

# Vermont Trail Collaborative

## Final Report

October 14, 2011

### Table of Contents

Background on the Vermont Trail Collaborative .....	2
Accomplishments of the Vermont Trail Collaborative and Work Groups .....	4
Appendix A: Vermont Trail Collaborative Participants .....	6
Appendix B: Final Report from the Science Panel.....	8
Appendix C: Final Report from the Stewardship and Communication Work Group .....	15
Appendix D: Draft Report from the Landscape Management Work Group .....	17

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## **Background on the Vermont Trail Collaborative**

The Vermont Trail Collaborative was established in 2009 to improve management and sustainability of trails and trail-related recreation on the Green Mountain National Forest (GMNF) and throughout Vermont. The collaborative goals, principles and structure are outlined in the Collaborative Planning Process Proposal dated September 3, 2009, available online at <http://www.uvm.edu/tourismresearch/trails>. The Vermont Trail Collaborative is an open forum with in-person meetings that occurred twice a year between 2009 and 2011, and three working groups with meetings that occurred more often.

This report summarizes the accomplishments of each work group, outlines the tasks that remain for the duration of the Vermont Trail Collaborative process, and gives direction to efforts moving forward after the initial collaborative process is completed in 2011.

### **Goals:<sup>1</sup>**

Establish a collaborative process to improve management of trails and recreation in the Green Mountain National Forest and throughout Vermont. Complete the formal collaborative process within two years (spring 2011). Success is defined by each member of the collaborative agreeing that:

- 1) The process has made a substantial contribution to the betterment of social and biological health in the region.
- 2) The trail system is more sustainable today than it was two years ago and this will continue into the foreseeable future.
- 3) Our understanding of and application of science to trail and recreation management has improved.
- 4) We have empowered local or regional groups to continue making progress.

### **Principles:<sup>1</sup>**

- Focus on common values while working to resolve issues that can only be dealt with at a larger scale (e.g., addressing social conflicts and perceived equity among various types of trail recreation, mitigating landscape level effects to wildlife and important habitats, quantifying possible cumulative effects to soil/water/air, identifying common priorities and strategies for user compliance and education, identifying/agreeing upon common maintenance practices or standards, etc.) while engaging and empowering local place-based groups, communities and citizens to resolve issues that are site-specific.
- Engage groups and individuals that represent the diversity of views, interests and demographics. Include individuals who are creative or civic leaders that may not belong to a particular interest group and are leaders in their communities, arts, schools, etc. Include youth.
- Make process transparent and invite participation early, often and throughout. Follow Federal Advisory Committee Act requirements by ensuring all meetings are advertised and open to the public. Use technology effectively to unify, build trust and be open and transparent.
- Incorporate best available science that is relevant to this particular landscape. Include science in the process itself, social sciences and physical or biological sciences. Focus on a few key priorities to expand or create 'new' science, as necessary, appropriate, and feasible.
- Utilize an 'adaptive' approach (i.e., don't try to answer all questions, or resolve all conflicts, for all time). Make agreed upon changes that will substantially improve the current situation over the next 10-15 years.

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<sup>1</sup> From the Collaborative Planning Process Proposal online at <http://www.uvm.edu/tourismresearch/trails>

- Based on common, shared information from the collaborative, each landowner or trail manager will make decisions that it deems appropriate, using methods it deems are appropriate. Any ‘sideboards’ that landowners and governments have should be made known.

## **Accomplishments of the Vermont Trail Collaborative and Work Groups**

**Vermont Trail Collaborative** – The collaborative included at least one representative from each group/organization that wanted to participate and were willing and interested in volunteering their time over the course of two years. This group met two times in 2009, two times in 2010, and once in 2011 to review work group accomplishments and provide feedback. Appendix A contains a list of participants.

**Steering Committee** - Consisted of the overall facilitator for the effort (UVM Extension), government leaders (i.e., Federal agencies, State agencies), a member of a Regional Planning Commission to represent municipal and regional planning perspectives, a representative of the Vermont Trails and Greenways Council, and facilitators of work groups. The steering committee met monthly via conference call to coordinate the collaborative process and consult on policy or decision-making issues related to the process.

**Science Panel** - A panel of representatives from the research community and Vermont Trail Collaborative reviewed existing science and literature to determine those most relevant to trail management issues in this landscape. The panel produced an annotated bibliography prefaced by a summary of key findings and research needs (Appendix B). The document was compiled to address the need for a review of current research related to trails and recreation on the Green Mountain National Forest and other areas of Vermont. A wide variety of environmental and social impacts from forest-based recreation are documented in the literature, including those related to soil erosion and trail degradation; vegetation; water and air quality; noise; wildlife and fish; and social conflicts among different types of recreation user groups. Citations were gathered through a literature review of published research reports and peer-reviewed scholarly writing, and from a review of internet sources. The document contains research that spans a wide variety of types of research including studies reported in peer-reviewed journals as well as literature published without peer-review, through organizations and agencies.

Key findings from this process are that social and ecological impacts result from outdoor recreation and the degree of these impacts varies across different types of recreation and settings. Some of these impacts can be mitigated by proper trail design, management, zoning and education of users. Several topics related to recreational trail use need more study in Vermont. High priority research needs are listed below, not in order of priority:

- User-caused noise in recreation settings
- Effects of recreation on soil and vegetation
- Effects of non-motorized winter activities and the potential for conflict with other types of users
- Effects of snowmobiles on air quality
- Effects of motorized recreation including impacts to air and water quality, vegetation, soil, and wildlife

- Trail riding and pack stock effects on wildlife, trail erosion and spread of invasive species

Although these topics have been studied in other areas of the country, the effects of these uses are often localized making generalization difficult and requiring research efforts in Vermont and similar landscapes.

**Stewardship and Communication Work Group** - In collaboration with the Vermont Trails and Greenways Council, the Stewardship and Communication Work Group took the lead on a coordinated effort throughout the state to improve the educational and interpretive information available for trail users. The Stewardship and Communication Work Group performed outreach to 101 individuals via six public trail-user group meetings. The work-group also developed and administered a state-wide recreation and trail survey that reached over 10,000 individuals. These efforts were designed to provide mechanisms for public input with the purpose of generating stakeholder data and comments on the environmental and social sustainability of Vermont's trail resources. Data collection informed the creation of a trail safety and education message aimed at branding a Universal Trail Ethic in Vermont (Appendix C). The work-group agreed this was important because a universally accepted trail ethic that establishes a common set of behavior expectations across all trail user groups does not currently exist in Vermont. The resulting "Vermont Trail Ethic", a set of 10 guidelines aimed at enhancing trails experiences for all trail users in Vermont, was released by the Vermont Trails and Greenways Council for National Trails Day in June 2011. The Trail Ethic will unite all trail users, trail managers, and property owners who host public trails. The Vermont Trail Ethic is housed and available for download on the Vermont Trails and Greenways Council website: [www.vermonttrailsandgreenways.org](http://www.vermonttrailsandgreenways.org). For additional Information contact: Walter Opuszynski, Chair of the Vermont Trails and Greenways Council at: Office (802) 496-2285 x2, Cell (802) 498-4506, Email: [walter@northernforestcanoetrail.org](mailto:walter@northernforestcanoetrail.org).

**Landscape Management Work Group** – The Landscape Management Work Group evaluated ways to improve upon the overall existing trail system in the Green Mountain National Forest, surrounding areas, and throughout Vermont. The work group hosted a series of seven public information meetings in the spring and fall/winter 2010 focusing on the north zone (Pittsfield, Warren and Brandon) and south zone (Bennington, Weston, Manchester and Dover) of the Green Mountain National Forest and surrounding environs to explore trail-related management issues. The meetings' format provided participants the opportunity to interact with facilitators, each other, and trail managers and to provide input into future management of trails in areas of interest to them. The main objective for the meetings was to learn about local ideas, opportunities, or concerns associated with all types of trail use to help land and trail managers provide a more sustainable trails system, more consistent management across jurisdictions, and a better quality recreation experience for the public. The meetings were warmly received, bountifully attended, and produced copious local and regional input.

The general gist of the meeting information can be summarized as follows:

- Participants identified many opportunities to improve both connectivity and sustainability of the trails network.
- Participants expressed great appreciation for the locally available opportunity to meet, identify issues, and begin or continue collaborations among diverse interest groups.
- There was (surprisingly) little articulation of user conflicts.
- There was clearly articulated need for greater enforcement against illegal/unauthorized uses.

Actions and recommendations have been developed based on feedback provided at the public information meetings (Appendix D). Most recommendations are envisioned to be carried out by a state-wide Vermont Trails Coordinator – a newly created full time paid position to be funded by a consortium of agencies and organizations. The coordinator would work under the direction and guidance of the Vermont Trails and Greenways Council (VTGC) to achieve the desired objectives of this recommendations report, and be the keeper of all records, maps, and databases associated with their assigned work. The specific design and function of this position can be agreed to by the VTGC and contributing funders. Some potential scenarios to consider:

- The VTGC and representatives from the contributing funders, Regional Planning Commissions, and select trail organization(s) may act as council to the coordinator.
- The council may provide assistance for the development and implementation of the recommendations included in this report.
- The coordinator may solicit funding for part time staff.
- The coordinator may oversee Americorps position(s).

The report in Appendix D is still considered a draft until additional review by the Vermont Trails and Greenways Council and Vermont Trail Collaborative members. It is also anticipated to be augmented by similar information meetings to be held in the northwestern and northeastern portions of Vermont in spring 2012. More detailed information associated with this report can be found in the notes for each meeting, as well as on the maps used as part of the information gathering process.

## Appendix A

### Vermont Trail Collaborative Participants

Dick	Andrews	Sierra Club
Ray	Atwood	Cycle Conservation Club of Vermont
John	Bennett	Windham Regional Commission
Mike	Benoit	Vermont Horse Council
Tom	Berry	Senator Patrick Leahy
Doug	Blodgett	Vermont Fish and Wildlife Department
Tom	Butland	Green Mountain Plonkers
Lisa	Chase	UVM Extension
Tony	Clark	Moosalamoo Association
Jeannette	Cole	Vermont Horse Council
Brian	Cotterill	Facilitator
Daniel	Davis	Kingdom Trails
Don	Dickson	Sierra Club
Heidi	Fleury	Green Mountain Club
Dwight	Gies	Mad River Path Association
Jean	Haigh	Green Mountain Club
Danny	Hale	Vermont ATV Sportsman's Association (VASA)/ VT Trails & Greenways Council
Jim	Harding	Green Mountain College
Dave	Hardy	Green Mountain Club
Rees	Harris	Cycle Conservation Club of Vermont
Jeff	Harvey	
Jim	Henderson	Bennington County Regional Commission
Rob	Hoelscher	US Forest Service
Jessi	Hudson	Vermont Association of Snow Travelers
Anthony	Iarrapino	Conservation Law Foundation
Patrick	Kell	Vermont Mountain Bike Association
Amy	Kelsey	Catamount Trail Association/ VT Trails & Greenways Council
Justin	Kenney	Vermont Youth Conservation Corps
Holly	Knox	US Forest Service
Colleen	Madrid	US Forest Service
Mark	Maghini	Fish and Wildlife Service
Jer	Marr	US Forest Service (now in a different state)
Mollie	Matteson	Center for Biological Diversity
Steve	McLeod	Vermont ATV Sportsman's Association (VASA)
Meg	Mitchell	US Forest Service (now in a different state)

Tom	Myers	Cycle Conservation Club of Vermont
Alexis	Nelson	Vermont Association of Snow Travelers/ VT Trails & Greenways Council
Ed	O'Leary	Vermont Department of Forests, Parks & Recreation
Walter	Opuszynski	Northern Forest Canoe Trail
Peter	Pettengill	University of Vermont
Kristi	Ponozzo	US Forest Service (no longer with the FS and now in Montana)
Melissa	Reichert	US Forest Service
Jessica	Ricketson	Vermont Department of Forests, Parks & Recreation
Clare	Rock	Central Vermont Regional Planning Commission
Sherry	Smecker Winnie	Vermont Department of Forests, Parks & Recreation
Frank	Stanley	Vermont ATV Sportsman's Association (VASA)
Jay	Strand	US Forest Service
Keegan	Tierney	Vermont Youth Conservation Corps
Tim	Tierney	Kingdom Trails
Bill	Valliere	UVM Vermont Tourism Data Center
Chad	Van Ormer	US Forest Service (now in a different state)
Jennifer	Waite	National Park Service Rivers & Trails Program
Kathleen	Wanner	Moosalamoo Association
Bryant	Watson	Vermont Association of Snow Travelers
Doug	Weber	Vermont Off Highway Vehicle Recreation Association (VORA)
Craig	Whipple	Vermont Department of Forests, Parks & Recreation
Jenna	Whitson	Green Mountain Club
Kathryn	Wrigley	Green Mountain Club

## Appendix B

### Final Report from the Science Panel

Complete final report from the Science Panel including annotated bibliography available at [http://www.uvm.edu/tourismresearch/trails/Annotated\\_bibliography\\_final.pdf](http://www.uvm.edu/tourismresearch/trails/Annotated_bibliography_final.pdf)

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## Executive Summary

The Science Panel Work Group of the Vermont Trail Collaborative compiled this document to address the need for a review of current research related to trails and recreation on the Green Mountain National Forest and other areas of Vermont. A wide variety of environmental and social impacts from forest-based recreation are documented in the literature, including those related to soil erosion and trail degradation; vegetation; water and air quality; noise; wildlife and fish; and social conflicts among different types of recreation user groups. Key findings from the literature review are summarized below, following by annotated bibliographies. Citations were gathered through a literature review of published research reports and peer-reviewed scholarly writing, and from a review of internet sources. Research contained in this document spans a wide variety of types of research including studies reported in peer-reviewed journals as well as literature published without peer-review, through organizations and agencies.

This document is a compilation of studies submitted by members of the Science Panel, the Vermont Trail Collaborative, and students from the Green Mountain College working under the supervision of Professor Jim Harding. Studies submitted were reviewed and organized by Bill Valliere, Research Specialist for the Park Studies Lab and Vermont Tourism Data Center at the University of Vermont. Many individuals with a variety of opinions and points of view contributed to this document, which is not meant to be interpreted as an expression of consensus. Rather, this document is a compilation of summary statements about scientific studies that are factual and accurately represent the research published.

For links to selected studies listed below, visit [www.uvm.edu/tourismresearch/science](http://www.uvm.edu/tourismresearch/science)

For more information on the Vermont Trail Collaborative, visit [www.uvm.edu/tourismresearch/trails](http://www.uvm.edu/tourismresearch/trails)

### *Key Findings*

- Social and ecological impacts result from outdoor recreation. The degree of these impacts varies across different types of recreation and setting.
- Ecological and social impacts of recreation can be mitigated by trail design and management, zoning and education of users.
- Recreation conflict is perceived to be increasing, due partially to new technologies, activities and equipment.
- User-caused noise in recreation settings negatively affects wildlife and the visitor experience at times. The physical and social aspects of visitor-caused noise are difficult to generalize from place to place, due to differences in geography and desired recreational experiences.
- A great deal of recreation research has focused on hiking and its impacts on resources and the visitor experience. Less is known about the effects of hiking on wildlife.
- Research on ecological impacts of mountain biking has mixed results. Some studies report impact from mountain bikes similar to impacts from hiking activity while others report greater ecological impact. Ecological impact is greatly affected by trail slope and construction, location, and intensity of use.
- A number of studies have been conducted in regards to impacts of motorized recreation. These include impacts to air and water quality, vegetation, soil, and wildlife. Findings suggest impacts are specific to the context of study. Motorized

forms of recreation typically have greater impacts on trails than non-motorized recreation.

- Sixteen of the twenty-five studies referenced below were either conducted in ecological or geographical zones not common to Vermont, or were conducted on trail systems not specifically managed for Off-Highway Vehicle (OHV) use. OHV use was allowed on all trail systems studied. These studies indicate negative environmental impacts of OHVs and concerns about user conflicts, and user-caused noise. OHV use can also have negative effects on wildlife, although some mammals (deer and big horn sheep, for example) may become habituated to these vehicles. The remaining publications were reviews of the literature, or statements about land management agency policies. While OHVs offer access to resource areas that are typically more remote, allowing access to these areas by individuals that may not otherwise have the ability to enjoy the outdoors, most studies do not support their use, especially in sensitive areas, not specifically designed and managed for such use.
- Most research on horseback riding and pack stock use has been conducted in the western United States. Studies on the ecological effects of stock use on trails generally conclude that stock use can have detrimental effects on trails and be a vector to spread invasive species.

### *Research Needs (not in order of priority)*

- More research on recreation conflict and displacement is needed regarding specific recreation uses, especially activities growing rapidly in popularity in Vermont such as mountain biking and OHV use.
- Research about user-caused noise in recreation settings is limited in scope. More research is needed in recreational settings of special interest in Vermont.
- The effects of recreation on soil and vegetation are greatly localized, making generalization difficult. There is a need to do this type of research in specific areas of interest in Vermont.
- More study of non-motorized winter activities is needed, particularly the effects of increasing use and the potential for conflict with other types of users.
- A recent study on the effects of snowmobiles on water quality has contributed much needed data. Additional study on the effects of snowmobiles on air and water quality is needed in Vermont to determine the localized effects from snowmobiles.
- More studies of the impacts of motorized recreation are needed in Vermont since most available studies have been conducted in different geographical zones. These studies should include impacts to air and water quality, vegetation, soil, and wildlife. Additionally, studies to determine the percentage of 2-stroke versus cleaner 4-stroke engines currently in use in Vermont should be conducted for both OHVs and snowmobiles. Finally, the number of users of OHVs and snowmobiles who would otherwise not be able to enjoy the outdoors should be determined.
- More study of trail riding and pack stock effects on wildlife, trail erosion and spread of invasive species may be warranted in Vermont, as this activity increases in popularity.

## *Recreation Conflict*

Conflict is often referred to as ‘goal interference’ in the context of recreation, i.e., when one individual’s or group’s recreational activities prevent the attainment of another individual’s or group’s recreational goals. Substantial recreation conflict between groups and activities has been found in outdoor recreation, and has been the subject of much research throughout the U.S. Recreation conflict may be increasing, in part, because of new technologies, activities and equipment. Studies have found that recreation conflict is related to many variables which include specific motivations for recreation, perceived similarity of groups or activities, level of experience, tolerance for sharing a resource and safety concerns. Zoning or separating recreation groups or activities can be effective in managing recreation conflict. The asymmetric or one-way nature of much recreation conflict suggests that management is needed to maintain a high quality experience for individuals who are sensitive to conflict. More research is needed regarding specific recreation uses, especially activities growing rapidly in popularity such as mountain biking and OHV use.

## *User-Caused Noise in Recreation Settings*

The issue of visitor-caused noise in outdoor recreational settings is a relatively new area of study. Research that is available looks at the effects of visitors-caused noise on wildlife and the experience of other visitors. Since this is a relatively new area of research, generalizations are difficult to make, and more research is needed in diverse recreational settings. The physical and social aspects of noise vary dramatically from place to place. Therefore, more research is necessary, particularly in areas of special interest, to determine how visitor-caused sound travels through the areas, and how that sound affects various types of users and wildlife in those areas.

## *Hiking*

A great deal of research has been done on the ecological effects hiking has on trails. This research generally takes the form of trampling studies in various types of soils and vegetation to determine how resistant and resilient different recreational areas are. Since soil and vegetation is greatly localized, generalization can be difficult. Therefore, there is a need to do this type of research in specific areas of interest.

Studies on the effects of hiking on wildlife are not as prevalent. The few studies that have been done show that some ungulates show a greater reaction (surprise) from this type of recreation than to some forms of motorized recreation, and they do not habituate to it.

A great deal of research has been done on the effects of increasing use of trails by hikers, and comprises an area of study called social carrying capacity. Frameworks for this research have been developed and are widely applied, primarily in summer conditions. Less is known about other times of year and other uses (i.e., snowshoeing and cross country skiing).

## *Non-Motorized Winter Trail Use*

There are few studies on the effects of non-motorized winter trail use on wildlife. The studies that have been done show that, like hiking, some ungulates show a greater reaction (surprise) from this type of recreation than to some forms of motorized recreation, and they do not habituate to it.

As mentioned above, a great deal of research has been done on the effects of increasing use of trails by hikers. Less is known about other times of year and other uses (i.e., snowshoeing and cross country skiing). Studies of both the ecological and social effects of these activities can be conducted using similar methods as studies about hiking. Carrying capacity frameworks can easily be adapted and applied to these forms of recreation, while new methods for winter ecology may need to be developed.

## *Mountain Bike Use*

Since mountain biking is a relatively new form of outdoor recreation, it has not been as well studied as hiking. However, there is a growing body of literature about this activity. Research on the ecological effects of mountain biking have often been comparative studies, comparing the effects of mountain bikes to the effects of hiking. This research seems to be inconclusive. Some studies report that mountain bikes cause greater trail erosion potential than hiking, while other studies indicate that the effects are similar. Two variables that seem to mitigate these effects are steepness of the trail studied and how the trail is constructed.

There are fewer studies of the social effects of mountain biking on other uses. Some reports of recreational conflict have been documented, both unidirectional and bidirectional. Studies report that zoning or user education can mitigate recreational conflict.

## *Snowmobile Use*

Several studies have been conducted, including a recent study in Vermont, to look at the effects of snowmobiling on snow pack runoff water quality. While a study in Yellowstone National Park showed concentrations of ammonium, nitrate, sulfate, benzene, and toluene in snow were positively correlated with snowmobile use, the recent Vermont study suggests that snowmobile use does not have significant impacts on the surface water quality in the vicinity of heavily used snowmobile trails. This apparent divergence of results may be due to the intensity of use in the Yellowstone region as compared to use in Vermont.

Studies of air quality often focus on the emission effects of snowmobile operation. Many of these studies have focused on the region in and around Yellowstone National Park. Findings from some studies suggest that emissions may exceed human health standards in some areas. More study is needed in the East to determine what the localized effects from snowmobiles might be. Further research is needed about the effects of snowmobile emissions on air quality. Recent studies on air quality examine the differences between older (2-stroke) engines versus newer (4-stroke) engines. Research of this type generally finds newer engines to produce fewer emissions than older engines. Research in Vermont should focus on the percentage of older (2-stroke) versus the newer (4-stroke) engines in use.

Most studies of the effects of motorized recreation on wildlife have taken place in Western habitats and have often focused on snowmobile use. Studies show that some wildlife species are negatively impacted by the presence of motorized recreation, although some mammals (deer, for example) may become habituated to these vehicles. Snow compaction from snowmobiles may also affect the survival and activities of small mammals. Studies of snowmobile impacts on wildlife in Eastern settings are limited.

Snowmobile use can conflict with non-motorized uses, such as snowshoeing and cross-country skiing. Additionally, noise and intrusion of the modern world into nature may compromise the enjoyment of some user groups. The numbers of snowmobilers, and their intensity of use, can reduce the positive experiences of other visitors, potentially resulting in displacement of the other users. It is unclear whether conflict between snowmobiles and other recreationists is unidirectional or bidirectional, and more research is needed.

### *Off-Highway Vehicle (OHV) Use*

The vast majority of studies indicate negative environmental impacts of OHVs and concerns about user conflicts, and user-caused noise. Sixteen of the twenty-five studies referenced below were either conducted in ecological or geographical zones not common to Vermont, or were conducted on trail systems not specifically managed for OHV use. More studies of the impacts of motorized recreation are needed in Vermont since most available studies have been conducted in different geographical zones. OHV use was allowed on all trail systems studied. In general, motorized forms of recreation have greater impacts on trails than non-motorized recreation. Research generally shows similar impacts across different types of motorized recreation. Differences in impacts across types of motorized recreation are often due to intensity of use.

Further research is needed about the effects of OHV emissions on air quality. More recent studies on air quality examine the differences between older (2-stroke) engines versus newer (4-stroke) engines. Research of this type generally finds newer engines to produce fewer emissions than older engines. Research in Vermont should focus on the percentage of older (2-stroke) versus the newer (4-stroke) engines in use.

Soil and vegetation studies are numerous in the literature. Soil compaction and the shear forces of motorized vehicles can alter hydrologic patterns and intensify erosion on trails where they are used. Many studies of this type have been done in the arid southwestern United States and in the West. More studies are needed to quantify the amount and extent of soil loss attributable to motorized recreation use in the Northeast.

OHV use has negative effects on wildlife. Most studies of the effects of motorized recreation on wildlife have taken place in Western habitats and, as mentioned above, have often focused on snowmobile use. Studies show that some wildlife species are negatively impacted by the presence of motorized recreation, although some mammals (deer and big horn sheep, for example) may become habituated to these vehicles. Studies of impacts from motorized recreation on wildlife in Eastern settings are limited. These types of studies should be conducted in Vermont.

While OHVs offer access to resource areas that are typically less accessible and more remote, allowing access to these areas by individuals that may not otherwise have the ability to enjoy the outdoors, this

type of use can conflict with non-motorized uses, such as hiking, wildlife photographers, birdwatchers, etc. While there are national standards for OHV's that have been accepted by the U.S. Forest Service, Bureau of Land Management, and by state and local land managers across the country, noise and intrusion of the modern world into nature may compromise the enjoyment of some user groups. More research is needed in this area. The numbers of motorized recreationists, and their intensity of use, can reduce the positive experiences of non-motorized visitors, potentially resulting in displacement of the non-motorized users. It is unclear whether conflict between motorized and non-motorized recreationists is unidirectional or bidirectional, and more research is needed. Research is also needed to estimate the prevalence of OHV users who are otherwise unable to enjoy the outdoors.

### *Horseback Riding and Pack Stock Use*

Most research on trail riding and pack stock use has been conducted in the western United States where stock use is more prevalent. Studies on the ecological effects of stock use on trails include effects on wildlife, trail erosion potential, and spread of invasive plant species. Studies generally conclude that stock use can have detrimental effects on trails and be a vector to spread invasive species. More study of trail riding and pack stock effects on wildlife, trail erosion and spread of invasive species may be warranted in Vermont, as this activity increases in popularity.

## **Appendix C**

### **Final Report from the Stewardship and Communication Work Group**

The Stewardship and Communication Work Group performed outreach to 101 individuals via six public trail-user group meetings. The work-group also developed and administered a state-wide recreation and trail survey that reached over 10,000 individuals. These efforts were designed to provide mechanisms for public input with the purpose of generating stakeholder data and comments on the environmental and social sustainability of Vermont's trail resources. Successful data collection informed the creation of a trail safety and education message aimed at branding a Universal Trail Ethic in Vermont. The work-group agreed this was important because a universally accepted trail ethic that establishes a common set of behavior expectations across all trail user groups does not currently exist in Vermont. For more specific details on the research, please visit:  
<http://www.uvm.edu/tourismresearch/trails/stewardshipandcommunicationreport.pdf>

Our research informed the creation of the Vermont Trail Ethic message and brand. This includes a trailhead sign containing ten behavioral trail use expectations and a stand-alone marketing logo. The logo and sign have emerged as the leading resources to deliver the proposed educational message. In addition, we anticipate that the data collected through this process may be useful in other recreation related planning applications.

It is important to note that the Vermont Trail Ethic trailhead sign and logo are not currently available for widespread use. While a .pdf of the trailhead sign is available for download at the Vermont Trails and Greenways Council website, the sign and logo have not been produced for mass distribution or marketing. The Vermont Trails and Greenways Council is currently housing the Trail Ethic. Next steps will address questions related to implementing more widespread use of the trailhead sign and logo as an educational resource by Trails organizations across the state.

# VERMONT

## TRAIL ETHIC

Help keep Vermont's recreation and trail resources healthy.

1. Know and respect the allowable use of the trail.
2. Respect other trail users.
3. Respect public and private landowners' property.
4. Use good judgment and tread lightly; trail conditions are subject to change at any time.
5. Stay on marked trails.
6. Respect natural resources, historic structures and wildlife.
7. Be prepared with food, water and first aid.
8. Pack out your trash.
9. Respect all trail closures.
10. Plan ahead, be safe and have fun.

Visit: [www.vermonttrailsandgreenways.org](http://www.vermonttrailsandgreenways.org) for more information

## Appendix D

### Draft Report from the Landscape Management Work Group

The following actions and recommendations have been developed through a series of public information meetings held in towns within and surrounding the Green Mountain National Forest in the spring and fall/winter 2010. The meetings were convened by the Vermont Trails Collaborative - Landscape Management Work Group (LMWG) - in collaboration with state-wide and local trail groups and Regional Planning Commissions, to elicit local and regional input focusing on six general topic areas. The meetings were warmly received, bountifully attended, and produced copious local and regional input.

The general gist of the meeting information can be summarized as follows:

- Participants identified many opportunities to improve both connectivity and sustainability of the trails network.
- Participants expressed great appreciation for the locally available opportunity to meet, identify issues, and begin or continue collaborations among diverse interest groups
- There was (surprisingly) little articulation of user conflicts.
- There was clearly articulated need for greater enforcement against illegal/unauthorized uses.

Most recommendations are envisioned to be carried out by a state-wide Vermont Trails Coordinator – a newly created full time paid position to be funded by a consortium of agencies and organizations. The coordinator would work under the direction and guidance of the Vermont Trails and Greenways Council (VTGC) to achieve the desired objectives of this recommendations report, and be the keeper of all records, maps, and databases associated with their assigned work. The specific design and function of this position can be agreed to by the VTGC and contributing funders. Some potential scenarios to consider:

- The VTGC and representatives from the contributing funders, Regional Planning Commissions, and select trail organization(s) may act as council to the coordinator.
- The council may provide assistance for the development and implementation of the recommendations included in this report.
- The coordinator may solicit funding for part time staff.
- The coordinator may oversee Americorps position(s).

This report, although final, is anticipated to be augmented by similar information meetings to be held in the northwestern and northeastern portions of Vermont in spring 2012. More detailed information associated with this report can be found in the notes for each meeting, as well as on the maps used as part of the information gathering process. The LMWG objectives relative to each issue preface the sets of related actions and implementation recommendations.

#### **Issue I. Trail Connectivity/Trails with Multiple Landowners**

##### Objectives:

1. Identify high priority state-wide or regionally important trails that transition across various landowners.

2. Determine priority trails for protection and management in perpetuity through identifying land interest acquisition (easements, fee, etc.) and/or management agreement priorities to protect against potential gaps or resolve existing gaps in the trail network.
3. Identify new opportunities to connect existing trail systems, segments and special features.

*Identified actions needed to meet objectives:*

- Continue to develop list of existing important trails at the state-wide, regional and/or local level. Trails information collected to date:
  - Important trails at the state-wide level
    - ✓ Appalachian and Long Trail systems
    - ✓ Catamount Trail
    - ✓ Snowmobile trail system managed by VAST
    - ✓ Northern Forest Canoe Trail
    - ✓ Rail Trails
  - Important trails at the regional level
    - ✓ West River Trail (x-country ski, hike, bike)
    - ✓ Mad River Path (x-country ski, hike, bike)
    - ✓ Mountain Valley Trail system (x-country ski)
    - ✓ Windmill Hill Pinnacle Association (WHPA) (ski, hike, bike)
- Continue to identify priority state-wide, regional and/or local existing trail segments that are in need of protection and management in perpetuity. Trail information collected to date:
  - Acquire land or obtain easement to protect Appalachian Trail in Stamford, Winhall, Killington, Hartford, Norwich, and the Chateaugay area (Stockbridge, Bridgewater and Barnard).
  - Acquire land or obtain easement in Waitsfield and adjacent towns to protect Mad River Path and side trails.
- Continue to identify a comprehensive list of opportunities to have new direct or loop trail connections for existing trail systems, segments or special features. Information collected to date includes the following opportunities within the north/south zones of the Green Mountain National Forest and surrounding areas:
  - North Zone (north of Highway US 4)
    - ✓ North Country Trail connect Crown Point, NY to AT (hike)
    - ✓ Mad River Path connect Warren to Moretown (x-country ski, hike, bike)
    - ✓ Pittsfield to Chittenden (bike)
    - ✓ Chittenden to Shrewsbury (snowmobile)
  - South Zone (south of Highway US 4)
    - ✓ WHPA trail system to West River Trail system (x-country ski, hike, bike)
    - ✓ Emerald Lake to Dorset Peak (hike)
    - ✓ Equinox trail system to Merck Forest trail system (hike)
    - ✓ Mountain Valley Trail system (bike loop)
    - ✓ North of Route 9 to Kelley Stand (horse loop)
    - ✓ Connect existing trail system in Stratton/Somerset area (horse)
    - ✓ Grout Pond to TransCanada trail system or West River trail systems (hike)
    - ✓ Need trailheads for horse trailers along Route 9
  - General
    - ✓ Improve disability access

*Recommendation(s):*

- Secure funding for a state-wide Vermont State Trails Coordinator – to be provided through the National Park Service, USDA Forest Service, ANR-Forests, Parks and Recreation, VTrans, and various to be identified grants and foundations. Responsibilities of this position would include, but not be limited to:
  - ✓ Regularly canvassing user groups, agencies and non-profit organizations to provide trails information.
  - ✓ Maintaining public database including site specific trail information and locations identified by GIS map layers.
  - ✓ Coordinating priority trail planning and activities to meet collaborative objectives.

## **Issue II. Ecological Impacts from Trails**

Objectives:

1. Identify a set of physical/ecological indicators of concern.
2. Utilizing existing information, identify potential sources of physical and ecological impacts resulting from trail related activities.
3. Provide recommendations to address identified areas of concern where trails may be adversely impacting physical and ecological indicators.

*Identified actions needed to meet objectives:*

- Continue to identify physical/ecological indicators and sources for impacts of concern.  
Indicators/sources collected to date:
  - Erosion and rutting
    - ✓ Illegal motorized use
    - ✓ Poor trail location and/or design
  - Presence of non-native invasive plants (NNIP), sources include:
    - ✓ Openings in forest canopy
    - ✓ Equipment during construction and maintenance
    - ✓ Manure
    - ✓ Human distribution (e.g., hikers, bikes, vehicles)
  - Flooded trail tread
    - ✓ Beaver
    - ✓ Poor trail location and/or design
  - Trail “creep”
    - ✓ Circumventing physical barriers
    - ✓ Poor trail location and/or design
  - Sensitive Habitat (wetlands, rookeries/nesting, deer wintering areas, mast)
    - ✓ Winter use
    - ✓ Noise
    - ✓ Motorized use
    - ✓ Trail location
- Encourage sustainable trail location, design (trail construction standards), and management through workshop/ training, and outreach activities. Trail information collected to date:
  - Careful trail location, design (trail construction standards) and management
    - ✓ Reroute or construct trails in more sustainable locations

- ✓ Consider temporary or permanent trail closures
- ✓ Seasonal closure or designate timing of use
- ✓ Conduct regular monitoring
- ✓ Provide workshop/ training opportunities for trail crews and managers
- Implement NNIP preventive measures
  - ✓ Clean equipment before and after entering sites
  - ✓ Keep forest canopy as closed as possible
  - ✓ Use native or natural seed mix for erosion control
- Develop techniques to address beaver/flooding
  - ✓ Proper trail location and design
  - ✓ Water level control
  - ✓ Beaver population control
- Provide reporting mechanism from trail users to provide feedback to managers
  - ✓ Post trails with Vermont Universal Trail Ethics signs
- Encourage responsible trail use through education, communication, and outreach activities
  - ✓ Implement the Vermont Universal Trail Ethics Education Initiative
  - ✓ Coordinate state-wide and/or regional message through media outlets regarding why trails are closed during mud season

*Recommendation(s):*

- The Vermont Trails Coordinator and/or Vermont Trails and Greenways Council (VTGC) should monitor, coordinate and implement education/outreach actions to meet objectives in conjunction with user groups.
- The University of Vermont and USDA Forest Service Northern Research Station should conduct research recommended by the Vermont Trails Collaborative science panel. (Note: Science Panel recommendations are not prioritized; specific research prioritization would be agreed to by the VTGC and contributing funders).

**Issue III. Trail User Relations**

Although “Trail User Conflicts” was the original issue conveyed to public meeting participants, it quickly became apparent that little conflict actually existed between user groups. Feedback indicated that user groups work together productively most of the time.

Objectives:

1. Identify social factors (such as noise, conflicting uses, safety, etc.) that cause trail based user conflicts.
2. Identify locations and sources of existing and potential trail user conflicts.
3. Provide recommendations to address existing and potential trail user conflicts.

*Identified actions needed to meet objectives:*

- Continue to develop a list of site-specific user conflicts through collaboration with user groups. Conflict information collected to date:
  - Motorized v. non-motorized
    - ✓ High speed can be a safety issue (snowmobiles and skiers on same trail)

- ✓ Noise impacting backcountry experience
- Non-motorized v. non-motorized
  - ✓ Manure from horses or dogs (skiers or hikers)
  - ✓ Horses in winter impacting snow conditions for skiers
- Recreation v. non-recreation
  - ✓ Logging activities
- Site specific locations where conflicts exist
  - ✓ Root Beer Ridge Trail in Weston area (x-country ski) impacts from logging activity
  - ✓ IP Road (FR 341) in Stratton/Winhall areas; conflicts between snowmobiles with groomers and dog mushers
  - ✓ Continue to develop list of site-specific user conflicts through collaboration with groups
- Continue to provide a forum for user groups to minimize or prevent trail use conflicts
- Implement the Vermont Universal Trail Ethics Education Initiative
- Improve or develop, and implement education and management activities to accommodate multiple user needs
  - Establish standard rules and regulations (posting speed limits, designation of single use trails, etc.)
  - Separate uses when multiple use trails are identified to be a safety issue or when conflicts are self evident
  - Separate trails uses spatially or temporally where unresolved conflicting use has been identified
  - Design trails to accommodate multiple user types
  - Improve signs that indicate allowed trail uses
  - Establish and provide reliable and standardized trail maps that clearly show allowed uses

*Recommendation(s):*

- The Vermont Trails and Greenways Council (VTGC) should provide an avenue for trail user groups and managers to discuss trail user relations and cooperative management activities.
- The VTGC, USDA Forest Service, and ANR-Forests, Parks and Recreation should actively embrace and implement the Vermont Universal Trail Ethics Education Initiative.
- Explore other forums that continue the collaborative process to address state-wide, regional and/or local trail user relations.
- The Vermont Trails Coordinator should work with user groups to identify site-specific user conflicts and multiple-use opportunities.

**Issue IV. Existing Supply and Demand for Trails**

Objectives:

1. Utilize existing data to identify/quantify supply A) of existing trail based recreation opportunities and B) the trends of demand for different public recreation activities.
2. Identify multiple uses that can be compatibly shared on existing trails.
3. Provide recommendations to address areas where the existing supply of trail based recreation opportunities does not meet the public demand for experiences.

*Identified actions needed to meet objectives:*

- Complete a statewide assessment of existing trails by managed use
- Update state-wide recreation trend information
- Continue to develop a list of site-specific opportunities for multiple use trails through collaboration with user groups. Multiple trail use information collected to date:
  - Horse use on snowmobile trail system (general)
  - Bike use on snowmobile trail system on Grout Pond to West Trail in Stratton area
  - Bike use on snowmobile trail system on Dome Trail/Stage Road in Readsboro area
  - Bike use on Mountain Valley Trail system in Weston area
  - Use existing Nordic trail systems for other uses when appropriate
- Conduct comprehensive trail planning and implement accordingly
  - Continue collaboration effort to identify user type demands and specific locations desired by user groups
  - Conduct formal user group surveys
  - Use indicators such as over-use of existing trails or user group membership
  - Identify areas that will support new trail uses or additional uses of existing trails in areas of high demand. Supply and demand information collected to date:
    - ✓ Generally, the uses for which demand is greater than supply are horses, bikes and ATVs
    - ✓ Specific information collected to date includes the following areas where new trail opportunities exist within the north/south zones of the Green Mountain National Forest and surrounding areas:
      - ▶ North Zone (north of Highway US 4)
        - ✓ Pittsford area (bike)
        - ✓ General area (horse)
        - ✓ General area (ATV)
      - ▶ South Zone (south of Highway US 4)
        - ✓ Good opportunity for trail network near Bennington Fish Hatchery (hike)
        - ✓ White Rocks and Equinox areas (bike)
        - ✓ Utley Brook area (bike)
        - ✓ Glastenbury area (horse)
        - ✓ Weston area (horse)
        - ✓ Old Stage Road in Readsboro/Searburg area (ATV)
        - ✓ Sucker Pond in Stamford area (ATV and bike)
        - ✓ Bennington area (snowmobile)
      - ▶ General
        - ✓ High elevation ski trails
        - ✓ Backcountry trail experience

*Recommendation(s):*

- The Vermont Trails and Greenways Council (VTGC) should develop a mechanism or agreement with the USFS, ANR and user groups to compile existing data into a state-wide database by allowed trail uses. The database can be compiled into GIS layers by VT Center for Geographic Information (VCGI).

- The University of Vermont (UVM) should update the 2004 Social and Economic Assessment Report prepared for the Green Mountain National Forest (GMNF).
- ANR-Forests, Parks and Recreation should update recreation trend information as part of the update to the State Comprehensive Outdoor Recreation Plan (SCORP).
- The USDA Forest Service should complete comprehensive trail planning specified in the GMNF Land and Resource Management Plan; likewise, the VTGC should complete state-wide comprehensive trail planning in conjunction with UVM and/or Regional Planning Commissions.
- The GMNF should update their trails data and produce maps that show trails by managed use.

## **Issue V. Trail Funding/Volunteer Management**

### Objectives:

1. Identify major sources of trail based funding that benefit trails.
2. Develop standard baseline cost estimates by use type for establishing and maintaining trails, including deferred maintenance.
3. Provide recommendations on how trail management organizations can work together to leverage scarce funding.
4. Provide recommendations on how to recruit and maintain volunteers

### *Identified actions needed to meet objectives:*

- Continue to identify sources, share information and seek funding for trail organizations and projects. Funding source information collected to date:
  - Target USDA Forest Service funding to partners on National Forest System lands
  - Enhancement funding through VTrans
  - Explore monies from Public Lands Highway Fund
  - Raise funds through membership fees and/or dues
  - VT Recreational Trails Grants funds
  - Ask the National Park Service Rivers, Trails and Conservation Assistance Program coordinator to compile list of existing funding sources
- Compile a list of existing sources that provide standard baseline cost estimates by use type for establishing and maintaining trails (including deferred maintenance).
  - Conduct survey of user groups to establish standard baseline cost estimates
- Develop a mechanism for trail organizations to leverage and pool funding sources through collaboration
  - Conduct grant writing workshops
- Continue to develop and implement recommendations on recruiting and maintaining volunteers. Ideas collected to date:
  - Streamline volunteer recruitment and maintenance program
  - Provide free training to volunteers
  - Develop volunteer incentives to increase volunteer interest
  - Focus on the young and first time users through education/outreach

### *Recommendation(s):*

- The Vermont Trails Coordinator should collaborate/facilitate funding and volunteer development program.

- The Vermont Trails Coordinator should maintain a clearinghouse of available grants and funding opportunities.
- The Vermont Trails Coordinator, in conjunction with the Vermont Trails and Greenways Council, should maintain a database and website with standard baseline cost estimates by use type for trail construction and maintenance.
- Federal agencies should simplify requirements for volunteer involvement.
- The Vermont Trails Coordinator should maintain a clearing house and website for volunteer opportunities and potential volunteers.

## **Issue VI. Unauthorized/Illegal Uses of Trails**

### Objectives:

1. Identify A) existing types and B) locations of unauthorized uses
2. Provide recommendations on how to address unauthorized uses to land managers.

### *Identified actions needed to meet objectives:*

- Continue to identify types and locations of unauthorized/illegal use activity through collaboration with user groups and monitoring. Sampling of information collected to date (Reference the Landscape Management Work Group public meeting notes available on the Vermont Trails Collaborative website for a detailed listing of unauthorized/illegal use by type and location):
  - Types of unauthorized/illegal use
    - ✓ ATVs and 4x4s off-road and on-road when not authorized for that use
    - ✓ Snowmobile use off designated trails or on property without landowner permission
    - ✓ User generated trails when it involves cutting of trees or substantial impact to resources
    - ✓ Use of trails on land that is specifically posted prohibiting access
  - Locations of unauthorized/illegal use
    - ✓ ATV use on Appalachian Trail (AT) in Glastenbury area, near AT near Sucker Pond in Stamford
    - ✓ ATV use crossing Bald Mountain Trail (FT 435) near Bennington
    - ✓ ATV/4x4 uses on Up Trail to Glastenbury Tower
    - ✓ Bikes in Rob Ford Meadows in Granville
    - ✓ Non-designated snowmobile trail leading out of Chittenden Reservoir area
    - ✓ ATV use off Fassett Hill/Taylor Brook areas in Hancock
    - ✓ Cutting trees and making ATV routes near AT/LT corridor near intersection of FR 273
- Continue efforts in trail user education. Ideas to consider include:
  - Implementation of the Universal Vermont Trail Ethics Initiative
  - Initiate program for off road vehicle vendors to provide information on where ATVs can legally ride
  - Develop and initiate a state-wide education campaign
- Implement and improve trail management techniques designed to control unauthorized uses. Information collected to date:
  - Identify areas for legal use

- Consider use of gates/barriers to prevent unauthorized uses
- Explore other barrier techniques to prevent unauthorized uses
- Increase use of consistent and standardized signing
- Develop and provide easily accessible maps showing allowed use
- Improve enforcement

*Recommendation(s):*

- Local users and trail managers should document and report unauthorized uses to appropriate federal, state or local authorities and user group organization(s)
- The Vermont Trails and Greenways Council (VTGC) should continue to disseminate and develop educational information on unauthorized uses including maps showing trails with allowed uses.
- The Vermont Trails Coordinator, in conjunction with the VTGC, should maintain a database and website with techniques for controlling unauthorized uses including signage and barriers.
- State and Federal agencies should increase enforcement focusing on public safety and negative environmental impacts of unauthorized trail uses.
- The USDA Forest Service should update their trails map clearly showing allowed uses.
- Towns should work to clear up the status of, and allowed uses on, Class 4 roads and legal town trails.