jurisdiction.[129] In the Truman Fisheries Proclamation, the United States asserted jurisdiction over fishery conservation zones "in those areas of the high seas contiguous to the coasts of the United States."[130] In recognition of the need for conservation and protection, the proclamation established fishery "conservation zones," which were subject to United States regulation and control.[131] This effort to extend coastal jurisdiction was followed by similar efforts in other countries.[132] Although the notion of freedom of the seas prevailed during this time period, the concept of a fishery zone where a state would have exclusive jurisdiction became generally accepted.[133]

This situation changed with the passage of the Law of the Sea Convention in 1982.[134] The Convention increased the national coastal jurisdiction to 200 nautical miles which allows states to exclude foreign fleets, control domestic fishing, and manage the fisheries.[135] These conditions have not provided effective management; for example, many fish stocks are currently over-fished.[136]

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125. *See* Iudicello & Lytle, *supra* note 78, at 130.

126. *See id.*

127. *See id.*

128. *See id.*

129. *See* Proclamation No. 2668: Policy of the United States with Respect to Coastal Fisheries in Certain Areas of the High Seas, 3 C.F.R. § 68 (1945), *reprinted in* 59 Stat. 885-86 (1945).

130. *Id.*

131. *See id.*

132. *See* Iudicello & Lytle, *supra* note 78, at 130. Peru, Chile, and Ecuador followed the United States with similar actions to extend their coastal jurisdictions.

133. *See id.* at 131.

134. *See* UNCLOS, *supra* note 51; Iudicello & Lytle, *supra* note 78, at 131. *See also* Shi-Ling Hsu & James E. Wilen, *Ecosystem Management and the 1996 Sustainable Fisheries Act*, 24 ECOLOGY L.Q. 799, 800 (1997).

135. *See* UNCLOS, *supra* note 51, at art. 56-57; Hsu & Wilen, *supra* note 134, at 800; Iudicello & Lytle, *supra* note 78, at 131.

136. *See* Hsu & Wilen, *supra* note 134, at 800. One report concluded that fishing yields in the United States Exclusive Economic Zone are about thirty percent below their estimated long-term potential.

B. The Magnuson Fishery Conservation and Management Act[137]

Congress enacted the Fishery Conservation and Management Act,[138] known as the Magnuson Act, in 1976 with two broad purposes.[139] The Act's first goal was to extend the jurisdiction of the United States for the purposes of regulating marine fisheries out to 200 nautical miles from the coast.[140] The second goal was to control foreign access to resources in this zone.[141] The Act was organized into four titles. Title IV contains miscellaneous provisions; the body of the act is in the other titles. Title I states the jurisdictional authority of the United States with reference to fishery management. It establishes the fishery conservation zone, now recognized as the exclusive economic zone (EEZ),[142] which extends to 200 nautical miles for the coastal baseline.[143] The United States claimed exclusive fishery management over all fish and all Continental Shelf fishery resources[144] except highly migratory species,[145] defined in the Act as tuna.[146]

Title II governs foreign fishing access to United States fisheries within the EEZ. Title II authorizes foreign fishing in the EEZ only if a treaty or international fishery agreement is in force and if the country wishing to fish enters into an agreement with the United States.[147] In addition, foreign fishermen are only given the right to fish for a portion of the "optimum yield."[148] This is called the total allowable level of foreign fishing (TALFF).

The report also found twenty-eight percent of the fish groups were being overutilized. *See id., citing* NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, OUR LIVING OCEANS: THE FIRST ANNUAL REPORT ON THE STATUS OF U.S. LIVING MARINE RESOURCES 7-8, 16 (1991).

137. 16 U.S.C. §§ 1801-82 (1998).

138. *See id.* In 1980, the Act was renamed the "Magnuson Fishery Conservation and Management Act" after the late Senator Warren G. Magnuson of Washington who was the Senate sponsor of the original law. *See* Pub. L. No. 96-561, 94 Stat. 3275, 3300 (amending 16 U.S.C. § 1801 (1998)).

139. *See* 16 U.S.C. § 1801(b).

140. *See id.* § 1801(b)(1). *See also* 50 C.F.R. §600.10.

141. *See id.* § 1801(b)(2).

142. The fishery conservation zone was redesignated the exclusive economic zone in an amendment to the Act. *See id.* §§ 1802(6), 1811.

143. *See id.* §§ 1453, 1802(6), 1811.

144. *See id.* § 1811(a).

145. *See id.* §§ 1811(a), 1812.

146. *See id.* § 1802(14).

147. *See id.* § 1821.

148. *Id.* § 1821(d). The Act defines "optimum yield" as that amount of fish:

> (A) which will provide the greatest overall benefit to the Nation, with particular reference to food production and recreational opportunities; and
> (B) which is prescribed as such on the basis of the maximum sustainable yield from such fishery, as modified by any relevant economic, social, or ecological factor.

Id. § 1802(21). Maximum sustainable yield is "the largest long-term average catch or yield that can be

Title III establishes several Regional Fishery Management Councils to implement the management and conservation goals of the Act.[149] Their duties include developing fishery management plans (FMPs), submitting reports to the Secretary of Commerce, reviewing and revising optimum yield determinations with reference to foreign fishing allowances, encouraging public participation, establishing scientific committees and advisory panels, and undertaking other activities necessary for carrying out the Act.[150] Their main task, however, is to establish FMPs consistent with seven "national standards" for fishery management and conservation.[151] The voting members of the Councils consist of state fishery management officials, the regional director of the National Marine Fisheries Service, and other individuals who are both knowledgeable about and experienced in management and conservation or the harvest of fishery resources of the geographic area.[152] The Secretary of Commerce chooses these individuals from lists submitted by the governors of the states represented on the Councils.[153] The Secretary of Commerce has established guidelines based on these national standards to assist the Councils.[154] As its main task, the Council submits fishery management plans, which must be consistent with the seven substantive

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taken from a stock or stock complex under prevailing ecological and environmental conditions." 50 C.F.R. § 600.310 (c)(1)(1999).

149. *See* 16 U.S.C. § 1852. The regions are divided geographically into the: New England Council, Mid-Atlantic Council, South Atlantic Council, Caribbean Council, Gulf Council, Pacific Council, North Pacific Council, and Western Pacific Council. *See id.*

150. *See id. See also,* Warren G. Magnuson, *The Fishery Conservation and Management Act of 1976: First Step Toward Improved Management of Marine Fisheries*, 52 WASH. L. REV. 427, 436 (1977).

151. 16 U.S.C. § 1851(a). The seven national standards are:

> (1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery . . .
> (2) Conservation and management measures shall be based upon the best scientific information available.
> (3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range . . .
> (4) Conservation and management measures shall not discriminate between residents of different States. . ..
> (5) Conservation and management measures shall, where practicable, promote efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.
> (6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.
> (7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

Id.

152. *Id.* § 1852(b)(1).

153. *See id.* § 1852(b)(2)

154. Guidelines for Development of Fishery Management Plans, 50 C.F.R. pt. 600 (1999).

policies, to the United States Department of Commerce for approval and implementation.[155]

The Magnuson Act changed the management system of United States fishery in five important ways.[156] The Act abandoned state control of coastal fisheries, imposed control over foreign fishing, implemented optimum yield as a management concept, excluded tuna from fisheries jurisdiction, and adopted the council system.[157]

C. Amendments to the Magnuson Act

While there are a number of amendments to the Magnuson Act,[158] only two are significant. These changes are amendments to Title I with reference to tuna policy and amendments to Title II with respect to foreign fishing.[159] Each is addressed below.

Title I of the original Magnuson Act excluded highly migratory species from national jurisdiction.[160] The United States believed a high degree of international cooperation was necessary to conserve and manage these fish because of their transitory nature.[161] However, almost all other nations claimed jurisdiction over all fishery resources, including tuna, within their EEZs.[162] In 1990, in the face of both domestic and international pressure the United States removed the highly migratory species exception to the Act.[163] This was important because in effect, this amendment gave up the lucrative fishing grounds used by the United States tuna fleet. At the time the amendment passed, the tuna fleet supported one of the largest fishery-based industries in the United States and ninety percent of the weight caught by the fleet came from international waters.[164]

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155. 16 U.S.C. §§ 1852-55.

156. Catherine E. Decker, *Issues in the Reauthorization of the Magnuson Fishery Conservation and Management Act*, 1 OCEAN & COASTAL L.J. 323, 329 (1995).

157. *See id.*, at 329-30. (citing Robert G. Hayes, *Original Intent of the Magnuson Act Framers*, CONSERVING AMERICA'S FISHERIES: A NATIONAL SYMPOSIUM ON THE MAGNUSON ACT 39, 41-44 (Richard H. Stroud ed., 1994).

158. 16 U.S.C. §§ 1801-82 (1994).

159. *See* Decker, *supra* note 156, at 334.

160. *See* 16 U.S.C. §§ 1801-02 (1994).

161. *See* Decker, *supra* note 156, at 335. As a result, the U.S. relied on international agreements to manage the highly migratory species.

162. *See id.*

163. *See* Fishery Conservation Amendments of 1990, Pub. L. No. 101-627, 104 Stat. 4436, 4437 (1990). Some suggested that changing the law would improve international relations and allow for more effective fishery management in the United States EEZ. *See* Decker, *supra* note 156, at 335.

164. *See* Decker, *supra* note 156, at 336.

In 1980, Title II was amended by the passage of the American Fisheries Protection Act.[165] Under the original act, fish available to foreign fishermen were limited to the portion of the optimum yield not harvested by the fishing vessels.[166] Advocates hoped that this would boost the growth of the United States fishing industry. However, Congress recognized that the hoped-for domestic dominance did not occur. Consequently, Congress passed the 1980 Act to remedy this error. This Act provided for a phased reduction of foreign fishing by giving the regional councils new formulas for deriving the amount of fish allowed to be caught by foreign vessels.[167] The new formulas, along with the fishery councils' ability to control the optimum yield, allowed for the near expulsion of foreign fishing in the United States EEZ.[168] Thus, the 1980 Act reached the original goal of decreasing foreign fishing in United States waters. Although these amendments corrected some problems with the original Act, other problems remained.

III. THE SUSTAINABLE FISHERIES ACT[169]

Between the passage of the original Act and the present, critics raised concerns over the sustainability of marine fisheries.[170] Some problems with the Magnuson Act included overfishing, inefficiency, and lack of public confidence in decisions of the Regional Councils due to conflict of interest among voting members.[171]

Unfortunately, fisheries management following the passage of the Magnuson Act did not achieve the anticipated level of fish stock conservation. Although the Magnuson Act almost eliminated foreign overfishing, domestic overfishing has taken its place. The open access to United States fisheries created incentives for fishermen to race for fish. In other words, there was a strong economic incentive for fishermen to catch as many fish as fast as possible in order to out fish their competitors and make a larger profit. Moreover, fishermen were aware that the fishing season could close abruptly once the total allowable catch was met, thus creating a further incentive to catch fish as quickly as possible. A recently published assessment of United States fish stocks concluded that of the stocks with a sufficient amount of

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165. Act of Dec. 22, 1980, Pub. L. No. 96-561, 94 Stat. 3275, 3296-300 (1980).

166. 16 U.S.C. § 1821 (1998).

167. *See id.* § 1821.

168. *See* Decker, *supra* note 156, at 335.

169. *See* Sustainable Fisheries Act, Pub. L. No. 104-297, 110 Stat. 3559 (1996) (amending Magnuson Act 16 U.S.C. § 1801-1882 (1976)).

170. *See* Decker, *supra* note 156, at 336.

171. *See id.*

data, forty percent were overutilized, forty-three percent were at full utilization, and seventeen percent were underutilized.[172]

Two reasons the Magnuson Act resulted in inefficiency are: (1) overcapitalization of the fishing fleet and (2) bycatch.[173] Overcapitalization occurs when there is more fishing capacity than is needed to catch the available fish.[174] One example of overcapitalization occurred in the southern shrimp trawl fishery.[175] Between 1960 and the late 1980s, the Gulf of Mexico shrimp fishery tripled in size to an estimated fleet size of 15,000 vessels.[176] However, during that same time span, catches decreased by 300 pounds per vessel ton.[177] The overcapitalization problem combined with the race to the fish also creates a safety risk for both the vessel and crew. Vessels operate twenty-four hours a day regardless of hazardous conditions to meet quotas.

Bycatch has also created problems in fisheries. Bycatch refers to fish or other species that are incidentally caught by a fishing vessel, but are not sold or kept for personal use.[178] Often, the bycatch is just thrown overboard. For example, in the North Pacific, more fish are discarded dead each year than are caught by United States fisherman in the North Atlantic.[179] Bycatch results in waste and is a large threat to biodiversity considering the lack of incentives for fishing vessels to avoid areas where bycatch levels are high.

Finally, the problem of actual or perceived conflicts of interest among voting members of the Regional Councils caused a loss of public confidence in the fishery management council's decisions.[180] This is important because allocation of fishing quotas is an important and controversial task of the Councils. Fisheries management measures need to avoid even the appearance of conflict. Otherwise, public confidence may be affected and may result in a decline in adherence to the measures. The safeguards originally available to prevent conflicts of interest have eroded,[181] causing public confidence to decline and creating the possibility of non-adherence to fishery management

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172. *See id.* (citing NAT'L MARINE FISHERIES SERV., UNITED STATES DEP'T OF COMM., OUR LIVING OCEANS: REPORT ON THE STATUS OF U.S. LIVING MARINE RESOURCES, NOAA TECH. MEM. 3 (NMFS-F/SPO-15, 1993)). A fish stock is considered *fully utilized* if the number of fish caught equals the number of fish produced. If fishing exceeds fish production, the stock is considered *overutilized*. If more fishing is needed to strike a balance between the productivity of the fish stock and the fish catch, the stock is considered *underutilized*.

173. *See id.* at 340.

174. *See id.*

175. *See id.*

176. *See id.*

177. *See id.*

178. *See id.*

179. *See id.* at 341.

180. *See id.*

181. *See id.*

measures. In addition, the Magnuson Act created a model of decentralized, discretionary industry self-regulation.[182] As a result of these growing concerns, Congress passed the Sustainable Fisheries Act of 1996 (SFA).[183]

After signing the bill, President William J. Clinton noted that the Act represents a "bipartisan effort to address the problems facing our nation's fisheries, both commercial and recreational, and will greatly improve the future management of important fishery resources."[184] Congress added measures to prevent fish stocks from reaching an overfished state and to ensure that already depressed stocks rebuild to levels that produce maximum sustainable yields from the fisheries.[185] In addition, Congress added new national standards including one with reference to bycatch as well as an additional requirement of identifying essential fish habitats in each fishery management.[186]

The SFA is a further step in refining the regulatory framework created in the original Act.[187] Critics of the original Act argued for less discretion over overfished fisheries. Conservation groups have given the SFA their stamp of approval.[188] Although the Act does not specifically call for the application of the precautionary principle to fishery conservation in the United States as was mandated in Jakarta, the Act takes a step towards precautionary actions. The key provisions of the Act cover the problem of overfishing and exemplify this step in the precautionary direction.[189] If the Secretary of Commerce determines that a fishery is "overfished,"[190] she is required to immediately notify the appropriate regional fishery management council, and

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182. David A. Dana, *Overcoming the Political Tragedy of the Commons: Lessons Learned From the Reauthorization of the Magnuson Act*, 24 ECOLOGY L.Q. 833, 842 (1997).

183. Sustainable Fisheries Act, Pub. L. No. 104-297, 110 Stat. 3559 (1996) (amending Magnuson Act 16 U.S.C. § 1801-1882 (1976)).

184. Statement by President William J. Clinton upon Signing S.39, 32 WEEKLY COMP. PRES. DOC. 1334 (October 14, 1996).

185. *See id.*

186. *See id.*

187. One author notes that the SFA should not be considered a systemic overhaul of fisheries management. This is because, like most legislation, it is the outcome of "political logrolling, tradeoffs, and compromises among disparate groups with different agendas." Hsu & Wilen, *supra* note 133, at 805. However, the author further notes that the amendments are not inconsequential. *See id.*

188. *See id.*

189. *See* Sustainable Fisheries Act, Pub. L. No. 104-297 at §§ 108, 109, 110 Stat. 3574-87 (amending 16 U.S.C. § 1853, 1854).

190. "Overfished" is a rate of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield on a continuing basis. *See id.* § 102 (8), 110 Stat. 3562 (amending 16 U.S.C. § 1802). "Maximum Sustainable Yield" is "the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions." 50 C.F.R. § 600.310 (c)(1)(1999). Approaching a condition of being "overfished" means that "based on trends in fishing effort, fishery resource size, and other appropriate factors," it will be "overfished" in two years. Pub. L. No. 104-297, at § 109(e)(1), 110 Stat. at 3584 (amending 16 U.S.C. § 1854 (e)).

then give the council one year to develop a Fisheries Management Plan that ceases overfishing and rebuilds the stock of fish.[191] If the council fails to develop an FMP, the Secretary is required to prepare a plan within nine months.[192] This is because the plan to stop overfishing must be developed within a time frame that is "as short as possible, taking into account the status and biology of any overfished stock of fish, the needs of fishing communities . . . and the interaction of the overfished stock of fish within the marine ecosystem," but must generally be accomplished in less than ten years.[193] The Regional Council is still responsible for specifying criteria for identifying when the fishery is overfished.[194]

The requirement for fishery management plans to stop overfishing is an implicit attempt to implement a weak version of the precautionary principle. The SFA does not explicitly adopt a version of the precautionary principle. However, the new overfishing definition recognizes that catching more than the maximum sustainable yield of a fish stock can result in an overfished status.[195] This demonstrates a weak implementation of the precautionary principle because this definition requires the Secretary to take proactive steps instead of reactive steps. The precautionary principle inherently requires proactive measures as opposed to reactive ones.

Although there is a requirement that the Secretary immediately notify the appropriate regional fishery management when a stock is overfished, the SFA allows the Regional Council one year to develop a plan that stops the overfishing. If the Regional Council fails to prepare a plan, the Secretary is required to prepare a plan within nine months. This new management plan requirement must be met by the Regional Council in as short a time as possible, but generally must be done within ten years.[196] Thus, despite the requirement that overfishing be stopped as soon as practicable, there is still the possibility of a ten-year lag from identification of a stock as being overfished and stopping the overfishing. Because of the critical status of many fisheries, the United States may benefit from the implementation of a stronger version of the precautionary principle. If a stronger version is adopted, a ten-year lag would not likely be allowed to occur. As a result, fisheries could be identified and recover in a shorter time span.

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191. *See* Pub. L. No. 104-297 at § 109(e)(1)-(3), 110 Stat. at 3584 (amending U.S.C. § 1854 (e)). The Secretary must also report to Congress annually on the status of fisheries, and identify fisheries that are overfished or approaching an overfished condition using the Council's overfished criteria. *See id.*

192. *See id.* at § 109(e)(4), 110 Stat. at 3584-85 (amending U.S.C. § 1854(e)).

193. *See id.* at § 109(e)(4) (amending U.S.C. § 1854(e)).

194. *See id.*

195. *See id.* at § 102 (8), 110 Stat. at 3562.

196. *See id.* at § 109(e)(5), 110 Stat. at 3585.

The new Act also requires regional fishery councils to "describe and identify essential fish habitat for the fishery" and "minimize to the extent practicable the adverse effects on such habitat caused by fishing."[197] Councils must also identify actions that should be considered to encourage the conservation and enhancement of essential fish habitat.[198] The Secretary must coordinate with and review the actions of other federal agencies that take any action, or authorize or fund any action that may adversely affect any essential fish habitat, and recommend measures to the agency in order to further the conservation of the essential fish habitat.[199] The state or federal agency must then provide the Secretary with a response within thirty days, which must include an explanation if the agency does not follow the Secretary's recommendations.[200]

The essential fish habitat requirement also incorporates a weak form of the principle, but does not fully address the serious overcapitalization problem in marine fisheries. Admittedly, Congress implicitly adopted a weaker version of the precautionary principle by requiring minimization of adverse impacts on the habitat caused by fishing. This is precautionary because conserving the essential fish habitat will likely lead to a stronger fish stock. Although conservation of essential fish habitat requires precaution, a very strong implementation of the precautionary principle would require no adverse impacts on essential fish habitat. This may prove impracticable, but given the current state of world fisheries, Congress should consider implementing a stronger version than the precaution that exists in the SFA. A stronger version implemented by the Secretary, while taking into consideration economic impacts on fishermen, might provide an analysis for regional fishery councils to use in determining whether there is too much harm to a particular essential fishery habitat.[201]

Another provision of the SFA relates to bycatch. Under the SFA, FMPs must conform to the seven original national standards,[202] in addition to three new standards set forth in the SFA.[203] One requires that plans minimize

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197. *Id.* at § 108(a)(3), 110 Stat. at 3574 (amending U.S.C. § 1854(e)). "Essential fish habitat" are waters in which fish spawn, breed or develop to maturity. *See id.* § 102(3), 110 Stat. at 3561 (amending 16 U.S.C. § 1802(10)).

198. *See id.*

199. *See id.* § 110(a)(3), 110 Stat. at 3587-89 (amending U.S.C. § 1854(e)).

200. *See id.*

201. The guidelines implementing the SFA already take into consideration the impact an FMP will have on human communities. *See* 50 C.F.R. § 600.345 (discussing National Standard 8-Communities). This consideration of human communities must be consistent with the conservation measures in the Magnuson-Stevens Act. *See* 50 C.F.R. § 600.345(a).

202. *See supra* note 150 and source cited therein.

203. *See* Pub. L. No. 104-297 at § 106(b), 110 Stat. at 3570 (amending 16 U.S.C. § 1802(28)).

bycatch or minimize bycatch mortality of bycatch that cannot be avoided.[204] Additionally, the first national standard, which mandated that management achieve the "optimum yield" for each fishery, previously defined as "maximum sustainable yield . . . as modified by any relevant economic, social, or ecological factor,"[205] now allows only that maximum yield be reduced by any such relevant factors.[206] This prevents councils from increasing allowable harvests in response to local pressure for larger allotments.

This bycatch reduction requirement also incorporates a version of the precautionary principle. By requiring a reduction in bycatch and bycatch mortality, Congress recognized that minimizing the amount of unintended catch can have a positive impact on marine ecology and the strength of fish stocks. Although it is possible to implement a stronger version of the precautionary principle, this new national standard is a step in the direction of precaution. In addition, preventing regional fishery councils from increasing allowable harvests because of local pressure for larger allotments is another good step in the precautionary direction. Moreover, this requirement can increase public confidence in fishery management councils because it is meant to prevent conflicts of interest from occurring. However, the effectiveness of this provision remains to be seen.

CONCLUSION

The Sustainable Fisheries Act did make drastic changes in fisheries management in the United States, but if biodiversity and ecosystem health are the goals, there is still a long way to go. Although the Sustainable Fisheries Act is generally influenced by the precautionary principle, the Act does not explicitly state the precautionary principle.[207] Given the current situation in marine fisheries, the United States should consider further amending the Magnuson Act to increase the effectiveness of the precautionary principle. However, this must be deliberated in light of other factors such as the economic effect on the fishing industry, on those employed in the industry, and the food supply.

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204. *See id.*

205. *See* 16 U.S.C. §1821(d).

206. *See id.* at § 102(7), 110 Stat. at 3562. The third national standard requires that conservation and management measures to promote safety of human life at sea. *See id.* § 106(b), 110 Stat. at 3570 (amending 16 U.S.C. § 1851(a)).

207. The guidelines implementing the Act also do not explicitly adopt the precautionary principle. *See* 50 C.F.R. pt.600. However, the guidelines do recognize a balancing of interests, one being biological constraints, which demonstrates a built-in precautionary provision. *See* 50 C.F.R. §600.305(b). The guidelines implementing the 10 national standards similarly demonstrate precaution. *See* 50 C.F.R. §§ 600.301-600.355 (1999).

Three examples of the SFA implementing a weak version of the precautionary principle include the amendments covering overfishing, essential fish habitat conservation, and bycatch reduction. Although the new overfishing definition is proactive, Congress should consider reducing the ten-year possible lag time between recognition as overfished and cessation of the overfishing. In addition, although the conservation of essential fish habitat implements the precautionary principle, the continued destruction of that habitat will still occur. The destruction that occurs should be well documented and kept track of to avoid the complete loss of important habitat. The bycatch reduction requirement is also precautionary, but Congress should consider actively implementing a stronger formulation of the principle.

Although these are important advances in fishery conservation, the SFA failed to recognize that overcapitalization was also a problem. Historically, technological resourcefulness of fishermen has side stepped the most stringent regulations designed at reducing fishing effort. For example, reductions in season lengths led fishermen to build bigger, faster vessels with more short-term harvesting capacity, which led to further reduction in season lengths. In response to this shortfall, some fisheries have adopted measures that attack the property rights issue: individual fishermen quotas (IFQs).[208] IFQs grant fishermen the right to harvest a certain percentage of the total annual allowable catch.[209] By giving the individual fishermen property rights in the harvest, this reduces the incentive to race to fish and allows individual fishermen to fish whenever it is most efficient.[210] The use of IFQs is increasing in the United States as well as in fisheries worldwide.[211]

Major problems with overfishing and overexploitation of marine fisheries exist and are increasing. Overfishing is seriously affecting biodiversity. For example, overfishing affects the targeted fish, sea birds, turtles, and other fish species. This in turn has a detrimental effect on the marine ecosystem and the environment in general. Three years after adoption of the SFA, the New England Fishery Management Council imposed reductions in daily cod catch in the Gulf of Maine.[212] The original allowable catch of 400 pounds per boat was reduced to 200 pounds per boat to save the cod, once a cornerstone of the fishing industry.[213] This is an example of an

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208. *See* Hsu & Wilen, *supra* note 134, at 807. For a discussion of property rights and fisheries, including IFQs, see Allison Rieser, Property Rights and Ecosystem Management in U.S. Fisheries: Contracting for the Commons?, 24 Ecology L.Q. 813 (1997).

209. *See id.*

210. *See id.*

211. *See id.*

212. THE ASSOCIATED PRESS, *Council Puts Strict Limits On Fishing to Save New England Cod*, N.Y TIMES, Jan. 30, 1999, at A15.

213. *See id.*

implementation of the precaution that may be too late. However, it is worth considering that a strong version of the precautionary principle ignores all consequences other than those of the environment.[214] In light of this recent event and the state of marine fisheries worldwide, the adoption of a stronger version of the precautionary principle could reduce the amount of overfishing. In turn, a reduction in overfishing can reduce the threat to biodiversity, which is integral to the health of the global ecosystem.

"To conserve something as broad and deep as the sea requires broadening of our vision, a deepening of our understanding, and most important of all, a commitment to concerted action for as long as necessary to do the job.[215]

Michele Territo

214. As noted earlier, a strict implementation of the precautionary principle is impractical in the marine fisheries context. Other issues such as commercial fishing viability and the impact on employment opportunities should be considered in striking the proper balance.

215. STRATEGY FOR BUILDING CONSERVATION, *supra* note 1, at 283.