Snowmobiles and the Environment

Off-road vehicles\(^1\) are becoming\(^2\) an environmental menace. Existing legal doctrine has begun to deal with the new safety and security problems caused by snowmobiles and similar vehicles.\(^3\) But environmental law remains in its adolescence, challenged by a whole range of recreational activities, from cross-country skiing to motor boating, which exert ever increasing pressures on the environment and our shrinking fund of outdoor recreational opportunities. A study of snowmobiles,\(^4\)

1. These are a related family of motorized land recreational vehicles including snowmobiles, trail bikes, dune buggies, all-terrain vehicles (ATV's), etc. They all share the characteristic of special adaptability to terrain inaccessible to conventional motor vehicles.

2. In 1960 there were only a few hundred snowmobiles; by the winter of 1971-72 there were nearly two million in use in the United States and Canada. Rice, *The Snowmobile Is an American Dream Machine*, N.Y. Times, Feb. 13, 1972, § 6 (Magazine), 14, 26.

3. The scope of the new problems created by snowmobiling is amazingly broad. In 1971, 139 snowmobilers were killed in the United States, Rice, *supra* note 2, at 30, a ninety percent increase as compared to 84 the year before, TIME, Mar. 15, 1971, at 62. Many died in bizarre ways such as decapitation resulting from collisions with snow-covered obstacles like barbed-wire fences or strangulation resulting when the user's scarf caught in the vehicle's tread. Thousand more were injured. Snowmobiling has caused hearing problems for users and given rise to a novel medical condition called "snowmobile's back." *Id.* at 62. A steep increase in winter vandalism has been noted in areas of previously inaccessible summer cabins in the woods.

4. A snowmobile, as defined in one state statute, is "any motor driven vehicle designed for travel primarily on snow or ice of a type which utilizes sled type runners or skis, or an endless belt tread or any combination of these or other similar means of contact with the surface upon which it is operated." Snowmobile Law, Mich. Comp. Laws Ann. § 257.1501(e) (Supp. 1972). Snowmobiles average about eight feet in length, weigh several hundred pounds, and are powered by a two-stroke twenty to forty horsepower gasoline engine which enables them to reach speeds of sixty miles per hour. They are steered by handlebars that control a pair of small skis and ride on rubber or polyurethane tracks like those of a tank. They range in price from $600 to $5,000. Rice, *supra* note 2.

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the best known member of the family of off-road vehicles, may help to evaluate the legal reaction so far to the environmental problems they pose, and various directions that efforts to control their use might take.

I. The Problem

Snowmobiling has both direct and indirect environmental effects. Aside from use deliberately to harass animals and to destroy property, the machines injure vegetation and wildlife because of their unavoidable disturbance and noise. The industry loudly proclaims that the vehicles exert a surface pressure only one tenth that of a man, but their extreme speed and mobility multiply snowmobiles' damage. Snowmobile tracks increase the density and thus lower the insulative qualities of snow, impeding the movements of small animals beneath and lowering the temperature at ground level, with unpredictable results to crops, birds, and animals.

Industry spokesmen stress that snowmobiles are used in the season "when the prospects for permanent change in an eco-system are most remote." But winter is precisely the time of year when plants and wildlife are most vulnerable. Breeding deer are weak and easily frightened; seedlings are brittle and dry. Given the complex interrelationships of an eco-system, a change at one level of the food-chain may create an imbalance throughout, with unforeseeable effects. Moreover, the increased mobility bestowed by snowmobiles often opens previously inaccessible wilderness areas to large numbers of persons, sometimes causing over-hunting or over-fishing. The mere presence of snow-

5. See forthcoming publication of Conservation Foundation on the environmental effects of off-road vehicles.

6. For reports of a particularly outrageous incident, resulting in the slaughter of sixteen deer for sport see Bloomfield, Snowmobiles, Boon or Ban?, Am. Forests, May, 1969, at 4.

7. According to a table presented in evidence at the Senate Hearings, Hearings 27, an unmuffled snowmobile at fifty feet is noisier than a DC-6 airliner on the inside. As presently muffled, the noise of a snowmobile is comparable to that of a truck on the highway. Although recommended standards are considerably lower, and technology exists to achieve those levels, one industry spokesman believes that "the American male just does not want a quiet snowmobile." American Heritage, Feb. 1970, at 113. A single snowmobile can be heard for over two miles in the silent woods.

8. Hearings 34.

9. Hearings 105-07.


11. For example, killing of coyotes by snowmobilers has allowed proliferation of grain-eating rodents causing economic loss in the prairie provinces of Canada. Olsen, Bad Show Out in the Cold Snow, Sports Illustrated, Mar. 16, 1970, at 30, 34.

12. American Heritage, supra note 5, at 113, reports that Pierz Lake in Minnesota, so isolated that in summer it can be reached only by a six-hour canoe trip, was being used one Sunday in mid-January by 120 fishermen with sixty-seven snowmobiles. On a single winter day 556 pounds of fish were caught.
mobiles in high concentrations may cause animals to migrate from an area.  

Finally, compared with other outdoor activities such as hiking or fishing, snowmobiling has a particularly high cost in terms of both aesthetics and annoyance: While a square mile may support a score of these other users all blissfully unaware of each other’s presence, a single noisy snowmobile can disrupt the enjoyment of all of them, though its operator may be well-intentioned and indeed may not even know that others are in the area.  

II. The Existing Framework for Control  

In a period of heightened environmental concern, snowmobiling has already received considerable governmental attention. Virtually every one of the approximately twenty-five snowbelt states has passed snowmobile legislation, similar in outline but differing widely in comprehensiveness. Such existing laws deal primarily with safety standards.

13. The deer kill in Quebec dropped from 12,400 in 1964 to 4,000 in 1969 with noise pollution from snowmobiles considered a major cause of deer emigration. SioRTS ILLUS. TRATED, supra note 9, at 33.

14. For an example of this type of disruption, see, e.g., Hearings 87.

15. A complete summary of state snowmobiling legislation would be beyond the scope of this Note inasmuch as most of the legislation is concerned with safety and regulates use on highways, use by minors, etc. In addition, there has been much copying among states and most of the provisions of the typical state statute are standard. What follows is an impressionistic summary of the existing state legislation insofar as it relates to the subject of this Note.

ALASKA STAT. §§ 05.30.010 et seq. (Supp. 1972) (an especially unsophisticated statute). Noise control provision requires only a “muffler in good working order,” § 05.30.060. For California see p. 776 infra. Colo. Rev. Stat. Ann. §§ 62-13-1 et seq. (1963) provides that fees from registration are to be used for “administration,” § 62-13-2, requires prior permission for use from the owner of private land, § 62-13-12, and provides for administrative promulgation of muffler standards, § 62-13-13. Conn. Gen. Stat. Rev. §§ 14-379 et seq. (Supp. 1971) applies to off-road vehicles as well. It forbids operation with “excessive or unusual noise,” § 14-387(5), and empowers the Commissioner of Motor Vehicles to set muffler standards not less stringent than 90 decibels, § 14-388. The snowmobile owner is made accountable for damages to crops and shrubs, § 14-388. Idaho Code §§ 49-2601 et seq. (Supp. 1972) provides that eighty percent of revenues collected by license fees be allocated to county snowmobile funds for development of snowmobile activities, § 49-1609, and requires only an adequate muffler, § 49-2611(b). The owner is made liable for property damage, § 49-2614. Idaho has also passed a Motorbike Recreation Fund Act, §§ 49-2701 et seq. providing for emission standards of 92 decibels or lower as fixed by rules promulgated by the Air Pollution Control Commission, § 49-2703, and establishing a motorbike recreation fund to buy land and maintain trails, § 49-2707 (again no use of funds to mitigate damage). The Illinois Snowmobile Registration and Safety Act, Ill. Rev. Stat. ch. 95 1/2, §§ 601-1 et seq. (Supp. 1972) contains the usual restrictions on operation which is negligent, so as to damage growing stock or create a substantial risk of such damage, on private property without consent, etc. § 605-1. Revenues are credited under § 609-1 to the State Boating Act Fund for the construction, maintenance, and rehabilitation of snowmobile recreation areas and any facilities for the use of snowmobiles. Indiana Stat. §§ 14-1-3-1 et seq. (1972 Supp.) dedicates revenues to the department of natural resources for enforcement and trail maintenance, § 14-1-3-4, and requires only a muffler “in good working order,” § 14-1-3-14(G). Iowa Code Ann.
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The statutes typically require registration of snowmobiles and regulate their operation on public roads. The provisions directed at protecting the environment and regulating conflicts with other users are comparatively few. Typically, the statutes forbid reckless or negligent op-

321G.1 et seq. (Supp. 1972) vests the state conservation commission with power to adopt rules and regulations for the use of snowmobiles insofar as game and fish resources are affected, and use on public lands is placed under the commission’s jurisdiction. Consideration is to be given by the commission to the need to protect the environment, private property, public lands, and wildlife, § 321G.2. Fees are to be paid to the conservation fund, § 321G.7, and noise emission standards are set at 82 decibels after July 1973, § 321G.11. § 321G.13 contains the usual prohibitions on operation, including a novel provision forbidding operation in violation of official signs for the protection of the environment, and restricts use in park, fish, or game areas except on trails. 12 Me. Rev. Stat. Ann. title 12, §§ 1971 et seq. is in all respects typical except that it was amended by Chapter 568, Public Laws, 105th Legislature (1972) to authorize the commissioner to close wildlife management areas and sanctuaries to off-road vehicles.


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eration, harassment of game, and operation in plantings or nurseries so as to damage growing stock or create a substantial risk of such damage. The statutes generally contain noise emission standards or empower an administrative agency to set them, though some of the statutes require only that snowmobiles be equipped with a muffler in good working order. Snowmobile statutes frequently provide that an operator on the land of another must stop and identify himself if requested to do so by the owner. Finally, the statutes often empower a responsible official, generally the commissioner of natural resources, to promulgate regulations governing the use and operation of snowmobiles.\(^{10}\)

The statutes often provide penalties for offenses against the regulations and usually confer enforcement responsibility on forest rangers and local police. Thus, the responsibility for insuring environmental protection—where such a responsibility is specified in statutes—falls upon administrative agencies with authority to designate areas of public lands open to snowmobile use. But this authority, even where specified, often goes unexercised.\(^{17}\)

In contrast to this standard pattern, several states have adopted statutes containing innovative and imaginative provisions. For example, California has established a Snowmobile Trust Fund to which snowmobile owners pay a special $5 fee beyond the universally imposed registration fee. The revenues are “continuously appropriated for expenditure by the Department of Parks and Recreation in carrying out a program of trails and areas for the sole use of snowmobiles.”\(^{18}\) Under Michigan’s statute the state is divided into three zones determining use on public highways, the classification roughly correlating with population density.\(^{19}\) Utah’s statute provides that no person shall operate a recreational vehicle in connection with harassment or damage to the

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16. The contemplated aims of such regulations vary; some statutes direct that regulations be promulgated “with a view of [sic] achieving maximum use . . . consistent with protection of the natural environment,” Snowmobile Law, MINN. STAT. ANN. § 84.86(1) (Supp. 1971), whereas others provide for regulations simply “with a view of achieving maximum use,” Snowmobile Law, NEB. REV. STAT. § 60-2012 (Supp. 1972), which of course insures that there will be no consideration whatsoever by the regulating agency of environmental factors and potential land-use conflicts.

17. For example, all of Michigan’s 3,750,000 acres of state forest lands, except for a few so-called natural areas, are open to unrestricted snowmobile use. Although 200 miles of marked trails exist, snowmobile use is not confined to them. MICHIGAN DEPARTMENT OF NATURAL RESOURCES, SNOWMOBILE GUIDE 1972.

18. CAL. VEHICLE CODE § 9261(6) (West Supp. 1972). California also has a forward-looking policy with respect to other off-road vehicles. See the Chappie-Z’berg Off-Highway Motor Vehicle Law of 1971, CAL. VEHICLE CODE §§ 38000 et seq. (West Supp. 1972). A separate Off-Highway Vehicle Fund is established (§ 38255) similar to the Snowmobile Trust Fund, and revenues from each class of vehicle are reported separately, a first step towards differentiating fees on the basis of individual costs.

environment, which is defined to include pollution of air, water or land, abuse of the watershed, impairment of plant or animal life or excessive mechanical noise. Washington's statute contains the interesting concept of taxing snowmobile fuel purchases. A yearly estimate of revenue from this tax is made and funds in the amount of the estimate are transferred to the state's general fund. The state also has a highly developed recreational trails system which differentiates among all-terrain vehicle trails, scenic trails, and so forth, and places each category of trail under the direction of a separate "trust" which charges fees so as to be self-supporting.

Snowmobiling on the various categories of federal lands comes under the jurisdiction of the Secretaries of Agriculture and the Interior, who administer the organic and land use statutes. As with state lands, national forest lands are generally open to snowmobiles unless prohibitions are posted, and use in national parks is restricted to designated trails and areas. Use in wilderness and primitive areas is prohibited under the Wilderness Act of 1964.

The regulatory situation is less clear with regard to private lands, on which slightly more than half of all snowmobiling takes place. Presumably snowmobilers who enter another's land without consent—i.e., virtually all snowmobilers on private land—are trespassers who might be liable for all the damage caused by their intrusion. Yet traditional tort law rarely provides an effective remedy because of the difficulties of identifying snowmobile tortfeasors, the narrowness in present legal notions of injury (virtually excluding, for example, annoyance alone), and the high costs of litigation. Legislative provisions may restrict use on private lands to the extent of requiring operators on the land of

The National Park Service . . . shall promote and regulate the use of federal areas known as national parks, monuments and reservations hereinafter specified . . . by such means and measures as conform to the fundamental purpose of the said parks and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations.
The National Forest Service Act, 16 U.S.C. 551 (1970) provides:
The Secretary of Agriculture shall make provision for the protection against destruction by fire and depredations upon the public forests which may have been set aside under the provisions of . . . this title, and which may be continued, and he may make such rules and regulations and establish such service as will insure the objects of such reservation, namely, to regulate their occupancy and use and to preserve the forest thereon from destruction.
23. Of 187 million acres of national forest land, fewer than 4.8 million acres are closed to snowmobile use. Hearings 15, 17.
another to stop to identify themselves at the request of the owner, but proposals that snowmobilers be required to obtain written consent before entering another's land have been rejected as impractical or unduly restrictive.

In short, the present system of legislation, administrative regulation, and enforcement is inadequate to handle the burgeoning snowmobile phenomenon. Even manufacturers recognize that enforcement is a problem, and support passage of additional legislation to insure uniformity and to provide reasonable guidelines for use. Some federal officials say the shortcomings in the existing framework lie not in the regulatory scheme but in the lack of resources to compel compliance. Others, and a number of state officials, think the legislation itself is inadequate.

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26. Rice, supra note 1, at 33. Moreover, since the use is open, notorious, and often adverse, it may eventually be construed to have ripened into prescriptive rights in the public or an implied dedication of private lands to public use at the close of the statutory period of limitations for adverse possession. See, e.g., State ex rel. Thornton v. Hay, 462 P.2d 671 (Ore. 1969) (discussion of possibility that prescriptive rights to seashore vested in public).
27. See, e.g., testimony of Thomas Boggs, Counsel, International Snowmobile Industry Association of Minneapolis, Minn., at Hearings 22.
28. Information on the effectiveness of enforcement on federal lands may be found in Hearings at 9, testimony of Edward A. Hummel, Assistant Director, Park Management, National Park Service. See also testimony of Jack W. Deinema, Associate Deputy Chief, Forest Service, at Hearings 13. Some state officials take the same position. "The greatest problem in enforcing the Rules and Regulations on State lands is in the lack of enforcement personnel," letter from Henry L. Diamond, Commissioner of the Department of Environmental Conservation of New York, March 6, 1972. States with less restrictive regulations have fewer enforcement problems. "As far as I know, the rangers in our parks have had no difficulty enforcing" the regulations. Letter from Frank Farren, Jr., Snowmobile Coordinator, Maine Department of Parks & Recreation, March 8, 1972.
29. Charles J. Guenther, Executive Assistant to the Michigan Department of Natural Resources, feels that present laws concerning trespassing are inadequate because they place the burden on the landowner to identify the trespasser. Letter to the author, March 24, 1972. Noting that the Michigan statute is "quite restrictive" and provides for administrative regulation, he admits that such regulation has not yet been forthcoming. The officers charged with enforcement responsibility have many other duties and indeed often are not in a position to know when regulations are being broken. They cannot make sure, except selectively, that snowmobiles remain in designated areas, are equipped with mufflers that meet the requisite specifications, are operated so as not to harass animals, and so forth. It is the very nature of the activity—spread over vast areas of difficult terrain—that gains in compliance could have comparatively great administrative costs.

The existing framework for control is open to a more basic criticism. From a welfare economics perspective, the system is inefficient because it fails to insure that the costs of snowmobiling are paid by those who cause them. Snowmobiling, among the most environmentally "expensive" of all recreational activities, in effect receives a subsidy from those whom it causes damage and annoyance. It consumes great quantities of scarce goods like quietness, natural resources, and recreational opportunities. The resulting costs are paid mainly by non-snowmobilers—whether they be competing recreational users or the public at large by way of government subsidy. Hence snowmobiling's costs are predominantly externalized. The result is a mis-allocation of resources, because snowmobiling is cheaper than it would be if users were charged for all the scarce resources they consume. Other recreational activities that bear the brunt of the noise and annoyance become correspondingly less desirable.

Land Management, Hearings 12: "I am in a position to say we definitely do need legislation."

Among the specific criticisms that may be made of the present system are that it fails to sufficiently limit the number of areas exposed to snowmobiles and their environmental impact and to set meaningful noise standards, and that there is a confusing lack of unifor- mity in statutory provisions from jurisdiction to jurisdiction. Political frontiers mean little where the natural environment is concerned, especially when affected by highly mobile vehicles like snowmobiles. Use within a single jurisdiction may have interjurisdic- tional ramifications. Moreover there is a significant amount of out-of-state and even interstate use, so lax regulations in one state may defeat efforts at control in another. Although interstate compacts have not so far been a major factor in the effort to pro- tect the environment, for a survey see Weakley, Interstate Compacts in the Law of Air and Water Pollution, 5 NAT. RES. L. 81 (1970), the regional nature of snowmobiling could conceivably require such an agreement. If necessary similar arrangements could be made with Canada.

It has also been argued that statutory penalties are too lax to serve any real deterrent purpose; and that groups with an interest in shaping recreational land use policy as to snowmobiles are given insufficient access to administrative bodies. See testimony of Lowell Krassner, Sierra Club, Hearings 79; Joel Pickelner, National Wildlife Federation, id. at 68; Garry A. Soucie, conservation director, Friends of the Earth, id. at 40.

This approach has become familiar in the legal field from the work of Ronald Coase and Guido Calabresi. See, e.g., Coase, The Problem of Social Cost, 3 J. L.,w & Econ. 1 (1960); G. CALABRESI, THE COSTS OF ACCIDENTS (1970), Calabresi, Views and Overviews, 1967 U. ILL. L.F. 600. An interesting application of these methods may be found in Woyke, Cigarettes and Health: A Calabresian Analysis, unpublished Senior Studies paper on file in the Yale Law Library (1967). The plan proposed below is patterned closely on a similar scheme proposed to recompense damage caused by sonic booms. See Baxter, The SST: From Watts to Harlem in Two Hours, 21 Stan. L. Rev. 1 (1968). The plan also bears some resemblance to many schemes of the last several decades aimed at overcoming some apparent shortcomings of tort law as applied in certain situations, e.g., Workmen's Com- pensation and of course the various no-fault schemes for automobile accidents.

The social costs of snowmobiling are not readily ascertainable in comparison with those of most other activities. This "costing" problem is one of both prediction and of quantification. What value can be assigned to an afternoon of cross-country skiing ruined by snowmobiles that leave tracks, make noise, frighten wildlife away and generally make the outdoors experience less pleasurable? How can we estimate environmental dam- age that may become apparent only in the next spring or perhaps twenty years later when the tree cover proves to be thinner than it should be? One kind of costs involves direct harm to the environment. A second consists of costs to other recreational users.
Current proposals\textsuperscript{32} to change the system all suffer from the same deficiency: they fail to \textit{internalize}\textsuperscript{33} costs. These proposals would in effect attempt to \textit{reduce} costs, either by setting noise standards, requiring additional equipment, or banning the vehicles outright. None would force the user to bear the remaining costs; all would thus perpetuate the allocative inefficiency of the present system.

Tort law in its existing form would almost certainly be unable to perform the internalizing function. The traditional tort law measures of cost, such as diminution of market value of property, are likely to fail if applied to snowmobiling. The environmental costs of snowmobiling are often remote from the activity itself in terms of time and space. Recoverable costs would be limited to those imposed in large chunks on single individuals, if only because the costs of setting the tort system in motion would far outweigh any recovery obtainable. Proof of causality presents another problem. A plaintiff in a snowmobile case would encounter extraordinary difficulty in identifying a single defendant as responsible for any injuries. Most of the damage caused by snowmobiling results from the cumulative effects of many small impacts; in addition, other types of activities have the potential to cause some of the same kinds of harm. Finally, there is the difficulty of picking out the particular snowmobile (of the thousands in a given

\textsuperscript{32} See, e.g., testimony of Lowell Krassner, Sierra Club, \textit{Hearings} 79; Joel Pickelner, National Wildlife Federation, \textit{id.} at 68; Garry A. Soucie, conservation director, Friends of the Earth, \textit{id.} at 40.

\textsuperscript{33} The term "internalize" is somewhat ambiguous in this context, since inasmuch as all costs are eventually borne by somebody, all costs are internal to some person or group if only society at large. However, the word is used here to denote allocating the costs in such a way that they will be minimized overall. As a theoretical matter, equally optimal resource allocations will result from any allocation of costs as long as the parties can bargain with each other, always a theoretical possibility. \textit{See} Coase, \textit{supra} note 30. In practice, however, some cost allocations will prove cheaper than others. \textit{See} Calabresi, \textit{supra} note 30. Different choices of the group to bear the costs (i.e., different internalizations) may contribute to cost minimization in different ways. Thus, one internalization might reduce administrative costs, while another might reduce costs by minimizing the likelihood that the chosen cost-bearer will be unable to pay when the time comes (so-called "risk spreading," the function of insurance). Perhaps the largest source of cost reductions are internalizations which provide an incentive to act in a less costly way. This effect can be maximized by internalizing the costs to the party who is in the best position to change his behavior to reduce costs (the best cost-avoider).

In the present instance, it is the snowmobilers themselves who can best reduce costs because they determine where and how much to use their machines, and most of the costs of snowmobiling depend on this factor of exposure. Although considerations of administrative costs might favor placing cost on the manufacturers in order to deal with fewer large entities than many smaller ones, and such an internalization would also provide an incentive to develop quieter, less harmful snowmobiles, seemingly the most substantial cost reductions must come from changes in snowmobile use patterns, which requires that costs be charged to users.

No allocation of costs is immutable, and if some device were developed in the future which made it more practical to place the costs on landowners or other recreational users (e.g., if special "transparent" earplugs were invented which shut out vehicle noise, without lessening other enjoyment) such costs would no longer be internalized to off-road vehicles.
area) that caused the damage even if it is the sort attributable to a single user.\textsuperscript{34}

III. Cost Internalization: A Statutory Scheme

These considerations of economic efficiency, along with others involving equity,\textsuperscript{35} argue for a major revision in the present system of regulating off-road vehicle use. A fairer, more efficient control of snowmobiling would result from recognizing explicitly that a prime function of the legal system, and especially of tort law, is to insure that costs are internalized to the activity creating them, so far as is possible consistent with the other functions that the legal system serves in our society.

The difficulties inherent in using the tort system as a mechanism of cost internalization could be met in part by dispensing with the tort law requirement of identifying a single person as responsible for the injury and instead concentrating on whether the injury could be attributed to the activity at all. Rather than relying on the tort system to insure internalization by charging every user for the damage he causes individually, the system would concentrate on charging the proper costs to the activity as a whole. Such an approach would permit cost internalization while eliminating the administrative costs inherent in identifying a tortfeasor, an almost impossible task in any case.

This goal could be achieved by requiring snowmobile users to pay into a statutory fund, established on the state or federal level, annual license fees based on the total estimated yearly costs of their activity and graduated according to the amount of damage each kind of user

\textsuperscript{34} The snowmobile problem bears a strong similarity to that of pollution control, since both involve large aggregate costs incurred in many small instances, often from an unidentified source. See also Summer v. Tice, 33 Cal. 2d 80, 199 P.2d 1 (1948). In that case the plaintiff was injured by a rifle bullet fired by one of the two defendants hunting together. The court held that the burden of going forward with the evidence shifted to the defendants. Each was to have the opportunity to convince the jury that he was not the responsible one; if neither succeeded both would be held liable jointly. This represents an attempt to expand the narrow causation doctrine in a situation where there were two possible defendants acting together if not jointly in the traditional case. The equivalent to snowmobiling would be if there were thousands of hunters in the woods all firing continuously and no real possibility of determining where a bullet was fired from.

\textsuperscript{35} The assertion of inequity in the present system of regulating snowmobile use involves a subjective judgment based on the fact that other activities "got there first," the fact that the burdens of snowmobiling are distributed randomly on "innocent bystanders," and perhaps a feeling that snowmobiling simply does not have the same claim to wilderness use as non-mechanical activities like hiking. Equity should be considered only if the system is judged otherwise acceptable in efficiency terms. The present system is economically inefficient anyway, and the system to be proposed in this Note seems acceptable on fairness grounds (or it is at least no more unfair than the existing one), so that the issue of equity will not hereafter be discussed.
could be expected to cause. The fund would be strictly liable to plain-
tiffs for instances of discrete damage, and would distribute the re-
mainder of its collections in other ways. Such a scheme would have a
twofold effect: first, it would make snowmobiling more expensive
(providing an incentive for snowmobilers to switch to other cheaper
forms of recreation, and for manufacturers to reduce costs by techno-
logical innovation); and second, it would ensure that those who pres-
ently bear the costs of snowmobiling are recompensed.

Fee Determination. Fees would be set so that their total would
reflect the aggregate social costs of snowmobiling. In arriving at its
yearly costs estimate, the fund could rely on three types of past experi-
ence: first, the amount of damages awarded against it in court in tort
suits for discrete injuries to property; second, its own expenses in re-
placing injured property on public lands; and finally past payouts for
the annoyance costs of snowmobiling.

With this aggregate amount as a goal, fee levels charged to users
could be differentiated in terms of vehicle-type and geographical area
of expected use. The more familiar insurance categorizations along
lines of age, education, and sex would have little application here
because costs would vary little with the carefulness of the user. Instead,
users would be required to contribute to the statutory fund in rough
proportion to the amount of annoyance and environmental damage
they could be expected to cause. A snowmobiler who insisted on using
his machine in high-grade forest areas would be more likely to cause
harm than a snowmobiler content to use his machine on a snow-covered
municipal golf-course, and this differentiation should be reflected in

36. Determining these costs so that they can be internalized as indicated above would
be a difficult matter. Two categories of costs may be distinguished: first, physical property
damage and second, injury to other recreational users (mainly in the form of anno-
ynce). As far as direct damage to the environment is concerned, the guiding principle of
cost determination would be that of replacement cost—how much would it cost to re-
turn the environment to the state it would have been in, or a reasonable approximation,
in the absence of off-road vehicle use. Such a calculation, although undoubtedly a com-
plex one, is by no means impossible; in any event it is not avoided by simply allowing
snowmobilers to go without paying anything as is now done.

The ideal way to fix costs of the second category—that of harm to other recreational
users—would be through a market mechanism that would allow snowmobiles and other
recreational users to bargain with each other for the privilege of carrying on their de-
sired activity. Such a market would undoubtedly be too cumbersome and unwieldy be-
cause of the number of persons and the inconvenience involved. The costs of running it
would outweigh any possible gain in efficiency. However, essentially the same result could
be achieved by surveying other recreational users to ascertain how much they would be
willing to pay to be rid of off-road vehicles. This amount could then be used as a
measure of annoyance costs.

In effect, the fund would be establishing a market that would never have come into
being on its own because of the impracticality of getting so many people together to
allocate such comparatively small costs. The fund would be able to provide a much
cheaper approximation of such a market.
the relative prices of use to each. Such a categorization would provide an incentive to confine snowmobile use to areas where it would be less harmful, and could be administered relatively easily through the present system of licensing by providing for graduated fees based on zones of use. Lower-grade environmental areas not favored by other users could be set aside for snowmobile use as "snowmobile parks" whose use would be substantially less expensive than the use of forest land. Enforcement could be handled by requiring the display of licenses of different colors in different zones, and public enforcement could be supplemented by allowing any private citizen to bring a suit for a kind of tort fine, much as citizens may recover part of the fines for violations they report under the Federal Clean Harbors Act of 1899.37

In the relatively rare instances where injury could be attributed to a particular individual, the system would allow suit to be brought against that individual instead of the fund. This would help preserve the deterrent effects of the existing system.

**Strict Liability Tort Recovery.** In all cases of discrete injury attributable to off-road vehicles, the fund would serve as statutory defendant and would be strictly liable. The traditional tort standards of negligence would not necessarily promote cost minimization because a person might behave in other than the cheapest way without running afoul of the ordinary due care test of negligence law. It would be difficult to give meaningful content to the reasonable man-due care standard of negligence law in this situation, since a snowmobiler cannot reduce the costs of his activity by being "careful," and almost all harmful conduct would not contravene the reasonableness standard. Negligence would thus be an inappropriate standard for determining rights to recovery from the fund. Abandonment of the fault inquiry also would reduce administrative costs.

**Unrecovered Surplus.** It is apparent that a large part of the social costs of snowmobiling would not be the basis of tort recovery, because most of these costs would not take the form of discrete recompensable instances of substantial damage. Rather, they would be incurred in the form of millions of instances of trivial property damage, extreme annoyance, and remote ecological effects. No practical way would exist to allocate recovery for these injuries to a single complainant, and the transaction costs of bringing suit would far outweigh any possible recovery. Hence, the statutory fund collecting fees from snowmobilers would finish the year with an unpaid-out surplus. This surplus could

be allocated by treating as a class other recreationists who currently bear the burden, just as off-road vehicle users themselves would be treated as a class. It could be expended on improvement of facilities for other types of users, or returned to them for their own use.

Several of the cost internalization features of this scheme are foreshadowed—and their validity established to some degree—by the more innovative existing state statutes. In these states, conversion to the proposed scheme could be accomplished simply by modifying selected provisions of laws already in force. The California Snowmobile Trust Fund,\textsuperscript{38} for example, clearly resembles the proposed statutory fund; although no effort is made to differentiate among various types of use by varying fee levels, and the proceeds are not expended for the benefit of those who bear the burdens of snowmobiling, it would be easy to incorporate these concepts with a few modifications in the California statute. Similarly, the zone system established by Michigan’s statute\textsuperscript{39} embodies in a rudimentary way the idea of differentiating areas of use by environmental costs, although only three zones are provided and these bear no direct relation to the varying environmental costs of snowmobile use in different areas. Finally, Washington’s statute\textsuperscript{40} accomplishes cost internalization to some degree. Taxing fuel consumption internalizes costs to the extent that fuel purchases correlate with amount of use and thus indirectly with environmental costs. However, the fuel tax has a major disadvantage: equal amounts of fuel consumption may result in very different environmental costs depending on the area of use. The trails system, by contrast, forces each activity to pay its own way, thereby better achieving cost internalization.

\textit{Objections.} One objection to such a scheme of cost internalization is that its administrative costs might be substantial. But the system would operate similarly to the present one of registration, and there is no reason to presume that its costs would be significantly greater. The expenses of the surveys and studies required in arriving at an estimate of environmental costs would probably be necessary under the existing system sooner or later. These administrative costs could properly be regarded as a cost of the activity itself and therefore subject to internalization along with other such costs.

Another possible objection would be that some of those who now use snowmobiles could not afford the activity if its costs were internalized. Of course, it would be possible to subsidize poorer users under

\textsuperscript{38} See p. 776 \textit{supra}.
\textsuperscript{39} See p. 776 \textit{supra}.
\textsuperscript{40} See p. 777 \textit{supra}.

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this system to enable them to participate if it were thought that snowmobiling was an essential activity like education or health care which all were entitled to share. In view of the recreational nature of the activity and the availability of cheaper close substitutes, such a subsidy seems unwarranted.

Limitations on the Scheme. Certain broader considerations militate against an exclusive reliance on this framework for control. Some wilderness areas, for example, should be closed to snowmobilers no matter how much they would be willing to pay for the privilege of use. This would be true where the damage done by off-road vehicles was irremediable, i.e., the costs would approach infinity. Similarly, collective decisions may be made that certain costs should be reduced by fiat, not merely internalized, e.g., that all snowmobiles are to be equipped with mufflers and that harassment of animals is to be absolutely forbidden. In short, for a variety of reasons any cost internalization scheme may need certain limits in the form of collectively promulgated regulations.

Another sort of limitation on cost internalization is inherent in the very assumption on which the concept is based, namely, that the economically most efficient allocation of resources is the “best” allocation of resources. This may not always be true. It might be thought desirable, for example, that the system play other than strictly allocational roles, e.g., that it provide for special penalties against individuals to discourage intentional abuse or harassment, that it “tax” the present generation to build up a reserve of high quality environmental lands for future generations, or that it “educate” people’s demands by subsidizing other forms of recreational activities or taxing off-road vehicle use so as to encourage them to take up other cheaper and perhaps ultimately more beneficial forms of outdoor recreation. Thus the system could be made to serve a quasi-advertising function in creating or altering demand. These decisions would have to be made collectively, but could easily be accommodated as adjustments within the above framework.

Conclusion

A statutory scheme utilizing the legal system to internalize the environmental costs of snowmobiling would serve the dual objectives of encouraging use in environmentally less harmful ways and assuring the proper allocation of recreational resources. A host of other off-road
vehicles exert costs on the environment and on other recreational users. The various types of recreational boating may also require similar treatment.\textsuperscript{41} The snowmobiling situation implies that traditional tort law is an inadequate means of internalizing costs for many of our society's most pervasive and serious problems—including sonic boom damage and nuclear radiation. A system similar to the one proposed here for snowmobiling might apply equally well to such injuries.

41. Since there are now more than one and a half million motorboats in every state of the union the problem may be at least as serious as with any land-based recreational vehicles.

The most significant aspect of the pollution problem connected with recreational boating is the discharge of untreated sewage into the water. The extent of the problem has been variously estimated. One estimate is that recreational boating is responsible for only \(1/10\) of one percent of water pollution (Robberson, \textit{Water Pollution and Boats}, \textit{Yachting}, June 1970, at 70). On the other hand, sanitary engineers from New York, New Jersey, and Connecticut agreed that motorboats pollute marinas and other selected areas, though their overall effects were negligible compared to those of industrial waste (N.Y. Times, Feb. 9, 1968, at 35, col. 1), and recreational boating was found to be among the main sources of pollution in an Interior Department survey of Long Island Sound (N.Y. Times, Oct. 25, 1969, at 35, col. 5).

Environmentally damaging effects of recreational boat use may stem from marine engines themselves. Several studies undertaken by engine companies and trade groups tend to minimize the effect of such engines. A study conducted by Environmental Engineering Corp. for the Mercury Corp. found no contamination resulting from outboard exhausts. The survey was made at freshwater Lake X, where 3,000,000 gallons of gasoline and oil were burned up on boat testing, and Cat Lake, which was never used by powerboats. The study uncovered no signs of organic compounds, and no observable effect on plankton or bottom organisms (N.Y. Times, Mar. 29, 1970, \S\ 5, at 10, col. 7, and N.Y. Times, Jan. 24, 1971, \S\ 12, at 4, col. 5). The possible effects of engine noise on aquatic life have apparently not been investigated. Recreational boating might also prove to lead indirectly to overfishing and overhunting as it becomes more popular.

Whatever the magnitude of the environmental effects of recreational boating, it is clear that it entails strong possibilities of conflict with other recreational uses like swimming, fishing, and hunting. If recreational boats have not caused criticism similar to that aroused by snowmobiles, it may be because motorboating has been established longer and other users have learned however reluctantly to live with it (\textit{but see, e.g.}, Berry, \textit{Boatmen's Paradox: Consumers of the River}, \textit{Nation}, Oct. 17, 1966, at 381). Another factor is that there is a greater overlapping of uses, \textit{i.e.}, many swimmers, hunters, and fishermen, also enjoy and often rely on boating. Boating could easily be treated analogously to snowmobiling in a scheme of the sort proposed above, with subcategorization based on zones of use and type of boat, with sailing presumably cheaper than motorboating.