SAVING THE LAND-WATER EDGE FROM RECREATION, FOR RECREATION

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> Edge is . . . the meeting place of contrasting environments; a zone which nature endows most abundantly with life, both in variety and in numbers.[1]

Many forms of life respond to what ecologists term the "edge effect"[2] and tend not only to be characteristic of the edge but also to increase in variety and density of population in zones of contact between one environment and another—between forest and meadow, or land and water, for example.[3] These zones of contact, or ecotones, are long and narrow in comparison to the areas on either side of them and often support plants and animals native to both of the neighboring environments, plus "edge species"[4] that live only in the ecotone. The zone of contact between land and water, whether located along streams, lakes, river estuaries or seacoasts, is a particularly significant edge. A great variety of waterfowl, aquatic mammals, and fish, including the majority of commercially useful species, spend at least part of their lives in the land-water ecotone. Unfortunately for these creatures, man, as his available leisure time grows, also spends an ever-increasing amount of time in this zone. Water-based recreation, including fishing, waterfowl hunting, swimming, and boating, and recreational housing, especially leisure-home subdivisions, depend heavily

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1. R. PARSON, CONSERVING AMERICAN RESOURCES 312 (2d ed. 1964).
2. E. ODUM, FUNDAMENTALS OF ECOLOGY 278 (2d ed. 1959).
3. It has been shown, for instance, that the population density of some nesting birds grows with the increase in number of feet of edge per unit area of community. *Id.*
4. *Id.*

on the edge and are exacting a significant toll from this ecologically fragile area.[5]

This article will examine the damage that man is inflicting on the land-water edge in the name of recreation, the effects of the common law water-rights doctrines and state and federal statutes on public and private use of the land-water edge, and legal constraints on its exploitation. Finally, an attempt will be made to indicate possible solutions to the conflict between providing man with adequate water-based recreation and conserving the ecology of the zone.

RECREATIONAL THREAT TO THE LAND-WATER EDGE

The Effect of Recreation on the Edge

Since most forms of water recreation require ease of land-side access to the edge, large scale development of the land-water ecotone occurred only after the development of mass transportation, especially the railroad. This causal relationship is illustrated by the growth of shoreline resorts in the United States and England. Although sea-bathing was fashionable at an earlier date, Atlantic City and similar shore resorts did not become widely popular until the middle of the last century. During the 20th century, the major factor in recreational development of the land-water ecotone has been the automobile and its more recent outgrowths—the boat-toting trailer, the camper, and the new breed of recreational vehicles, including dune buggies, amphibians and motorhomes.

Water-based recreational benefits have also provided the impetus for the relatively recent proliferation of edge communities: seaside resorts, lakefront summer colonies, year-round leisure-home subdivisions, houseboat and "boatel" villages. Although Florida probably leads the way in what has been described as "Venetian, cookie-cutter housing development"[6] projected outward from the natural shore, this popular type of recreational exploitation of edge is not limited to the Southeastern shores. It is also widespread along the Atlantic and Gulf coasts wherever marshland and tideland have been dredged and filled to form a mosaic that affords each house its own boat dock and access to the water.[7]

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5. *See* R. PARSON, *supra* note 1, at 331.

6. 2 U.S. FISH AND WILDLIFE SERVICE, NATIONAL ESTUARY STUDY 211 (1970) (caption to photograph) [hereinafter cited as ESTUARY STUDY].

7. *See generally* Teclaff, *The Coastal Zone—Control Over Encroachments Into the Tidewaters*, 1 J. MAR. L. & COMM. 241 (1970) (on the extension of edge by means of filling and bulkheading). Where the amount of edge is reduced, through channelization of a river, for example, the density of recreational exploitation appears to be correspondingly less. One commentator noted that on the Kankakee River the unmodi-

The creation of man-made edge in inland areas by damming streams or tapping groundwater to provide artificial lakes has greatly increased in recent years. Among such creations are the ski lakes of southern California that were developed to meet the huge demand for boating and water skiing in areas such as the Mohave Desert which lack natural surface bodies of water.[8] More remarkable is the current upsurge in construction of artificial water bodies in areas, such as northern Wisconsin, which are already liberally endowed with natural lakes.[9] Furthermore, Americans create, on a do-it-yourself basis, their own edge by constructing ponds on rural properties, many times with the blessing and assistance of the federal government if certain requirements are met.[10] In 1970, for example, over 47,000 ponds were built in this country.[11] The recreational value of an existing pond is an extremely powerful attraction to country property seekers.[12]

Of all man's activities in the land-water ecotone, recreation would appear to be the most compatible with maintenance of environmental quality and least detrimental to other forms of life and biotic communities. The point has now been reached, however, where intensified use of edge for water recreation not only threatens environmental quality through interference with plant and animal communities which share the land-water ecotone with man, but also interferes with man's own enjoyment of the ecotone through over-crowding. The root of the problem is man's inability to "adjust his use of the land to the multitudinous and gradual variations in nature."[13] Instead, he converts the natural landscape into one reflective of his culture by creating distinct land units within each of which he seeks to mold certain

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fied meandering stretch boasted 15 times as many cottages per mile of river front as the channelized stretch. He attributed the lower density on the channelized stretch in part to its faster muddier current which lowered its recreational value. Meyer, *The Kankakee Marsh of Northern Indiana and Illinois*, in R. PLATT, FIELD STUDY IN AMERICAN GEOGRAPHY 202, 214 (Univ. of Chi. Dep't of Geog. Res. Paper No. 61, 1959).

8. *See* Note, *Public Recreation and Subdivisions on Lakes and Reservoirs in California*, 23 STAN. L. REV. 811, 823 n.81 (1971), *citing* CALIFORNIA DIVISION OF SMALL CRAFT HARBORS, CALIFORNIA SMALL CRAFT HARBORS AND FACILITIES PLAN (1964).

9. *See* Kusler, *Artificial Lakes and Land Subdivisions*, 1971 WIS. L. REV. 369, 370-73.

10. *See* 16 U.S.C. §§ 1001 *et seq.* (1970).

11. Faber, *Something Makes a Pond More Than a Pond*, N.Y. Times, Oct. 31, 1971, § 8, at 1, col. 1.

12. *Id.*

13. R. HARTSHORNE, THE NATURE OF GEOGRAPHY 279 (rev. ed. 1949). This effect is particularly visible in the land-water ecotone, especially when viewed from the air. For example, ESTUARY STUDY, *supra* note 6, offers a graphic illustration of the effect in aerial photographs of Boca Ciega Bay, Florida, an area in which man has usurped an enormous amount of edge from other biotic communities. The photographs, taken between 1949 and 1963, show the evolution from the intricate contours of a fish and wildlife estuarine habitat to the stereotyped simplicity of a recreational housing development. 2 ESTUARY STUDY, *supra* note 6, at 211.

characteristics. Thus, he tends to create something alien to nature—a mosaic. Such a patchwork is a clear indication of human design.[14]

Although conservationists are eloquently indignant over the ugliness and intrusiveness of man's structures in the land-water edge,[15] aesthetic deterioration is not, unfortunately, the worst injury inflicted upon the edge. The very existence of thousands of miles of shoreline is in danger from erosion, in many cases due directly to private recreational development. The protective dunes of barrier beaches such as those of the Carolinas or Long Island, New York, have been destroyed by leveling in the process of providing residential views of the water and constructing summer cottages too close to the shore. The impact of a new source of disturbance to the fragile dune ecology—the dune buggy—has yet to be assessed. The problem of erosion is further complicated by the private ownership of much of the shore which is placed, therefore, outside the jurisdiction of federal erosion-control programs.[16] A combination of intensive coastal development, haphazard private construction of bulkheads and jetties, and stubborn resistance to any federal erosion-control aid package that would require greater public access to the shoreline, has cost Miami Beach almost all of the sand on its beaches.[17]

As erosion is an undesirable accompaniment of recreational construction along the natural shore, sedimentation is the bane of many artificial lakes created specifically for leisure-home communities. The loss of capacity of these normally small lakes is so high in some instances that they are rendered unattractive for water recreation within a few years. In addition, the pollution generated by the usual accoutrements of leisure-home communities, such as septic tanks and chemical lawn fertilizers, represents an even more serious problem for artificial lakes, because of their constricted water area, than for large natural lakes and the seacoast.[18]

Public development of the land-water edge for recreational purposes avoids some of the problems of private development, only to harm the environment and reduce the quality of the recreational experience in other ways. Increased demand for public marine recreation areas has led to grave problems in overcrowding at the shore including problems of safety and traffic management. In addition,

14. R. HARTSHORNE, *supra* note 13.
15. *See, e.g.*, R. PARSON, *supra* note 1, at 333.
16. *Shoreline Study Shows 2,700 Miles of U.S. Shores Critically Eroded*, 2 NAUTILUS COASTAL ZONE MANAGEMENT, Sept. 1971, at 1, 2.
17. N.Y. Times, Nov. 28, 1971, at 53, col. 4.
18. Kusler, *supra* note 9, at 382 n.24, 385 n.30.

authorities are faced with increasingly serious conflicts between activities. The growing number of sail and motorboats are greedy consumers of space, and swimmers and surfers frequently protest the resultant reduction in usability of areas set aside for them.[19] Furthermore, traffic problems lead to pressure for increased access to the edge in the form of more roads, but the land-water edge is peculiarly vulnerable to road-building because of its narrowness. The roads themselves are destructive of the ecology, and any improvements made to them only compound the injury by attracting more traffic. Thus, by one means or another public access leads to abuse, and a resource of incomparable value frequently deteriorates because it is the property of all.

The amount of environmental damage the edge can stand from all these different sources varies to some extent with the nature of its components. The intertidal beach, for example, is a zone of extreme physical stress resulting from natural forces such as the pounding of surf. Its animal life is well adapted to stress, and the area can handle heavy use by man with relatively minor ecological damage. Marshes and uplands, by contrast, are much more vulnerable habitats. According to the Conservation Director of the American Littoral Society, these areas cannot withstand the physical effects of leveling, dredging, bulkheading, black-topping, bad air, bad water, pesticides, noise, or in some instances even the presence of man. He points out that the result of physical or biological stress upon such habitats is low diversity—a reduction in the number of species of plants and animals present.[20] The impact of man-made changes on such fragile environments is to reverse the edge effect so far as all biotic communities are concerned. The human onslaught destroys the variety and richness of life in these areas of land-water edge and in so doing diminishes the psychic value of that environment for man himself. As the National Estuary Study notes, "[r]ecreational facilities and recreation uses . . . can be equally damaging . . . as other types of human exploitation of [the] natural environment."[21]

The Effect of the Common Law Water Rights Doctrines

1. *Public Rights and Navigability.* Before it could become fully established as a use of the land-water ecotone by the general public,

19. *See* 5 ESTUARY STUDY, *supra* note 6, at 86 (Appendix F).
20. Bennett, *Right Way for the Gateway*, N.Y. Times, Oct. 31, 1971, at 10A, col. 3.
21. 5 ESTUARY STUDY, *supra* note 6, at 37 (Appendix E).

water recreation had to overcome two tendencies in existing water law: preference for private use and development of the edge, and lack of its acceptance as an activity. Exclusion of the public from a large portion of the land-water edge has resulted primarily from application of the common law rule that public rights pertain only to navigable waters.[22] Had this rule held to its original English version—that navigability is synonymous with ebb-and-flow of the tide[23]—even more of the edge would have been closed to public enjoyment. In 1851, however, the ebb-and-flow test was abandoned,[24] and within two decades the navigability-in-fact test, as elaborated by the Supreme Court of the United States in *The Daniel Ball*,[25] was fully developed. According to the federal test, waters must be suitable as "highways for commerce" to be subject to commerce clause power.

The federal test was not universally accepted by all states, however, for the purpose of establishing the public easement of navigation over privately held beds. The courts of several states sought to liberalize the test by bringing lakes within the rubric of the federal test by finding recreational boating to be within the penumbra of "navigation"[26] or by stretching the definition of commerce to include such activity.[27] In a 1971 decision the California Court of Appeals reiterated that the commercial navigation test had long been abandoned and held that the test of navigability for the public easement is met if a stream can be used for recreational purposes: "Members of the public have the right to navigate and to exercise the incidents of navigation in a lawful manner at any point below high water mark on waters of this state which are capable of being navigated by oar or motor propelled small craft."[28]

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22. *Cf.* Reece v. Miller, 51 L.J.R. 64 (Magis. Cas. 1882). *See also* The Propeller Genesee Chief v. Fitzhugh, 53 U.S. (12 How.) 443, 454-55 (1851).

23. For a discussion of the tidal rule, see Fraser, *Title to Soil Under Public Waters—A Question of Fact*, 2 MINN. L. REV. 313 (1918).

24. The Propeller Genesee Chief v. Fitzhugh, 53 U.S. (12 How.) 443 (1851) (abandoning ebb-and-flow test for extent of federal maritime jurisdiction).

25. 77 U.S. (10 Wall) 557, 563 (1870):

> Those rivers must be regarded as public navigable rivers in law which are navigable in fact. And they are navigable in fact when they are used, *or are susceptible of being used*, in their ordinary condition, as highways for commerce, over which trade and travel are or may be conducted in the customary modes of trade and travel on water.

26. *See, e.g.*, Lamprey v. State, 52 Minn. 181, 53 N.W. 1139 (1893) (title to bed of navigable lakes held to be in riparian owners but burdened with public navigation servitude).

27. *See, e.g.*, Luscher v. Reynolds, 153 Ore. 625, 56 P.2d 1158 (1936) (title to bed of lake in riparians but burdened with public navigation servitude). *See also* Powell v. Springston Lumber Co., 12 Idaho 723, 88 P. 97 (1906) (public easement of navigation over navigable stream bed); Felger v. Robinson, 3 Ore. 455 (1869) (a stream capable of floating logs at some season every year is a public highway for such purpose).

28. People v. Mack, Civil No. 12936 (Cal. Ct. App., Sept. 15, 1971), 3 BNA

If the bed of a waterway is held by the state, the public right of access and use can be more easily guaranteed. Normally, the states hold title to beds beneath waters influenced by the tides. As to non-tidal waters, the bed of the waterway is said to be in the state only if the waterway was "used as a highway" at the time of the state's admission into the Union.[29] Generally, however, the net result of the federal "highways-for-commerce" test was to place most of the smaller and shallower lakes and streams outside public ownership, access and control for recreational purposes.[30] This exclusionary effect undoubtedly helped to preserve environmental quality in some instances by obviating the types of abuse characteristic of areas open to public access. On the other hand, as the demand for recreational waterfront property grew, the navigability test may be said to have shielded and encouraged private owners, so long as they did not directly harm other private owners, in the development of uses which have been highly detrimental to the environment.

2. *Alienation of Trust Lands Under Navigable Waters.* In addition to having been excluded from recreational use of non-navigable waters, the public also lost its rights in some navigable waters, the beds of which were originally held by the states, through a loose interpretation of the public trust doctrine, favoring private use and development.[31] Though it was well-established by the end of the 19th

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ENV. REP. CAS. 1391, 1395 (1971) (title to bed of stream which was 2-11 feet deep held by riparians but burdened with public easement of navigation).

29. Under the "highways-for-*commerce*" doctrine. The Supreme Court of the United States has recently held that a waterway need not have been used for commercial gain in order to be considered navigable. Utah v. United States, 403 U.S. 9, 11 (1971). The Court said that the gist of the federal test of navigability, which was stated in The Daniel Ball, 77 U.S. (10 Wall.) 557, 563 (1870), is that the lake was used as a highway. *Id.* This represents a broad interpretation of the federal test of navigability. *Compare* Utah v. United States, *supra, with* text & notes 22-23 *supra. See also* Harrison v. Fite, 148 F. 781, 784 (8th Cir. 1906); Proctor v. Sim, 134 Wash. 606, 236 P. 114 (1925).

30. *Cf.* Lebanon Lumber Co. v. Leonard, 68 Ore. 147 (1913) (where bed and banks of a stream are owned by riparian proprietor, navigability does not give navigator right of way over the land or bank); *accord* State v. Superior Court of Lewis County, 60 Wash. 193, 110 P. 1017 (1910).

31. *See generally* Nelson, *State Disposition of Submerged Lands Versus Public Rights in Navigable Waters,* 3 NAT. RES. LAW. 491 (1970); Teclaff, *supra* note 7, at 252-68; Note, *California's Tideland Trust: Shoring It Up,* 22 HAST. L.J. 759 (1971).

The public trust doctrine is generally held to refer to the concept that certain resources are held by the state in trust for the general public and such resources cannot, or at least should not, be dissipated.

> Three types of restrictions on governmental authority are often thought to be imposed by the public trust: first, the property subject to the trust must not only be used for a public purpose, but it must be held available for use by the general public; second, the property may not be sold, even for a fair cash equivalent; and third, the property must be maintained for particular types of uses. The last claim is expressed in two ways. Either it is urged that the resources must be held available for certain traditional uses, such as navigation, recreation, or fishery, or it is said that the uses which are made of the property must be in some sense related to the natural uses peculiar to that resource.

century that states are incapable of alienating the entire subsurface area of large expanses of tidewater, they were not precluded from alienating parcels of tideland, especially where such alienation did not interfere with navigation.[32] It is true that the public retained its rights in the waters above the alienated lands, but only so long as these areas were not filled.[33] State legislatures, however, have frequently made grants of tidelands on the express condition that they be reclaimed and filled in, justifying the grants on the ground of public interest.[34] Where tideland grants have resulted in improvements for a recreational purpose, courts have not been disposed to regard the loss of public rights too seriously.[35]

Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 MICH. L. REV. 473, 477 (1970) (footnotes omitted).

32. In its most significant pronouncement on the public trust doctrine, the Supreme Court of the United States acknowledged that

> [t]he control of the state for the purposes of the trust can never be lost, except as to such parcels as are used in promoting the interests of the public therein, or can be disposed of without any substantial impairment of the public interest in the lands and waters remaining.

Illinois Cent. R.R. v. Illinois, 146 U.S. 387, 453 (1892).

In People v. California Fish Co., 166 Cal. 576, 597, 138 P. 79, 88 (1913), where navigational improvement was invoked as the reason for a grant of tideland, the Supreme Court of California said:

> One of the duties of the trust is to adapt the land to the use for navigation in the best manner. If in so adapting the tidelands for this use it is found necessary or advisable in any of the use to cut off portions of it from access to navigable water so that it becomes unavailable for navigation, the state has power to exclude such portions from the public use, and, to that extent, revoke the original dedication.

33. For example, in the early case Allen v. Allen, 19 R.I. 114, 116, 32 A. 166 (1895), the Supreme Court of Rhode Island noted that

> public rights secured by this trust are the rights of passage, of navigation, and of fishery, and these rights extend . . . to all land below high-water mark, unless it has been so used, built upon, or occupied as to prevent the passage of boats and the natural ebb and flow of the tide.

In this context, Professor Sax has observed that "the mere granting of property to a private owner does not ipso facto prevent the exercise of the police power, for states routinely exercise a great deal of regulatory authority over privately owned land. Sax, *supra* note 28, at 489. *See* Atwood v. Hammond, 4 Cal. 2d 31, 39, 48 P.2d 20, 24 (1935); City of Boston v. Richardson, 105 Mass. 351, 362 (1870).

34. *See, e.g.*, CAL. HARB. & NAV. CODE, APP. 1, § 87(j) (West Supp. 1971) (San Diego Unified Port District Act of 1962, declaring that all unimproved tidelands acquired by the district must be "substantially improved" within ten years or revert to the state); Butler Act, ch. 8537, [1921] Fla. Laws 332; ch. 791, [1856] Fla. Laws — (both Florida acts vested title to the tidelands in the upland owners for the purpose of improving the foreshore); Act No. 969, [1956] S.C. Acts 2350 ("it is in the public interest that such property may be available for reclamation, improvement and development").

35. Thus in City of Long Beach v. Mansell, 3 Cal. 3d 462, 500, 476 P.2d 423, 451, 91 Cal. Rptr. 23, 51 (1970), in which the facts disclosed that the shoreline of Alamitos Bay had been developed for many years as a residential-marina complex, the court concluded that the alienation of the tidelands involved, "however haphazard and reckless it may have been," had not denied the public the use of the area in question because of the "impressive array of public facilities for navigation and recreation" which had resulted. The city and state were estopped by their own conduct from asserting detriment to the public interest where detriment was slight and was clearly outweighed by the harm which would be caused should the governmental claims on title prevail. The case is discussed in Note, *Coastal Zone Management—The Tidelands: Legislative Apathy v. Judicial Concern*, 8 SAN DIEGO L. REV. 695, 697-706, 719-21 (1971).

3. *Riparian and Appropriation Doctrines.* The exclusionary effect of the navigability test on public recreational use of the zone of edge has been compounded by the riparian rights doctrine adhered to by most of the states east of the Mississippi and the prior appropriation system accepted in many areas of the West. Although riparianism cannot exclude the public from navigable waters, it inhibits public enjoyment of navigable rivers and lakes by denying access to and the use of shores and banks. As between riparians it tolerates private recreational use of the waterway unless such use is injurious to other riparians.[36]

In its natural-flow version the riparian doctrine has operated to preserve the ecology of the zone of edge by insisting on *in situ* use of the water with no impairment of quality or quantity; in its reasonable use version, however, the effectiveness of this environmental protection has been greatly diluted.[37] Under the latter rule, as set forth in the *Restatement of Torts*,

> [u]nless he has a special privilege, a riparian proprietor on a watercourse or lake who, in using the water therein, intentionally causes substantial harm to another riparian proprietor thereon through invasion of such other's interest in the use of water therein, is liable to the other in an action for damages if, but only if, the harmful use of water is unreasonable in respect to the other proprietor . . . .[38]

The same authority, however, declares that a use is not unreasonable if "the utility of the use outweighs the gravity of the harm."[39]

"Reasonableness" has been the subject of such varied interpretations, especially in regard to the use of lakes by riparian owners, as to yield clearly inadequate environmental guidelines.[40] In general, the issue has turned upon the degree of interference with the rights of other owners. Courts have been unwilling to condemn a particular use in toto or to deny to any one riparian the exercise of a right which

36. The riparian rights doctrine views the right of use of water as an incident of the ownership interest in land contiguous to the source of water; each riparian owner is entitled to an equal right to the use of the water. *See generally* Hanks, *The Law of Water in New Jersey*, 22 RUTGERS L. REV. 621 (1968); Teclaff, *Private Water Rights in France and in the Eastern United States*, 11 AM. J. COMP. L. 560 (1962).

37. Under the natural flow version of the doctrine, each riparian is "entitled to the natural flow of the stream past his land undiminished in quantity [with the traditional exceptions of minor domestic uses or stock watering] and unimpaired in quality." F. TRELEASE, H. BLOOMENTHAL & J. GERAUD, CASES AND MATERIALS ON NATURAL RESOURCES 1 (1965) [hereinafter cited as F. TRELEASE]. By contrast, under the reasonable use version, "each riparian may make a reasonable use of the water consistent with like uses by the others." *Id.*

38. RESTATEMENT OF TORTS § 851 (1939).

39. *Id.* § 852.

40. For a discussion of some of the factors which courts utilize in evaluating reasonableness, see Hanks, *supra* note 36, at 630-32.

belongs to all riparians equally.[41] Reasonableness—or the balancing of equities—is thus a rather poor yardstick in an environmental context. Damage to the land-water ecotone may be swift and irreversible, because all riparians are entitled, in the same degree, to exercise a use which, though relatively harmless when exercised on an individual basis, may be cumulatively deadly.[42]

While the riparian rights doctrine affects public use of navigable waters, prior appropriation does not.[43] On the other hand, while riparianism tolerates private recreational uses, prior appropriation until recently did not; it is the outstanding example of the slow acceptance of recreational uses in law.[44] Prior appropriation,[45] as it developed during the latter half of the 19th century in the Western United States, prompted the artificial extension of edge, through diversion and canal networks, for essentially one purpose—irrigation. Having developed in an often arid environment, it demanded an accounting of the amount of water used[46] and would not tolerate waste.

Prior appropriation inhibited recreational use of water in two principal ways: appropriation generally required an actual diversion of water with the intent to apply it to a beneficial use,[47] whereas

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41. The Supreme Court of Minnesota, for example, recognized that
> [a]n abutting or riparian owner of a lake, suitable for fishing, boating, hunting, swimming, and other domestic or recreational uses to which our lakes are ordinarily put in common with other abutting owners, has a right to make such use of the lake over its entire surface, in common with all other abutting owners, provided such use is reasonable and does not unduly interfere with the exercise of similar rights on the part of other abutting owners . . . .

Flynn v. Beisel, 257 Minn. 531, 539, 102 N.W.2d 284, 290 (1960); *cf.* Forest Land Co. v. Black, 216 S.C. 255, 57 S.E.2d 420 (1950).

42. It should be noted, however, that several commentators, while recognizing the shortcomings of the reasonableness test, have praised its flexibility, especially "its capacity for full consideration of competing interests and uses, disregarding rigid preferences and permitting a pragmatic assessment of the most desirable water uses." Johnson & Morry, *Filling and Building on Small Lakes—Time for Judicial and Legislative Controls*, 45 WASH. L. REV. 27, 41-42 (1970). *See also* Comment, *Public Recreation on Navigable Lakes and the Doctrine of Reasonable Use*, 55 IOWA L. REV. 1064, 1071-72 (1970).

43. For discussions of the relative economic merits of the riparian and appropriation systems, see Gaffney, *Economic Aspects of Water Resource Policy*, 28 AM. J. ECON. & SOC. 131, 137-41 (1969); Milliman, *Water Law and Private Decision-Making: A Critique*, 2 J. LAW & ECON. 41 (1959).

44. *See generally* Note, *Water Appropriation for Recreation*, 1 LAND & WATER L. REV. 209 (1966).

45. The doctrine of prior appropriation rests on two basic principles: "beneficial use of water, not land ownership, is the basis of the right to water, and . . . priority of use, not equality of right, is the basis of the division of water between appropriators when there is not enough for all." F. TRELEASE, *supra* note 37, at 2.

46. In most states an application must be made for a fixed quantity of water, and the water must then be applied to a beneficial use within a reasonable time. *See, e.g.*, ARIZ. REV. STAT. ANN. §§ 45-141 to -155 (Supp. 1971-72); COLO. REV. STAT. §§ 148-2-1 to 148-2-8 (Cum. Supp. 1968-69). *See also* Trelease, *The Concept of Reasonable Beneficial Use in the Law of Surface Streams*, 12 WYO. L.J. 1 (1957).

47. *E.g.*, City & County of Denver v. North Colo. Water Conserv. Dist., 130 Colo. 375, 386, 276 P.2d 992, 998 (1954); Board of County Comm'rs v. Rocky Mountain Water Co., 102 Colo. 351, 358, 79 P.2d 373, 377 (1938).

recreation was viewed as an *in situ* activity[48] and was not regarded as a beneficial use.[49] Eventually some Western states enacted legislation to reserve a minimum amount of the unappropriated flow of a river for water recreation or to declare recreation a beneficial use.[50]

Thus, the pertinent rules of water law—the navigability test, a loose interpretation of the trust principle, and the riparian and prior appropriation principles applied to inland waters—facilitated private acquisition and control of large portions of the zone of edge, despite the federal interest in navigable waters. Given the rapidly increasing demand for public access to the land-water ecotone, however, it was inevitable that the federal and state governments would enter the picture by acquiring coastal and inland property and opening it to the public.

Governmental Encouragement of Public Use of the Edge

The interest of the federal government in providing public recreation sites has been in evidence since the establishment of Yellowstone, the first national park, in 1872.[51] Recently, however, the federal government's role in recreational development has been expanding at an accelerating pace.[52]

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48. *See* Colorado River Water Conserv. Dist. v. Rocky Mountain Power Co., 158 Colo. 331, 335, 406 P.2d 798, 800 (1965).

49. The place of water recreation in the appropriation system is well illustrated by the Colorado case of Empire Water & Power Co. v. Cascade Town Co., 205 F. 123 (8th Cir. 1913), in which a power company's plans for impoundment of waters would have destroyed a scenic waterfall and turned a beautiful canyon, with unique flora and abundant wildlife, into a dry gulch. The plaintiff, a summer resort located by the falls, sought to preserve the beauty of the falls by enjoining the defendant's proposed plans. Although acknowledging the benefit to society of such resorts, the court held to the basic principles of the prior appropriation system:

> The laws of Colorado are designed to prevent waste of a most valuable but limited natural resource, and to confine the use to needs. By rejecting the common-law rule they deny the right of the landowner to have the stream run in its natural way without diminution. He cannot hold to all the water for the scant vegetation which lines the banks but must make the most efficient use by applying it to his land. . . . We think complainant is not entitled to a continuance of the falls solely for their scenic beauty. . . . [T]he trial court based its decision of this branch of the case largely upon the artistic value of the falls, and made no inquiry into the effectiveness of the use of the water in the way adopted as compared with the customary methods of irrigation.

205 F. at 129.

50. For example, a Texas statute recognizes recreation as one of several purposes for which the public waters of the state may be appropriated. TEX. WATER CODE § 5.023(a)(7), (9), (10) (1971). The California code was amended in 1959 to provide that the "use of water for recreation . . . is a beneficial use." CAL. WATER CODE § 1243 (West 1971). Even after such revision, however, the California State Water Rights Board ruled that the undisturbed flow of a river could not be appropriated for such purpose since the statute has no effect on riparian rights. J. BEUSCHER, WATER RIGHTS 255 (1967), *citing In re* Application 12919A, No. D-1030 (Calif. State Water Rights Bd. 1961).

51. 15 U.S.C. §§ 21-40c (1970).

52. *Compare* 3 PRESIDENT'S WATER RESOURCES POLICY COMM'N, REPORT, WATER

Within the present century, development of water for multi-purpose uses has made many federally administered water resources areas available for recreation.[53] General authorization covering all federal water resources projects is provided by the Federal Water Project Recreation Act of 1965,[54] which declares:

> It is the policy of the Congress and the intent of this Act that (a) in investigating and planning any Federal navigation, flood control, reclamation, hydroelectric, or multiple-purpose water resource project, full consideration shall be given to the opportunities, if any, which the project affords for out-door recreation . . . and that, wherever any such project can reasonably serve . . . [this purpose] consistently with the provisions of this Act, it shall be constucted, operated and maintained accordingly . . . .[55]

It provides further that non-federal public bodies may administer such areas for recreation.[56] Areas within the National Wildlife System are made accessible on a limited basis for public use by a federal statute which provides that they be administered for recreation "as an appropriate incidental or secondary use" and that "such public recreational use shall be permitted only to the extent that is practicable and not inconsistent" with other authorized or primary uses and objecives.[57]

RESOURCES LAW 331-34 (1950) (devoting 3 pages to recreation out of 800 pages), *with* 16 U.S.C. § 460*l* to 460*l*-22 (1970) (creating an entirely separate federal recreation fund—the Land and Water Conservation Fund—designed to stimulate development of outdoor recreation facilities and administered by a new federal agency, the Bureau of Outdoor Recreation).

53. The Federal Power Commission, for example, is authorized to require its licensees to make provision for "beneficial public uses, including recreational purposes." 16 U.S.C. § 803a (1970). The Tennessee Valley Authority Act permits real property to be conveyed for the purpose of recreation, or use as a summer residence, or for the operation on such premises of pleasure resorts for boating, fishing, bathing, or similar purposes. *Id.* § 831c(k)(a). With regard to water resource development projects coming under the supervision of the Department of the Army, the Corps of Engineers is authorized either to construct, maintain, and operate public park and recreational facilities itself or to permit local interests to do so, and to grant leases of such areas and facilities upon terms deemed reasonable. *Id.* § 460d. The statute expressly states that, when determined by the Secretary of the Army not to be contrary to the public interest "[t]he water areas of all such projects shall be open to public use generally for boating, swimming, bathing, fishing, and other recreational purposes, and ready access to and exit from such areas along the shores of such projects shall be maintained for general public use." *Id.*

54. *Id.* §§ 460*l*-5(a), 460*l*-12 to 460*l*-21, 662(d).

55. *Id.* § 460*l*-12.

56. *Id.* A more specific provision for recreational facilities at reservoirs constructed under the reclamation laws is contained in section 8 of the Federal Water Project Recreation Act:

> The Secretary [of Interior] is authorized, in conjunction with any reservoir heretofore constructed by him pursuant to the Federal reclamation laws or any reservoir which is otherwise under his control, except reservoirs within national wildlife refuges, to investigate, plan, construct, operate and maintain, or otherwise provide for public outdoor recreation . . . facilities . . . .

Id. § 460*l*-18.

57. *Id.* §§ 460k to 460k-4.

The statutory provisions specifically permit acquisition of "limited areas of land for recreational development adjacent to" tracts being used for conservation purposes.[58] In addition, there exist a number of national parks either bordering the coast or containing sizeable bodies of water.[59] These were formed primarily to preserve unique scenic areas, rather than to meet the expanding need for public access to the land-water edge or to furnish facilities for active water recreation. Such latter needs began to be filled, however, in the 1960's with the authorization and establishment of the national seashores and lakeshores and certain of the national recreational areas.[60]

States have also contributed substantially to increased public access to the land-water ecotone through acquisition of land in the zone of edge and through provision of recreational facilities as specific reservoir sites.[61] Some also require their agencies to give general access to certain types of state-owned waterfront property. For example, the California Health and Safety Code provides that "all water supply reservoirs of a public agency . . . shall be open for recreational use by the people of this State."[62]

In certain instances states have gone beyond this role in maximizing use of the zone of edge to require private waterfront housing subdivisions to provide public access to the waters. All subdivisions abutting on navigable lakes or streams in Wisconsin must provide public access to the low water mark at least 60 feet wide and at intervals of not more than half a mile.[63] California has somewhat similar provisions which state that no subdivision fronting upon the shore of the sea or of any lake or reservoir partly or wholly owned by any

58. *Id.* § 460k-1.

59. These parks and their dates of creation include: Glacier, Mont., 1910; Acadia, Me., 1919; Isle Royale, Mich., 1931; Big Bend, Tex., 1934; Everglades, Fla., 1934; Olympic, Wash., 1938; Virgin Islands, 1956. *See* 16 U.S.C. §§ 161, 341, 251, 408, 156, 410, 398 (1970), respectively.

60. Cape Hatteras National Seashore was authorized by Act of Aug. 17, 1937, 16 U.S.C. § 459 (1970). The more recently authorized national seashores, and their dates of creation, are Cape Cod (1961), Point Reyes (1962), Padre Island (1962), Fire Island (1964), Assateague Island (1965), and Cape Lookout (1966). *See* 16 U.S.C. §§ 459b-459g (1970). The national lakeshores are Pictured Rocks (1966), *id.* § 460s, the Indiana Dunes (1966), *id.* § 460u, Apostle Islands (1970), *id.* § 460w, and Sleeping Bear Dunes (1970), *id.* § 460x. Among the national recreational areas created around bodies of water are Bighorn Canyon (1968), Flaming Gorge (1968), and Delaware Water Gap (1965). *See* 16 U.S.C. 460o, 460t-460u (1970).

61. *See, e.g.*, California State Beach, Recreational and Historical Facility Bond Act of 1964, CALIF. PUB. RES. CODE §§ 5096.1 *et seq.* (West Supp. 1972); Green Acres Land Acquisition Act of 1961, N.J. STAT. ANN. §§ 13:8A-1 *et seq.* (1968); ORE. REV. STAT. § 390.630 (1971) (Highway Commission empowered to acquire land along the ocean shore for recreation areas or access); KY. REV. STAT. § 150.625 (1971) (Dept. Highways authorized to impound lakes for recreation when constructing fill where made necessary for road construction).

62. CAL. HEALTH & SAFETY CODE § 4051 (West 1970).

63. WIS. STAT. ANN. § 236.16(3) (Supp. 1971-72).

public agency may be approved which does not provide "reasonable" access by fee or easement from public highways to tidelands or to the water.[64] Criteria of reasonable access include the type of shoreline and various recreational uses appropriate to the area; the access provided may be by highway, trail (foot, bike, or horse) or "any other means of travel."[65]

Impressive as these acquisitions are, however, they represent only a tiny inroad into the amount of privately held land located in the edge zone. As an alternative, attention has begun to focus on provision of access to public waters as a matter of general right irrespective of ownership of the adjoining upland. One example of current thinking on this subject is the proposed National Open Beaches Act of 1971,[66] which reportedly would establish a legal presumption that the public has a basic right of access to and over seacoast beaches.[67] Thus, it is clear that the current attitude of both state and federal government favors increased public access to the land-water edge.

LEGAL CONSTRAINTS ON USE OF THE EDGE

From the foregoing brief historical survey it is apparent that recreational use of water has finally won acceptance in law. It is equally apparent, however, that the laws and public management policies are only now beginning to take account of the operation of the edge effect. If that principle operates for man as it does for some other species—if an increase in the amount of edge available results in a concomitant increase in density of occupation—then merely making more edge available, through creation of artificial bodies of water, establishment of seashore, lakeshore, and riverside parks, and opening up of reservoirs for recreational use, is not the total solution to the environmental problem. Although the creation of additional facilities will perhaps remove some pressure from existing facilities, it will not reverse the environmental damage already done. Instead, it will simply spread deterioration over an enlarged area. Thus, the answer lies not in increased accessibility to edge, but rather in control of use in the zone of edge.

An example of wise federal control of the public use of edge in areas of high environmental quality is the Wild and Scenic Rivers Act

64. CAL. BUS. & PROF. CODE §§ 11610.5(a), .7(a) (West Supp. 1971). For discussions of *non-statutory* means of providing public access to privately-owned beaches, see Note, *Californians Need Beaches—Maybe Yours!*, 7 SAN DIEGO L. REV. 605 (1970); Note, *Public Access to Beaches*, 22 STAN. L. REV. 564 (1970).

65. CAL. BUS. & PROF. CODE §§ 11610.5(c), .7(c) (West Supp. 1971).

66. S. 631, 92d Cong., 1st Sess. (1971).

67. See 1 BNA ENV. REP. CURR. DEV'S 1112 (Feb. 12, 1971).

of 1968.[68] The Act distinguishes between edge that is essentially untouched (wild rivers), edge that is accessible by road but largely undeveloped (scenic rivers), and edge which is readily accessible and already somewhat developed (recreational rivers). Another example is provided by fish and wildlife conservation areas in which public recreational use is permitted. The Secretary of the Interior is specifically authorized to "curtail public recreation use generally or certain types of public recreation use within individual areas or portions thereof whenever he considers such action to be necessary" to ensure compliance with the primary objectives for which the area was established.[69]

In the private sector the most significant environmental impact of the federal administration in recreational use of the land-water ecotone, whether coastal or inland, has been that of the Corps of Engineers. This result stems from its authority, pursuant to the Rivers and Harbors Appropriation Act of 1899, to grant permits for work in navigable waters[70]—a power particularly relevant to the development of recreational housing. Whether he seeks to dam a stream within the Corps' jurisdiction and create a reservoir for a recreational subdivision, or fill a coastal marsh and create a Venetian-type development of homes with boat docks, the developer must first obtain a permit from the Corps.

Since 1958 the amended Fish and Wildlife Coordination Act has required the Corps to consult with the Department of the Interior before issuing a permit.[71] Until recently, however, the Corps, when evaluating grounds for granting or withholding permits, took into consideration only the effect of the proposed work or structure on navigation.[72] Cooperation between the Corps and Interior's agencies responsible for wildlife, pollution and parks was eventually formalized in a 1969 agreement to combat pollution and conserve natural and other resources of recreational value in dredging, filling, or excavation operations in navigable waters.[73] Increased involvement of the Corps

68. 61 U.S.C. §§ 1271-1287 (1970). *See generally* Tarlock & Tippy, *The Wild and Scenic Rivers Act of 1968*, 55 CORNELL L.J. 707 (1970).

69. 16 U.S.C. § 460k (1970).

70. 33 U.S.C. §§ 401, 403-404, 406-407, 408-409, 411-415, 418 (1970). *See* Schoenbaum, *The Efficacy of Federal and State Control of Water Pollution in Intrastate Streams*, 14 ARIZ. L. REV. 1, 23-27 (1972).

71. 16 U.S.C. § 662(a) (1970).

72. *See* Teclaff, *supra* note 7, at 248 n.26. It remained unclear, however, whether the Rivers and Harbors Act of 1899, even when supplemented by the Fish and Wildlife Coordination Act, constituted adequate authorization for the Corps to evaluate a permit on any basis other than the proposed project's effect on navigation. The doubt was removed when the United States Court of Appeals for the Fifth Circuit held that the Secretary of the Army could base his refusal to grant a permit on factually substantial ecological reasons, even though the proposed project would not interfere with navigation. Zabel v. Tabb, 430 F.2d 199 (5th Cir. 1970), *cert. denied*, 401 U.S. 910 (1971).

73. 33 C.F.R. § 209.120 (1969).

with problems of environmental protection became mandatory with the passage of the National Environmental Policy Act of 1969 (NEPA).[74]

The NEPA represents a profound change in the federal attitude toward the environment and may become the basis for rational management of public and private recreation. The Act requires all agencies of the federal government to include in every recommendation or report on proposals for "major Federal actions significantly affecting the quality of the human environment," a detailed statement on the following elements: the environmental impact of the proposed action, unavoidable adverse environmental effects if the action were implemented, alternatives to the proposed action, the relationship between local short-terms uses of the environment and the maintenance and enhancement of long-term productivity, and any irreversible and irretrievable commitments of resources which would be involved in the proposed action.[75]

Regardless of whether a "major federal action" is found which would require the filing of an environmental impact statement, it seems that much private as well as public recreational development in the land-water edge will be affected to some extent by the NEPA, as is evidenced by the following statement of congressional policy:

> [I]t is the continuing policy of the Federal Government, in cooperation with State and local governments, and other concerned public and private organizations, to use all practicable means and measures, including financial and technical assistance . . . to create and maintain conditions under which man and nature can exist in productive harmony . . . .[76]

Thus, it would appear that the scope of the legislation extends beyond the actions of federal agencies to encompass that amorphous area in which federal, state, and even local responsibilities overlap. This conclusion is supported by *Izaak Walton League v. Macchia*,[77] a case involving dredging and filling brought under NEPA. The Walton League claimed that state officials, with the approval of federal officials, had cooperated with defendants, *private* developers of recreational property, in irreparably destroying marine resources. It asked, *inter alia*, for an order mandating federal, state, and local officials to protect the ecological and commercial values of the natural resources held in trust for the public. In obvious agreement with this objective,

74. 42 U.S.C. §§ 4321-4347 (1970).
75. *Id.* § 4332(2)(C).
76. *Id.* § 4331(a).
77. 329 F. Supp. 504 (D.N.J. 1971).

the federal court found that the defendants' claim that the plaintiff's action improperly interfered with state-recognized riparian rights was

> a premature consideration and ignore[d] the fundamental compatibility of interests of both the State and Federal Governments which, by definition, is designed to promote and protect the general as well as the individual welfare of all men. It is 'survival' about which we speak when we discuss the ecological impact of man's activities in this supersonic age and not technical, hair-line, provincial differences between State and Federal interests.[78]

Whether the NEPA will have an effect on recreational projects begun before passage of that Act remains in doubt. The Corps of Engineers, for example, has taken the precaution of requiring an environmental impact statement on actions recommended, authorized, or under construction prior to the date of the legislation's enactment, January 1, 1970.[79] Federal courts, however, have offered inconsistent interpretations of the Act. For example, in *Pennsylvania Environmental Council v. Bartlett*, the Third Circuit found "no evidence of a congressional intention that the act be applied retroactively,"[80] while the District Court for the Central District of Maryland has held that even projects already undertaken had to comply with the requirements of section 102 of the NEPA.[81] The retroactivity issue has serious implications for many recreational projects currently in varying stages of progress, but regardless of the resolution of that question the NEPA will have far reaching effects on the future development of land-water edge.[82]

The direct force of the NEPA, however, relates purely to procedural matters. Although it mandates consideration of alternative courses of action, it is not, in the broader sense of the term, a planning tool. The possibility of integrating environmental protection with recreational planning for the edge zone has until recently been hampered by the lack of any clear-cut federal directive. All of the coastal and Great Lakes states, for example, prepared comprehensive outdoor recreation plans to comply with the provisions of the Land and Water

78. *Id.* at 515.
79. *See* Army Corps of Engineers, *Environmental Statements, Proposed Guidelines on Preparation and Coordination*, 36 Fed. Reg. 11,309, 11,311 (1971).
80. Civ. No. 19,453 (3d Cir., Dec. 1, 1971), 3 BNA ENV. REP. CAS. 1421, 1428 (1971).
81. Berkson v. Morton, Civ. No. 71-1085B (D. Md., Oct. 1, 1971), 3 BNA ENV. REP. CAS. 1121 (1971).
82. *See generally* Note, *Retroactive Application of the National Environmental Policy Act of 1969*, 22 HAST. L.J. 805 (1971); Note, *Retroactive Application of the National Environmental Policy Act of 1969*, 69 MICH. L. REV. 732 (1971).

Conservation Fund Act of 1965,[83] but the Act is geared to maximizing public benefit through recreation[84] and not to the resolution of potential conflicts between recreational use of water and environmental quality. Thus it was not surprising that most of the state plans developed pursuant to that Act contained only the minimal information needed to comply with the legislation; few adequately considered either outdoor recreation demands on the land-water ecotone or measures necessary to protect the environment.[85]

While the federal government is moving slowly toward direct regulation, several statewide or regional initiatives in planning and regulation of the land-water edge for environmental protection have already generated repercussions, tangentially at least, with regard to recreational uses. Among them are the growing number of tidelands and wetlands protection acts,[86] the San Francisco Bay Plan,[87] Wisconsin's shoreland zoning system,[88] and the Tahoe Basin Compact.[89] In essence these are all zoning programs, yet each has made significant progress in overcoming the traditional drawbacks of zoning as a regulatory mechanism.[90]

The operations of the San Francisco Bay Conservation and Development Commission[91] comply with an overall plan developed through years of detailed study. The Commission's jurisdiction, in addition to the water area of the Bay, extends to "a shoreline band consisting of all territory located between the shoreline of San Francisco Bay as defined . . . and a line 100 feet landward of and parallel with that line."[92] Water-oriented recreation is one of a restricted group of uses for which further filling of the Bay may be permitted, but only when the public benefits from the fill outweigh the loss of water area and no alternative upland location is available.[93] The Commission's

83. 16 U.S.C. §§ 460*l et seq.* (1970). *See* 2 ESTUARY STUDY, *supra* note 6, at 227.

84. See note 52 *supra.*

85. 2 ESTUARY STUDY, *supra* note 6, at 227.

86. See Teclaff, *supra* note 7, at 269-72. *See generally* Heath, *Estuarine Conservation Legislation in the States,* 5 LAND & WATER L. REV. 351 (1970).

87. San Francisco Bay Conservation & Development Comm'n Act, CAL. GOV'T CODE §§ 66600-66661 (West Supp. 1971).

88. WIS. STAT. ANN. §§ 59.97, 59.971 (Supp. 1971).

89. CAL. GOV'T CODE §§ 66800-67130 (West Supp. 1971).

90. Zoning by individual government units is a piecemeal form of regulation at best. Up to now it has been largely absent in recreational communities in the land-water ecotone, except for regulation of minimum lot size. Many recreational communities are located in rural areas and, despite the increased demand for public services such as sewerage, water, roads, and maintenance, their planning services are minimal. Moreover, because political boundaries frequently traverse rivers, lakes, and estuaries, existent zoning tends to be ineffective because management is local and divided.

91. CAL. GOV'T CODE §§ 66600-66661 (West Supp. 1971).

92. *Id.* § 66610(b).

93. *Id.* §§ 66602, 66605.

permit-granting power extends beyond filling and dredging to all proposed projects that involve "any substantial changes in the use of any water, land or structure within the area of the commission's jurisdiction."[94]

In 1966 Wisconsin initiated a system of shoreland corridor zoning applicable to all of its 72 counties.[95] If the counties fail to adopt, or meet reasonable minimum standards set forth in, regulations governing unincorporated areas within 1,000 feet of lakes, ponds and flowages, and within 300 feet of rivers and streams, the State Department of Natural Resources is authorized to adopt regulations in their stead.[96] Regulations must cover minimum lot size, waste and sewage disposal, location of buildings, dredging and filling, and even tree-cutting along the waterfront.[97] The zoning system applies only to the shorelands of navigable lakes or streams and of artificial lakes created from navigable lakes or streams.[98]

The San Francisco Bay Plan provides for regulation of the zone of edge for a single segment of a state's shoreline, while the Wisconsin shoreland zoning system represents a form of regulation along any navigable waters within a single state. By contrast, the Tahoe Regional Planning Compact[99] permits regulation of a single resource area of high environmental quality belonging to two states—California and Nevada. The Compact provides for an interstate body, the Tahoe Regional Planning Agency, with power to make and enforce for the entire Lake Tahoe Basin a plan encompassing five correlated elements—land use, transportation, conservation, recreation, and public services and facilities.[100] The agency is given power to adopt ordinances and regulations that contain general regional standards, including the following pertaining to shoreline areas: subdivision, zoning, land fills, piers, harbors, breakwaters, channels, other shoreline developments, and waste disposal in shoreline areas and from boats.[101] All public works projects are reviewed prior to construction, and approval

94. *Id.* § 66604.
95. WIS. STAT. ANN. § 59.971(1) (Supp. 1971-72). *See generally* Kusler, *supra* note 9, at 402 n.94, 405 n.125, 409-10.
96. WIS. STAT. ANN. § 59.971(6) (Supp. 1971-72).
97. WIS. ADMIN. CODE, NR 115.03(2) (1971).
98. WIS. STAT. ANN. § 59.971(1) (Supp. 1971-72).
99. CAL. GOV'T CODE §§ 66800-67130 (West Supp. 1971). For a history of the compact and current developments, see County of El Dorado, No. Sac. 7896 (Cal. Sup. Ct., Aug. 17, 1971), 3 BNA ENV. REP. CAS 1010 (1971); Note, *Regional Government for Lake Tahoe*, 22 HAST. L.J. 705 (1971). For background information and a general discussion of problems facing Lake Tahoe and attempts to solve them, see Ayer, *Water Quality Control at Lake Tahoe: Dissertation on Grasshopper Soup*, 58 CALIF. L. REV. 1273 (1970); Comment, *Lake Tahoe: The Future of a National Asset—Land Use, Water, and Pollution*, 52 CALIF. L. REV. 563 (1964).
100. CAL. GOV'T CODE § 66801, arts. III(a), V(b) (West Supp. 1971).
101. *Id.* art. VI(a).

is conditioned upon compliance with the regional plan.[102] Since the primary attraction of the Tahoe Basin lies in its water area (Lake Tahoe plus 40 other small lakes) and beautiful scenery, this compact represents a much more comprehensive regulation of the zone of edge for recreational purposes than does the San Francisco Bay legislation.

In these three programs there is an emerging concept of the edge as a distinct physical entity—a concept almost entirely lacking in the common law, with its division of the edge into separate components: land and water, tideland and upland, shore and bank. This evolution was carried a stage further in the 1969 proposals of the Commission on Marine Science, Engineering, and Resources.[103] These proposals created a control blueprint for the entire coastal zone of the United States. While proposing State Coastal Zone Authorities, thus acknowledging that control of the coastal zone belongs primarily to the states, the Commission recommended vesting overall supervisory power in the federal government through authority to grant preliminary approval of state plans, discretionary power to provide or withhold financial aid, ongoing authority to review state plans and their implementation at any of several stages, and power to intercede if a state fails to exercise control.[104] In separate references, the Commission's Panel on Management and Development of the Coastal Zone suggested that the federal goverment be "empowered to act in the public interest," participate in the actions of the Coastal Zone Authority, and acquire and manage areas determined to be "endangered . . . and not protected adequately."[105] Although they did result in a spin-off of comprehensive state plans and projects for the establishment of a number of state agencies with overall authority to plan and regulate,[106] the Commission's proposals for the interposition of federal authority in planning and man-

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102. *Id.* art. VI(d).

103. COMMISSION ON MARINE SCIENCE, ENGINEERING AND RESOURCES, REPORT, OUR NATION AND THE SEA, A PLAN FOR NATIONAL ACTION 49-81 (1969) [hereinafter cited as OUR NATION AND THE SEA]. For a general discussion and critique of the Commission's proposals, see Knight, *Proposed System of Coastal Zone Management: An Interim Analysis*, 3 NAT. RES. LAW. 599 (1970).

104. OUR NATION AND THE SEA, *supra* note 103, at 56-62.

105. 1 COMMISSION ON MARINE SCIENCE, ENGINEERING AND RESOURCES, SCIENCE AND ENVIRONMENT, PANEL REPORTS pt. III, at 148, 155 (Rep. of Panel on Man. & Dev. of Coastal Zone, 1969).

106. For example, California's Department of Navigation and Ocean Development, designated that state's Coastal Zone Authority in anticipation of federal legislation, has prepared a comprehensive management plan that is currently under review prior to submission to the legislature. *See* 2 BNA ENV. REP. CURR. DEV'S 1284 (1972). The forward impetus of planning such as has been undertaken by North Carolina, Georgia, Oregon and Puerto Rico, however, has been partially frustrated by a switch in emphasis on the part of the administration from coastal zone management to a more all-inclusive national land policy. 2 BNA ENV. REP. CURR. DEV'S 433 (1971). *See generally* COASTAL ZONE RESOURCE MANAGEMENT (J. Hite & J. Stepp eds. 1971).

agement of the land-water edge were limited in application to the seacoast and then only to the edge in isolation from the rest of the environment and the totality of land and water use.

This deficiency in management of the zone of edge may be remedied to some extent if the Nixon Administration's proposed "National Land Use Policy Act of 1971"[107] or similar legislation is enacted. The Act would declare that "coastal zones and estuaries, flood plains, shorelands and other lands near or under major bodies or courses of water which possess special natural and scenic characteristics are being damaged by ill-planned development that threaten [*sic*] these values" and that "key facilities such as major airports, highway interchanges, and *recreational facilities* are inducing disorderly development and urbanization of more than local impact."[108] Coastal zones, estuaries and the shorelands and flood plains of rivers, lakes and streams of state importance would be designated areas of "critical environmental concern," defined as "areas where uncontrolled development could result in irreversible damage to important historic, cultural, or aesthetic values, or natural systems or processes, which are of more than local significance."[109]

Section 104 of the proposed Act outlines a program of state land use which would include methods for inventorying and designating areas of critical environmental concern, exercising state control over the use of land within such areas, assuring that local regulations do not restrict or exclude development and land use of regional benefit, and controlling proposed large-scale development of more than local significance in its impact upon the environment. It would also include a policy for influencing the location of new communities and a method for assuring appropriate controls over the use of land around new communities. Federal grants to states would be authorized, but only upon a satisfactory showing that no areas of critical environmental concern to the nation were excluded from a state's program; that states had procedures to prevent action "in substantial disregard" for the purposes, policies and requirements of their programs; and that, in particular, state laws, regulations and criteria affecting land use in the coastal zone and estuaries further take into account: "(1) the aesthetic and ecological values of wetlands for wildlife habitat, food production sources for aquatic life, recreation, sedimentation control, and shoreland storm protection; and (2) the susceptibility of wetlands to perman-

107. H.R. 4332, 92d Cong., 1st Sess. (1971). The text of the bill is contained in COUNCIL ON ENVIRONMENTAL QUALITY, THE PRESIDENT'S 1971 ENVIRONMENTAL PROGRAM 211 (1971).
108. H.R. 4332, 92d Cong., 1st Sess. § 101(a)(2) (emphasis added).
109. *Id.* § 102.

ent destruction through draining, dredging, and filling, and the need to restrict such activities."[110]

RESOLVING THE CONFLICT BETWEEN USE AND CONSERVATION OF THE EDGE

It is frequently argued that too much shoreland is in private ownership and that all that is necessary to provide greater water-recreation opportunities and an enhanced environment for the public is for government to acquire more of the land-water ecotone. On the contrary, there exist good grounds for arguing that the leisure-home subdivision, and similar high density private exploitations of edge, maximize use more efficiently and intensively than does public development.[111] Thus, if efficient use of edge were the operative factor, one might conclude that from an environmental standpoint it would be better to encourage the concentration of population in such high-density forms of development in selected areas so as to leave other areas open. Actually, in a recreational context, as with other forms of human activity, the edge effect operates indiscriminately, attracting high densities of population to and generating intensive use of public as well as private shoreland. Indeed, under some types of state regulation, ostensibly to correct or preclude rampant private development of shorelands, the private use is more prevalent than ever, even as the public use expands.

For example, Jekyll Island, Georgia, once the secluded and virtually untouched retreat of a small group of millionaires, became a state park in 1947. Although its magnificent beaches have since been available for public recreation, a string of motels of the Florida Gold Coast type has developed behind them, and the remainder of the island is rapidly becoming inundated by housing subdivisions and condominium apartments—all to the great detriment of the local wildlife.[112] The state supposedly controls the rate and type of development, but from an environmental point of view the damage has already been done and

110. *Id.* § 104(d).

111. *See, e.g.*, Kusler, *supra* note 9, at 380 n.20:

> Assume . . . that a circular lake 4,500 feet wide was created from a 4,500-foot stretch of stream. This lake would contain approximately 400 acres of water and approximately 14,000 feet of shoreline. Assuming all the shore was suitable for development, this shoreline could accommodate 280 private homes on 100-foot-wide lots if development were two tiers deep. If five individuals, on the average, made use of each cottage, the lake would provide shoreland recreation opportunities for picnicking, swimming and other outdoor activities for 1400 individuals (instead of several hundred swimmers, 180 fishermen, 27 motor boats and 20 water ski boats). Indeed, these figures underestimate the actual use of shoreland sites since lots are more than two tiers deep and any lake configuration other than the circular shape hypothesized would provide greater length of shoreline per acre of water.

112. Authors' personal observation, Jan. 1972.

is well-nigh irreversible. As the number of transient and resident recreational users multiplies and as pressure upon the limited means of access to the island increases, there inevitably will develop conflict between users, destruction of the natural ecosystem, and loss of aesthetic and recreational pleasure.

In any attempt to preserve environmental quality in the land-water ecotone and to resolve conflicts between water recreation and conservation of the environment, it would appear therefore that the question of public or private ownership is not the foremost consideration; it may even be irrelevant. Instead, primary emphasis must be placed on recognition of the operation of the edge effect and appreciation of the immense difficulty that will inhere in attempts to preserve the pristine nature of the relatively untouched parts of the land-water ecotone and to eliminate all but the least disturbing forms of recreational use.

At many resort areas recreational use of water and enjoyment of scenery are secondary to other uses and values which the edge effect tends to maximize. Indeed, this factor is being taken into account in some of the most recent planning, which attempts to reconcile heavy urban use with environmental quality. In New York City, for example, the Mayor's Council on the Environment urges a "careful balance of carnival atmosphere and natural surroundings" for the proposed Gateway National Recreational Area, a project that would incorporate five separate coastal sites, including a wildlife refuge, into a huge urban playground within or close to the metropolis.[113]

At the opposite end of the scale, a study of wilderness perception in the Boundary Waters Canoe Area showed that a canoeist's concept of wilderness differed from and demanded much more than that of all other users, especially motorboaters.[114] Remoteness, apparently, was an irrelevant factor. A lake near an access point might be considered wilderness as much as one several portages away. The distinguishing factor was level of use. From the canoeists' point of view wilderness was lost when boats and access roads were present; whereas the motorboaters tolerated a high level of recreational use and viewed even lakes surrounded with buildings as wilderness.

The user of true wilderness may primarily seek solitude; the lakefront leisure-home owner exclusiveness, privacy, and prestige; and the seaside excursionist companionship and the attributes of an urban pleasure ground. None of these requirements need be a function of

113. N.Y. Times, Jan. 23, 1972, at 67, col. 5.
114. Lucas, *Wilderness Perception and Use: The Example of the Boundary Waters Canoe Area*, 3 NAT. RES. J. 394, 403-06 (1964).

the physical nature of the chosen segment of the land-water ecotone. Scenic beauty, the type of surrounding vegetation, the presence or absence of fish, or the migration habits of shore birds may be secondary in importance to all three groups of users in comparison with their individual, specific recreational needs. Quite often something else can be substituted for the natural resource. Miami Beach hotel owners, for example, routinely do this by constructing, adjacent to the beach, swimming pools which are used by the majority of people in preference to the sea. What the hotel provides by building on the beach is the opportunity to enjoy not only a natural resource, the water, but also a certain degree of exclusivity in occupation of the zone of edge.

It should be possible to segregate conflicting uses through detailed analysis of environmental factors and recreational need and control of access points. Uses which have less need of natural resources but a heavy impact upon the environment should be encouraged to locate in areas of lower environmental value, while areas of high environmental value should be reserved for uses which require access to natural resources but have less impact upon the environment.

In the last analysis, the problem becomes one of controlling access, since access and use have a direct positive relationship. Swimming, for instance, is a low-impact use even when large numbers of people are in the water, in comparison with motorboating, which brings noise, pollution, erosion of shores, and disturbance of fish and wildlife. Swimming becomes a high-impact use, however, if a vast complex of roads, parking lots, gas stations, and ancillary commercial ventures of all kinds must be built to accommodate the swimmers and their non-resource-based needs.[115]

Restricting access via control of transportation through the zone of edge involves none of the constitutional problems which beset zoning, nor does it invite charges of a taking of property occasioned by restrictions on actual land use. Even before enactment of the NEPA there existed precedents for such action—from President Truman's Executive Order banning airplane access to the Boundary Waters Canoe Area,[116] to the Federal-Aid Highway Act of 1968.[117] The latter states:

> After the effective date of the . . . Act . . . the Secretary [of Transportation] shall not approve any . . . project which requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national,

115. *See* Reis, *Policy and Planning for Recreational Use of Inland Waters*, 40 TEMP. L.Q. 155, 183-84 (1967).
116. Exec. Order No. 10,092, 3 C.F.R. at 287 (Comp. 1949-53), 14 Fed. Reg. 7637, 7640 (1949).
117. 23 U.S.C. §§ 101 *et seq.* (1970).

> State, or local significance as determined by the Federal, State, or local officials having jurisdiction thereof . . . unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use.[118]

Under the NEPA highway officials must file a statement assessing the environmental impact of federally funded roads and citing alternatives to the proposed action.[119] The two Acts potentially could be invoked to curtail road construction through or along the zone of edge, whether publicly or privately owned, provided such construction were federally funded. The Highway Act could be utilized to restrict the construction of new roads and the widening of existing ones over any publicly owned land set aside for recreational purposes or environmental protection. The NEPA could be invoked where any major federal action is involved, no matter what the ownership of the land, although the definition of "major federal action" is anything but clear.[120] Since road construction in the zone of edge frequently requires the filling of marsh and wetlands, however, it would probably involve the issuance of permits by the Corps of Engineers and thus would likely fall within the scope of the NEPA, even if the project did not otherwise qualify as a major federal action.

Restricting further road construction is one method of controlling the single most environmentally disruptive means of access to the water recreation afforded by the edge. Another method is to ban vehicles altogether in certain areas. Such action has been taken, for example, on Mackinac Island, a state park in Michigan, and on Fire Island, New York, long before that area became a national seashore. Public officials increasingly have begun to consider this method and utilize it as an alternative to rationing actual visitor use of parks and recreational areas. Asked whether overcrowding had become critical in the national parks, the Director of the National Park Service replied in a recent interview: "Overcrowding of people is not yet at that point. What is critical . . . is the overwhelming amount of paraphernalia that visitors bring with them—their automobiles, their campers, all the things that our technological society has developed for the comfort of urban man."[121] Thus, it is the "paraphernalia" of man, not man

118. *Id.* § 138.
119. 42 U.S.C. § 4332 (1970).
120. For example, as the United States Court of Appeals for the Third Circuit pointed out, "[n]o case has come to our attention deciding whether a grant for a secondary system road . . . is a 'major federal action' within the meaning of NEPA Section 102(2)(c)." Pennsylvania Environmental Council v. Bartlett, Civil No. 19,453 (3d Cir., Dec. 1, 1971), 3 BNA ENV. REP. CAS. 1421, 1428 (1971).
121. *Changing the National Parks to Cope with People—And Cars*, 72 U.S. NEWS

himself, that is now being barred in some of the national parks, such as Yosemite where the road system was closed to private automobiles at the east end of the Valley in 1970, the Florida Everglades at the Shark River Overlook, and remote Mt. McKinley Park in Alaska, where it is planned, for the sake of wildlife protection, to exclude automobile traffic from the single access road to Wonder Lake.[122] The search is on for substitutes—shuttle-buses, tramways, funiculars, even underground tubes. The goal apparently is to provide, through mass transportation, the "careful balance of carnival atmosphere and natural surroundings" mentioned in a recent planning study,[123] which conceivably could satisfy the recreational needs of our increasingly urbanized population and still preserve the environment outside narrow corridors of traffic.

By controlling means of access to privately as well as publicly-owned edge rather than by segregating uses, it may be possible to furnish within relatively small compass many different types of recreational experience—from pocket wilderness to urban pleasure ground—with a minimum of disturbance to existing biotic communities. It is variety, the epitome of the edge effect itself, that provides the clue to management of the land-water ecotone. The insistence on *alternatives* in recent environmental legislation[124] is the foremost safeguard against the tendency to bury the edge under pavement and concrete.

The fragility, intricacy, and above all the narrowness of the edge require a precise and delicate adaptation of recreational use to environment in each individual instance if environmental quality is not to suffer. One cannot do better in this respect than study other edge communities for, as Rachel Carson indicated in *The Edge of the Sea:*

> All the life of the shore—the past and the present—by the very fact of its existence there, gives evidence that it has dealt successfully with the realities of its world—the towering physical realities of the sea itself, and the subtle life relationships that bind each living thing to its own community. The patterns of life as created and shaped by these realities intermingle and overlap so that the major design is exceedingly complex.[125]

Unless man begins to recognize these complexities and to plan his recreational uses accordingly, he runs the risk of losing the most diverse element of his environment—the land-water edge.

& WORLD REP. No. 4, at 52 (Jan. 24, 1972) (Interview with George B. Hartzog, Jr., Director, National Park Service).

122. *Id.*

123. See text accompanying note 113 *supra.*

124. 42 U.S.C. § 4332 (1970).

125. R. CARSON, THE EDGE OF THE SEA 11 (1955).