# MARINE RESERVES, THE PUBLIC TRUST DOCTRINE AND INTERGENERATIONAL EQUITY

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The history of fisheries management chronicles how species by species and crisis by crisis approaches to fisheries management has, with few exceptions, failed to create sustainable fisheries or healthily functioning ecosystems.[1] We have instead created the situation where the depletion and restriction of catch of one regulated species, has often led to the overfishing of the next unregulated species that may have flourished in the ecosystem deprived of its primary preditor. This fishing down the food web in many cases caused a "domino effect" of overfishing.[2] But worse, this pattern of fishing can have cascading effects that permanently alter the ecosystem balance, so that the first commercially or recreationally important fish stock may never recover despite protection of that species by regulation.[3]

The effects of overfishing are not simply the direct population effects on the target species. Many fisheries produce a large amount of bycatch of non-targeted species, most of which is discarded dead.[4] In addition, many types of fishing gear are destructive to marine habitat. Fishing can lead to changes in the composition of ecological communities and resulting changes in the structure of marine food webs.[5] A report for the Pew Oceans Commission entitled *Ecological Effects of Fishing in Marine Ecosystems of the United States*[6]

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1. NOAA Fisheries reports that eighty-six stocks are currently overfished and sixty-six stocks are experiencing overfishing. The overfished status of 695 stocks remains classified as "unknown or not defined," and whether overfishing is occurring cannot be determined in the case of 658 stocks because the harvest rate is not known or the threshold for overfishing has not been defined. *See* NOAA Fisheries, *Sustaining and Rebuilding, 2002 Report to Congress, The Status of Fisheries* 25, 9 (April 2003)

2. *See* Pew Oceans Commission, *America's Living Oceans: Charting a Course for Sea Change* 40 (May 2003) [hereinafter Pew Oceans Commission Report].

3. *Id.*

4. Bycatch is the term used for incidental take in fisheries and refers to "[d]iscarded catch of any living marine resource plus retained incidental catch and unobserved mortality due to a direct encounter with fishing gear." *See* NOAA Fisheries, Bycatch, http://www.nmfs.noaa.gov/bycatch.htm#def , *quoting* Managing the Nation's Bycatch (1998).

5. Pew Oceans Commission Report, *supra* note 2, at 40.

6. Paul K. Dayton, Simon Thrush, and Felicia C. Coleman, *Ecological Effects of Fishing in Marine Ecosystems of the United States* (Pew Ocean Commission 2002) [hereinafter *Ecological Effects of Fishing*] .

surveyed the direct and indirect effects of overfishing, bycatch, habitat degradation, and fishing-induced food web changes. The consequences of these current fishing practices that have been observed include:

> "changes in the structure of marine habitats that ultimately influence the diversity, biomass, and productivity of the associated biota;"[7]
>
> "removal of predators, which disrupts and truncates trophic relationships;"[8]
>
> and "endangerment of marine mammals, sea turtles, some seabirds, and even some fish."[9]

The report found that the combined effects of current fishing practices alter the composition of ecological communities and the "structure, function, productivity, and resilience of marine ecosystems. . . ."[10] Loss of biodiversity leads to decreased functional diversity as well as an increase in the inherent unpredictability of ecosystems and a reduction in overall biological productivity.[11] The report's conclusion was that "the weight of evidence overwhelmingly indicates that the unintended consequences of fishing on marine ecosystems are severe, dramatic, and in some cases irreversible."[12]

Single species models cannot take account of the effects of fishery-induced food web shifts and cascading effects in the ecosystem. The health of the ecosystem is inextricably linked to the health and resilience of the fishery and vice versa. Because of this, ecosystem-based management is being recommended by many commentators[13] as an alternative to the current fisheries management regimes which generally focus on a single species or a

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7. *Id.* at 1. (Citations omitted).
8. *Id.* (Citations omitted).
9. *Id.* (Citations omitted).
10. *Id.* (Citations omitted).
11. *Id.*
12. *Id.*
13. *See generally, e.g.,* Martin H. Belsky, *The Ecosystem Model Mandate for a Comprehensive United States Ocean Policy and Law of the Sea*, 26 SAN DIEGO L. REV. 417, 461 (1989); *Symposium: The Ecosystem Approach: New Departures for Land and Water: Fisheries Management*, 24 ECOLOGY L. Q. 619 (1997); W.M. von Zharen, *Ocean Ecosystem Stewardship*,23 WM. & MARY ENVTL. L. & POL'Y REV. 1 (1998); Marion McPherson, *Integrating Ecosystem Management Approaches into Federal Fishery Management through the Magnuson-Stevens Fishery Conservation and Management Act*, 6 OCEAN & COASTAL L. J. 1 (2001); Stephen R. Palumbi, *Marine Reserves, A Tool for Ecosystem Management and Conservation* (Pew Commission Report 2002).

closely related group of species as problems arise in the fishery. Ecosystem management would require consideration of:

> all interactions that a target fish stock has with predators, competitors, and prey species; the effects of weather and climate on fisheries biology and ecology; the complex interactions between fishes and their habitat; and the effects of fishing on fish stocks and their habitat.[14]

While arguments for ecosystem management are persuasive, implementing ecosystem-based management can be overwhelming. Having enough information to consider and understand the complex interactions in an ecosystem seems to be impossible, and attempting to manage species taking all this into account might be an interminable exercise. The 1999 report to Congress by the Ecosystem Principles Advisory Panel,[15] however, concludes that "the approach need not be endlessly complicated."[16] The Panel emphasized that "[e]cosystem-based fisheries management does not require that we understand all things about all components of the ecosystem."[17] The Panel emphasized that "[e]cosystem-based fisheries management does not require that we understand all things about all components of the ecosystem."[18]

The Panel recommends that an ecosystem-based approach be incrementally incorporated into the management process as data are gathered, training is carried out and guidelines are developed to ensure compliance with ecosystem principles, goals and policies.[19] A framework of principles, incremental steps toward integrating ecosystem principles into fisheries management, and recommendations and guidelines for developing and implementing Fishery Ecosystem Plans were developed by the Panel.[20] Fishery Ecosystem Plans are intended "to integrate FMPs and include . . . ecosystem Principles, Goals, and Policies in a way that will be meaningful."[21]

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14. Ecosystems Principles Advisory Panel, Ecosystem Based Fisheries Management, A Report to Congress 1 (1999) [hereinafter Ecosystem Management Report].

15. The Panel was directed by Congress to assess the extent to which ecosystem principles are used in fisheries management and to recommend how such principles can be further implemented to improve living marine resource management. For its charter, *see* Ecosystems Management Report, *supra* note 14, at Appendix A (1999).

16. *Id.* at 1.

17. *Id.* at 105.

18. *Id.* at 10.

19. *Id.* at 33-34.

20. *See generally*, *id.* at 1-5.

21. *Id.*

The Ecosystem Principles Advisory Panel[22] and numerous other experts and commentators[23] believe marine protected areas and marine reserves[24] are an important element of an ecosystem-based approach to management. The Pew Oceans Commission, created by the private Pew Foundation to provide an independent report to the nation on recommendations for a new oceans policy, also found marine reserves necessary to assure the long-term health of ocean ecosystems.[25]

Evidence has piled up to support that marine reserves increase biomass of overfished stocks.[26] But marine reserves can also perform other services to complement an ecosystem-based approach to management. Research on many marine reserves is showing a "spillover effect" in abundance of fish in adjacent areas.[27] Designation of marine reserves protects some habitat from the direct effects of fishing[28] and provide areas for recovery and restoration.[29] Marine reserves provide baseline information on habitat to help distinguish natural variability from user impacts.[30] Reserves can serve as experimental sites for ecosystem restoration and studying processes that may be operable throughout an ecosystem or region.[31] Finally, a reserve may provide "insurance"

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22. *Id.* at 29.

23. *See, e.g.,* Jeff Brax , *Zoning the Oceans: Using the National Marine Sanctuaries Act and the Antiquities Act to Establish Marine Protection Areas and Marine Reserves in America*, 29 ECOLOGY L.Q. 71 (2002); Matthew Chapman, *Annual Review of Environmental and Natural Resources Law: The Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve: Ephemeral Protection*, 29 ECOLOGY L.Q. 347 (2002); Robin Kundis Craig, *Taking the Long View of Ocean Ecosystems: Historical Science, Marine Restoration, and the Oceans Act of 2000*, 29 ECOLOGY L.Q. 649, 684-687( 2002);Robin Kundis Craig, *Taking Steps Toward Marine Wilderness Protection? Fishing and Coral Reef Marine Reserves in Florida and Hawaii*, 34 MCGEORGE L. REV. 155 (2003); Kristen M. Fletcher, *"National Fisheries Law and Policy" Fix It! Constructing a Recommendation to the Ocean Commission for the Future of Fisheries*, 8 ROGER WILLIAMS U. L. REV. 93 (2002); Suzanne Iudicello and 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 (1994); William J. Ballantine, Networks of "No-Take" Marine Reserves Are Practical and Necessary, in NANCY L. SHACKELL & J.H. MARTIN WILLISON, MARINE PROTECTED AREAS AND SUSTAINABLE FISHERIES (1995); Stephen R. Palumbi*, Marine Reserves: A Tool for Eosystem Management and Conservation* (Pew Oceans Commission 2002).

24. Marine reserves are a type of marine protected area commonly referred to as "no take zones."

25. Pew Oceans Commission Report, *supra* note 2, at 34, 106.

26. *See,* Stephen R. Palumbi*, Marine Reserves: A Tool for Eosystem Management and Conservation* 22-24 (Pew Oceans Commission 2002).

27. *Id.* 25-28.

28. *See Ecological Effects of Fishing*, *supra* note 6, at 26-28 for a discussion of the direct effects of fishing gear on marine habitat and marine ecosystems.

29. *See* PISCO, The Science of Marine Reserves (How Marine Reserves Fit into the Big Picture) *at* http://www.piscoweb.org/outreach/pubs/reserves/ [hereinafter PISCO].

30. *Id.*

31. *See Ecological Effects of Fishing*, *supra* note 6, at 34.

against excessive exploitation in light of scientific indeterminacy and management uncertainty.[32]

There is no shortage of legislation that may provide authority for establishment of marine reserves. A partial list includes:

> state and federal fisheries management legislation,[33]
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> the National Marine Sanctuaries Act,[34]
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> the National Wilderness Preservation System (Wilderness Act),[35]
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> the National Wildlife Refuge System,[36]
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> the National Estuarine Research Reserve provisions of the Coastal Zone Management Act,[37]
>
> the National Park Service Organic Act,[38]
>
> the Endangered Species Act,[39] and
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> state authority to manage sovereignty lands.[40]

Although much authority clearly exists, regulators and managers have a lot of discretion about management tools and in their judgment about what constitutes the best scientific evidence in choosing management tools. Because so much controversy has surrounded the establishment of marine reserves, managers are being quite cautious in the use of marine reserves as a management tool.

One of the most often heard criticisms of the use of marine reserves is that they violate the public trust doctrine. The states own lands below navigable waters in trust for the public.[41] The

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32. *See* Ecosystems Management Report, *supra* note 14, at 29; *Ecological Effects of Fishing*, *supra* note 6, at 34; and PISCO, *supra* note 28.

33. Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. §§ 1801–1882 (2002 & Supp. 2003); *see also, e.g.*, FLA. STAT. chap. 370 (2003).

34. 16 U.S.C. §§ 1431 et. seq. (2000& Supp. 2003).

35. 16 U.S.C. § 1131(2000& Supp. 2003).

36. 16 U.S.C. § 668dd (2002 & Supp. 2003).

37. 16 U.S.C. § 1461 (2000& Supp. 2003).

38. 16 U.S.C. §§ 1,2-4 (2000& Supp. 2003).

39. 16 U.S.C. §§ 1531-1544 (2000& Supp. 2003).

40. *See, e.g.*, FLA. STAT.chap. 253.

41. *See* Pollard's Lessee v. Hagan, 44 U.S. 212 (1845); Shively v. Bowlby, 152 U.S. 1 (1894).

traditional triad of public uses protected by the doctrine were navigation, fishing and commerce.[42] Modern jurisprudence has not, however, limited the purposes of the trust to the traditional public uses of navigable waters. The doctrine has evolved to reflect the public's contemporary interests in navigable waters and tidelands.[43]

Most states recognize recreational use as part of the public trust.[44] State courts have also identified environmental and ecological protection and preservation of scenic beauty as within the trust protections.[45] The public trust has also been extend ed to "preservation of those lands in their natural state, so that they may serve as ecological units for scientific study, as open space, and as environments which provide food and habitat for birds and marine life, and which favorably affect the scenery and climate of the area."[46]

The biggest problem with application of the public trust doctrine is that many of the protected uses can conflict with each other, and the doctrine creates no specific hierarchy in the uses. Legislatures and agencies generally must balance competing interests based on the appropriateness of the use to the particular area of the ocean.[47] One case suggests, however, that the protection of waters and wildlife is fundamental to the enjoyment of all other public trust uses. In *Weden v. San Juan County*,[48] the Washington Supreme Court addressed the controversial issue of regulating personal water craft (PWC). In determining that a county ordinance prohibiting navigation and recreational use by PWCs is consistent with the state's public trust doctrine, the court found that "it would be an odd use of the public trust doctrine to sanction an activity that actually harms and damages the waters and wildlife of this state."[49]

In Florida, the public trust doctrine is incorporated in the Florida Constitution:

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42. Shively v. Bowlby, 152 U.S. 1 (1894).

43. *See* JACK H. ARCHER, DONALD L. CONNORS, KENNETH LAURENCE, SARAH CHAPIN COLUMBIA, & ROBERT BOWEN, THE PUBLIC TRUST DOCTRINE AND THE MANAGEMENT OF AMERICA'S COASTS 23 (1994) [hereinafter Archer et al.].

44. *See, e.g.,* State v. Superior Court of Lake Co., 615 P.2d 239 (Cal. 1981);White v. Hughes, 190 So. 446, 449 (Fl. 1939); Ryals v. Pigott, 580 So.2d 1140 (Miss. 1990); Gwathmey v. North Carolina, 464 S.E.2d 674 (N.C. 1995).

45. *See, e.g.,* Kootenai Envtl. Alliance, Inc. v. Panhandle Yacht Club, Inc., 6771 P.2d 1085 (1983) (The public trust doctrine protects "navigation, fish and wildlife habitat, aquatic life, recreation, [and] aesthetic beauty."); State v. Trudeau, 408 N.W. 2d 337 (Wis.1987) ("The rights Wisconsin's citizens enjoy with respect to bodies of water held in trust by the state include the enjoyment of natural scenic beauty. . . .").

46. *See, e.g.*, Marks v. Whitney, 491 P.2d 374, 380 (Cal.1971).

47. *See generally* Archer et al., *supra* note 42 ,at 27-29.

48. 958 P.2d 273 (Wash. 1980).

49. *Id.* at 284.

> Art. X, Section 11. Sovereignty lands. – The title to lands under navigable waters, within the boundaries of the state, which have not been alienated, including beaches below the mean high water lines, is held by the state by virtue of its sovereignty, in trust for all the people. Sale of such lands mya be authorized by law, but only when in the public interest. Private use of portions lands may be authorized by law., but only when not contrary to the public interest.[50]

The Florida Supreme Court has specifically expanded the State's trust uses to include swimming and bathing,[51] but the Constitution's general reference to "the public interest," rather than referring to "public trust uses," is an indication that Florida intends the doctrine to be dynamic and reflect the public's contemporary interests in and uses of navigable waters. Another section of the Florida Constitution gives us additional insight into the public trust doctrine in relation to the marine living resources associated with sovereignty lands:

> Art. X, Section 16. Limiting Marine Net Fishing. --
>
> (a) The marine living resources of the State of Florida belong to all of the people of the state and should be conserved and managed for the benefit of the state, its people, and *future generations*. . . .[52]

This inclusion of the concept of intergenerational equity in relation to marine living resources adds an intemporal aspect to Florida's public trust doctrine.[53]

Professor Edith Brown Weiss sets out perhaps the most well known statement of the principles of intergenerational equity.[54] She describes the principles as follows:

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50. FLA. CONST., Art. X, Section 1 (1970).

51. White v. Hughes, 190 So. 446, 449 (1939).

52. FLA. CONST., Art. X, Section 16 (1994).

53. At least one federal statute particularly relevant to Florida also incorporates the concept of intergenerational equity. The legislation establishing Biscayne National Park states: "In order to preserve and protect for the education, inspiration, recreation, and enjoyment of present and future generations a rare combination of terrestrial, marine, and amphibious life in a tropical setting of great natural beauty, there is hereby established the Biscayne National Park . . . ." 16 U.S.C. 410gg.

54. *See* Edith Brown Weiss, *Our Rights and Obligations to Future Generations for the Environment*, 84 AM. J. INT'L L. 198, 201-202 (1990); *see also generally,* EDITH BROWN WEISS, IN FAIRNESS TO FUTURE GENERATIONS (1989).

> I. Conservation of Options: Each generation should conserve the diversity of the natural and cultural resource base so that the options of future generations are not unduly restricted.[55]
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> II. Conservation of Quality: "[E]ach generation should . . . maintain the quality of the planet so that it is passed on in no worse condition than that in which it was received."[56]
>
> III. Conservation of Access: Each generation should provide its members with "equitable rights of access to the legacy of past generations and . . . conserve this access for future generations."[57]

In the context of these principles of intergenerational equity, the importance of marine reserves becomes clear as a means to conserve options, quality and access to marine living resources for future generations. Florida's public trust doctrine is not a limitation on the use of marine reserves; the state must protect a broad array of public interests and uses in navigable waters. The state has the authority to regulate public trust uses to minimize conflicts and assure the protection of waters and wildlife that are fundamental to the enjoyment of all other public trust uses.

The state's public trust doctrine does not establish any apparent priority among conflicting public trust uses. The additional constitutional requirement to preserve the rights of future generations to marine living resources, however, creates an overarching limitation on the exercise of public trust uses. The inherent uncertainty in science and variability in ecosystems necessitates measures to insure the intergenerational rights in regard to the diversity and quality of, and access to, marine living resources. Marine reserves can provide that "insurance policy" for future generations.

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55. *Id.*
56. *Id.*
57. *Id.*