

OFF ROAD VEHICLES — ENVIRONMENTAL IMPACT — MANAGEMENT RESPONSE: A BIBLIOGRAPHY

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**OFF ROAD VEHICLES - ENVIRONMENTAL IMPACT -
MANAGEMENT RESPONSE: A BIBLIOGRAPHY**

**Compiled by
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**University of Minnesota
Agricultural Experiment Station Miscellaneous Publication**

St. Paul, Minnesota

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The rapid growth in the popularity of off-road vehicles (ORVs) has created enjoyment for many but has resulted in problems and challenges for those responsible for the management and care of our natural resources. Theirs is the task of providing benefits to participants while reducing impacts to a minimum. Trade-offs are inevitable.

Over the past two decades many publications describing the ORV phenomenon have accumulated. These publications document research results, policy statements, opinions and case histories. Together, they can contribute to a more reasoned approach to difficult, often controversial decisions.

The effects of and responses to ORVs are varied and complex. The literature reflects this complexity. Our bibliography categorizes major areas of concern. It is impossible to avoid overlaps and omissions. Certain topics have been intentionally omitted because they have been covered in a companion publication, "Trail Planning, Construction and Maintenance: A Bibliography," published as Minnesota Agricultural Experiment Station Miscellaneous Publication no. 26, in 1984. For example, references dealing directly with questions about ORV users and their characteristics are included in the earlier publication under the section "User Studies." For material on planning, construction and maintenance of snowmobile and other ORV trails, please refer to the trail planning bibliography.

With few exceptions, all of the publications included are in the University of Minnesota Forestry Library. Call numbers and other shelving designations are indicated. A few publications included are in the University of Minnesota Entomology, Fisheries, Wildlife Library and in the University of Minnesota St. Paul Campus Central Library. These exceptions are noted as "EFW" and "SPCL."

Xerox copies or loans of publications indexed are available from the Interlibrary Loan Division, St. Paul Campus Libraries, 1984 Buford Ave., St. Paul, MN 55108.

It is our hope that this bibliography will prove a useful tool in the complex task of recreational land use management.

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- American Motorcyclist Association, 1982. Trail riding in America: A guide to recreational off-road riding. Edited by William D. Laichas and Thomas M. McFarlane. Cincinnati, Ohio, Directions Marketing Co., Inc. 128 pp. [Pamphlet file]
Includes a chapter on "Trail riding and the environment." Also includes information on ORV legislation for each state.
- Bennett, Shaun, 1973. A trail rider's guide to the environment. Westerville, Ohio, American Motorcycle Association. 60 pp. [Pamphlet file]
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Discusses environmental damage caused by ORVs in the national parks and calls for government action to stop it.

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A study of off-road vehicles in California and the problems associated with them. Recommends public land management which would balance the needs of ORV recreationists with the needs of non-motorized recreationists. (pp. 1, 3)
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[Pamphlet file]
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Conclusion: "the best management approach is to close all salt marsh and tidal habitats to vehicle use." (p. 22)
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- Sparrow, S. D. et al., 1978. Effects of off-road vehicle traffic on soils and vegetation in the Denali Highway region of Alaska. J. Soil and Water Cons. 33:20-27. [Pamphlet file]
- Walejko, R. N. et al., 1973. Effect of snowmobile traffic on alfalfa. J. Soil and Water Cons. 28:272-273. [SPCL]
- Wanek, Wallace J., 1971. Snowmobiling impact on vegetation, temperatures and soil microbes. In: Snowmobile and Off the Road Vehicle Research Symposium, 1971, Proc., pp. 117-130. [796.9/Sn65]
 The author concludes that the impact of snowmobiles appears to be greater on forest communities than on open areas. (p. 127)
- Wanek, Wallace J., 1971. A study of the impact of snowmobiling on northern Minnesota ecology. (Preliminary report, Mar. 1, 1971) Bemidji State College, Center for Environmental Studies. 24 pp. [MN6560/Misc.1971]
 Primarily a study of the effects of snowmobiling on plant communities. The 1971/72 report states that one aspect of the research was using a power line right of way "for studying the effectiveness of snowmobiles as agents of vegetation control." (p. 3)
 Reports are also available for 1972-1975.
- Webb, Robert H. et al., 1983. Natural recovery of soils and vegetation following human disturbance. In: Webb, R. H. and H. G. Wilshire, Environmental effects of off-road vehicles, pp. 279-302. [QH545.A43E58/1983]
 "Recovery of desert soils and vegetation from land use such as ORV activity will require at least decades and probably centuries." (p. 297)
- Whittaker, James C. and Dennis S. Wentworth, 1971. Impact of snowmobiling on vegetation. In: Snowmobile and Off the Road Vehicle Research Symposium, 1971, Proc., pp. 142-146. [796.9/Sn65]
 Results were inconclusive but seemed to suggest that compaction from snowmobiles "may cause diminished yields per acre from forage grass fields." (p. 144)
- Whittaker, James C. and Dennis S. Wentworth, 1972. Snowmobile compaction and forage grass yields in Maine. Maine Life Sci. and Agr. Exp. Sta., Misc. Rep. 143. 3 pp. [MA1000/MIR-143]
- Wilshire, H. G. et al., 1978. Impacts of off-road vehicles on vegetation. North Amer. Wildlife and Nat. Res. Conf., Trans. 43:131-139. [Pamphlet file]

Wilshire, H. G. et al., 1978. Impacts of vehicles on natural terrain at seven sites in the San Francisco Bay Area. Environ. Geol. 2:295-319. [Pamphlet file]

The impacts of ORVs on both vegetation and soil were investigated.

Wooding, Frank J. and Stephen D. Sparrow, 1979. An assessment of damage caused by off-road vehicle traffic on subarctic tundra in the Denali Highway area of Alaska. In: Recreational Impact on Wildlands, Seattle, 1978, Conf. Proc., pp. 89-93. U.S. For. Serv., Region 6, R-6-001.

"All ORV traffic causes some injury to the tundra vegetation." The degree of injury depends on the amount of traffic, plant habitat type, and soil stability properties. (p. 89)

Zoltai, S. C., 1976. Voyageur air cushion vehicle trials on the Mackenzie Delta: Environmental effects two years later. Northern For. Res. Cent., Inf. Rep. NOR-X-146. 23 pp.

Reports on a series of tests conducted with an ACV "to assess the impact of multiple passes on the terrain, vegetation, and avifauna under Low Arctic conditions." (p. 1)

Effects on Soil

- Baccus, John T. and Jack K. Horton, 1980. Studies of the relation between vehicle traffic and biotic and sedimentary processes at Padre Island National Seashore. In: Conf. on Sci. Res. in the Nat. Parks, 2d, 1979, Proc. 9:307-346. [Q500.973/C76/2nd/v.9]
- Bridge, Galen S., 1980. Off-road vehicles' (ORV) impact on soil and water conservation measures installed by the Soil Conservation Service (SCS) and its cooperators. In: Andrews, R. N. L. and P. F. Nowak. Off-road vehicle use: A management challenge, pp. 176-182.
- Crozier, M. J. et al., 1978. Off-road vehicle recreation: The impact of off-road motorcycles on soil and vegetation conditions. New Zealand Geography Conference, 9th, 1977, Proc., pp. 76-79. [Pamphlet file]
- Davidson, Eric and Martha Fox, 1974. Effects of off-road motorcycle activity on Mojave Desert vegetation and soil. Madrono 22:381-390. [Pamphlet file]
"The effect of motorcycle disturbance on the vegetation and soil is due to running over plants and disruption and compaction of surface soil." (p. 381)
- Della-Moretta, Leonard B. and Henry C. Hodges, 1983. Off-highway tire/road damage and healing mechanisms. U.S. For. Serv., Equip. Dev. Center, Project Record 8371 1202. 9 pp.
- Eckert, R. E., Jr. et al., 1979. Impacts of off-road vehicles on infiltration and sediment production of two desert soils. J. Range Management 32:394-397.
- Gillette, Dale A. and John Adams, 1983. Accelerated wind erosion and prediction of rates. In: Webb, R. H. and H. G. Wilshire, Environmental effects of off-road vehicles, pp. 97-109. [QH545.A43E58/1983]
"Soils disturbed by ORVs may be subject to wind erosion where they were resistant before disturbance." (p. 97)
- Heede, Burchard H., 1983. Control of rills and gullies in off-road vehicle traffic areas. In: Webb, R. H. and H. G. Wilshire. Environmental effects of off-road vehicles, pp. 245-264. [QH545.A43E58/1983]
"In most desert environments, ORVs can cause plant and surface soil destruction that leads to ... erosion." (p. 262)
- Hinckley, Bern S. et al., 1983. Accelerated water erosion in ORV-use areas. In: Webb, R. H. and H. G. Wilshire. Environmental effects of off-road vehicles, pp. 81-96. [QH545.A43E58/1983]
"Off-road vehicle activity on arid landscapes nearly always results in greatly increased erosion." (p. 92)
- Ingelög, Torleif et al., 1977. Effekter av langvarigt tramp och fordonskörning pa mark, vegetation och vissa markdjur i ett äldre tallbestand. (Effects of long-term trampling and vehicle-driving on soil, vegetation, and certain soil animals of an old Scots pine stand.) Stockholm, Skogshögskolan, Inst.

- Kay, Jeanne and students, 1981. Evaluating environmental impacts of off-road vehicles. *Journal of Geography* 80(1):10-18. [Pamphlet file]
- Lacey, R. M. and H. E. Balbach, 1980. Evaluation of areas for off-road recreational motorcycle use. Vol. II: Alternate soil suitability determination methods. Champaign, IL, U.S. Army, Construction Engineering Research Laboratory, Tech. Rep. N-86 . 52 pp.
- Leatherman, Stephen P., 1979. Effects of off-road vehicles on the geomorphology of dunes in Cape Cod National Seashore. In: Conf. on Sci. Res. in the Nat. Parks, 1st, 1976, Proc. 2:1119-1124. [500.973/C76/v.2]
- Leininger, Wayne C. and Gene F. Payne, n.d. The effects of off-road vehicle travel on rangeland in southeastern Montana. Montana Agr. Expt. Station, Res. Rep. 153. 47 pp.]MT1000/RR-153]
- Nakata, John K., 1983. Off-road vehicular destabilization of hill slopes: The major contributing factor to destructive debris flows in Ogden, Utah, 1979. In: Webb, R. H. and H. G. Wilshire. Environmental effects of off-road vehicles, pp. 343-353. [QH545.A43E58/1983]
- Niedoroda, A., 1975. The geomorphologic effects of off-road vehicles on coastal systems of Cape Cod, Massachusetts. National Park Service Cooperative Research Unit and Univ. of Massachusetts Institute for Man and Environment, UM-NPSCRU Report no. 17. 99 pp. + refs. [ME3260/R-17]
- Payne, Gene F. et al., 1983. Vehicle impacts on Northern Great Plains range vegetation. *J. Range Mgt.* 36:327-331.
There were two primary objectives of this study: (1) to "determine the effects of vehicle impacts on soil and vegetation" and (2) to "evaluate photography as a means of identifying vehicle impact." (p. 327)
- Runge, F. D., 1976. The impact of off road vehicles on soil and water conservation. In: National Symposium on Off-Road Vehicles in Australia, Canberra, 1976, Proc., pp. 200-202. [Q388.3/N213]
- Snyder, C. T. et al., 1976. Effects of off-road vehicle use on the hydrology and landscape of arid environments in central and southern California. U.S. Geological Survey, Water-Resources Investigations 76-99. 45 pp.
"Compaction of soils and reduction of permeability appears to be the most serious hydrologic impact of motorcycle use...." (p. 1)
- Sparrow, S. D. et al., 1978. Effects of off-road vehicle traffic on soils and vegetation in the Denali Highway region of Alaska. *J. Soil and Water Cons.* 33(1):20-27. [Pamphlet file]
- Stull, Robert et al., 1979. Effects of off-road vehicles in Ballinger Canyon. *California Geology* 7:19-21 [Pamphlet file]
Gives estimates of soil loss resulting from ORV use.
- Voorhees, W. B. et al., 1978. Compaction and soil structure modification by wheel traffic in the northern Corn Belt. *Soil Sci Soc. Amer. J.*

- Wanek, Wallace J., 1971. Snowmobiling impact on vegetation, temperatures and soil microbes. In: Snowmobile and Off the Road Vehicle Research Symposium, 1971, Proc., pp. 117-130. [796.9/Sn65]
The author concludes that snowmobile impact seems to be greater on soil in forest communities as compared to open areas. (p. 127)
- Webb, Robert H., 1983. Compaction of desert soils by off-road vehicles. In: Webb, R. H. and H. G. Wilshire. Environmental effects of off-road vehicles, pp. 51-79. [QH545.A43E58/1983]
- Webb, Robert H. et al., 1978. Environmental effects of soil property changes with off-road vehicle use. Environmental Management 2: 219-233.
Property changes caused by ORVs "increase the erosion potential of the soil, impede germination of seedlings, and slow natural revegetation." (p. 219)
- Webb, Robert H. et al., 1983. Natural recovery of soils and vegetation following human disturbance. In: Webb, R. H. and H. G. Wilshire. Environmental effects of off-road vehicles, pp. 279-302. [QH545.A43E58/1983]
"Recovery of desert soils and vegetation from land use such as ORV activity will require at least decades and probably centuries." (p. 297)
- Webb, Robert H., 1982. Off-road motorcycle effects on a desert soil. Environmental Conservation 9:197-208. [Pamphlet file]
- Wilshire, H. G., 1983. The impact of vehicles on desert soil stabilizers. In: Webb, R. H. and H. G. Wilshire. Environmental effects of off-road vehicles, pp. 31-50. [QH545.A43E58/1983]
Author concludes that "all of the principal natural soil-protective elements in the desert are highly vulnerable to vehicle use." (p. 45)
- Wilshire, H. G. et al., 1978. Impacts of vehicles on natural terrain at seven sites in the San Francisco Bay Area. Environmental Geology 2:295-319. [Pamphlet file]
- Wilshire, H. G., 1979? Physical effects of recreational off-road vehicles and soil conservation. In: H.C.R.S. Planning for trail-bike recreation, pp. 63-66.
- Wood, Garnet, 1974. Soil analysis and use interpretation of soil capability on the Allegheny National Forest. U.S. For. Serv., Eastern Region. 11 pp. + tables and maps. (Cover title: Soil analysis and use interpretation for off-road travel).

Effects on Wildlife

- Adams, Evelyn S., 1975. Effects of lead and hydrocarbons from snowmobile exhaust on brook trout (Salvelinus fontinalis). Amer. Fish. Soc. Trans. 104:363-373. [Pamphlet file]
"Stamina, as measured by the ability to swim against a current, was significantly less in trout exposed to snowmobile exhaust than in control fish." (p. 363)
- Baldwin, Malcolm F. and Dan H. Stoddard, 1974. ORVs and wildlife: A scientific survey. ORV Monitor, Dec., 1974, pp. 7-8.
Excerpts from the authors' book "The Off-Road Vehicle and Environmental Quality."
- Baldwin, Malcolm F. and Dan H. Stoddard, Jr., 1973. The off-road vehicle and environmental quality: An updated report on the social and environmental effects of off-road vehicles, particularly snowmobiles, with suggested policies for their control. Washington, D.C., Conservation Foundation, 2d ed. 61 pp. [Q388.3/B193/1973]
Recommendations are given relating to legislation, law enforcement, vehicle use zoning, and research needed to study the effects of ORVs on fish and wildlife. (pp. 42-46)
- Berry, Kristin H., 1980. A review of the effects of off-road vehicles on birds and other vertebrates. In: Management of Western Forests and Grasslands for Nongame Birds, Workshop Proceedings. U.S. For. Serv., Gen. Tech. Rep. INT-86, pp. 451-467.
A review of the literature on the effects of ORVs on birds, other vertebrates and on wildlife habitats.
- Blodget, Bradford G., 1978. The effect of off-road vehicles on least terns and other shorebirds. National Park Service Coop. Res. Unit and Univ. of Mass. Inst. for Man and Environment, UM-NPSCRU Report no. 26. 79 pp.
[ME3260/R-26]
- Blodget, Bradford G. and Dianne Smith, 1976. The effects of off-road recreational vehicles on shorebird populations. In: Conference on Scientific Research in the National Parks, 1st, Abstracts, p. 214.
[333.780973/C76]
- Bollinger, John G. et al., 1973. Snowmobile noise effects on wildlife: Report 1972-73. Submitted to the International Snowmobile Industry Association. University of Wisconsin Engineering Expt. Station. 85 pp. [EFW Library: WS3320/Misc.-R]
The authors concluded that "The effects of snowmobiles on white-tailed deer were not very evident during the winter of 1972-73." (p. 63)
- Bondello, Michael C. and Bayard H. Brattstrom, 1979? The effect of motorcycle sounds on the emergence of Couch's Spadefoot Toad, Scaphiopus couchi. U.S. Bur. of Land Management. Mimeo, 27 pp.
A study in the California Desert to determine whether ORV noise could induce toads to emerge from their burrows. Part I of a study entitled "The

experimental effects of off-road vehicle sounds on three species of desert vertebrates."

Bondello, Michael C. and Bayard H. Brattstrom, 1979? The effects of dune buggy sounds on behavioral hearing thresholds of desert kangaroo rats, Dipodomys deserti. U.S. Bur. of Land Mangement. Mimeo, 61 pp.
Reports on studies done in the California Desert. Concludes that "Indigenous sand dune inhabitants are unable to tolerate ORV impacts." (p. 1). Part III of a study entitled "The experimental effects of off-road vehicle sounds on three species of desert vertebrates."

Brattstrom, Bayard H. and Michael C. Bondello, 1983. Effects of off-road vehicle noise on desert vertebrates. In: Webb, R. H. and H. G. Wilshire, Environmental effects of off-road vehicles, pp. 167-206.
[QH545.A43E58/1983]
"Studies indicate that ORV activities in the California Desert represent disruptive and often destructive influences on the native wildlife of this region." (p. 202)

Bury, R. Bruce et al., 1977. Effects of off-road vehicles on vertebrates in the California Desert. U.S. Fish and Wildlife Service, Wildlife Research Report 8. 23 pp.
Examines the impact of ORVs on creosote shrub habitat and associated wildlife in the western California Desert.

Bury, R. Bruce, 1980. What we know and do not know about off-road vehicle impacts on wildlife. In: Andrews, R. N. L. and P. F. Nowak. Off-road vehicle use: A management challenge, pp. 110-122.
Review of the literature on ORV impacts on wildlife. The southwestern U.S. is emphasized.

Bury, Richard L., 1978. Impacts of snowmobiles on wildlife. North American Wildlife and Nat. Res. Conf. Trans. 43:149-156. [Pamphlet file]
Concludes that "The major effects of snowmobiles on wildlife appear to be in changes of the animals' daily routine, rather than direct mortality." (p. 150)

Busack, Stephen D. and R. Bruce Bury, 1974. Some effects of off-road vehicles and sheep grazing on lizard populations in the Mojave Desert. Biological Conservation 6:179-183. [Pamphlet file]
Authors conclude that "Prolonged subjection of desert lands to intensive grazing and vehicular damage may lead to long-term, perhaps irreparable, damage to the wildlife communities." (p. 182)

Doan, K. H., 1970. Effect of snowmobiles on fish and wildlife resources. International Assoc. of Game, Fish and Conservation Commissioners, Proc. 60:97-103. [EFW Library]

Doherty, James E., 1974. Shame on the snow. National Wildlife 12(2):28-29.
[Pamphlet file]

Dorrance, Michael J. et al. 1975. Effects of snowmobiles on white-tailed deer.

J. Wildl. Manage. 39:563-569. [Pamphlet file]

Eckstein, Ronald G. et al., 1979. Snowmobile effects on movements of white-tailed deer: A case study. Environmental Conservation 6:45-51. [Pamphlet file]

The authors recommend that "snowmobile trails be routed away from areas where deer concentrate during the winter...." The authors conclude, however, that "so far as any effect on White-tailed Deer is concerned, the environment is not very seriously changed by the advent of snowmobiles." (p. 51)

Hicks, Donn et al., 1976. Impacts of Barstow-Las Vegas Motorcycle Race on wildlife habitat. U.S. Bur. of Land Management. Mimeo, 46 pp. Concludes that ORV activity causes reduction in animal density and a reduction in productivity and habitat quality of desert ecosystems. (p. 13)

Huff, Dan E. et al., 1972. Wildlife-snowmobile interaction project; preliminary report covering period November 1971-April 1972. University of Minnesota and Minnesota Dept. of Natural Resources cooperating. 34 pp. [MN8520/Misc.1972]

Two study areas were chosen for the comparison of deer movement patterns in areas protected from snowmobile activity with those where snowmobile use was heavy. (p. 1)

Jarvinen, Julie A. and William D. Schmid, 1971. Snowmobile use and winter mortality of small mammals. In: Snowmobile and Off the Road Vehicle Research Symposium, 1971, Proceedings, pp. 131-141. [796.9/Sn65] Mechanical compaction of snowfields by snowmobiles "can produce a stress upon subnivean organisms and thereby increase winter mortality rates." (p. 131).

Kopischke, Earl D., 1972. Effects of snowmobile activity on the distribution of white-tailed deer in south-central Minnesota, 1971-72. Minnesota Game Research Quarterly Progress Reports 32(3):139-146. [EFW Library]

Lazan, Gil, 1969. The thrill killers. Amer. For. 75(5):6-7, 36. Reports that at least 45 deer were killed by snowmobiles in Minnesota in the winter of 1969.

Luckenbach, Roger A., 1978. An analysis of off-road vehicle use on desert avifaunas. North Amer. Wildlife and Nat. Res. Conf. Trans. 43:157-162. [Pamphlet file] Conclusion: Very few studies exist on the effects of ORVs on desert birds. "What data exist show convincingly the detrimental ... impact on birds." (p. 161)

McCool, Stephen F., 1978. Snowmobiles, animals, and man: Interactions and management issues. North Amer. Wildlife and Nat. Res. Conf. Trans. 43:140-148. [Pamphlet file] "The snowmobile's presence in wildland landscapes has generated numerous conflicts, impacts, and issues that remain unresolved." (p. 140)

- Neil, P. H. et al., 1975. Effects of harassment on wild animals - an annotated bibliography of selected references. Colorado Division of Wildlife, Special Report no. 37. 21 pp. [EFW Library: C07430/SR-37]
Includes a section on off-road vehicles.
- Neumann, Peter W. and H. Gray Merriam, 1972. Ecological effects of snowmobiles. Canadian Field Naturalist 86:207-212. [Pamphlet file]
- Rennison, David C. and Allan K. Wallace, 1976. The extent of acoustic influence of off-road vehicles in wilderness areas. In: National Symposium on Off-Road Vehicles in Australia, Canberra, 1976, Proc., pp. 169-183. [Q388.3/N213]
- Richens, Voit B. and Gerald R. Lavigne, 1978. Response of white-tailed deer to snowmobiles and snowmobile trails in Maine. Canadian Field-Naturalist 92:334-344. [Pamphlet file]
The authors conclude that "Deer management could be enhanced by use of snowmobiles." (p. 334)
- Schmid, William D., 1971? Compaction of the subnivean environment by snowmobiles. Mimeo, 8 pp. + figures. [Pamphlet file]
"Mechanical compaction of snowfields by snowmobiles destroys the mild subnivean microclimate important to the winter survival of small mammals."
(p. 2)
- Schmid, William D., 1971. Modification of the subnivean microclimate by snowmobiles. In: Snow and Ice in Relation to Wildlife & Recreation Symposium, Ames, Iowa, 1971, Proc., pp. 251-257. [591.6/Sn61]
"Compaction of snowfields by snowmobiles alters the mild subnivean microclimate and promotes densification of snow. The stress of winter temperatures may increase for organisms that live within or beneath these compacted snowfields." (p. 251)
- Soom, Andres et al., 1972. Studying the effects of snowmobile noise on wildlife. In: Inter-Noise 72 Proceedings, pp. 236-241. [Pamphlet file]
The presence of snowmobiles did not cause animals to leave areas which they normally inhabited but it "did appear to increase animal movements within and near their normal home ranges." (p. 241)
- Wheeler, Nancy R., 1976. Effects of the predator Polinices duplicatus (Gastropoda) and off-road vehicles on the Mya arenaria (Pelecypoda) population in Hatches Harbor, Cape Cod National Seashore, Massachusetts. In: Conference on Scientific Research in the National Parks, 1st, Abstracts, p. 213. [333.780973/C76]

Effects on Other Recreationists

- Allan, Nigel J. R., 1975. Man, machine and snow: A study of recreationists' landscape perceptions. Syracuse University, Dept. of Geog., Discussion Paper Series no. 2. 20 pp. [NO4740/Misc.1975]
Concludes that winter recreationists prefer separate user zones.
Recommends that to avoid conflicts between snowmobilers and skiers "it may be necessary for the U.S. Forest Service to ... zone land for separate user activities." (p. 17)
- Badaracco, Robert J., 1976. Conflicts between off-road vehicle enthusiasts and other outdoor recreationists - the ISD Syndrome. Presented at the Southern California Acad. of Sciences Symposium on Social, Recreational, and Environmental Impacts of Off-Road Vehicles, Santa Barbara, Calif., 1976. 24 pp. + references. [Pamphlet file]
The "Impairment-Suppression-Displacement" or "ISD Syndrome" is defined as a process whereby land managers manage for the more aggressive ORV users, thus displacing non-mechanized users.
- Badaracco, Robert J., 1976. ORVs: Often rough on visitors. Parks and Recreation 11(9):32-34, 68-75.
Deals with conflicts between non-mechanized and mechanized recreationists. Part 1 is a literature review of research and studies concerning these conflicts. Part 2 is "an analysis of related underlying factors and implications." (p. 33)
- Briggs, Phillip C., 1979? The dirtbike as a form of outdoor recreation. In: H.C.R.S., Planning for Trailbike Recreation, pp. 32-36.
Conflicts between ORV users and nonusers cause a major problem for ORV managers.
- Coggeshall, Almy D. and Harry N. Roberts, n.d. Snowmobiles and ski touring: A study in recreational conflicts. Rotterdam Junction, N.Y., Eastern New York Ski Touring Assoc. 6 pp. [Pamphlet file]
- Davis, W. S., 1975. Is a skiing-snowmobile compatibility possible? Forest Notes 121:5.
- Falk, Jonathan, 1976. Ski-touring vs. snowmobiling. In: Backcountry management in the White Mountains of New Hampshire. Yale Univ., Sch. of For. and Env. Stud., Working Paper no. 2, pp. 76-84.
- Genereaux, John and Michele Genereaux, 1983. The use of three-wheel vehicles on snowmobile trails in Minnesota: Results of a survey of landowners on grants-in-aid snowmobile trails. 24 pp. + app. [MN8520/Misc.1983]
- Grandage, Jim, 1976. The bushwalker's viewpoint on off-road vehicles. In: National Symposium on Off-Road Vehicles in Australia, Canberra, 1976, Proc., pp. 129-138. [Q388.3/N213]
Discusses the conflict between off-road vehicles and bushwalkers.
- Harrison, Robin T. et al., 1980. Predicting impact of noise on recreationists.

- U.S. For. Serv., ED&T Project no. 2688. 32 pp. + appendices.
- Harrison, Robin T., 1979. Predicting off-road vehicle acoustic impact on forest recreation - a simplified method. In: Recreational Impact on Wildlands, Seattle, 1978, Conf. Proc., pp. 120-137. U.S. For. Serv. Region 6, R-6-001.
Describes "a simplified mathematical model (Acoustic Impact Prediction Method) ... for the prediction of the impact of off-road vehicle noises on forest recreation situations." (p. 120)
- Harrison, Robin T., 1980. Predicting snowmobile acoustic impact on recreationists. U.S. For. Serv. Equip. Dev. Center, ED&T Project no. 9227. Project Record 8023 1204. 19 pp.
- Harrison, Robin T., 1979? Trailbike noise. In: H.C.R.S., Planning for Trailbike Recreation, pp. 29-32.
Land use planners must deal with two major facets of conflict revolving around trailbike noise: (1) The use of trailbikes around noise sensitive areas, and (2) Encounters between motorized and non-motorized recreationists on trails. (p. 31)
- Jackson, Edgar L. and Robert A. G. Wong, 1982. Perceived conflict between urban cross-country skiers and snowmobilers in Alberta. J. Leis. Res. 14:47-62.
- Jacob, Gerald R., 1978. Conflict in outdoor recreation: A bibliography of relevant literature. Utah State University, Dept. of For. and Outdoor Rec., Inst. for Outdoor Rec. and Tourism. 22 pp. [UT3140/Misc.1978]
- Keith, John E., 1980. Snowmobiling and cross-country skiing conflicts in Utah: Some initial research results. In: North American Symposium on Dispersed Winter Recreation, St. Paul, 1980, Proc., pp. 154-160. Univ. of Minn., Off. of Spec. Prog., Educ. Ser. 2-3. [MN2020/ES-2-3]
- Kemsley, William, 1980. ORV user conflicts. In: Andrews, R. N. L. and P. F. Nowak, Off-road vehicle use: A management challenge, pp. 234-238.
The author is editor of Backpacker magazine.
- Knopp, Timothy B. and John D. Tyger, 1973. A study of conflict in recreational land use: Snowmobiling vs. ski-touring. J. Leis. Res. 5(3):6-17.
- Lindsay, John J., 1974. Outdoor recreation conflict in Vermont, 1973. Univ. of Vermont, Sch. of Nat. Res., Rec. Man. Prog., Res. Rep. SNR-RM2. 46 pp. [VE3280/RR-2]
"The study objectives were to determine the extent and cause of outdoor recreation conflicts in Vermont." According to a survey, snowmobilers caused the greatest amount of conflict. (Summary)
- Lindsay, John J., 1976. Snowmobiling in Vermont, 1975. Univ. of Vermont, Sch. of Nat. Res., Rec. Man. Prog., Res. Rep. SNR-RM3. 23 pp. [VE3280/RR-3]
One of the objectives of the study was to "explore the causes and possible solutions to outdoor recreation conflict caused by snowmobiling activity." (p. iii)

- Lindsay, John J., 1980. Trends in outdoor recreation activity conflicts. In: Proc. 1980 National Outdoor Recreation Trends Symposium 1:215-221. U.S. For. Serv., Gen. Tech. Rep. NE-57.
One of the major causes of outdoor recreation conflicts "is the difference in perception, attitude and behavior between motorized and pedestrian users of recreation environments." (p. 216)
- Lindsay, John J. and Charles P. Ciali, 1978. Vermont trail bike study. Univ. of Vermont, Sch. of Nat. Res., Rec. Man. Prog., Res. Rep. SNR-RM5. 31 pp. [VE3280/RR-5]
Recommendations are made to control conflicts associated with trail bike riding.
- McCool, Stephen F. and Brian Curtis, 1980. Sources of conflict among winter recreationists. In: North American Symposium on Dispersed Winter Recreation, St. Paul, 1980, Proc., pp. 73-77. Univ. of Minn., Off. of Spec. Prog., Educ. Ser. 2-3. [MN2020/ES-2-3]
Discussion of conflicts between Nordic skiers and snowmobilers.
- Muntz, E. P. et al., 1972. Public lands and off-road motorized recreation. Univ. of Southern California, Environmental Engineering Programs. 18 pp. [CA4000/Misc.1972]
Reports on a study measuring the comparative impact on the forest environment of hikers and machines.
- Nash, A. E. Keir, 1980. Nature aesthetics, the public interest, and ORV users' perspectives. In: Andrews, R. N. L. and P. F. Nowak, Off-road vehicle use: A management challenge, pp. 12-77.
The author states in his conclusion that his "central purpose ... has been to argue that in framing and implementing ORV use policies as much attention should be given to the social-psychological costs and benefits as to the ecological costs." (p. 72)
- Noe, F. P. et al., 1982. Normative response and norm activation among ORV users within a seashore environment. Leisure Sciences 5:127-142.
A study of conflicts between pedestrians and motorized recreationists at Cape Hatteras National Seashore.
- Noe, F. P. et al., 1982. Perception of conflict between off-road vehicle and non off-road vehicle users in a leisure setting. J. Environmental Systems 11:223-233. [Pamphlet file]
- Parker, Francis J., 1975. No place to hide? Forest Notes 121:10-12.
- Petrie, Brian M., 1972. The snowmobile and all-terrain vehicle as a generator of social conflict in Canada: A speculative approach. In: Conference on Snowmobiles and All-Terrain Vehicles, London, Ontario, 1971, Proc., pp. 5-10. [Q343.0946/C76]
- Rennison, David C. and Allan K. Wallace, 1976. The extent of acoustic influence of off-road vehicles in wilderness areas. In: National Symposium on Off-Road Vehicles in Australia, Canberra, 1976, Proc., pp. 169-183.

Wellman, J. Douglas and Gregory J. Buhyoff, 1979? Off-road vehicle use and social conflict at Cape Hatteras National Seashore. Final report prepared for Chief Scientist, Southeast Region, National Park Service. 156 pp.

Management - Policy

- American Motorcyclist Association, n.d. Motorcycling on public lands. 2 pp.
[Pamphlet file]
- Andrews, Richard N. L. and Paul F. Nowak, Editors, 1980. Off-road vehicle use: A management challenge. Sponsored by Office of Environmental Quality, U.S. Dept. of Agriculture; School of Natural Resources, University of Michigan; and University of Michigan Extension Service. 348 pp.
A major purpose of the conference was to examine USDA's implementation of Executive Orders 11644 and 11989 and "to provide a basis for more effective ORV management." (foreword)
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- U.S. Bureau of Land Management, 1974. Final environmental statement: Barstow to Las Vegas Hare and Hound Motorcycle Race. Sacramento, California State Office, BLM. Various pagings.

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