Snowmobiling in Maine:

Past Successes, Future Challenges

By David Vail

With one snowmobile registration for every 15 residents, Maine may well have the most snowmobiles per capita of any U.S. state. Moreover, the state's 12,000-mile network of groomed trails and its 2,500-mile Interconnected Trail System make it a major winter tourist attraction. Still, as Vail points out—and as the number of snowmobile-related deaths this winter confirms—such progress has not come without costs and conflict. Although Vail argues the benefits outweigh the costs, he suggests the state should act now to alleviate the conflicts related to congestion, over use of the state's major trails, noise and air pollution, and free riding by non-dues-paying sledders. He argues these problems cannot be handled by local snowmobile clubs alone, but require an active partnership with state government to mitigate current conflicts and to avert future ones.

A quarter century ago, Maine snowmobilers had a reputation for lawlessness and recklessness. Landowners were exasperated by "rogue sledders" vandalism and dangerous riding on logging roads, as well as by the practical impossibility of monitoring and excluding them from millions of remote acres. A few decades later, snowmobilers' standards of behavior have changed for the better and snowmobiling has, to a great extent, become a family, club and community activity. Snowmobiling has proven to be a largely compatible secondary use of interior Maine's spectacular forest, lake and alpine landscapes. The state, relying primarily on carrots rather than on sticks, has played a remarkable role in facilitating a complementary relationship among three types of capital: natural capital (the landscape), physical capital (trail infrastructure), and institutional capital (stable relationships among snowmobilers and between snowmobilers, landowners and towns).

Since the lawless 1970s, the number of registered sleds has doubled to 96,000. With one registration for every 15 residents, Maine may well have the most snowmobiles per capita of any U.S. state. Maine's 12,000-mile network of groomed trails, and particularly the 2,500-mile Interconnected Trail System (ITS) "superhighway," have become a major winter tourist attraction. Today, total spending by snowmobilers rivals alpine skiers and gives a much-needed boost to economically distressed interior regions and gateway towns, such as Rangeley, Jackman, Greenville, Millinocket, and Fort Kent.

The Maine Snowmobile Association (MSA), with its 16,000 dues payers and 32,000 family members, has mastered the art of publicizing snowmobiling's contributions to economy, community and quality of life, not to mention the win-win relationship between 287 snowmobile clubs and landowners (94% of snowmobile trails are on private land). It is notable that the activity receives little negative press, considering that snowmobiles are noisy, smelly, polluting and potentially dangerous (Haiss 2002). In Maine, sportsmen's (*sic*) organizations have substantial political clout, and MSA is the largest of them all (a bizarre indication of sledders' political weight was last winter's threat by forest owners and truckers to hold snowmobilers hostage by closing trails on 700,000 acres unless the legislature eased fines for violation of truck weight limits (AP 2002a).

Creative responses by the Maine Legislature and Department of Conservation (DOC) to the looming 1970s snowmobiling crisis built a foundation for the subsequent behavioral, social, and economic transformation of snowmobiling. The snowmobile governance success story is based on landowner-club contracting, brokered by the Bureau of Parks and Land's Off Road Vehicles Division, and extensive, high quality trail infrastructure, financed largely from state trail grants. Yet Maine's successful development of constructive landowner-sledder relations and an outstanding trail system contained the seeds of longer-term problems. Further, successful state and host town promotion of snowmobiling as an economic development tool has reinforced emerging problems. This essay draws on a 2001 case study of the Rangeley Lakes region to describe both successes and evolving challenges in snowmobile management, suggesting possible policy and remedies.[1]

The tremendous growth of snowmobiling over the last three decades has had complex and contradictory effects.

FRAMING THE ANALYSIS: SNOWMOBILING'S CONTRIBUTIONS AND CONFLICTS

The tremendous growth of snowmobiling over the last three decades has had complex and contradictory effects. My subjective view is that the positives greatly outweigh the negatives, but changing conditions have intensified some longstanding problems and given rise to new ones. With well-crafted policy responses, there is scope for improvement.

On the positive side, sledding (as it is widely called by participants) has improved the quality of winter life for tens of thousands of individuals and families, dispelling cabin fever and enabling them to enjoy the outdoors year-round. For many snowmo-

bilers, it is a social activity, with group ice fishing expeditions, club barbeques, and community events such as Rangeley's annual Snodeo and Greenville's Ricky Craven Charity Run. The MSA points with pride to the clubs' charitable contributions (more than $300,000 per year) and its Landowner Appreciation Program (MSA 2001).

Snowmobiling also buoys economically distressed regions, where winter unemployment far exceeds the statewide rate and where past manufacturing and natural resource-based mainstays are "mature" or declining.[2] In 1995-96, University of Maine economists combined a snowmobiler expenditure survey with other data to estimate conservatively that snowmobilers spent $153 million that season (Reiling et al. 1996). Reiling's extrapolation to 1997-98, based on growth in registrations, put the figure at $176 million (Reiling 1998).

Using the same method, the MSA estimates 2000-01 spending at $225 million (MSA 2001), although with less outstanding snow conditions in 2001-02, spending was probably slightly lower (Myers 2002). Moreover, as income generated by snowmobiling is respent, it has a multiplier effect, bringing the MSA's estimate of total Maine economic impact to roughly $300 million. This is nearly 1% of Maine's 2000-01 gross state product, equivalent to a fair-sized paper mill. Total employment creation is estimated at 3,100 full-time equivalent jobs, or 1.3% of employment Maine's seven northern interior counties (MDOL 2002a, 3).

These are impressive aggregate contributions from what is just one piece of Maine's tourism and recreation economy. However, there are reasons to believe the estimates are seriously overstated. In reality, more than half of spending by snowmobilers "leaks" out of the Maine economy into purchases of goods and services produced elsewhere. For example, nearly half of sledders' spending is for snowmobiles ($85 million in 1997-98). Since they are not produced in Maine, the in-state value added and income is limited to commercial margins (roughly 15% of retail sales or $13 million). The same is true, to a greater or lesser degree, for such purchases as trailers, apparel, fuel, repairs, meals, entertainment, and lodging. A more realistic estimate of 2000-01 spending is $90-100 million (Reiling 2002 concurs). Adding a plausible multiplier effect, the total impact on gross state product is in the neighborhood of $150-160 million, half the MSA's $300 million figure.[3] This is not chump change, but neither is it salvation for interior Maine's ailing economy.

What makes snowmobiling a policy challenge is that it also has a downside, which can be codified as five types of actual or potential conflicts. The following figure presents a typology with illustrations (two-directional arrows convey that detrimental effects run in both directions).

Maine is not the only U.S. jurisdiction coping with such conflicts. For instance, Type 2, 3, and 5 conflicts are central to the controversy surrounding the

Table 1: Patterns of Conflict

		Group Affected	Impact
Type 1 Snowmobiles	→	Landowners:	Obstruction of logging roads; vandalism
Type 2 Snowmobiles	↔	Snowmobiles:	Hot spot congestion; free riding on groomed trails
Type 3 Snowmobiles	↔	Other Recreationists:	ATV trail damage; disruption of cross-country skiers' solitude
Type 4 Snowmobiles	→	Host Communities:	Noise and air pollution; traffic congestion
Type 5 Snowmobiles	→	Environmentalists:	Air and water pollution; wilderness disruption

Bush administration's decision to reverse snowmobile bans at Yellowstone and Grand Teton National Parks (Harden 2002).

ASSESSING AND RESOLVING SNOWMOBILIING CONFLICTS

The state's greatest accomplishment has been to facilitate voluntary, decentralized solutions to Type 1 conflicts between sledders and landowners. This has been a remarkable exercise in institution building and behavior modification, avoiding the need for heavy-handed regulation, government micromanagement, or expenditure of general fund revenues. Snowmobilers were induced to organize the Maine Snowmobile Association and build local clubs by two major incentives: 1) DOC assistance in negotiating trail licenses with landowners and 2) state reimbursement of trail infrastructure investment via trail grants, financed from registration fees and 0.62% of state gas tax revenue. For participating landowners, there were three core incentives: the ability to control trail location, self-policing of snowmobilers' behavior by the clubs and the Warden's Service, and relief from legal liability. Safety education, landowner appreciation and other DOC-assisted programs also helped to build trust and cement win-win relationships.

Under these arrangements, the trail network expanded to 12,000 miles, overall trail quality improved, and the number of local clubs grew to 287. In the Rangeley Lakes region, representatives of snowmobilers and the large forestland owners confirm that their longstanding relationship remains on excellent terms (Ellis 2001; Gamble 2001; Medina 2001).

As facilitators, the legislature and DOC have continued to innovate. The following table shows the dramatic recent increase in trail grants. This investment will grow still further, following recent hard-won legislation that allocates more gasoline taxes to snowmobiling and other off-road vehicle programs. The trail grant budget will receive roughly an additional $350,000 per year (although the total tax rebate remains well below the gas tax paid by sledders). Trail grants have recently been extended to municipalities in a cost-sharing arrangement. They encourage civic investment in trails in recognition that they attract tourist sledders whose spending boosts local economies. The state now also helps to defray the cost of big ticket items, such as self-propelled groomers and permanent bridges. And stiffer drunk driving penalties, along with more warden surveillance on the trails, financed by registration fees, have kept accident and death rates in check, despite soaring sledding volume in recent years.

Table 2: State Contributions to the Trail Grant Program

Year	State Trail Grants KM	$	State Share of $ Outlay	Total $ Outlay per KM
1986-87	8,600	$ 286,000	54%	$ 62
1996-87	12,200	1,322,000	62%	175
1999-00	12,400	1,787,000	67%	215

Source: BPL (Maine Bureau of Parks and Lands) 2000

Maine has been less successful resolving Type 2 sledder-sledder conflicts, which result primarily from the overuse of trails and free riding. Despite Maine's extensive trail network, sledding concentrates at prime places and peak times, causing hot-spot congestion (congestion is shorthand for a cluster of amenity-reducing or cost-increasing effects, such as crowding, smelly and unhealthy exhaust fumes, trail deterioration, accidents, hostile encounters, and added travel time to less-crowded trails). On Presidents' Day weekend in a community such as Rangeley-Oquossoc, congestion spills over from the trails to the towns' roads, parking areas, public spaces, and commercial establishments. Several recent trends have intensified hot-spot congestion, including reduced snowcover south of the Unorganized Territories, trail closures near the northeast's sprawling metropolitan centers, and concentration of leisure activities into weekend bursts. But the prime cause is the sheer growth in snowmobiling: during the 1990s, registrations increased by 50% (from 64,000 to 96,000), but with just a 22% expansion of

The essence of the free rider problem is that a registered sled can be driven on all 12,000 miles of trails without any direct user charge.

the trail network (BPL 2000).

The essence of the free rider problem is that a registered sled can be driven on all 12,000 miles of trails without any direct user charge. Strictly speaking, snowmobilers cannot free ride since they must pay gas tax and registration fees (currently $30 for Maine residents and $65 for non-residents). And a free riding loophole was closed last year when the legislature ended New Hampshire sledders' privilege of riding free in Maine (subsequently, non-resident registrations jumped from 15,000 to 20,000). As noted, most registration revenues are returned to clubs and towns as trail grants. However, state grants cover only two-thirds of the monetary outlay for trails (see previous table) and none of the tens of thousands of hours of volunteer work by club members. It can be argued that the current level of investment is well below what is needed to maintain 12,000 miles of intensively used trails in top condition (Ellis 2001; Myers 2002; Peppard 2001).

Since sledders pay no direct fee to ride the trails, they have little incentive to contribute to trail infrastructure investment. This is especially true for one-time or infrequent visitors to an area. Maine's infrastructure is maintained almost entirely by the 287 local clubs. They collect dues, averaging about $18 per year from 14,000 sledder members; they recruit members for volunteer trail work; and they solicit voluntary donations from visiting riders. Given the free riding opportunity, it is not surprising that over 70% of registered sled owners have not joined clubs. Rangeley's club president laments that with increased wear and tear and growing numbers of sledders "from away," many volunteer workers are burning out and growing resentful of free riders (Ellis 2001). The MSA's executive director concurs with this assessment (Myers 2002).

By all accounts, the only serious Type 3 conflict involves the adverse effects of all-terrain vehicles (ATVs) on snowmobiling (Ellis 2001; Myers 2002; Peppard 2001). The context has three main features: first, a doubling of ATV numbers to nearly 50,000 since 1990; second, serious obstacles to controlling ATV access (they are all-terrain vehicles); third, "rogue" behavior by many riders, analogous to sledders a generation ago. The conflict takes two distinct forms. Most tangibly, ATVers tear up snowmobile trails and engage in occasional vandalism to signs, bridges, etc. More important over the long term, the disrespect of some ATVers, for landowners, rights—reflected in vandalism, timber stand damage, soil erosion, and stream siltation—have led a growing number of owners to post and gate land against *all* recreational use. The innocent—sledders, hunters, hikers and others—are punished along with the guilty (AP 2002b; Burnett 2001; Goad 2002). In the Rangeley region, one industrial forest owner has required the snowmobile club to pay for gates to close trails in snow-free seasons; another forest manager observes that ATV headaches have made them less inclined to allow a proposed new snowmobile loop trail to cross their land (Ellis 2001; Gamble 2001).

A few words are in order regarding the quite limited severity of other conflicts. Sledder-cross-country skier antagonisms, intense and highly politicized in national parks out West, appear to be minimal in Maine. Journalists have noted the lack of serious conflict with cross-country skiers, snowshoers, hikers and dog-sledders (Haiss 2002; Wonsavage 2002). A speculative interpretation starts from two sets of facts. First, in much of rural Maine, "sledders got there first" and skiers have not organized to claim a prior right of access, particularly on private land. Indeed, back-country skiers benefit from snowmobile tracks in deep snow (Foltz 2001). Second, participation in back-country ski touring is very limited, although construction of a proposed 180-mile hut-to-hut trail system might well change that (Jespersen 2002).

Most Maine cross-country skiers make day trips to public lands or private ski-tour centers, where tracks are segregated from snowmobile trails. Rangeley's experience is instructive. The Rangeley Cross-Country Ski Club started as a branch of the local snowmobile club,

receiving trail grooming services and even a club loan in its early days. The two clubs, collaborating with landowners, jointly designed 75 kilometers of ski tracks to minimize unsafe encounters. However, future growth may bring problems. Both clubs hope to expand their trail networks, and both anticipate conflicts (Ellis 2001; Foltz 2001). Nonetheless, there are grounds for optimism that the "social capital" of trust, negotiating experience, and conflict resolution techniques built up over 10 years will facilitate the Rangeley region's bold new initiative, "To develop a more permanent system of trails for all types of activities including hiking, skiing, horseback riding, snowmobiling, cycling and ATVs" (Jones 2002).

Regarding Type 4 conflicts, popular media coverage, reinforced by key informant interviews, conveys the impression that most residents of snowombiling's host towns tolerate occasional unruly behavior and weekend peaks of noise, bad air, and traffic congestion because they value its contribution to local economic vitality. Many residents, of course, are sledders themselves or derive income from snowmobiling (Ellis 2001; Giffen 2001; Myers 2002; Peppard 2001). Indeed, governments in towns such as Rangeley have become active snowmobiling boosters, contributing tax dollars to local trails, additional in-town parking, etc., with trail grant assistance. But here, too, growth comes at a cost. A Fort Kent couple's recent successful nuisance suit against in-town snowmobiling reflects a latent frustration that is likely to boil over in other host communities as hot-spot congestion intensifies (PH 2002).

Snowmobiling's environmental impacts have provoked surprisingly little adverse response from Maine's conservation groups, apart from a long-standing controversy over motorized recreation on public lands. This larger debate about "engines in the wilderness" goes well beyond snowmobiles. It includes both the general issue of motorized access and specific conflicts centering on ATVs, jet skis, dirt bikes, float planes and even electric generators (Vail 2001). In fact, the MSA has at times made common cause with conservationists by advocating for acquisition of public lands and easements. Two specific snowmobile access issues involve permitted crossings of the Allagash Wilderness Waterway and intrusion on the Appalachian Trail in the Nahmakanta region. In addition, officials believe that snowmobile access to remote ponds has contributed to illegal ice fishing and depletion of game fish stocks, and that snowmobile trails make it easier for coyotes to track and kill deer. The lack of a sense of urgency about these suspected impacts is reflected in the fact that no formal investigations have been conducted (Giffen 2001; Peppard 2001).

Environmental opposition to snowmobiles is more intense at the federal level than in Maine. The Natural Resources Defense Council and Bluewater Network have led the charge against snowmobiling in the national parks, emphasizing snowmobiles' air pollution, deposition of nitrogen oxides, disturbance of wildlife habitat, and disturbance of muscle-powered recreation. Further, the U.S. Environmental Protection Agency is framing tougher emissions standards that will accelerate the spread of quieter, less-polluting, four-stroke snowmobile engines, which are now coming into large-volume production (Daley 2002; NRDC 2002).

FOUR EVOLVING CHALLENGES AND POLICY RESPONSES

Looking to the coming decade, it seems to me that Maine's snowmobiling policy faces four important challenges and suffers from a critical information gap. If promotional efforts succeed in attracting more sledders to the north woods, the challenges will be still more urgent. The four are closely connected: (1) intensified hot-spot congestion and persistent free riding; (2) an overload of responsibilities on local snowmobile clubs; (3) reemergence of landowner relations problems; and (4) defusing ATV conflicts. The information gap is snowmobiling's poorly understood environmental impacts. The following assessment and bulleted recommendations are far from definitive; they are intended to provoke thought and discussion.

Hot-Spot Congestion and Persistent Free Riding

Public and private responses to these twin problems are already under way. Rangeley's restaurant and lodging owners, for instance, plan to offer "mid-week special" discounts to spread snowmobiling more evenly

over time. The MSA is promoting less-popular destinations, such as Rumford and Lincoln, to spread sledding more evenly over space. These steps are in the right direction, but the forces behind hot spot congestion are so powerful that state intervention is necessary.

- The Maine Office of Tourism has a high priority mandate to encourage more visits at off-peak times and to less popular destinations. It should collaborate with snowmobiling clubs and host communities to develop and promote off-peak snowmobile tourism packages.

…the forces behind hot-spot congestion are so powerful that state intervention is necessary.

In one sense, free riding is reduced by recent $5 increases in resident and non-resident registration fees and the new non-resident fee on New Hampshire sled owners. However, an annual fee does nothing to discourage hot spots or channel revenues directly to the clubs whose trails suffer the greatest wear and tear. Economists typically advocate *congestion pricing*—in this case, variable trail-user fees—as an efficient tool to limit peak demand. If monitoring and fee collection costs could be kept down, fees could be introduced at hot-spot times and places, both to ration access and cover higher grooming costs. Snowmobilers planning trips would need to know in advance where and when they would be used, as well as the fee structure. Club members would presumably ride free (an incentive to join clubs) and off-peak use would continue to be free. Non-club snowmobilers, who are currently able to free ride anywhere on the Interconnected Trail System (ITS), would undoubtedly resist such an innovation.

Advances in vehicle monitoring and toll collection technology—e.g., windshield bar codes, tamperproof bar code readers, automated billing, and stiff non-payment penalties—have already enabled several industrial nations to implement automated low-cost highway toll systems with variable peak and off-peak tolls. With creativity, such a system (using invisible, randomly located sensors) should soon be feasible on densely used ITS segments.

- In the near-term, DOC and the MSA should develop more precise measures of hot-spot congestion. They should develop a formula for estimating carrying capacities of key trail segments and should monitor actual use levels. This would enable them to better prioritize initiatives such as trail widening, curve straightening, and rationing of access.
- Looking out five to 10 years, the state should implement a system of variable trail fees (e.g., weekend passes) for hot spots on the Interconnected Trail System.

Snowmobile Clubs Stretched to the Limit

One of the strongest impressions from Rangeley key informant interviews is that the responsibilities of trail maintenance and landowner relations seem to be getting beyond the snowmobile clubs, managerial, financial and volunteer labor capacities. Expanded club-town cooperation also intensifies demands on club managers (Ellis 2001; Giffen 2001; Irland 2001; Peppard 2001).

In trail maintenance there are classic signs of volunteer labor burnout. It results mainly from increased grooming demands as sledding volume grows, but also in part from volunteers' resentment of non-club members free riding on their effort. Increased landowner demands for trail relocation also add to the workload. This challenge centers primarily on local trails rather than the ITS, especially connectors linking the ITS with town centers. Changing land ownership and real estate development patterns, described below, are the heart of the matter. However, sledding growth is also implicated, as some owners respond to increased traffic across their property by posting it.

The boost to trail grants made possible by higher registration fees and gas tax allocations can reduce the severity of these problems, especially if clubs are allowed to use the grants to compensate trail crews and

managers (Ellis 2001; Myers 2002). Some Rangeley respondents suggest that the state go much further by managing and maintaining more of the ITS (Ellis 2001; Irland 2001). There may be places where this makes sense; however, it does not seem to be a viable general solution. The Bureau of Parks and Lands (within the Department of Conservation) has a long-standing resistance to involvement in managing private land; moreover, the cost per mile on DOC-managed trails is about twice that of club-maintained trails (Myers 2002). Nevertheless, the trail system has reached a degree of complexity and a density of use that requires more than just an injection of more funds.

- Given the growth in management responsibilities and trail maintenance demands, much of the increase in trail grants should be available for compensating clubs' trail managers and crews.
- DOC should expand its capacity to provide training and technical assistance on the increasingly complex responsibilities club managers face.

Reemergence of Landowner Relations Problems

The impression conveyed by interviews in the Rangeley Lakes region is that clubs' relationships with the large landowners remain excellent. Even so, some owners are reluctant to dedicate additional commercial forestland to trails rather than trees. That could stymie the club's—and the town's—aspiration to construct a new expedition loop trail that would strengthen Rangeley's position as a sledding destination, rather than a pass-through "burgers and gas" stop (Ellis 2001; Gamble 2001; Medina 2001).

The more serious challenge, as mentioned, centers on small landowners, especially camp, second-home and condominium owners with property along the trails connecting towns with the ITS. For towns seeking a boost to their winter economy, convenient, well-signed connector trails are critical. Apart from increased sled traffic disturbance, the problem does not seem to be of snowmobilers' doing. It is well known that most of the Maine woods has been on the market in recent years. In a rural version of the suburban sprawl process, working forest is being irreversibly fragmented and converted for leisure homes, particularly in lake and pond landscapes handy to towns such as Rangeley. Even if all the new owners tolerated snowmobiling on their land, clubs would face more complicated annual negotiations and trail relocation demands. The reality is worse: numerous owners have either been aggravated by ATVers or do not want the sight, sound and smell of snowmobiles on their land (Burnett 2001). In this situation, more landowner appreciation awards are not likely to solve the problem.

…some owners are reluctant to dedicate additional commercial forestland to trails rather than trees.

- In the near-term, snowmobile clubs need greater state assistance, in particular a greater commitment of Department of Conservation staff time, to educate new property owners about the generally benign effects of sledding and to help clubs negotiate trail agreements with them.
- If Rangeley's situation is at all representative, it may be necessary over the longer term for the Bureau of Parks and Lands to ensure continued access to critical stretches of connector trail by using some gas tax and registration revenues to acquire easements or even purchase land.

The ATV Problem

The negative effects of ATV trespassing on snowmobile trails—and on private and public lands more generally—have received considerable media attention.

They are taken very seriously by DOC, and are regarded by the MSA as the number one problem facing snowmobilers (Myers 2002). The Off Road Vehicles Division's ATV strategy is similar to the one it pursued so successfully with snowmobilers. It focuses on encouraging ATV club formation, using the familiar combination of landowner-club negotiations, limited landowner liability, and self-policing, with trail grants as the main carrot. The legislature's 2002 allocation of nearly $200,000 in additional gas tax revenues to the ATV program will underwrite the effort. However, DOC faces a more serious structural obstacle with ATVs: the incentive to join clubs is weaker since ATVers can travel more-or-less anywhere at any time of year. Furthermore, trespassers are more difficult to police. David Peppard, former landowner relations director at the Maine Department of Inland Fisheries and Wildlife, also notes that many riders seek out rugged, trackless areas (Edgecomb 2002; Peppard 2001).

In parts of Maine, the nuisance and property damage caused by ATVs have reached such serious levels that a firmer use of the stick is needed to complement the trail grant carrot (Burnett 2001).

- The ATV registration fee should be doubled to $24 per year, with most of the added revenue (ca. $600,000) channeled to policing and prosecuting trespassers. Some additional funds also should be channeled into damage compensation for landowners and remedial work on damaged snowmobile trails.
- There should be stiffer fines for crossing land without permission, with the revenue dedicated to damage remediation.

Shaky Information About Environmental Impacts

Finally, since snowmobiling in Maine seems destined to grow further—a growth that is promoted by the state—we need a much better understanding of its environmental costs (and possible benefits). There is a widespread view that, since snowmobiling occurs on snow-covered ground and is dispersed over a vast and resilient frozen landscape, it does only minor, local, and transient harm to air quality, to terrestrial and aquatic ecosystems, and to the productivity of farms, forests, and cold water fisheries. These perceptions *may* be valid, but we lack the facts to make an informed judgment. It is instructive that when the Swedish government finally investigated snowmobiling's environmental impacts in the mid-1990s, several were serious enough to warrant sledding restrictions and other remedial policies (Vail and Heldt 2002).

- A fraction of gas taxes and registration fees for all motorized recreation vehicles, say $100,000 per year, should be allocated to environmental impact analysis and environmental remediation projects.
- The legislature should consider introducing a reduced registration fee for sleds with four cycle engines, similar to Maine's Clean Car Rebate, as a way to accelerate the spread of this cleaner, quieter, more fuel efficient technology.

The immediate purposes of these policy proposals are to mitigate snowmobiling's present social and environmental conflicts and to avert future conflicts. The ultimate goal is to strengthen and sustain snowmobiling's contribution to rural Maine's quality of life and economic vitality.

David Vail is Adams-Catlin Professor of Economics at Bowdoin College. His snowmobile research is part of a larger project with Swedish colleagues, on nature tourism and sustainable rural development. Vail has been involved in Maine public policy for twenty-five years, most recently as a member of the House Speaker's Tax Reform Advisory Committee.

ENDNOTES

1. This article builds on a comparative study of recreation and multiple-use forest landscape management in Maine and Sweden (Vail and Heldt 2000, 2002; Vail and Hultkrantz 2000).

2. In January 2002, when Maine's overall unemployment rate stood at 4.8%, the rate was 7.0% in Greenville, 6.7% in Millinocket, 5.6% in Farmington and 7.9% in Dover-Foxcroft (MDOL 2002b).

3. The income multiplier employed by the State Planning Office, ca. 1.65, seems reasonable, given that a large part of any added income is not spent for Maine goods and services, but rather leaks into either taxes or savings or imports to the state (Rose 1998). To illustrate, if snowmobiling directly generates $100 million of income in Maine, and if 10% of that amount goes into personal savings and income taxes, then the multiplier process is triggered by a $90 million injection of added spending into the economy. The total impact on gross state product would be $90 m. x 1.65 = $148.5 million. Note that when Mainers purchase snowmobiles produced in Canada or Minnesota, most of the beneficial multiplier effect occurs there, not in Maine.

REFERENCES

Associated Press. "Lumber Companies Upset Over New Fines Plan to Post 700,000 Acres." *Boston Globe* Jan. 11, 2002a.

Associated Press. "Landowners, ATV Riders Heading for Showdown." *Portland Press Herald* 25 June, 2002b.

Burnett, Lee. "Will More Money Curb ATV Abusers?" *Maine Times* 13 Dec. 2001.

Bureau of Parks and Lands: Off Road Vehicles Division Report. *Current Operations and Future Opportunities.* Augusta, Maine Department of Conservation: 2000.

Daley, B. "In the Woods, a Winter Storm." *Boston Globe* 24 Feb. 2002: A1.

Edgecomb, M. "Vehicle for Debate." *Bangor Daily News* 24 June 2002.

Goad, M. "Reckless ATV Riders Clash with Landowners." *Maine Sunday Telegram* 24 March 2002: B1.

Haiss, T. "We're So Reasonable and Civilized." *Maine Times* 28 Feb. 2002: 15.

Harden, B. "Snowmobilers Favoring Access to Yellowstone Have Found an Ally in Bush." *New York Times* 6 March 2002: A16.

Jespersen, B. "Trail System Sparks Debate." *Kennebec Journal* 6 March 2002.

Jones, J. "Conservation Works! Update." *Habitat.* 18.2 (2002): 11.

Maine Department of Labor. *Labor Market Digest.* Augusta, ME: April 2002a.

Maine Department of Labor. *The Month In Brief.* Augusta, ME: March 2002b.

Maine Snowmobile Association. *Snowmobile Maine 2001-2002 Season.* Augusta, ME: 2001.

Natural Resources Defense Council. "Getting Snowmobiles Out of Yellowstone." *Nature's Voice.* May-June (2002): 2.

Staff writer. "Judge Rules Snowmobilers, 'Nuisance'." *Portland Press Herald* 21 March 2002.

Reiling, S. *An Economic Evaluation of Snowmobiling in Maine: Update for 1997-98.* Orono, ME: The Maine Snowmobile Association, 1998.

Reiling, S., M. Kotchen and A. Kezis. *An Economic Evaluation of Snowmobiling in Maine.* Orono, ME: The Maine Snowmobile Association, 1996.

Vail, D. "Engines in the Wilderness: Governing Motorized Recreation in Maine's North Woods." Unpublished paper presented to the U.S. Society for Ecological Economics, Duluth, MN: July 2001.

Vail, D. and T. Heldt. "Institutional Factors Affecting the Scale and Structure of Tourism." *Current Issues in Tourism.* 3.4 (2000): 283-324.

Vail, D. and T. Heldt. "Governance Regimes to Tame Snowmobilers: Swedish and American Cases." Under review by *Society and Natural Resources.* 2002.

Vail, D. and L. Hultkrantz. "Property Rights and Sustainable Nature Tourism: Institutional Adaptation and Maladaptation in Sweden and Maine." *Ecological Economics.* 35.2 (2000): 223-42.

Wonsavage, D. "An Outdoor Kinship Links Snowmobilers, Nordic Skiers." *Maine Sunday Telegram* 13 Jan. 2002: 1K.

KEY INFORMANT INTERVIEWS

Kirk Ellis, President, Rangely Lakes Snowmobile Club, 2001.

Jeff Foltz, President, Rangeley Cross Country Ski Club, 2001.

Gordon Gamble, New England Lands Manager, Mead Paper Corp., 2001.

Lloyd Irland, Principal, Irland Associates and Project Director, Rangeley Conservation Works! Project, 2001.

Sara Medina, Regional Forest Manager, Seven Islands Land Company, 2001.

Bob Myers, Executive Director, Maine Snowmobile Association, 2002.

Sgt. David Peppard, Director of Landowner Relations, Maine Department of Inland Fisheries and Wildlife, 2001.

Steve Reiling, Department of Resource Economics and Policy, University of Maine, 2002.

Galen Rose, Staff Economist, Maine State Planning Office,1998.

A. Giffen, Land and Water Associates, Project Director, Rangeley Conservation Works! Project, 2001.


MAINE
EDUCATION
PRODUCT