VERMONT BACKCOUNTRY SKI HANDBOOK

A Guide to Backcountry Ski Zone Management and Use on Public and Private Lands

The Vermont Backcountry Ski Handbook is intended to provide public land managers and partners in land management throughout Vermont with the basic tools and information needed to propose a sanctioned backcountry skiing and riding project.

Acknowledgments

This first edition of the Vermont Backcountry Ski Handbook has been made possible through the work of the Vermont Department of Forests, Parks, and Recreation in close partnership with the U. S. Forest Service - Green Mountain National Forest, Vermont Fish & Wildlife Department, Catamount Trail Association, as well as Dun Cochrane, Amy Kelsey, Brian Mohr, Greg Maino, Kelly Ault and Michael Snyder, Commissioner, Dept. of Forests, Parks & Recreation. The authors particularly appreciate the time that the Vermont Department of Forests, Parks and Recreation Management Team, Catamount Trail Association Chapter Leadership, and United States Forest Service Recreation Program took to edit and comment on the draft document.

Creative + Design *by Buttery*
www.butteryagency.com

photography by Justin Cash
Brian Mohr/EmberPhoto
Bob Perry

environmental illustrations by Jackson Tupper

front and back cover photographs by Justin Cash

List of Authors in Alphabetical Order

WORKING GROUP CO-LEADS

Luke O'Brien | *Forest Recreation Specialist*
ANR – *Forests, Parks, and Recreation*

Kathryn Wrigley | *Forest Recreation Specialist*
ANR – *Forests, Parks, and Recreation*

WORKING GROUP

Holly Knox | *Recreation Program Manager*
USFS – *Green Mt. National Forest*

Walter Opuszynski | *Forest Recreation Specialist*
ANR – *Forests, Parks and Recreation*

Ethan Phelps | *Parks Regional Manager*
ANR – *Forests, Parks and Recreation*

Jessica Savage | *Recreation Program Manager*
ANR – *Forests, Parks and Recreation*

Lisa Thornton | *Stewardship Forester*
ANR – *Forests, Parks and Recreation*

Matthew Williams | *Executive Director*
Catamount Trail Association

Bob Zaino | *Ecologist*
ANR – *Fish and Wildlife Department*

Abbreviations & Acronyms

GOVERNMENT AGENCY & DEPARTMENTS

ANR – *Vermont Agency of Natural Resources*

FPR – *Vermont Department of Forests, Parks, and Recreation*

FW – *Vermont Department of Fish and Wildlife*

USFS – *United States Forest Service*

USDA – *United States Department of Agriculture*

GMNF – *Green Mountain National Forest*

NON-PROFIT ORGANIZATIONS

CTA – *Catamount Trail Association*

ROC – *Ridgeline Outdoor Collective*

NEKBC – *Northeast Kingdom Backcountry Coalition*

MRVBC – *Mad River Backcountry Coalition*

DHASH – *Dutch Hill Alliance of Skiers and Hikers*

Contents

Contents

Introduction

Vermont's forested landscape has long been the iconic backdrop for countless winter adventures, backcountry skiing among them. Backcountry skiing, as the term is currently used, refers to skiing done without using ski lifts, usually in a natural setting rather than at a resort with groomed slopes and trails, and with a goal of skiing down steep, wooded slopes rather than touring through gently rolling or flat terrain. It is a longstanding tradition that backcountry skiing* is an allowable activity on state and federal land in Vermont, as long as there is no vegetation removal to facilitate the activity. However, an increase in backcountry skiing, illegal vegetation removal, and the desire of skiers to create designated ski zones is causing public and private landowners to rethink management strategies for this activity. This includes viewing backcountry skiing as a spectrum of use ranging from those who explore the woods on skis without removing vegetation to those who ski in a designated zone with an approved proposal and plan. Skiing has endured for millennia and the Vermont backcountry skiing community continues to play a role in the evolution of the activity.

* *Throughout this document, the term* ***skiing*** *is used to include both* ***skiing*** *and* ***snowboarding****.*

Justin Cash

Why the handbook is needed

Justin Cash

Increased demand for sanctioned backcountry skiing terrain is often met with misunderstanding and skepticism by skiers and land managers alike. This has been particularly true in the western part of the U.S., where a naturally open forest structure and the availability of terrain above the tree line means that skiers have many options for backcountry skiing that do not require any vegetation removal. In Vermont, such naturally occurring skiable zones are rare. Conflicts arise between skiers and public and private landowners when skiers cut vegetation without authorization. **This handbook is intended to help skiers understand the concerns of public and private landowners, and vice versa, with the goal of encouraging collaborative projects that provide skiable backcountry zones that complement forest management and ecological protection goals.**

While the public may freely move by foot across most public lands, removing vegetation of any kind without prior approval is not allowed. An amendment to Vermont's Timber Trespass Statute *(13 V.S.A § 3606)* passed in 2015, effective on all state, municipal, and private lands, it broadens the definition of timber to include, "sprouts from which trees may grow, seedlings, saplings, bushes or shrubs," further clarifying how illegal cutting applies to backcountry skiing. The amendment also makes unauthorized cutting or damaging of trees of any size a criminal offense in addition to a cause for civil action. The penalties for violation include fines and potentially jail time. Similarly, the unsanctioned cutting of vegetation is considered an illegal activity on federal lands and is in violation of the code of federal regulations.

Although Vermont's public and private lands offer numerous opportunities geared toward traditional cross-country skiers, there has been limited attention provided to sanctioned opportunities for alpine-oriented backcountry skiing. This use seeks more vertical terrain, outside of a defined trail system and/or resort boundary. The emerging backcountry ski groups in Vermont indicate a willingness to collaborate on managed backcountry skiing experiences. These areas can provide access for backcountry skiers of all ages and abilities, while allowing for thoughtful vegetation management and protection of water and habitat quality. There is a growing recognition by skiers and land managers alike that unregulated cutting—recently made a crime—has been and continues to be a problem for the future of their sport as well as the forests it relies on.

The unmanaged cutting of trees and understory vegetation has the potential to lead to more significant

ecological impacts if left unmanaged. Specifically, impacts witnessed at known backcountry skiing locations, such as Brandon Gap, have included the reduction of both softwood and hardwood stem densities that has begun to compromise the natural ecosystem functions of the area. This change in forest composition has contributed to a reduction in stand diversity that, in turn, has increased the potential to convert these stands from an uneven-aged to an even-aged forest condition. *(Knox 2015)*. This reduction of vegetation and decline in stand diversity, over time, could potentially result in longer lasting impacts that include: degradation of wildlife habitat; conversion of mixed-wood stands to purely northern hardwood forest types; expansion of native ferns into fern ski zones that inhibit seedling establishment and plant regeneration; damage to softwood regeneration; soil erosion and loss; and/or various other impacts on the flora and fauna of the forest.

Research suggests that public and private landowners can most effectively mitigate conflicts and promote mutual gains with a facilitative strategy, rather than through regulation *(Grafton 2000)*. Studies have shown that when users of natural resources organize themselves to devise and enforce basic rules, they manage those resources in a more sustainable manner than when rules are externally imposed upon them *(Ostrom 2009)*. Ostrom *(2009)* goes further to note that several design principles characterize the efficacy of resource user cooperation, including: establishing boundaries; utilizing local/user group knowledge to help devise effective rules; establishing monitoring activities; and establishing multiple layers of organizational/partner support. Providing opportunities for users to recreate and assist with resource maintenance enables the public and private landowners to gain more credible commitments from users over the use of law enforcement alone *(Ostrom, Gardner and Walker 1994; Ostrom 2009)*.

This **Vermont Backcountry Ski Handbook** provides land managers, partner organizations, and the public with the basic tools and information needed to propose, develop, and manage sanctioned bc ski zone projects.

Justin Cash

Information the Handbook provides

This handbook provides a set of interrelated chapters, each of which serves as a resource to help public and private landowners work with partner organizations through a robust backcountry skiing zone proposal process. This document aims to help create a common language that can be used across different land ownership and terrain types to make decisions that are grounded in an understanding of Vermont's dynamic natural and working landscape. This handbook *does not set policy,* but provides information, ideas, and processes to help clarify the variety of information that is taken into consideration when creating and evaluating backcountry ski zone project proposals (Box 1).

Chapter 1 Overview of Backcountry Skiing lays the groundwork to create a common understanding of backcountry skiing between landowners and partner organizations that are interested in developing and managing a backcountry ski zone. It does this by providing a brief history of backcountry skiing, describing current, common backcountry ski gear, defining various types of backcountry skiing access, and visually depicting a general backcountry ski zone.

Chapter 2 Natural Resource and Social Considerations focuses on major topics that land managers and landowners take into consideration when making decisions about uses of the land. It includes information on ecological, management, and social considerations related to backcountry skiing and is meant to provide guidance for those going through the process.

Chapter 3 Partnerships identifies the types of private and public landowners that a group might encounter when developing a backcountry ski zone proposal. In Vermont, this includes federal land managers, state land managers, municipal land managers, and private landowners. Since public land managers often work with established groups, there is also information on the Catamount Trail Association, how to get involved, and how to create a chapter.

Chapter 4 Backcountry Ski Zone Delineation Process is intended to provide guidance for groups that are creating a proposal. It stresses the importance of working with the landowner from the beginning and ensuring that you understand the proposal process for a specific location. Highlights include identifying your target skiing audience, what to look for when doing field reconnaissance, visualizing tree skiing zones, what to do about uphill skin tracks, and identifying skiable lines.

Chapter 5 Implementing Constructing a backcountry ski zone outlines strategies for training crew leaders, flagging terrain, beginning work, using the right tools, as well as two examples of real-world backcountry ski zone cutting guidelines from the USFS and VT FPR.

Chapter 6 Safety and Risk Management includes suggested safety protocols for volunteer activities and outlines how to create a Search And Rescue (SAR) plan for a backcountry ski zone.

Chapter 7 Maintenance highlights the long-term commitment and planning needed to create new recreation opportunities, in this case backcountry ski zones, on public and private land.

Chapter 8 Monitoring outlines why monitoring is important and what types of long-term data sets can leverage your understanding and planning for monitoring in your backcountry ski zone.

Chapter 9 Overnight Facilities discusses best practices for existing overnight facilities on the landscape as well as how the location of a nearby overnight facility may influence a backcountry ski zone project proposal.

Justin Cash

Chapter 1 Overview of Backcountry Skiing

Chapter 1

Overview of Backcountry Skiing

This chapter provides insight into backcountry skiing as it has evolved over time. It describes how backcountry skiing emerged as an activity and the historic impact it has made on the Vermont landscape. This chapter also describes how changes in technology and equipment have opened this historic activity to a growing diversity of new enthusiasts.

Bob Perry

A Brief History of Backcountry Skiing

Backcountry skiing is not a new activity: in fact, it is the oldest type of skiing, and has recently grown immensely in popularity. The first evidence of skiing dates to the Stone Age, when hunters and trappers in Asia used primitive wooden skis lined with animal furs for winter travel. Spreading to the arctic regions of Eurasia, skiing became widespread throughout Scandinavia, where advances in technique and technology were made by early farmers, hunters, and warriors. The rescue of the young Prince Haakon Haakonson of Norway by Birkebeiner skiers in 1206 is one of the oldest accounts of early skiing.

In the 18th century, many advances in skiing occurred in Norway, Sweden, Austria, and Switzerland, including the early development of the cambered ski and the first use of a heel strap and stiff binding by Sondre Norheim in the Telemark region of Norway. Later in the 1800's, thinner, lightweight, and laminated hickory skis were developed, and the skiing tradition was imported to Wisconsin and other midwestern states by Scandinavian immigrants. In 1882, the first American ski club was founded in Berlin, New Hampshire.

Throughout the early 20th century, many recognizable ski adaptations occurred, including the steel edge,

Bob Perry

spring heel cables, laminated wood, plastic, and aluminum skis and, in 1952, the first fiberglass skis. Between 1911 and 1926, many first ascents occurred on the Northeast's highest peaks, including Mt. Marcy in the Adirondacks (1911), Tuckerman's Ravine on Mount Washington (1913), Mt. Mansfield (1914), and Mt. Katahdin (1926). The first descent of the Tuckerman's Ravine headwall occurred in 1926 *(International Skiing Association Website 2020)*.

In the 1930s, the first mountain huts were established in the White Mountains and, beginning in 1933, the Civilian Conservation Corps (CCC) cleared many of the first ski lines in northern New England, including those on Burke Mountain and Mount Mansfield. The first rope tow was installed in Woodstock in 1934, initiating a long, steady growth of developed ski areas throughout New England and the mountain West.

Ski mountaineering was popularized by the 10th Mountain Division, who trained in modern ski warfare during World War II. Throughout the early and mid-1900s, remote and mountainous skiing grew in popularity and many first North American ascents and descents were recorded by modern ski pioneers. In 1972, the Fischer ski company introduced an 'aluminum sandwich fiberglass Nordic backcountry ski with sidecut and aluminum edges' that, using the telemark turning style, helped popularize modern backcountry skiing.

David Goodman's 1989 book, *Classic Backcountry Skiing: A Guide to the Best Ski Tours in New England* further stimulated interest by providing detailed information for backcountry skiing adventures in Vermont, New Hampshire, Maine and, in later editions, New York.

David Goodman captures the essence of why people head into the backcountry in *Best Backcountry Skiing in the Northeast* (2010) with an anecdote from Fraser Noble, a downhill skier from the 1960s:

> *"It's hard to convey to people who haven't done any walking for skiing what the experience is about. It's quite different than just buying an impersonal lift ticket and skiing the mountain from the top. You work hard for the turn and get far more exercise than you do when just downhill skiing. The scenery is also an important part of it. These trails were not just a slash down a mountain. They had a lot of interesting natural rolls and turns in them. Also, when you walk up, you have time to have long chats with people you're skiing with. That's part of the whole ski experience too."*

Backcountry skiing, heck, skiing in Vermont owes much of its existence to Perry Merrill and the Civilian Conservation Corps (CCC). Between 1933 and 1942, CCC crews under the leadership of Perry Merrill, Vermont State Forester, cleared the first mountain ski trails in Vermont and gave birth to the state's modern ski industry. Similarly, these mountain trails and, later, the terrain developed and improved by Vermont ski areas fostered a new generation of skiers.

For decades, backcountry skiing was the province of leather boots and free heel telemark bindings. Using a variety of waxes, fish-scale (wax less) pattern skis, or adhesive climbing skins and employing a combination of Nordic, telemark, and parallel techniques, skiers could access a variety of terrain. However, due to the specialized equipment and skill needed to use it, access to remote and mountainous terrain was limited to a relatively small number of hardy skiers.

It was only in the last 30 years that technical advances in equipment allowed greater numbers of people to explore the backcountry. Disenchanted by overcrowding, high ticket prices, and highly groomed snow surfaces at ski resorts, many alpine skiers were eager for a change. Circa 1986, the alpine touring (AT) or Randonnée binding was developed, enabling alpine skiers to 'free the heel' for touring and lock their heel down for descending. This development greatly expanded the range of terrain accessible to traditional alpine skiers who, previously, were confined to the in-bounds, lift-served terrain provided by developed ski resorts.

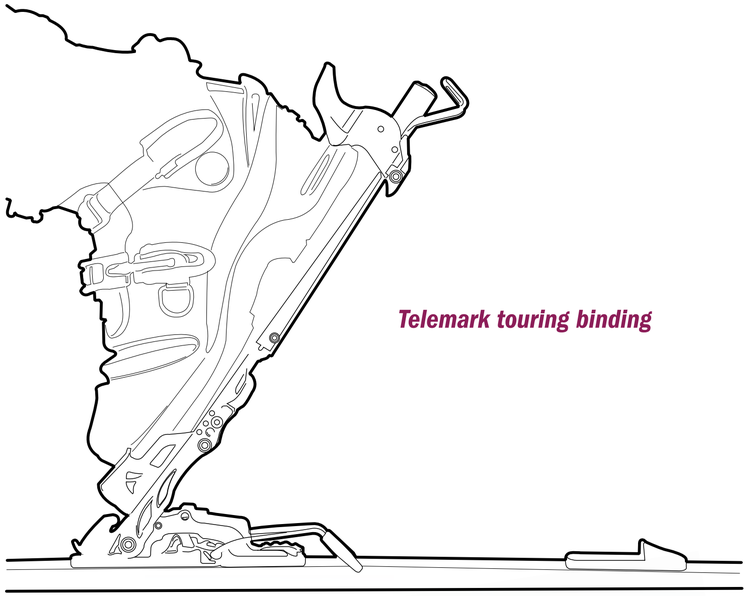
Similarly, in 1992, Black Diamond developed the first plastic free-heel boot, providing telemark skiers with a more rigid binding attachment and the ability to make telemark and parallel turns more easily on steeper terrain.

In 1991, Voile developed the Splitboard, a hybrid snowboard that can be separated into two ski-like parts *(Splitboard Wikipedia 2020)* for free-heel ascending (using climbing skins) and re-attached as a snowboard for descending. Previously, snowboarders were at a distinct disadvantage in accessing the backcountry and were usually confined to access using snowshoes while carrying their board.

Taken together, the advancements in telemark, alpine, and snowboard technology have greatly expanded the ability and desire of outdoor winter enthusiasts to venture deeper and higher into the backcountry using the equipment of their choice. Technological advances in cell phones and GPS made getting out with this newer equipment even easier. You can see where other people are skiing by looking at Strava or share a geo-located map with a friend of a good spot to try out. Freed from the limits of developed ski areas, skiers in increasingly greater numbers have started to explore the backcountry and 'earn their turns' on previously inaccessible terrain.

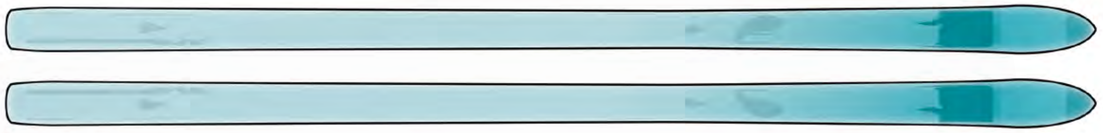
Backcountry Skiing and Riding Equipment

Backcountry equipment has advanced considerably in recent decades and covers a broad spectrum of needs. Skiers use specific gear (or 'set ups') to meet their preferences, skill level, and budget. Not all equipment is suited for all backcountry terrain. Weather, snow conditions, terrain, and difficulty levels all influence a skier's choice of equipment. Leather boots and skinny wax less skis, for example, may be appropriate for low-angle backcountry touring but would be inadequate for more advanced terrain such as Tuckerman's Ravine on Mount Washington or even the Teardrop Trail on Mount Mansfield.

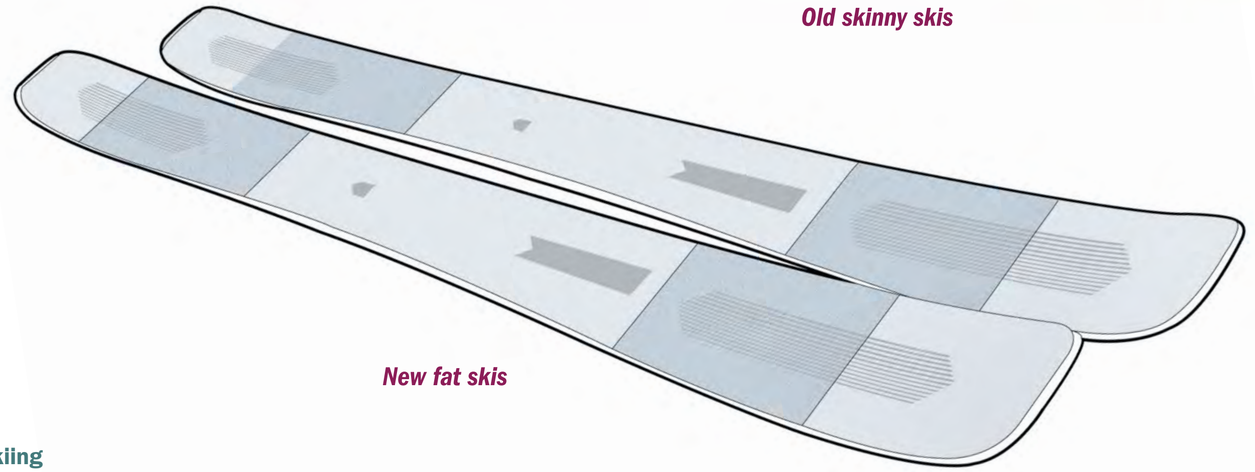


Telemark touring binding

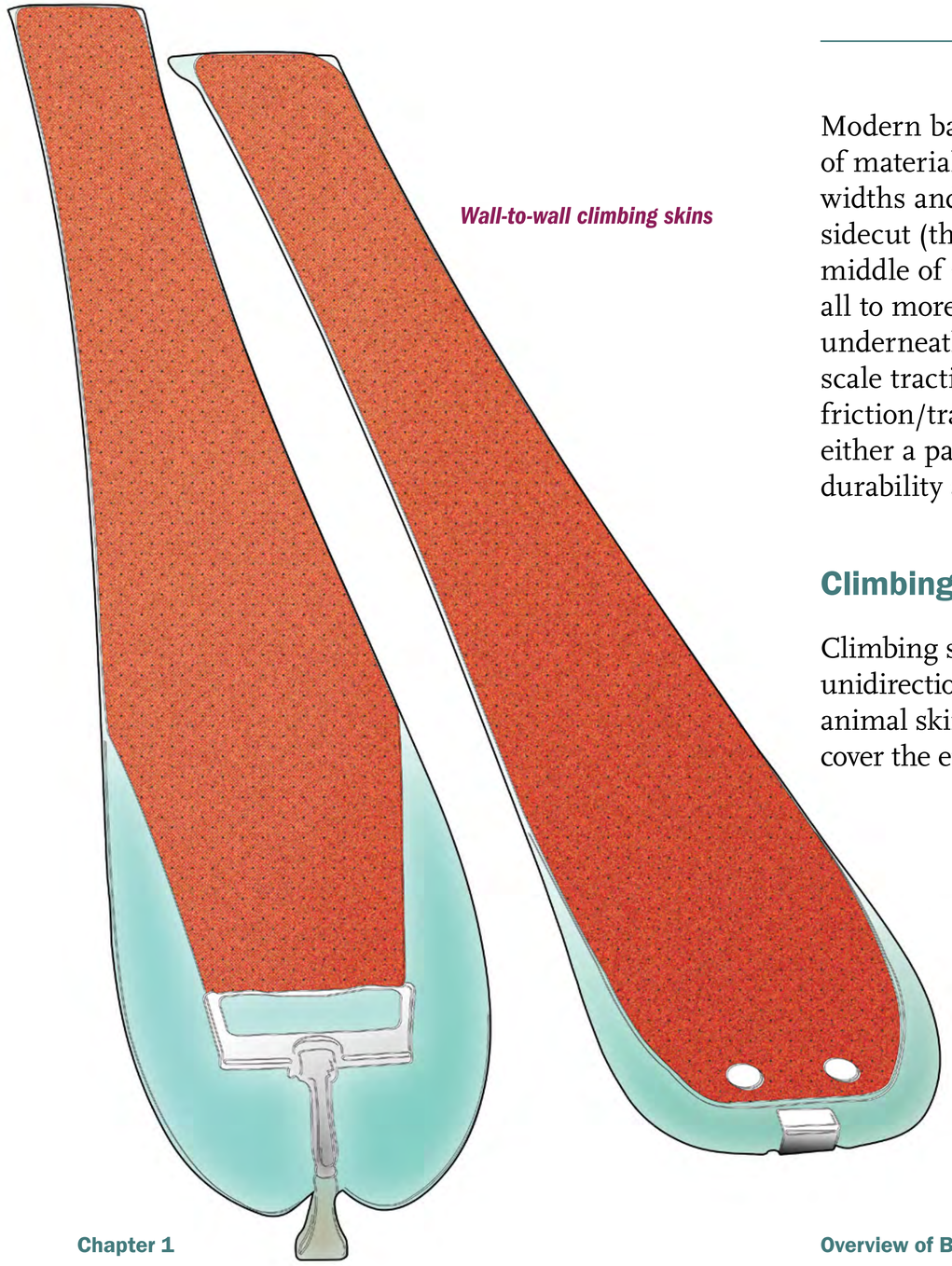
Following is a brief introduction to common forms of gear used in the backcountry today. This information is based on knowledge available at the time of this document's publication (2023).



Old skinny skis



New fat skis



Wall-to-wall climbing skins

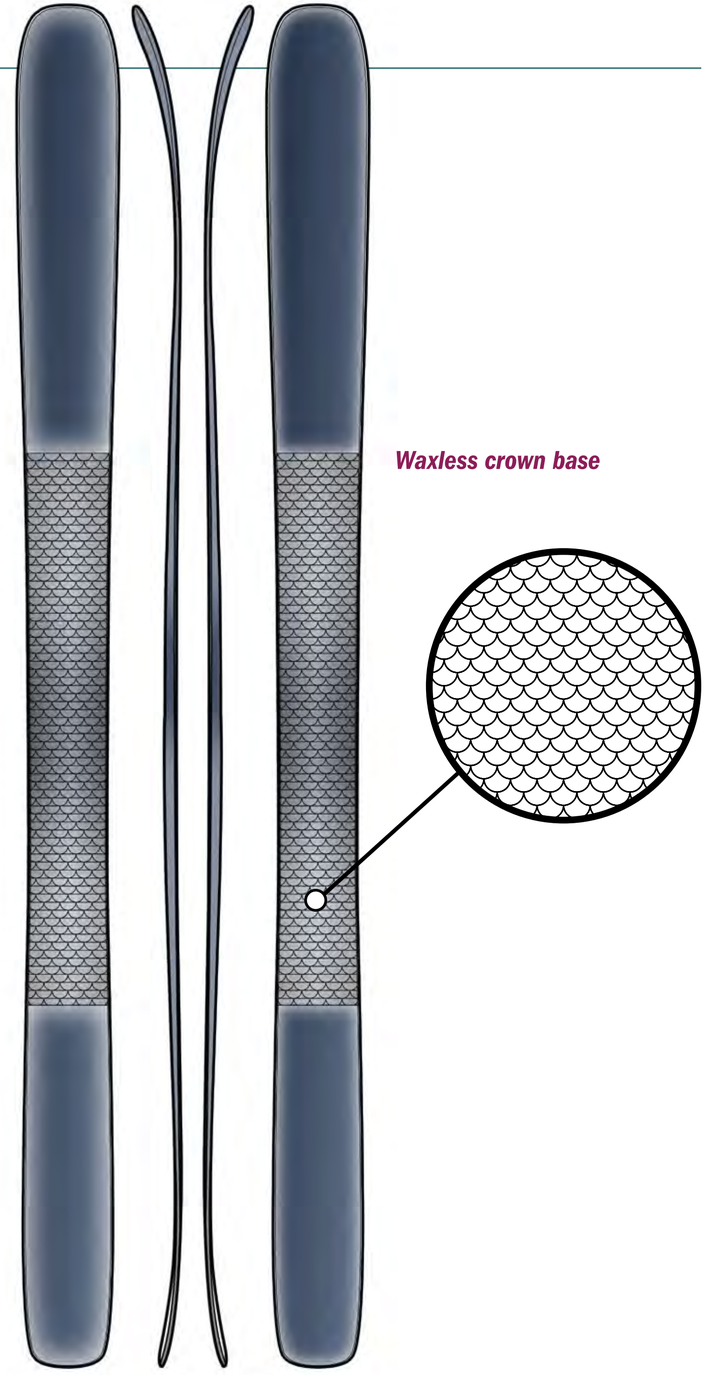
Modern backcountry skis are made with a variety of materials and come in a number of lengths and widths and feature various degrees of camber (flex), sidecut (the difference in width between tip/tail and middle of ski), and rocker (curvature at tip and tail), all to more easily tour or turn. Skis are either smooth underneath (for less friction) or have textured fish scale traction (also known as wax less base, for greater friction/traction). Most backcountry skis feature either a partial or full length metal edge to add durability and influence turning and edging.

Climbing Skins

Climbing skins are strips of fabric that are covered in unidirectional hairs (historically these were literally animal skins attached to the bottom of skis). Skins can cover the entire base of the ski or just the middle 'kick' zone of a metal-edged Nordic ski. The unidirectional hairs mat down when you glide forward/go uphill and then engage to prevent you from sliding backwards downhill. Skiing uphill using skins is called "skinning" or "skinning up."

Boots and Bindings

Metal-edged Nordic skis offer a way to get out into the snow whether you live in



Waxless crown base

town and are traversing a golf-course or want to noodle around in some lower pitches of woods behind your house. These metal-edged skis can be as skinny as 60 cm underfoot or as wide as 100 cm underfoot. The skinnier skis can be mounted with NNN-BC bindings that resemble traditional Nordic bindings, but are a bit beefier. You have to use an NNN-BC boot with these bindings. You can choose from a few styles of boot depending on how wide your skis are. The widest skis in this category may be used with 3-pin bindings (described below) or a light Alpine touring binding (described below).

The leather boot with 3-pin binding has been standard issue backcountry gear for decades and has been used to access all kinds of terrain, including flat, undulating, low-angle, and the occasional steep slopes. Reinforced leather boots with buckles and/or an adjustable heel cable provide additional stability and maneuverability. Some rigid boots and bindings are suitable for low-angle touring as well. The plastic telemark boot is far more rigid and can be used on rolling and flat terrain as well as the steeps and is a better choice if longer tours with steep uphills and downhills are in your adventure.

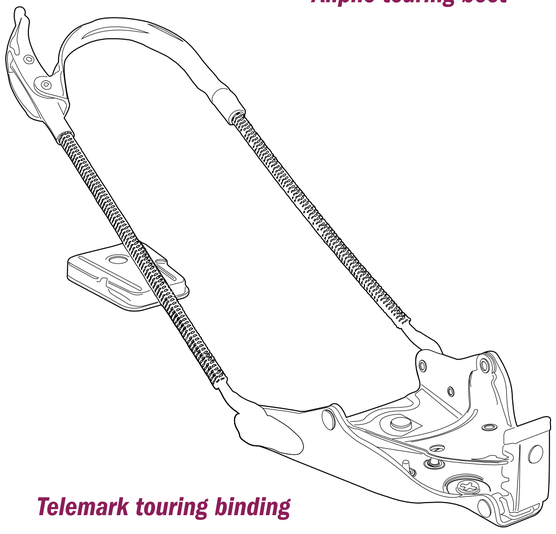
Safety equipment

The ten essentials are always a necessity when going into the backcountry. These include things like extra

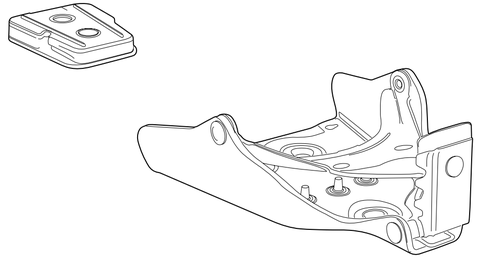
Alipne touring boot

Snowboard touring boot

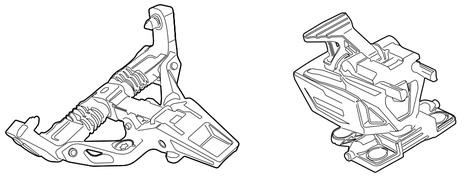
Leather touring boot



Telemark touring binding



3-Pin telemark binding



Alpine touring binding

layers, water, a map, snacks, a headlamp, etc. A well-stocked medical kit and small repair kit is useful for emergencies on any backcountry outing. In more steep terrain- especially areas prone to slides and avalanches- a shovel, probe, and beacon are essential equipment for assessment, rescues and bivouacs. None of these pieces of gear will help unless you also bring humility and respect with you and know when to turn around and call it a day.

The Spectrum of Backcountry Skiing Access

This manual focuses on the process for creating a designated backcountry ski zone in Vermont. The description of the other types of access are to help contextualize what backcountry skiing looks like across the Vermont landscape. Due to the long history of backcountry skiing in Vermont and New England and the emergence of a new cohort of skiers, the following definitions include both a description of where the access is likely to occur and what type of skier is most likely to be found there.

Dispersed access

Where This is the traditional means of backcountry skiing in Vermont and includes off-trail ski touring in remote or undeveloped areas. This may occur on flat, rolling, or steep terrain. Skiers typically ascend peaks or steeper terrain using climbing skins and then, similar to downhill skiing, incorporate sustained downhills- often eventually returning to the initial access path that was packed on the way in for the return route or 'runout' to the trailhead. Generally, dispersed access does not focus on cleared lines or ski zones and is more focused on winter exploration. Typically involving single, pairs, or small groups of skiers, this is a catch-all for skiing that happens in the woods across Vermont. There is no cutting of any vegetation.

Who Skiers that access these skiing opportunities are likely more experienced in backcountry navigation and exploration than others. However, skiing off-trail in the woods is accessible to anyone.

Cross-country touring

Where Skiers can find remote cross-country touring areas throughout Vermont; some destinations are formally managed (e.g. a Nordic center with groomed and ungroomed terrain) while others provide a more primitive, unmanaged experience (e.g. forest roads or ungroomed section of Vermont's Catamount Trail). Bolton Valley, in Mount Mansfield State Forest, for example, is a well-known area that provides a diversity of cross-country touring options, including groomed terrain, ungroomed backcountry trails, thinned ski zoned areas, hut skiing, and a popular section of the Catamount Trail.

Who Cross-country touring is suitable for skiers with a wide range of skills and interests. For many, the comfort and predictability of a well-managed Nordic trail- with maps, signs, and groomed conditions- is an ideal entry to skiing. Others may prefer more primitive settings where more challenging terrain and snow conditions necessitate greater skill levels, self-reliance, and a sense of adventure.

Resort-accessed Skiing (aka side-country skiing)

Where Side-country refers to out-of-bounds skiing at a developed Nordic or (more often) alpine ski area. However, side country skiing shares many characteristics with backcountry skiing, and skiers typically travel out-of-bounds and then return to the resort area. This easier access can lead to less-experienced backcountry skiers getting in over their heads more quickly. Side-country experiences, combined with new alpine touring, cell phone, and GPS technology, are likely responsible for the many new skiers who are contributing to the explosive growth of backcountry skiing in Vermont and more broadly.


1 Skin Track Ascent
2 Side-Stepping
3 Herringbone
4 Boot Packing
5 Skin Track with Kick Turns
1
2
3
4
5
Jackson Tupper

Who Skiers who have access to a lift-served resort. With uphill policies at alpine resorts, this terrain is available to those willing to skin up as well. This terrain serves a wide array of backcountry abilities.

Ephemeral

Where Ephemeral backcountry skiing locations emerge as a result of an event that temporarily improves the quality of skiing through the creation of open areas on the land for a brief period of time, such as a timber harvest, or a naturally occurring landslide or avalanche, even a heavy snow event may create access to terrain that is normally not skiable. Following a timber harvest, skiers may take advantage of a newly opened understory or access roads. These sites can provide access to other locations and/or stand-alone as a destination for skiers seeking to 'earn their turns' without bushwhacking. Ephemeral skiing conditions change over time as the forest or open land regenerates and can be challenging depending on how a harvest operation is 'closed out' (e.g. whether/not skid trails and woods roads are maintained or cleared, if water bars are present, or the amount of slash that is left on site). Eventually, forest regrowth makes these sites less desirable and skiers will explore other areas.

Who Skiers that access these opportunity areas are likely more experienced in backcountry navigation and exploration than others.

Historic backcountry skiing sites

Where These sites exist throughout Vermont and the Northeast. They are places on the landscape that have been skied by people since the 1930s (or earlier) and are considered open secrets within the backcountry skiing and land management community. Many of these locations are highlighted in various editions of David Goodman's book *Best Backcountry Skiing in the Northeast*. These areas show up on Strava Heat Maps, which points to how well-known they are. One example of such a location in Vermont is the Tear Drop Trail, off the west side of Mount Mansfield in Mount Mansfield State Forest. Other examples of historic sites include community ski hills, many of which are documented by the New England Lost Ski Areas Project (NELSAP). They also exist at current ski resorts that have licenses to operate on state lands such as Bolton Nordic and Backcountry in west side of Mt. Mansfield State Forest and Ranch Valley in the east side of Mt. Mansfield State Forest.

Historic sites are particularly challenging areas for public land managers due to their well-known and well-established nature and the historic vegetation management that has occurred, often over many decades.

Who Newcomers to the sport, guidebook followers, 'peak baggers', and anyone who is interested in skiing a historic line.

Sanctioned Backcountry Ski Zone

Where These areas include sites that are intentionally designated through a deliberative review and approval process. One such site in Vermont, Brandon Gap on the Green Mountain National Forest, became the first sanctioned federally managed backcountry ski zone in the United States. Thanks to the work of Dun Cochrane and Holly Knox of the USFS, and ROC, the Northeast has an example of what a planned and publicly managed backcountry zone looks like. Other sites that have undergone a formal proposal and review process include federal (USFS at Dutch Hill), State (VTFPR at Willoughby State Forest) and private (landowners at Braintree and East Haven). Navigating the proposal process for a sanctioned backcountry ski zone on public and private land in Vermont is the focus of this manual.

Who Sanctioned backcountry ski zones are aimed at serving a large cross-section of the backcountry skiing population, from beginner backcountry skier to expert. These zones may have one or more of the following features: one-way skin tracks, known transition points with signs and/or wayfinding

information, and well-designed and maintained descent lines that are thinned using approved cutting guidelines and location specific plans. How many features a zone may contain will be based on the ecological, management, and social considerations of the particular location. For instance, a less-developed sanctioned zone may just have a one-way skin track identified to help direct traffic with limited signage and little to no vegetation removal. This spectrum within backcountry ski zones is intended to give landowners the flexibility to create a backcountry ski zone that aligns with the goals of their forest.

Diagram of Backcountry Skiing Zone

Although all areas are unique, most backcountry zones share a number of common basic features, depicted below, including: 1) a trailhead, parking, or base area, 2) an access route (woods road, Nordic trail, hiking trail, etc.) or skin track used for ascending, 3) a summit, change-over area or shelter destination (that may serve as a second base area), 4) the ski line or ski zone area used for descending, and 5) the ski out (or 'run out'). Occasionally, the ski out involves travel to a secondary destination, such as a lodge, shelter, shuttle vehicle, or additional peak.

ABOUT THE VT BACKCOUNTRY SKI HANDBOOK

THE VT BACKCOUNTRY SKI HANDBOOK CAN:

- Help public land managers and private landowners more clearly understand what backcountry skiing is;
- Help partner organizations looking to create a proposal understand the breadth of information needed by public land managers and private landowners to come to a decision;
- Foster a common language related to backcountry ski zones that can be used by a variety of land management organizations, including both public and private entities;
- Be approached, read, and used flexibly. Although presented as one manual, the chapters are designed to support each other and be used independently to answer questions.
- Provide real-world examples of guidelines used in existing BC ski zones, sample documents related to CTA chapter establishment, and online tools for creating maps and understanding how natural resources overlay with proposed zones

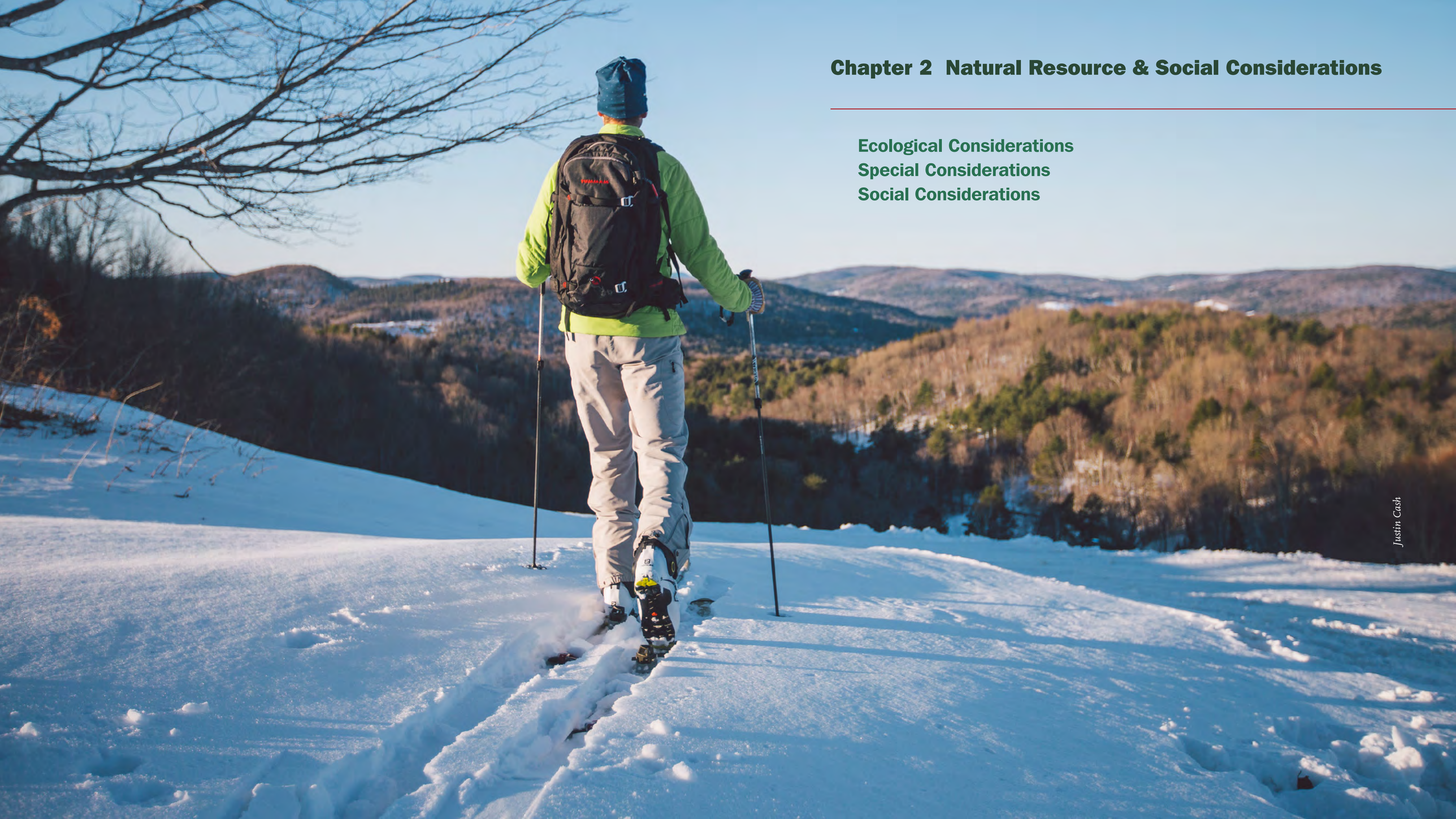
THE RESOURCES IN THIS DOCUMENT DO NOT:

- Identify all of the specific ecological, management or other factors that might be considered for a unique proposal on public or private land;
- Replace institutional policies, plans, procedures or statutes

Justin Cash


1 Parking Area
2 Staging Area
3 Skinning Ascent
4 Transition Point
5 Descent
6 Hut or Shelter
1
2
3
4
5
6
Jackson Tupper

Chapter 2 Natural Resource & Social Considerations



Justin Cash

Natural Resource & Social Considerations

This chapter introduces and discusses a variety of environmental and social considerations related to backcountry ski zones including wildlife, vegetation management, unauthorized cutting, pets, parking, and the Vermont Backcountry Ethics. It is intended to highlight the diversity of considerations driving land management goals and objectives on public and private land and how they may or may not align with the development of a designated backcountry ski zone.

Ecological Considerations

The creation of ski zones and skiable lines, and the activity of backcountry skiing itself, can impact plants, animals, and natural communities, but these impacts can, in most cases, be avoided or minimized with thoughtful planning and careful implementation. The following section summarizes some of the main ecological factors to consider when planning a project. It is important to understand these factors because they are directly related to the proposal process on public land.

In this document, the term "impact" will be used as a neutral term that is associated with change (Lucas 1979; Access Fund 2008). Impacts depend on three major factors: (1) the amount and distribution of use, (2) the type and behavior of visitors, and (3) the ecosystems and its condition (Hendee, Stankey and Lucas 2005). Ecological impacts have a potential effect on the biological and physical characteristics of a location that make it less natural (Hendee, Stankey and Lucas 1990). How an ecological impact is interpreted by a public land management entity or a private landowner will likely be tied to their respective mission or management plan for an area. It is therefore important to understand the potential impacts of backcountry skiing and how to best mitigate them through careful planning.

Landscape-Scale Considerations

Many animals thrive best in remote landscapes free from frequent human presence. In addition, both plants and animals cannot persist in isolated islands of habitat. They need a well-connected natural landscape that allows wildlife to travel freely and allows plants to disperse over time. Ski zones and ski lines, because of the frequent human presence, or because of changes to vegetation patterns from zone creation, have the potential to interrupt the free movement of species. Efforts such as Vermont Conservation Design *(VCD; Sorenson and Zaino 2018)* help identify important forest blocks and connections between blocks and offer a way to consider how ski zones and ski lines fit into the surrounding landscape. For instance, with the VCD tool you can identify connectivity pinch points on a landscape. Understanding pinch points and other sensitive locations may influence where a ski zone can be developed. VT Fish and Wildlife has staff dedicated to assisting the public on how to use this tool effectively.

Forest Stand Level Considerations

The forests of Vermont are part of one of the largest intact forest ecosystems in the world: the Northern Forest. Forests are important for many reasons, including: water quality, recreation, forest products, carbon sequestration and storage, and more. A forest with well-developed layers of vegetation at multiple heights is considered to have complex or diverse vertical structure and offers habitat for a variety of birds and other wildlife. It also provides the best future for skiable places in the forest: complex forest structure provides all the right components for tree skiing.

Vermont Conservation Design

A landscape-level conservation design for Vermont is a practical approach to protecting and enhancing ecological function into the future. The lands and waters identified in this project are the areas of the state that are of highest priority for maintaining ecological integrity. Together, these lands comprise a connected landscape of large and intact forested habitat, healthy aquatic and riparian systems, and a full range of physical features (bedrock, soils, elevation, slope, and aspect) on which plant and animal natural communities depend. When conserved or managed appropriately to retain or enhance ecological function, these lands will sustain Vermont's natural legacy into the future.

It is our hope this information will inform land management, local planning, and land conservation decisions throughout Vermont. Private landowners, municipalities, state agencies, and conservation organizations should find this information helpful as we all work together for a vibrant and healthy Vermont, now and into the future.

Courtesy of the VT Fish and Wildlife Website

When preparing a proposal, it is important to understand both the vertical and horizontal structure of your location. Knowing how the location of your proposal might compound or mitigate an existing lack of forest structure in the landscape will help you develop a stronger project proposal.

To help describe what forest structure is and why it is important, this section will use the Foresters for the Birds framework that was created in 2008 through a collaborative partnership between FPR and Audubon Vermont. The Birder's Dozen *(Figure 1)* includes twelve of the 40 responsibility bird species, a bird species with a large portion of its total population breeding in a region, that have been identified by Audubon Vermont as high priorities for protection in Vermont and throughout the northeast. One of the reasons that these birds were selected is because they are simple to identify by sight and/or sound by landowners, recreationists, and land managers alike. Birds are also well studied and can be indicators of the overall quality of an area for other wildlife species. Understanding how birds are linked to specific parts of the forest structure is intended to help anyone who enters a forest see the trees and other vegetation as providing something for wildlife and other natural functions, not just about how a human can move through the woods most easily.

Foresters for The Birds

What is Foresters for the Birds?

Foresters for the Birds is an innovative project that works to keep forests as forests and common birds common by helping landowners integrate the practices of timber and songbird habitat management. The project was established through a partnership between Audubon Vermont and the Vermont Department of Forests, Parks, and Recreation in 2008. It has grown to become a network of foresters, biologists, and forest landowners across Vermont and the Atlantic Flyway who are working together to make a positive difference for forests, birds, and land stewardship in the region.

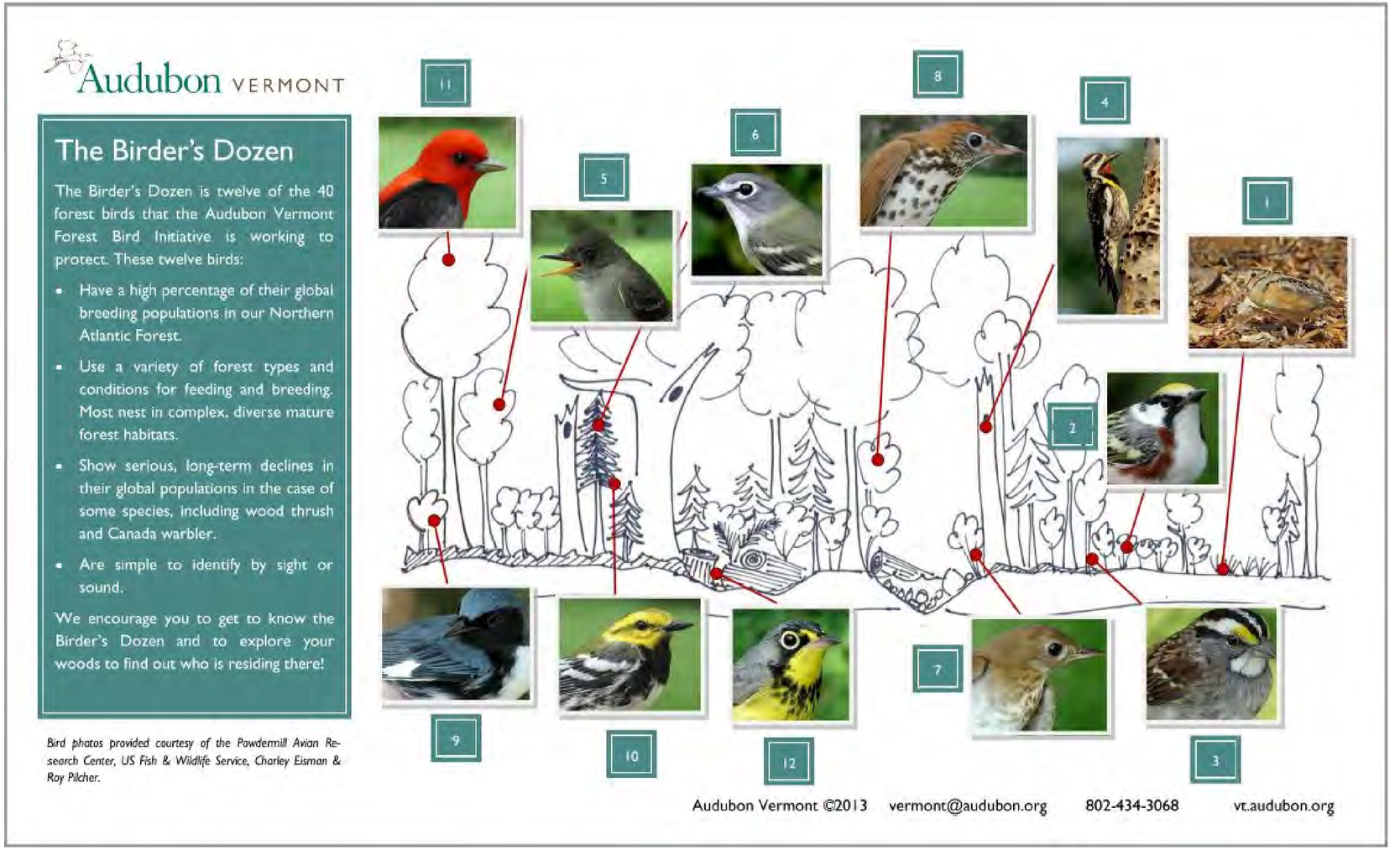
Project Vision and Long-term Outcomes

We envision healthy forests that provide suitable breeding and post-breeding habitat conditions for a suite of priority birds and sustained yields of timber and other forest products and services along the Atlantic Flyway.

- Forest plans that manage for bird habitat and timber will be the norm along the flyway.
- Parcelization and fragmentation rates will be reduced in priority forest blocks.
- Priority bird species populations will stabilize or increase along the flyway.

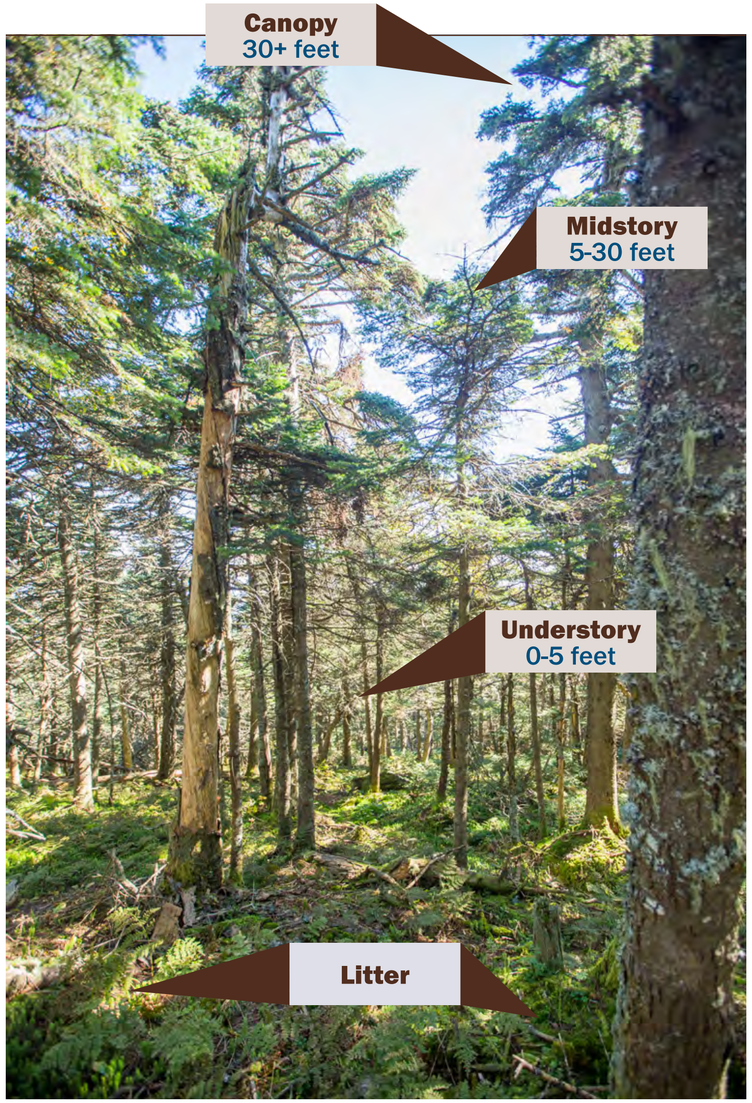
Courtesy of FPR and Audubon Vermont

Birds and other wildlife need a few basic components of habitat to survive, which might sound familiar to us—food, water, shelter, and space. *Figure 1 (right)* highlights the Birders Dozen and the different parts of forest structure that are critical for each species *(The Birder's Dozen Key can be found in Appendix B*). Forest structure is everything in the woods that takes up or creates space, dead or alive. The two main parts of forest structure are horizontal structure and vertical structure. Horizontal structure is hard to see unless you are looking at aerial photos or Google Earth because it is the arrangement of different habitat types across an area. The VCD layer in Biofinder may help you better understand the horizontal structure of a particular location. Vertical structure is composed of the understory, midstory, canopy, coarse and fine woody debris, snag and cavity trees, and leaf litter *(Figure 2)*. You see this as you move through the woods.



BioFinder

BioFinder is a free, publicly accessible online database and mapping tool for identifying Vermont's lands and waters that support important ecosystems, natural communities, habitats, and species. It features Vermont Conservation Design and was developed by the Agency of Natural Resources and partners to support stewardship and conservation. BioFinder highlights networks of forests, streams and other features that together create the heart and backbone of Vermont's landscape. It is a great tool for doing desk top reconnaissance prior to going out into the field.



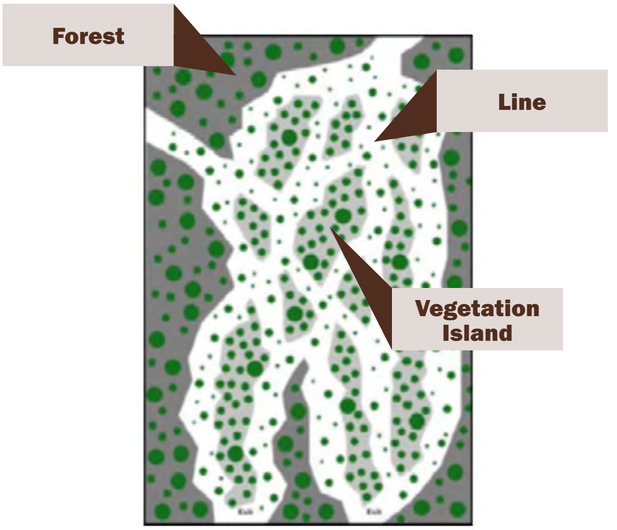
Justin Cash

Vertical structure within a forest

Canopy trees hold snow and protect it from wind loading, wind scouring, and sun crust. The midstory are the young trees that will eventually replace the canopy trees. Often foresters have an objective in mind when keeping and growing mid-story and understory trees that is linked to the long-term health of the forest. Indiscriminate cutting of them may interfere with the public or private landowner forest management objectives. When the midstory is removed it not only impacts the long-term management objectives of a forest, but it means that there will be no new canopy trees to replace the canopy trees that die. The loss of canopy trees can affect a zone's ability to hold and protect the snow for skiing, among many other forest functions. The understory is the vegetation most likely to hit you in the face or trip you while skiing a line. By following the proposal processes of public and private landowners and refraining from illegal cutting, backcountry skiers can ski in well-maintained designated ski zones while participating in managing a healthy forest that will be a more resilient forest in the face of climate change, sustain forest ecosystem health, integrity, and functions, provide wildlife habitat, support local forest economies, and provide recreation opportunities.

The long-term impacts of vegetation removal for backcountry skiing have been observed by experts in the field. Graduate research done at the Bolton Nordic and Backcountry area of Mount Mansfield State Forest confirmed these anecdotal observations. The project found that a historic backcountry ski site had significantly less understory vegetation and lower diversity of saplings, seedlings, and herbaceous vegetation than adjacent forest without human vegetation management for skiing *(Wrigley 2015)*. In order to support the health of the forest, backcountry ski zones should contain skiable lines that are created based on the location of the backcountry ski zone boundary, ecological considerations, and delineated vegetation islands *(Figure 3; description in Chapter 4)*.

Figure 2. Depiction of a backcountry ski zone from above. It contains skiable lines and vegetation islands and is surrounded by a matrix forest. USFS



Wildlife Considerations

Non-motorized recreation is often viewed as benign by the public due to its dispersal over large areas *(Stankowich 2008)*. However, people recreating on the landscape do have an impact on wildlife behavior and health. This is important to remember when considering proposing a new activity on public or private land. The predictability, frequency, and location of recreation activity influence wildlife reactions *(Stankowich 2008, Knight and Cole 1991)*. Wildlife react most to spatially unpredictable activities *(Taylor and Knight 2003; Miller et al 2001)*, which is one reason why concentrating use in a designated place is the current strategy for sanctioned backcountry ski zone management. This use of discrete locations also helps public and private landowners as well as skiers understand this particular use in the larger landscape context of the VCD.

A common experience for skiers and other recreationists is to see an animal that has been spooked by their presence. Often, the animal will run or leave the vicinity of the person. This fleeing is called flight and is considered an avoidance response. There are three main responses of wildlife to humans: avoidance, habituation, and attraction *(Knight and Cole 1991, Whittaker and Knight 1998, Stankowich 2008, Geist 1974)*. Avoidance occurs when an animal takes flight or, in the long-term, changes its location. Here we focus on avoidance behavior and its wider effects to help clarify why certain locations may not be considered ideal for a sanctioned backcountry ski zone. Again, landowners often are looking at the larger landscape when making management plans and decisions, not just a discrete location on the landbase.

Wildlife Flight

Flight is the most identified human wildlife interaction. Large mammals, such as bear or moose, exhibit the greatest response when human activity is spatially unpredictable *(Miller et al 2001)*. Whether or not an animal runs from a person depends on the location, frequency, and predictability of human presence *(Knight & Cole 1991)*. An animal's reaction is commonly determined by how far away a threat is from an individual before they flee. Factors influencing when an animal runs include time of year, time of day, mating season, distance to refuge, and whether the population is hunted *(Blumstein et al 2003)*. An animal running away from a person may not be the most accurate indicator of distress if there is no other site for the animal to move to.

An animal living in an area with no safe space to move to may not flee when disturbed. People tend to assume that no movement means that the animal is habituated to humans and thus not affected by the disturbance *(Stankowich 2008)*. However, an animal not moving is likely experiencing physiological stress induced by the want to leave the area, but having nowhere to go *(Thiel et al. 2008; Boonstra 1998; Creel 2007)*. Malnourished individuals are particularly vulnerable since they are already not well *(Knight & Cole 1991)*, which is particularly pertinent when thinking about a winter activity. Well-vetted backcountry ski zones ensure that wildlife have alternative areas of appropriate habitat for refuge outside of the ski zone.

Change in Habitat and Forage Use

Regular disturbance in an area from activities such as backcountry skiing can lead wildlife to change their use of an area to a less desirable, but safer area. A change like this can have significant long-term impacts on a population of animals *(Knight and Cole 1991, Papouchis et al. 2001, Miller et al. 2001)*. The loss of suitable habitat might reduce the carrying capacity of certain wildlife species on public lands *(Taylor and Knight 2005)*. Combining what is known about local wildlife population distributions and habitat distribution in an area can help public and private landowners determine where to encourage and discourage use. The Vermont Conservation Design is an excellent tool to help assess where a particular proposed sanctioned backcountry ski zone falls in the context of the larger landscape as well as the animal population at a state-wide level.

Vigilance

Vigilance refers to an animal's alertness in relation to predator threats. Recreationists can be perceived as

predators. Wildlife disturbance significantly increases energy demand and usage in winter *(Neumann et al. 2010)*. A lack of habituation increases the risks to wildlife because there are more severe consequences on an individual's energy budget when the animals' risk perception is high *(Neumann et al. 2010)*. One management strategy for addressing vigilance is to use established backcountry ski zones to concentrate use in a known area while keeping other parts of the landscape free of the same number of users *(Papouchis et al. 2001, Miller et al. 2001)*.

Why we are focused on backcountry ski zones

Backcountry skiers can trigger avoidance behaviors *(Taylor and Knight 2003)* in wildlife and the risk effects associated with them. Where backcountry skiing activities become more frequent and focused on the landscape, the cumulative impacts of such disturbance can become a significant concern for local wildlife populations. There is also the potential to compound effects on wildlife when more than one recreational activity is occurring in the same location *(Knight and Cole 1991; Bell and Austin 1985)*.

Impacts to wildlife are among the reasons that the current approach for addressing sanctioned backcountry skiing focuses on the establishment of a ski zone with clearly delineated boundaries. A management zone allows for human use while keeping parts of the landscape free of ski lines *(Papouchis et al 2001, Miller et al. 2001)*. An education component, Vermont Backcountry Ethics, compliments the zone management strategy by providing users with best practices to follow while backcountry skiing.

Natural Communities

In the book Wetland, Woodland, Wildland – 2019, authors Thompson, Sorenson and Zaino identify 97 different natural community types that can be found in the state of Vermont. These defined natural community types provide a way to classify the complexity of nature, and to assess the conservation value of a particular example of any natural community type *(Thompson et al. 2019)*. Natural communities in Vermont include types such as Alpine Meadow, Northern Hardwood Forest, Black Spruce Swamp, and Cattail Marsh. These places provide habitat for a wide variety of native plant and animal species. Maintaining undisturbed, high-quality examples of natural communities helps protect these species.

Natural communities can help inform the layout of ski lines and ski zones. Most backcountry skiing occurs in higher elevation areas within Montane Spruce-Fir Forest, Montane Yellow Birch-Red Spruce Forest, and Northern Hardwood Forest. In these and other expansive forest types, managing for a mostly closed canopy, structural diversity, and abundant regeneration of native species will help maintain the quality of the natural community and its value as plant and animal habitat.

Small-patch natural communities deserve special attention. Though tiny in acreage, these places—such as seeps, swamps, vernal pools, and outcrops—make a large contribution to biodiversity. One study of a northern hardwood forest in southern Quebec found that small wetlands occupy only 1% of the area but support 45% of the vascular plant species *(Flinn et al. 2008)*. They are likewise important habitat for many wildlife species. For example, black bears rely on seeps and other wetlands for early spring forage. Avoid these small natural communities if possible or, if not, buffer them during the layout of ski lines and ski zones. Exact buffer widths may vary based on jurisdiction.

Alpine and subalpine natural communities occupy just a small area in Vermont. When they are blanketed with a deep and dense snowpack or ice, these communities—which include Alpine Meadow, Alpine Peatland, and Subalpine Krummholz—offer unique skiing opportunities. They also support some of the rarest plants growing in the state—the summit ridge of Mount Mansfield supports over 50 different rare and uncommon plant species. Skiers can help protect these plants while recreating by being thoughtful in when and how they choose to ski above tree line, including not skiing in these zones during certain conditions such as when there is early season fresh powder or

melting spring slush. Compressing loose snow (such as fresh powder or melting spring slush) with each step, is likely injuring the plants beneath! Instead, travel on deep, firm snow like hard wind pack or dense spring "corn" snow.

Special Considerations

Rare, Threatened, and Endangered Species (RTE)

Vermont's rare, threatened, and endangered (RTE) species are an important part of our natural heritage. They include animals such as the bald eagle, Bicknell's thrush, American marten, and plants such as diapensia and ram's head lady's-slipper. Threatened and endangered species are protected by state statute. Many land management agencies, including Vermont ANR, take special steps to protect rare species as well. Information about the known locations of RTE species is available from the Vermont Natural Resources Atlas and the BioFinder website. The needs of RTE plants and animals are species and site specific. If RTE species are present (or likely to be present) in an area considered for backcountry ski zone development the process will likely involve extra steps and the involvement of a qualified botanist or biologist.

Important Wildlife Habitats

Some habitats are particularly important to the biological needs of particular species. Deer wintering areas are stands of dense softwood cover that traps snow and provides important winter shelter for white-tailed deer. These areas are typically found at low and mid elevations, and the characteristics that make for good wintering habitat (lack of deep snow and thermal protection) often make them unsuitable for consistent winter skiing. Bear mast stands are areas with concentrations of beech or oak (or occasionally other species). Beech nuts and acorns provide a critical fall food source for black bear and other species such as white-tailed deer and wild turkey. While not heavily used by wildlife during ski season, mast stands can be disturbed if ski zones or ski lines remove important mast trees, or if there is ski zone or ski line creation and maintenance, or hiking use, during the spring and fall.

Vermont Natural Resources Atlas

The Natural Resources Atlas provides geographic information about environmental features and sites that the Vermont Agency of Natural Resources manages, monitors, permits, or regulates. This website is a free public resource that can be used to create place specific maps that you can use to do a desktop review of an area that may have potential for backcountry skiing. You can also export maps and load them into various free mapping apps, this allows you to bring them into the field with you and see your location in relation to ecological features. You can also save and print maps with information about property boundaries, wetlands, RTE, etc. that you need to submit as part of a pre-proposal and full proposals for projects on VT FPR land.

Courtesy of VT Agency of Natural Resources Website

Riparian Areas

The natural vegetation along rivers, streams, lakes, and ponds plays an important role in protecting water quality and aquatic habitat, as well as providing important terrestrial habitat for many wildlife species. In addition, the cold and clean water that flows out of our mountains plays a critical role in maintaining the water quality of Vermont's larger rivers. In general, a zone extending out 50 feet from small streams, and a zone out 100 feet from larger streams, rivers, lakes, and ponds is most sensitive to disturbance. Avoid cutting ski zones or ski lines in these areas. If skiable lines must cross streams, perpendicular crossings minimize the impact to riparian areas.

Federal Management Area designations – Green Mountain National Forest

Management of the Green Mountain National Forest is guided by the 2006 Forest Plan. The Forest Plan identifies management area designations, like zoning, and specifies appropriate activities for each management area. Work with your local Forest Service staff to understand if backcountry ski management in select areas is compatible with management area direction.

Federal – Congressionally Designated Wilderness

Designated Wilderness areas offer the greatest level of protection for federal lands and ensure that natural processes may function, to the extent possible, without the interference of humans. The development of backcountry ski terrain and/or the creation and maintenance of skiable lines is not compatible with management of the eight Congressionally designated wilderness areas located within the Green Mountain National Forest.

Special Considerations

Backcountry skiing, as with many other outdoor activities (i.e. hiking, hunting, biking, paddling, etc.) has the potential to create a wide range of social interactions that may color public perception of both the activity and its participants. Public and private land management is designed to accommodate a wide variety of interests and goals such as timber management, wildlife habitat, rare, threatened, or endangered species, recreation, solitude, and ecosystem services such as water filtration and carbon storage and sequestration. Due to the diversity of these interests, it is vital that recreationalists (as well as others) strive to minimize both real and perceived conflicts among users. These factors extend beyond the resource considerations described above and include social factors influencing human interactions.

Unauthorized Cutting

Unauthorized cutting of any trees for the creation of skiable terrain is illegal regardless of land ownership. The State of Vermont's Timber Trespass Law (13 V.S.A § 3606), updated in 2015, provides a definition of timber as, "sprouts from which trees may grow, seedlings, saplings, bushes or shrubs," making any unauthorized cutting or damaging of vegetation on state lands and private lands illegal with both civil and criminal action possible. In areas where vegetation removal is authorized, land owners should require that specific guidelines be followed to ensure that certain target species, sizes, and numbers be retained or removed (what is cut) and proper technical and safety procedures are applied to how they are cut *(See Chapter 4 and Chapter 5)*.

Unauthorized Cutting and Use Implications

The following language, adopted from the International Mountain Bike Association's stance on unauthorized mountain biking trails, can easily be applied to Vermont's backcountry skiing.

When you illegally cut you:

- Damage natural resources as well as cultural and historical resources
- Violate trust between [backcountry skiers] and [public and private] land managers, and threaten current and future backcountry ski access
- Display [backcountry skiers] as being disrespectful and irresponsible, and alienate other members of the backcountry skiing community
- Create a safety hazard
- Face potential civil and/or criminal penalties

Backcountry Skiers & Other User Groups

- Consider potential conflict between backcountry skiers and other winter recreational user groups
- Collaborate with these other user groups in gaining access and the development of a backcountry ski zone
- Consider potential inter-group conflicts
- Is there enough space to disperse use properly?
- Does the zone provide opportunity for skiers with different interests?
- Design back country ski zones with multiple tiers to meet demands of skiers with different ability levels (find more information on this in Chapter 4)
- For example, create a network of skiable lines that provide a range of difficulty levels
- Group outings are a good way to introduce new skiers to backcountry terrain and to learn backcountry skills. However, group activities have the potential to impact other visitors, particularly those seeking solitude in the backcountry. Be mindful of these potential impacts when planning group outings.
- Some landowners require special group use permits. More information about this is provided in Chapter 3.

Parking Areas

Trailheads and parking areas provide controlled access points to day and multi-day backcountry use. The exact location, size, and layout of parking areas can vary by both terrain and land ownership or management. In areas without designated or adequate parking, vehicles parked along roadsides can present a hazard and/or an inconvenience for snowplows, neighbors, and emergency vehicles. Skiers should be mindful to respect trailhead owners and minimize potential conflicts with others. Winter parking areas can fill up quickly and lead to overcrowding. Avoid parking along adjacent roadsides when parking areas are full. Additionally, do not block private driveways, plow truck and school bus turnarounds, and access for search and rescue (SAR) operations.

Pets

Regulations on pets, including dogs, vary by landowner. For instance, the USFS requires that pets be under physical restrictive control while in developed recreation areas but not while in other parts of the national forest. Many municipalities have leash laws or ordinances. VT FPR does not have a specific policy on dogs outside of campgrounds and other facilities and high-use areas but does encourage users to leash dogs when appropriate and to have voice command over

unleashed dogs. Private landowners may have their own rules related to pets and access to their land. It is best to know and follow the rules of the landowner where you will be recreating.

VT Backcountry Ethics

The Vermont Backcountry Ethics (VBE) are a set of Leave No Trace guidelines for the Vermont backcountry skiing community, designed by Vermonters to promote the safe and responsible use of the winter environment. The principles were developed in 2015 through a partnership between Catamount Trail Association (CTA), Vermont Department of Forests, Parks, and Recreation (VT FPR), Green Mountain Club (GMC), Green Mountain National Forest (GMNF), Winter Wildlands Alliance, and the Leave No Trace Center for Outdoor Ethics. The VBE's seven principles have been adapted from the seven core and nationally recognized guidelines for Leave No Trace outdoor travel. A trailhead version is included below. A longer version can be found in Appendix D.

VERMONT BACKCOUNTRY ETHICS

LEAVE NOTHING BUT TRACKS

1 _ Plan Ahead & Prepare

- Practice safety first.
- Know where you are going.
- Know your own and your group's limits, and minimize risks.

2 _ Travel On Durable Surfaces

- Stay on deep snow cover whenever possible.

3 _ Dispose of Waste Properly

- Pack it in. Pack it out.

4 _ Leave Things As They Are

- Leave only tracks. No unauthorized cutting.

5 _ Minimize Campfire & Hut Impacts

- Use a lightweight stove for cooking and enjoy a lantern for light.
- Leave huts and cabins in better shape than you found them.

6 _ Respect Wildlife

- Observe wildlife from a distance. Do not follow or approach wildlife. Winter is an especially vulnerable time for animals.

7 _ Be Considerate of Others

- Any maintenance cutting can be done only with permission, as part of an suthorized project or program. Respect landowners, both public and private.
- Respect other skiers/riders and all other users.
- When ascending trails, keep clear and yield to downhill traffic. Avoid booting and snowshoeing in skin or ski tracks. When descending always stay in control, go one at a time, and slow down near others.
- Respect designated areas, signs and wildlife.

CATAMOUNT TRAIL ASSOCIATION · LONG TRAIL · VERMONT · UAS · WINTER WILDLANDS ALLIANCE · Leave No Trace

www.catamounttrail.org

Justin Cash

How to Promote the Vermont Backcountry Ethics (VBE)

Display the principles on durable, letter-sized signs at backcountry trailheads, ski areas and other locations throughout the state. Think creatively about locations where land managers, a CTA Chapter, organization, or business can share the information with outdoor recreation users. In addition to trailheads, consider backcountry huts and local businesses. Communicate clearly with landowners and land managers in siting signage. It can be helpful to keep track of where your organization posts the signs, so you know where you want to re-post each year. Contact CTA to request signs or if you need any assistance.

Circulate the principles through communication channels: CTA and land managers display the VBE on their website. Consider sharing the information through the communication tools that CTA and chapters have access to, such as websites, social media pages, email networks or print newsletters.

Review the principles at meetings, events, or outdoor gatherings: The principles create a common language, code of conduct and shared accountability that outdoor recreation users and community members appreciate. Talk about the principles with groups of cross-country and backcountry skiers or the leadership of organizations (i.e. Board of Directors, staff, partners). Announce the VBE at events or review them before hitting the backcountry zone.

Put VBE to work: CTA is working closely with VT FPR, GMNF, and other land managers, landowners, and community partners to update strategies for responsibly managing terrain in ways that align with the VBE. Consider ways that facilitate integrating the principles into local projects or within the overall culture of CTA Chapters, organizations, businesses, or recreation groups.

Chapter 3 Partnerships

Landowner Management Considerations
Public Land
Private Land

Ember Photography

Partnerships

Many factors influence the management of public and private lands. Knowing, understanding, and respecting the limitations and opportunities of various stakeholders is essential to forming healthy partnerships. Further, partnerships are a vital means for increasing capacity by leveraging the combined technical, financial, and on-the-ground resources toward a collective goal.

Successful cross-country touring and backcountry skiing projects across Vermont are inherently collaborative endeavors. Local and statewide projects provide widespread community, health, and economic benefits, creating incentives for diverse partners to get involved. Many times, public and private entities will benefit from engaging in multi-sector partnerships with non-profit organizations; outdoor recreation and tourism businesses; civic, municipal, health and educational institutions; landowners and land managers; emergency service personnel; and outdoor recreationists.

Developing a common vision for opportunities in a region will lead to a clearer understanding of the capacity and resources needed for projects. Partner conversations can lead to clear expectations and commitments of in-kind resources, cash, or services. In some cases, a simple written agreement (Cooperative Agreement or Memorandum of Understanding, for example) is a useful tool for outlining joint purpose, benefits, expectations, and legal protections of a partnership. As one example, CTA has a Cooperative Agreement with the Vermont Department of Forests, Parks, and Recreation, which formalizes their partnership.

Understand the land owners' objectives

- Objectives will vary across government agencies and among private landowners
- Find public land managers' missions, goals, and objectives online and in specific management plans
- Public land is managed for multiple uses but not on every acre!
- Some areas have very specific objectives and constraints not compatible with backcountry skiing
- Projects on public land will likely require a public involvement process
- Private land is managed for uses determined by the private landowner
- The goals and objectives, including legal protections and interests, on public land and/or private land may not align with backcountry skiing
- Determine the proper communication channels - who is the correct point of contact at the state, USFS, municipal level, private landowner, etc.?

Landowner Management Considerations

Public Land

Vermont's public lands are managed by various organizations, agencies, and departments, from national to local, and are subject to differing statutory or management goals. Public land makes up only 20% of Vermont's forested landscape; the remaining 80% is privately owned *(Butler, Butler and Hewes, 2014)*. For public land managers, private landowners, and backcountry skiers to jointly develop backcountry ski zones, it is important for all parties to understand the goals and impacts of various management activities in order to find ski compatible interests, where they may exist. The following section highlights different public agency and department missions and proposal processes.

Federal: US Forest Service

Mission: The mission of the Forest Service is

USFS Proposal Process

Prior to developing a formal proposal, project proponents should consult with District Recreation Program Managers to understand the process, timeline, and sideboards. Proposal development is an iterative process with final proposals assessed as follows:

1. **Review initial proposal to ensure alignment with the 2006 Forest Plan**
   a. Does the Management Area(s) allow the activity?
   b. Does the activity work towards achieving Forest-wide or Management Area direction for Desired Future Condition?
   c. Does the activity align with Standards and Guidelines?

2. **Evaluate the proposal for economic, environmental, and social sustainability**
   a. What are the anticipated use levels and can the project/proposal support those levels, considering: sustainable design/location as well as support infrastructure such as parking
   b. Safety concerns, including potential user conflicts
   c. Resource concerns
   d. Maintenance concerns, including having the support of a volunteer organization
   e. Purpose (leads to vista, loop, to services, other attractions)
   f. Short and long-term financial needs
   g. Duplicate opportunities-including analysis of opportunities on State, federal or private land: is the new project needed?
   h. Consider if the proposal would require or could benefit from a Special Use Permit

to sustain the health, diversity, and productivity of the nation's forests and grasslands to meet the needs of present and future generations.

State of Vermont: Agency of Natural Resources

The Vermont Agency of Natural Resources owns over 355,000 acres of land, across the three Agency departments: Department of Forests, Parks, and Recreation (FPR), Department of Fish & Wildlife (FW), and to a much lesser extent, the Department of Environmental Conservation (DEC).

The mission of the Department of Forests, Parks, and Recreation is:
FPR is responsible for the conservation and management of Vermont's forest resources, the operation and maintenance of the State Park system, and the promotion and support of outdoor recreation for Vermonters and our visitors.

The mission of the Department of Fish & Wildlife:
The mission of the VT Fish & Wildlife Dept is the conservation of all species of fish, wildlife, and plants and their habitats for the people of Vermont. To accomplish this mission, the integrity, diversity, and vitality of their natural systems must be protected

Long Range Management Plans

Public lands in Vermont, including State Forests, State Parks, and Wildlife Management Areas, undergo a deliberative and robust land management planning process that prescribes management direction into the future. These plans include a significant public input process and take into consideration the setting, ecology, history, legal restrictions, public interest, and natural resources when prescribing management goals, objectives, strategies, and projects. Recreation

FPR Proposal Process and Evaluation Criteria

1. **Fill out Pre-Proposal Form (Appendix G)**
2. **Submit to FPR Staff – District Stewardship Forester or Forest Recreation Specialist**
3. **FPR will respond within 30 days of receipt of pre-proposal**
4. **You may receive a rejection of the pre-proposal or an invitation to submit a Full Proposal**
5. **Submit Full Proposal**
6. **Full Proposal will be reviewed by the District Stewardship Team – this review may include:** Resources Assessment/Inventory; Site Visits; Public Involvement; Amendment to an LRMP; Lands Team (Agency of Natural Resources) Review; Town Involvement; Feasibility Studies; Design/Engineering/Planning; Timeline Shifts; Modification of Proposal
7. **A response with next steps outlined will be given to all Full Proposals within 60 days.**
8. **If project is approved, then it will be put in District Annual Stewardship Plan, which is put together in late fall/early winter.**

Submitted VTFPR Pre-proposals Evaluation Criteria:

1. Is there a Long Range Management Plan (LRMP)* or Interim Stewardship Plan (ISP)* for the state forest or park you are interested in?
2. Is the project consistent with the classifications in the LRMP? Will the project change the land use or recreational experience in the area? Are there any known resource constraints? (i.e. Deer Wintering Areas or Rare, Threatened, or Endangered Species)
3. Does the project meet the goals of the property?
4. Is the use allowed by legal/statutory constraints on the parcel?
5. Is this a new use on this property?

* *All projects on properties which do not have and LRMP or ISP will be reviewed for resource and legal impacts and compatibility by the appropriate ANR staff.*

Justin Cash

Submitted VTFPR Full Proposal Evaluation Criteria:

Based on District Stewardship Team Review of your submitted pre-proposal, you may be invited to submit a full proposal. The following criteria will help guide the review of your proposal and determine the necessity of making modifications:

1. Resource constraints (i.e. Wildlife impacts, presence of RTE, erodible soils, riparian zones, archeological/cultural concerns, etc.)
2. Use or management conflicts (for example: new trail by a remote campsite or a license for some other use of the parcel)?
3. Impacts to adjacent parcels
4. Projects/Trail Design Standards
5. Long and short-term capacity to maintain this use/resource
6. Funding or fundraising capacity for this project
7. Public demand for this project
8. Demonstrated lack of regional public supply for this activity/use
9. Formal agreement with a partner
10. Whether this activity is established and growing

Ember Photography

is just one part of this planning process and is evaluated and managed based on the compatibility of use with various other factors. Dispersed skiing is generally allowed on state lands (see the Agency of Natural Resources Uses of State Lands Policy), more recent LRMPs may include specific language about Designated backcountry ski zones.

District Stewardship Teams

Lands owned by the Vermont Agency of Natural Resources are managed under the guidance of District Stewardship Teams (DST). DSTs have membership from all three ANR departments – Forests, Parks & Recreation; Fish and Wildlife; and Environmental Conservation and are led by FPR Stewardship Foresters in each district. These multi-disciplinary teams meet regularly to discuss land management, review project proposals, and provide input on issues of regional or statewide importance. The DST is responsible for the development of long-range management plans (LRMPs) and annual stewardship plans (ASPs) that guide management of specific parcels of state-owned land as well as the review of proposals for uses of state land. While management actions are discussed collaboratively with staff expertise from all three departments, uses of state lands must be consistent with the missions of the individual departments as well as the purpose of ownership of the particular land parcel. For instance, Wildlife Management Areas have limitations on the types of recreation allowed because of parameters associated with their federal funding sources.

Process for new uses on Wildlife Management Areas

Lands owned by the Vermont Agency of Natural Wildlife Management Areas (WMAs) are owned and managed to further the mission of the VT Fish and Wildlife Department (VFWD), with the primary goals of protecting wildlife habitat and promoting wildlife-based activities. Currently, no developed skiing areas exist on WMAs. Use of Wildlife Management Areas is governed by the Rule Governing Public Use of Vermont Fish and Wildlife Department Lands *(10 App. VSA ∫ 15)*. Dispersed pedestrian activities, including skiing, are allowed on WMAs. Proposals for other activities would be evaluated based on their compatibility with and impacts to the primary goal of WMAs. The clearing of any vegetation for the purpose of enhancing the opportunities for backcountry skiing on WMAs is not allowed.

Group Activities & Commercial Services

State of Vermont

The Vermont Agency of Natural Resources, which houses both the Department of Forests, Parks and, Recreation and the Fish and Wildlife Department has an established Special Use Permit (SUP) and Licensing process for commercial activities or large groups (more than 10 people in an organized activity). It is easy to apply for these through an online application, which is located on ANR's website. Further information about Who needs a SUP or License and Why can be found at FPR's Special Use Permit and Licensing website.

USFS

A Special Use Permit is permission for individuals or other entities to conduct an activity on National Forest System land that is beyond the normal day-to-day use of the forest. Permits are reviewed for activities such as recreation events (e.g., a ski-mo race), outfitting and guiding, and commercial filming. Learn more at: https://www.fs.usda.gov/main/gmfl/passes-permits/event-commercial

Municipal: Town Lands and Forests

Town forests can be excellent options for local recreation and managing for forestry, wildlife, and water quality. Most communities manage town forests through the local select board, although some towns have designated recreation, town forest, or conservation commissions or committees who are tasked with managing public use of municipal forests and many rely on FPR county foresters for technical assistance and management. Some communities may have active management plans for certain parcels of land that outline goals for conservation, recreation, and forestry. If there is not a management plan or other guiding document for parcel, the Town Forest Recreation Planning Toolkit created by the Vermont Urban and Community Forestry Program provides step-by-step planning resources. In addition to accessing the Town Forest Recreation Planning Toolkit, you can reach out to your local officials to share ideas, pitch proposals, and get broad-based feedback. If you do not know who to approach or where to find information on existing management plans, contact the local Town Clerk for guidance.

Town Forest Recreation Planning Toolkit

Step-by-Step Planning Process

A town forest recreation plan offers a voice to the community and a roadmap for community leaders and volunteers toward sustainable recreational use of the town forest. This step-by-step planning process (and printable pdf) is a framework to develop a community vision, invite robust community engagement and create actionable strategies. The process is designed to be flexible and can be adapted to meet your community needs and capacity.

Pods

The Town Forest Recreation Planning Pods contain all the materials your community will need to engage in town forest recreation planning. The pods are organized around six themes and include guidance documents, instructions, templates, and other materials.

Private Land

Vermont has a long-standing tradition of allowing public access on private lands and Vermont's Landowner Liability Law *(12 V.S.A.§ 5791- § 5795)* provides strong protections to landowners who allow public use on their property. Many private landowners create trail networks for themselves on their land. This section is intended to help private landowners think about what goes into planning a backcountry ski zone on their property and how it may fit into their plan for their property. Landowners who are enrolled in the Use Value Appraisal, or Current Use, program will need to consult with their forester on how this new use may affect their forest management plan. This section also highlights the nuances of how an organized group of backcountry skiers might work with private timber companies and/or other private landowners to develop a backcountry ski zone. When developing a proposal on private land, make sure to understand when and where input from a Vermont Licensed Forester is needed *(see callout box below)*. Good communication and a thoughtful strategy will help identify values that are important to both landowners and skiers. A detailed backcountry ski zone development plan ensures that backcountry access on private lands (e.g. parking, access trails, ski lines, volunteer activities, etc.) is done in a respectful and orderly fashion and will help avoid potential pitfalls.

Vermont Licensed Forester

Who must be licensed?

Any person holding himself or herself out to the public as a forester must be licensed. 26 V.S.A. § 5203(a)(4). And regardless of title, any person practicing forestry must be licensed. Id. § 5203(a)(3). The practice of forestry is defined by statute:

- Forestry means the science, art, and practice of creating, managing, using, and conserving forests and associated resources to meet desired goals, needs, and values, including timber management, wildlife management, biodiversity management, and watershed management. Forestry science consists of those biological, physical, quantitative, managerial, and social sciences that are applied to forest management. Forestry services include investigations, consultations, timber inventory, and appraisal, development of forest management plans, and responsible supervision of forest management or other forestry activities on public or private lands.
- Forestry does not include services for the physical implementation of cutting, hauling, handling, or processing of forest products or for the physical implementation of silvicultural treatments and practices.--26 V.S.A. § 5202(4).

Exemptions to licensure (26 V.S.A. § 5204)

(1) An individual, college or university, family, family trust, or business from practicing forestry on his, her, or its own lands, provided that a business may only practice forestry on an aggregate of not more than 400 acres of its own lands.

(2) The practice of any other occupation or profession by a person duly licensed or otherwise authorized under the laws of this State.

(3) (A) An individual from carrying out forest practices when acting under the general supervision of a forester or acting as an expert consultant on work related to forestry, such as forest certification audits or the study of hydrology or wildlife biology.

(B) As used in subdivision (A) of this subdivision (3), "general supervision" means the forester need not be on-site when the individual performs the work described in subdivision (A), but shall maintain continued involvement in and accept professional responsibility for that work.

(4) Unlicensed professional activities within or relating to forests, if such activities do not involve the application of forestry principles or judgment and do not require forestry education, training, and experience to ensure competent performance. (Added 2015, No. 166 (Adj. Sess.), § 2.)

Forest Management Plans

Private landowners may or may not have a forest management plan. In Vermont, approximately 50% of all eligible forestland is enrolled in the Use Value Appraisal program (or Current Use). The Current Use program provides landowners with property tax incentives to conserve Vermont's working landscape through active forestry and/or agriculture practices. (Municipalities, with lands in other towns, and non-profit conservation organizations can also enroll town lands in the Current Use program.) Every forestland parcel enrolled in current use has a forest management plan that outlines the present and future activities on the land and a schedule of management activities for a variety of goals. Failure to follow the approved plan carries stiff penalties.

If a private landowner does have a forest management plan, it may include goals and objectives such as timber management, firewood production, wildlife habitat, water quality, and protection of other unique values such as historic or ecological features. While it is possible that backcountry skiing may be compatible with the forest management plan, it is important to see whether there are goals that may limit or preclude the development of backcountry ski zones on a parcel. It will be important to work closely with the landowner and/or the licensed forester who wrote the forest management plan, or the county forester who approved it to ensure that your proposal does not negatively impact the parcel's adherence to Current Use rules.

Even if private landowners' goals are not codified in a forest management plan, it is helpful when planning a backcountry ski zone to understand what their goals are.

Timberlands

In some areas of Vermont, particularly along the Green Mountains and in the rural Northeast Kingdom, private timber companies own large swaths of land that are managed primarily for forestry and, increasingly, maple syrup production. These land owners may be open to backcountry ski zone proposals, so long as they are consistent with their management goals. Some of these parcels are governed by conservation easements that require permanent public access. Dispersed backcountry and cross-country skiing are typically protected under a public access easement, but it is important to note that landowners may NOT be obligated to provide parking (especially in the winter) or backcountry ski zone access. Furthermore, no cutting on any private land should occur without written permission of the landowner, and the conservation partner who supervises the conservation and public access easement (e.g., Agency of Natural Resources or a Land Trust).

Some timberland easements require a 'corridor manager' to oversee trail-based uses (i.e., snowmobiles, hiking, horseback riding, etc.). Corridor managers represent a specific user-group and may need to work with other recreational users to develop a corridor management plan that outlines how uses will occur and be managed on the property. A backcountry ski group, for example, would need to demonstrate how access would occur, consistent with other forest management goals. This may include plans for parking, access trails, signs, risk management, and maintenance. Corridor management plans may be concise or include multi-faceted, long-term implementation goals. These plans are usually required to go through a public process.

Some private landowners and timber companies that do not have easements covering their land may, in certain cases, be open to permanently protecting access for backcountry skiing use through the sale of an easement or public land acquisition for their property. This process involves sensitive conversations and should be done with care. The Catamount Trail Association's Trail Protection Committee is a good resource for backcountry chapters (or prospective chapters) considering potential skiing-related conservation projects in their area.

Use Value Appraisal (Current Use) Program

Vermont's UVA Program enables eligible private landowners who practice long-term forestry or agriculture to have their land appraised based on the property's current use value of production of wood or food rather than its residential or commercial development value. The Department of Taxes, Division of Property Valuation and Review (PV&R) is the lead agency, but FPR County Foresters administer the Forestry Use Value Appraisal portion of the program.

Establishing a Formal Backcountry Ski Group

Both state and federal agencies prefer to work with a group that has long-term potential as a partner. When evaluating proposals for uses of public land it is important for a newly created recreation resource to have a group of people committed to the long-term upkeep and maintenance of that resource. Federal and state agencies both have long established partnerships with recreation organizations that have been formalized through various agreements. The Catamount Trail Association is a group that has an existing relationship with public agencies. Therefore, if interest is growing in your community for cross country touring or backcountry skiing opportunities, consider becoming a chapter of the CTA. Gauge local readiness by answering the following questions:

- Are there opportunities to work with public and/or private landowners on publicly accessible cross-

country touring trails or a backcountry ski zone? Can the necessary infrastructure and/or desired amenities for the benefit of the public be put in place?

- Is there a core group of skiers interested in volunteering their time to pursue cross country touring networks or backcountry skiing zones? Is there a solid base of support?
- Is there a local entity or existing organization that can provide structure, education and accountability and can serve as a liaison to the CTA?

If you answered yes to any of these questions, read on for guidelines to partnering with the CTA by becoming a Chapter.

What is the relationship between CTA and Chapters?

The CTA is a statewide, non-profit, member-driven organization that works to expand access to Vermont's backcountry. The CTA builds and maintains backcountry skiable lines and terrain, works to conserve mountain lands, and runs programs to expand equitable access to skiing.

Through the CTA's Chapter program, local groups that are interested in creating managed backcountry ski zones or skiable lines can organize and receive support from the CTA to help build and sustain their projects.

Chapters of the CTA are approved by the CTA Board of Directors to advance local cross-country touring or backcountry skiing and riding projects as well as pursue education and outreach activities and are directed by local officers and guided by Chapter-developed bylaws.

Why Start a Chapter?

As opportunities for cross country touring and backcountry skiing gain momentum across Vermont, the CTA is positioned to bolster community-led initiatives by providing necessary organizational support. There are several benefits to becoming a CTA Chapter:

- Leveraging CTA's 30+ year organizational reputation in serving conservation, recreation, and community interests across Vermont
- Benefiting from CTA's relationships with private landowners and public land managers, CTA's membership base, and the expertise of CTA volunteers across the state.
- Utilizing the tax-exempt status of CTA as a federally designated non-profit organization to enable fundraising for local projects.
- Obtaining CTA's technical assistance, administrative support, and insurance.

By working together, CTA and Chapters have the potential to:

- Expand cross country touring and backcountry skiing opportunities for all abilities across a variety of locations and terrain across Vermont;
- Increase awareness and stewardship of Vermont's diverse landscapes and promote the greater conservation of our mountain environments;
- Strengthen relationships with land managers and landowners and support their information gathering, education and public service needs, in order to manage skiable lines and backcountry ski zones that adhere to the best ecological practices;
- Promote environmental awareness by winter backcountry travelers, in accordance with the Vermont Backcountry Ethics;
- Bring cross country and backcountry skiers together for work parties, ski tours, and related outdoor activities for camaraderie and knowledge sharing; and,
- Serve as a collective voice that can better advocate for non-motorized, human-powered recreation and the quality of life, recreational, health, economic and educational benefits they provide communities and Vermonters.

Organizing local activities to build lasting relationships: Tips from CTA

To build a strong base of community support for backcountry ski projects, consider bringing community members together to learn about and build excitement for local cross-country and backcountry skiing opportunities. Strive to engage others who may not be aware or as enthusiastic about your project to build relationships as well as to learn from and address potential concerns. Showing enthusiasm and understanding for projects and places, as well as their value to the community, can lead to a diverse, motivated base of volunteer ambassadors available to help with trail work, events, and fundraising.

Cultivate a supporter base: Identify a list of supporters and community members that you can directly communicate with and mobilize for local project activities. If you are a Chapter of the CTA, you will have established a formal membership and will have access to a database with contact information.

Create a buzz: Provide frequent updates on noteworthy progress or interesting news. Electronic communications are important tools to build momentum, update the community about projects, and provide opportunities to get involved. Try to offer multiple pathways for action. Recognize accomplishments and those who have been ambassadors for the effort.

Organize Events and Build Community: Gatherings such as trail work days, tours, outings and events can accomplish many goals: make progress on important projects, promote the Vermont Backcountry Ethics, fundraise, develop camaraderie among outdoor recreation users, and build support for cross-country and backcountry skiing projects.

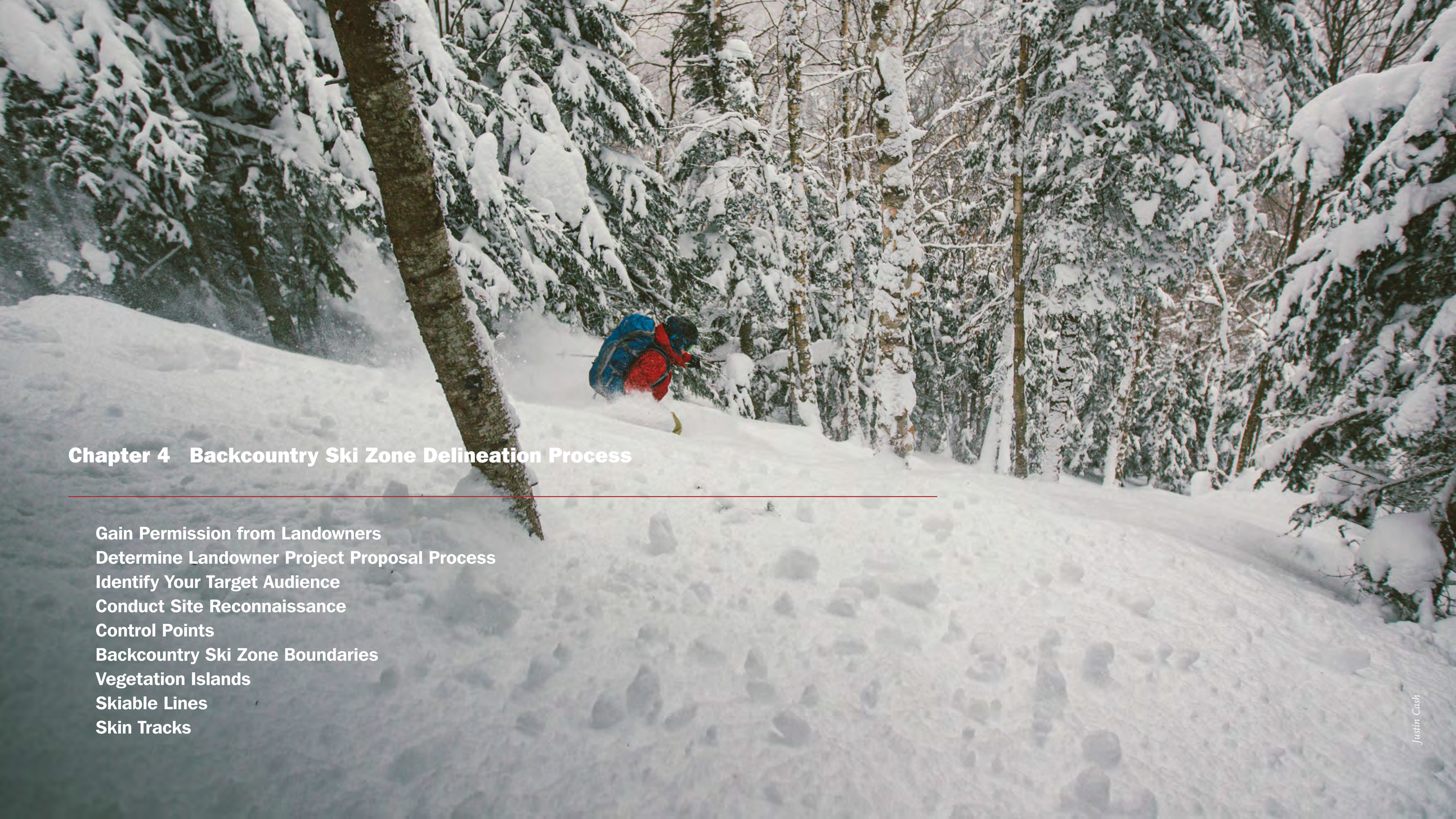
Tell Your Story: Use the media to inform your community and generate interest about local projects. Groups like the CTA can provide support and collaboration on the following ideas:

Build a relationship with media representatives for whom cross-country and backcountry skiing and riding stories are within their news purview. Identify a spokesperson in your group to be a point of contact for reporters. Your spokesperson should meet with the reporter to provide background for projects and then provide frequent and noteworthy updates 3-4 times a year.

Invite media representatives to take a tour, attend an event, or interview a key leader or new partner. Send them a written press release or advisory via email, and then follow up with a phone call.

Take advantage of free calendar listings online, on the radio, and in print news or email newsletters to promote events and garner media attention.

Justin Cash



Chapter 4 Backcountry Ski Zone Delineation Process

Gain Permission from Landowners
Determine Landowner Project Proposal Process
Identify Your Target Audience
Conduct Site Reconnaissance
Control Points
Backcountry Ski Zone Boundaries
Vegetation Islands
Skiable Lines
Skin Tracks

Justin Cash

Backcountry Ski Zone Delineation Process

Potential backcountry ski zones should be delineated to align natural topography and ecological factors with user group desires and landowner management objectives. Proposed backcountry ski zone management will include the management of vegetation to indicate where skier traffic is encouraged but will not include the removal of all trees – living or dead, standing or downed – within that line. Trees will be retained within these lines in order to maintain the species composition, and stem sizes and densities desired by the landowner.

In order to maintain a healthy forest, emphasis for vegetation management should be placed on promoting uneven-aged conditions by using retention vegetation islands (patches of vegetation) within backcountry ski zones. The vegetation islands will not be cut or removed. The density of the retained vegetation within the vegetation islands will discourage skier traffic through these areas. Vegetation islands will range in size and should exhibit a diversity of species, ages, and composition as well as both vertical and horizontal woody structure that is in line with the forest management plan for the forest. The retention of these islands will aid in maintaining uneven aged conditions; provide for future tree regeneration that will increase the stands' resilience; decrease the stands' susceptibility to wind throw, disease, and insects; and maintain wildlife habitat. More details on these retained vegetation islands can be found below. To reduce the number of visitors leaving the designated skiable lines, narrow bands of dense vegetation may also be retained along edges and where other user trails may access the backcountry ski zones *(Coppes and Braunisch, 2013)*.

Gain Permission from Landowners

Meet with land managers and/or landowners to discuss the skiing project proposal (see Chapter 3 for more information on different land managers and their respective proposal processes)

Determine Landowner Project Proposal Process

The process for each type of land ownership is addressed in Chapter 3.

- Walk your proposed tree-skiing terrain with the landowners and/or their licensed forester to ensure management goals and objectives are being met
- Keep an open mind and be prepared to adapt accordingly
- Adjustments in your backcountry ski zone delineation may be necessary to meet management objectives of the landowner
- Zone delineation specifics might be slightly different among public land agencies, be understanding and work with them through their process

Identify Your Target Audience

Identify zones that can accommodate different skier/ability levels:

- Lower angle slopes – These provide a great opportunity to create low-angle and low-density lines for beginner and intermediate skiers, which is a key user group since so many new people are entering backcountry skiing.
- Higher angle slopes - These provide opportunities for advanced skiers. The steeper slopes require higher skill due to the steepness and vegetation density. It is important to include options around particularly steep pitches or cliffs in these areas.

If you have steep pitches, consider having wider runout zones below them to ensure for safe turns, stops, and falls.

- Where lines can go will be greatly influenced by ecological considerations, so make sure to always have a map with those 'no-go' places when contemplating line locations (see below for suggestions on creating a map)
- Be mindful of maintenance/workload required. A line that cannot be maintained is a line that should not be cut

Conduct Site Reconnaissance

- Before You Go
  - Create a map of your site in Biofinder or ANR Atlas that includes locations you know you will have to avoid such as: Rare, Threatened, and Endangered Species; Important Wildlife Areas (ex. deer wintering area); Riparian Areas; Federal Management Areas that limit backcountry skiing; Federally designated Wilderness Areas. For more information on these areas see Exclusion Areas below or Management Considerations in Chapter 2
  - **Have a plan for how you are going to collect, store, and share information.** There are various free or subscription based phone apps that allow you to upload a map and record points, pictures, etc., and then share that information with others. This is a great resource, particularly for sharing information with landowners and/or licensed foresters
- Parking and Access
  - Is there currently parking?
  - Would parking be a problem?
  - Is parking already a problem?
  - How much parking do you expect you will need for your backcountry ski zone?
  - How will access be managed (plowed/sanded) in winter? Who will manage it? Who will incur any costs associated with management?
  - Are there 'curbside' issues (line of sight, snow removal, drainage ditches, culverts, etc.)?
  - Does the location allow for shared access by other recreation users (i.e., snowmobiles, Nordic skiers, snowshoers, etc.) as well as emergency access (fire, EMT, SAR, etc.)?
- Considerations while traversing a potential backcountry ski zone:
  - Conduct the traverse from top to bottom. As you walk from the bottom to the top, notice and map things on the way up. When you are walking down evaluate the skiing and the required vegetation management as well as any limiting site factors, which may include:
    - Rare, Threatened, and Endangered Species; Important Wildlife Areas (ex. deer wintering area); Riparian Areas; Federal Management Areas that limit backcountry skiing; Federally designated Wilderness Areas
    - Suitable locations for vegetation islands
    - Naturally occurring openings and/or open forest understory conditions that would be suitable for skiing with little to no vegetation management/removal
    - Locations that may not be mapped in Biofinder or ANR Atlas, but indicate they may need special consideration such as wildlife trees, cliffs or steeps that might host unique or RTE flora or fauna
    - Also take note of vistas, rest spots, blind spots going up/down, potential rescue cache locations, etc.
    - Note locations that seem good as a potential skiable line

- Consider one or more site reconnaissance trips, and including the landowner and/or a licensed forester, will likely make the overall process go more smoothly

After you conduct site reconnaissance, answer these questions with your target audience in mind:

- Does the line provide an “out” or easier option for skiers?
- Does a “braided line” design, where multiple intersecting lines exist within one tree skiing zone, provide exit points for skiers?
- Does the line end with an egress route? Or does its dead end into terrain that makes it difficult for a skier/ to exit the area, such as an extensive straight away or a steep drainage? Lay out tree skiing zones so that they end in a defined egress route, pause point, or transition area (location where you are taking off/putting on skins)
- Where are the entry points into the ski zone? Do they provide a safe and appropriate transition area (location where you are taking off/putting on skins)?
- What level of user does the zone serve? Does this match the goals and intention of the landowner and/or licensed forester?
    - In beginner zones, entry points should be easily noticeable and recognizable. Consider signing these entry points to alert skiers/s
    - In more advanced terrain, these entry points may be less noticeable to deter beginner skiers and provide a sense of “discovery”

Control Points

A common and time-tested trail design strategy is to consider all of the many relevant site variables involved in your project and ‘connect the dots.’ Most projects have a few basic, common variables that need be considered, such as parking, boundaries, summits, and vistas. Other variables may be unique features that you want to accent, such as boulders, ledges, historic sites, and natural areas. And then there are some variables that you will want to avoid altogether, identified in detail in Chapter 2 - Natural Resource & Social Considerations, such as riparian areas, sensitive wildlife habitats, and sensitive ecological areas. Sometimes features fall into both categories, for example a wetland edge may provide a vista opportunity but will require setbacks or bridging.

Using the ‘connect the dots’ strategy, backcountry users can better delineate a ski zone that includes desirable features (parking, summit, low-angle skin track, beginner to advanced descent options) and avoids undesirable features (neighboring houses) and/or known natural resource management constraints (deer wintering areas, RTE, and riparian areas).

Backcountry Ski Zone Boundaries

Delineate ski zone boundaries. Utilize various features and micro-topography to determine these boundaries. This may include:

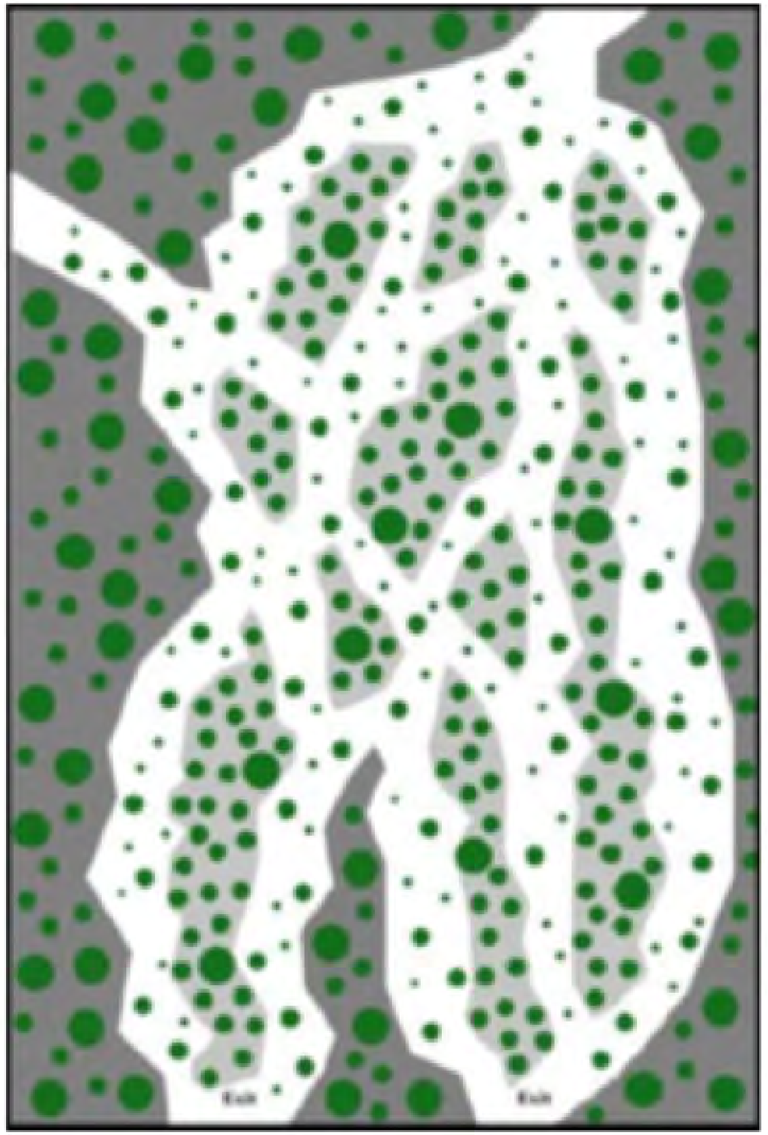
- Aspect (favor slopes that will hold snow (N, E))
- Drainages/stream corridors
- Changes in slope aspect (leeward sides collect and retain snow longer)
- Changes in terrain (such as ridgelines, edges of bowls, or double fall lines)
- Rocky or brushy (or inaccessible) terrain
- Ski Zone infrastructure/access points (ex. trail utilized for access bordering one or more sides of your backcountry ski zone)

A backcountry ski zone may accommodate multiple lines, depending on the size of the area.

Vegetation Islands

Vegetation islands are the location within the backcountry ski zone boundaries where silvicultural goals may be addressed. These islands are intended to maintain the forest functionality by providing areas where both forest structure and diversity can be addressed. Vegetation islands are a place where a vegetation of different sizes, different species, etc. can be maintained. They will contain examples of healthy, vigorous trees that can act as seed sources for the surrounding forest. They also provide challenge and diversity to the ski terrain while protecting forest diversity and ecosystem functions. Identifying and laying out vegetation islands is crucial to the long-term health of the forest and will, to a large extent, dictate the number, width, and variety of potential ski lines. Areas to consider for islands: softwood inclusions; wetland and stream corridor buffers; seeps and springs; exposed ledge/rocky outcroppings; patches of structurally diverse mixed-wood vegetation:

- **Vegetation islands should be large enough to include:**
  - snags (or potential future snags)
  - trees of varying sizes and age classes, with at least several stems that are canopy dominant and represent the largest size class distribution exhibited throughout the stand
  - a diversity of species, preferably exhibiting mixed-wood conditions (of both hardwood and softwood composition)
  - unique species of plants, shrubs, and trees that may be unique to the site, such as American mountain ash
- Islands should also be large enough to screen out other skiable lines existing within a backcountry ski zone, this will prevent people from attempting to go through the islands. Much like ensuring switchbacks on a hiking trail are not visible to ascending/descending hikers to minimize social trails.
- Small islands of retained vegetation (that contain only a few stems) are not significant enough to maintain stand diversity and sustain the stands' resilience to wind throw, ice damage, or insect infestation.
- Be mindful that the uphill-most trees will likely suffer from skier abuse & falls, as well as snowpack pressures.
- Protect higher value trees by leaving some less desirable 'sacrificial' trees on the uphill side.
- Islands work best when diamond or triangle shaped with the point starting uphill (versus boxes or perpendicular 'walls' that can inhibit flow and sighting of the fall line).



Skiable Lines

The management goals of the matrix (surrounding) forest will inform the size, number, and composition of vegetation islands in a designated backcountry ski zone. These goals will differ by project location depending on forest conditions and the particular public or private landowner forest management goals and objectives and desired future conditions. Stand characteristics of the matrix forest outside of the skiable lines will vary based on the existing structural conditions of the area. Any potential vegetation manipulation and removal will be limited to within the skiable line boundaries. Skiable lines should never be fully cleared of vegetation and trees. No vegetation manipulation or removal should occur within the designated vegetation islands.

Once the boundaries of the backcountry ski zone are identified and the vegetation islands are delineated, you may begin identifying locations for descending skiable lines as well as an uphill skin track. The width of these lines and the number size, and species of the remaining trees will be based on a variety of factors such as the intended audience and ecological limitations. A beginner backcountry skier audience will likely need wider lines that have more widely spaced trees, whereas a more advanced skier may desire narrower lines with more trees and other obstacles, such as cliffs. Ensuring that you create lines based on the desired user experience will be possible due to all of your early work on the proposal process and/or discussions and planning that you've done with the landowners and/or licensed foresters and will take into consideration all identified limiting ecological considerations.

When identifying skiable lines start small and work incrementally towards a larger vision. This will allow for time to see how the lines are used and will spread workload and maintenance over multiple seasons. Visualize your audience and their intended experience and what it will look like, on the ground, when complete.

- **Know before you go – Create a map of your site in Biofinder or ANR Atlas that includes locations that you know you will have to avoid such as:** Rare, Threatened, and Endangered Species; Important Wildlife Areas (ex. deer wintering area); Riparian Areas; Federal Management Areas that limit backcountry skiing; Federally designated Wilderness Areas. For more information on these areas see Special Considerations in Chapter 2.
- Multiple lines will likely exist within a delineated zone, depending on the size and terrain features
- Three priorities often dictate the identification of a good line, assuming access and egress are suitable:
    - Fall line – Is it skiable? And what level of skiers will it serve: beginner, intermediate, advanced?
    - Safety – Can it be safely navigated in most conditions, are there options for easier and more difficult areas, do obstacles exist that may be obscured in snow (blowdowns, stumps, rocks, etc.)?
    - Ecology - Does the line or series of lines avoid/safeguard ecological values? If not, seek alternatives.
- Line width may vary depending on user experience, site conditions and/or management plan standards and guidelines, which will be identified by the public land agency, private landowner, or licensed forester that you are working with
- **Line width DOES NOT indicate a full clearing width, all lines are expected to have a closed canopy,** and "vegetation islands" composed of trees and vegetation need to be retained within backcountry ski zones to maintain a healthy forest and to meet specific management criteria identified by the land owner (Chapter 3 identifies the different Land Owners)

Skin Tracks

It is important to consider how backcountry ski zones and the skiable lines within them are accessed and situated in the context of other user groups, uphill traffic, and the flow of use. Having a plan to identify or establish well-managed access routes and skin tracks will help direct traffic to desired areas, avoid sensitive features or potential conflicts, and create more efficient (and enjoyable!) ski lines and experiences.

Skin tracks provide uphill skiers with long, relatively smooth routes along topographic lines with switchbacks that enable users to gain elevation at a sustainable pace. Well-sited skin tracks often utilize existing trails, woods roads, or landforms to access backcountry ski terrain, however you along with the landowner and/or licensed forester may need to modify existing routes or design new skin tracks to provide access that is sustainable. For example, avoid (or minimize) stream crossings and ice bulges.

Where possible, skin tracks should create loops that allow for natural flow, where downhill and uphill traffic is situated on separate, designated skiable lines and skiers can circulate (or lap) between runs. By providing a clearly marked skin track, the backcountry ski zone directs skiers where landowners and/or licensed foresters approved this use. An official skin track can also help minimize conflict between users.

IF YOU ARE USING THIS TABLE – IT MEANS THAT YOU HAVE:

Contacted Landowner ☐	Gone through Landowner Project Process ☐	Considered Ecological, Social, and Special Considerations of Land ☐	Identified No-go Areas & Vegetation Islands ☐	Marked Ski Zone & Skiable Lines with Landowner ☐
Skier Type	**Experience Goal**	**Vegetation Goal**	**Suggested Line Width (Start low + expand)**	**Suggested Slope**
Beginner	For the Fun! Introduction to BC Skiing – will need plenty of space between trees to make turns	Retain enough canopy & midstory trees to maintain closed canopy	25 - 30+ ft	Under 20%
Intermediate	For the Fun! Looking for tighter turns and/or limited obstacles	Retain enough canopy & mid-story trees to maintain closed canopy. Remaining trees can be closer together to create more challenging turns than beginner terrain	20 - 25 ft	20% - 30%
Advanced	For the challenge (and fun)!	The most residual canopy and midstory trees. Still maintaining a closed canopy. May have more smaller stems and/or shrubs as well as obstacles. If you choose to include obstacles, there should always be an alternative option included.	15 - 20 ft	Above 30%
Skin Track	A sustainable ascent	Retain canopy and midstory trees. These may be collocated with hiking trails, when creating new skin tracks follow the terrain for a gentle ascent	6 - 8 ft	

Justin Cash

Chapter 5 Implementing & Constructing a Backcountry Ski Zone

Mark the Backcountry Ski Zone & Skiable Lines
Train Local Partner Organization Volunteers
Let the Work Begin
Tool List
VT FPR Backcountry Ski Zone Guidelines (Appendix K)
USFS Backcountry Ski Zone Guidelines (Appendix M)

Implementing & Constructing a Backcountry Ski Zone

Whether on public or private land, you will need to work with the landowner and/or a licensed forester to get approval for your backcountry ski zone and the skiable lines it contains. When implementing a project on public land or private land, you will have to work with agency staff and/or a licensed forester to explicitly mark delineated backcountry ski zones including vegetation islands, skiable lines, any vegetation that might be removed, etc. Once everything has been marked, determine whether implementation will require hand saws and loppers or if chainsaws are needed. No work should be done within a backcountry ski zone until delineation of the zone and lines has occurred and been approved by agency staff, the private landowner, and/or a licensed forester.

Mark the Backcountry Ski Zone & Skiable Lines

- Mark and map the backcountry ski zone, skiable lines, vegetation islands, etc. for implementation prior to any workdays
- Mark backcountry ski zone boundaries
- Mark the fall line, often done with flagging by starting uphill and walking straight down the fall line.
- Walk terrain and mark vegetation islands.
- Marking tips:
    - Yellow & orange flagging do not work well during fall foliage
    - Green flagging will blend in with foliage in the summer
    - Pink and Blue flagging works well in most areas throughout the year
    - VTFPR and USFS provide guidance for what color flagging to use for what part of the zone you are marking
- GPS ski zone boundaries AND boundaries of your skiable lines.
    - Having these areas GPS'd will aid in any future monitoring efforts if desired by the landowner and/or licensed forester
        - Knowing these boundaries for monitoring will allow you to manage "Creep" (expansion of lines and zones) occurring from either unauthorized cutting or natural tree mortality occurring at the edge of your skiable lines
- Once lines are established, it may be appropriate to remove flagging to reduce the visual impacts of the projects, especially in areas that see regular use at other times of year (i.e., hiking, hunting).

Train Local Partner Organization Volunteers

The local partner group should have a training on best practices for skiable line implementation with volunteers who are interested in participating in workdays. If the group is working with a public land agency, they need to work with the point person from the agency to plan the training day, the agency point person will also need to be present at the training day. Training should explain the marking methods used and what each flagging color means with special emphasis on what color flagging indicates there is to be no cutting. A key component of this training is how to properly prune a tree or shrub.

For practical and safety reasons, it may be more productive to separate efforts using chainsaws from those using hand tools. Hand tools can allow more volunteers to more efficiently clear small stems and

saplings and remove brush to reveal the larger trees that may need to be removed later by certified sawyers as long as their removal is approved by agency staff, landowners, and/or a licensed forester. It is important to note that problematic trees can always be removed at a later date- months or years in the future- and that a 'slow and steady' approach conducted by a dedicated group of agency staff, landowners, licensed foresters, and volunteers will enable the backcountry zone to evolve over time. Using hand tools is one way to ensure that the zone evolves slowly and deliberately.

Note about chainsaw use: All sawyers operating on public land must be certified according to requirements associated with the agreements that they are working under. This certification will likely fall under the category of needing Game of Logging (GOL) 1-3 or USFS certification. Sawyers must also use appropriate, complete PPE, and follow all safety protocols at all times. Swampers and brushers also need to use PPE when working around chainsaws. Landowners reserve the right to stop sawyers if they are being unsafe or creating unsafe working conditions.

Let the Work Begin

Working with groups requires careful planning (and patience). Be sure to create a welcoming environment and review project goals, safety protocols, and overarching land management objectives so that participants understand both the project details and context. When possible, have agency staff, landowners, and/or licensed foresters present to discuss their role and thank them for their involvement and support. Facilitating introductions and networking among participants will help build community, give a sense of ownership over the project, and increase the likelihood of future involvement.

- Gather volunteers to implement your project
- Hold a 'safety circle'/'tailgate talk' to identify potential risks, set goals for the day, and do introductions
- Make sure everyone has appropriate and complete PPE, including tick protection
- Have a basic 'how-to' tutorial on proper pruning techniques for trees and shrubs
- Consider delegating a timekeeper to ensure that the group stays on task, takes regular breaks, and ends on time
- Keep in mind anticipated snowpack when pruning overhead branches
- Be sure to respect volunteer's time and thank them for their efforts! (Offering treats at the end of the day goes a long way!)
- At the end of a work day a time should be reserved to reflect on the tasks completed. This could include safety concerns, suggestions for efficiency, and a time to thank participants techniques for trees and shrubs

Tool List

Volunteer and small-group projects tend to rely on a variety of personal tools. If funding is available, consider building a cache of frequently used trail tools for your group, like loppers, hand pruners, and pruning saws. Mark your tools and delegate responsibility for someone to track their use—dole them out and collect them at the end of the day (small tools, in particular, tend to disappear at the end of the day). Be sure to inspect and maintain tools regularly and pull broken or unsafe tools out of use until they can be repaired.

Planning/Design tools

- GPS
- Compass
- Clinometer
- Flagging (orange, blue, pink)
- Smart Phone

Construction tools

- Handsaws - pruning saws, bow saws and, in some cases, pole saws
- Loppers; Stone/oil lube for loppers
- Hand pruners
- Radios or some other plan for communicating with the group
- **If you decide it is appropriate to have a chainsaw on site:**
  - **Chainsaws (that are fitted with proper safety mechanism such as a working chain brake, throttle interlock, and chain catch) for clearing blowdowns. There should be many areas/ options to go around larger trees without requiring a chainsaw. (At Mad River Glen, chainsaws have NOT been used, except to clear blowdowns, for decades...)**
  - Chainsaw fuel canisters and bar oil (e.g., SIGG fuel bottles are easily transported into the backcountry)
  - PPE – chaps, helmet w/face shield, ear protection, steel toed boots, gloves, tourniquet, etc.)

Personal Protective Equipment (PPE)

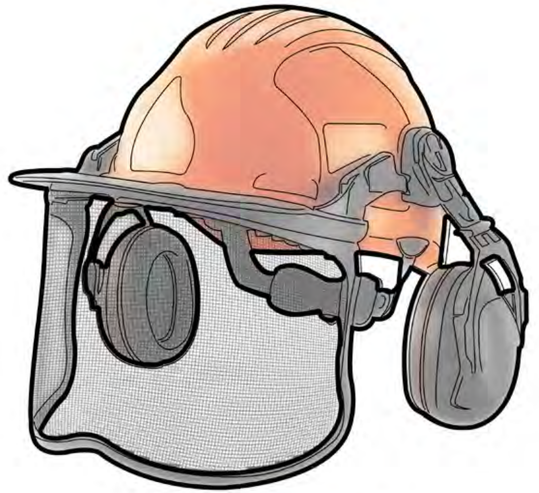
- Gloves, long sleeve shirts and pants, sturdy boots. Extra dry layers & gloves in rain
- First aid kit
- Hardhat
- Eye protection
- Hearing protection, if working around brush saws or chainsaws
- Gaiters
- Tick and insect repellent
- Water, lunch, and snacks
- Chainsaw PPE (chaps, helmet w/ face shield, ear protection, steel toed boots, gloves, tourniquet)

VT FPR Backcountry Ski Zone Guidelines (Appendix J)

Ski zone guidelines may vary by project and location. Example Guidance for Implementation from the NEK Willoughby State Forest is provided below. In this example, all braided ski lines were marked with flagging and team leaders were provided laminated guidelines to adhere to when leading volunteer crews.

USFS Backcountry Ski Zone Guidelines (Appendix K)

Ski zone guidelines may vary by project and location. Example Guidance for Implementation from the Brandon Gap is provided in the Appendices. In this example, all braided ski lines were marked with flagging and team leaders were provided laminated guidelines to adhere to when leading volunteer crews.



USFS Backcountry Ski Zone Guidelines

FLAGGING SPECIFICATIONS

- Pink Flagging: Skier's right-side boundary
- Pink & Black striped Flagging: Skier's left boundary
- Blue Flagging: Top of NO CUT zones (islands)

INFORMATION ON TEAM LEADER PLACARDS

Vegetation - to Cut:

- Mid to low story hardwood shrubs and trees
- Hobblebush
- Shrubs/woody veg greater than 1 meter in height: prune to ground level but retain root structure
- Live and dead branches where posing a hazard: cut the branch to preserve the branch collar. Do not cut into the collar but cut as close as you can to it…see diagram and pictures to right.
- Standing dead trees that pose a safety risk
- When removing vegetation, emphasize removing stems that are poorly formed; show signs of disease; or are hardwoods overtopping softwoods

Vegetation – Cutting Restrictions:

Do not remove:

- Any vegetation less than 1 meter (3.2 feet) in height except hobblebush
- Mountain ash

Limit cutting of:

- Saplings/pole size spruce and fir if healthy/vigorous
- Large yellow birch trees unless a safety risk
- Mature trees that maintain the closed canopy unless a safety risk

BLOW DOWNS AND SLASH

- Downed trees: cut up to max height 2' off ground
- Scatter slash along edges of retained islands (and within islands) to buffer from skier traffic
- Pile excess slash into uneven terrain undulations, to cover holes/rocks, or in the undersides of cliffs
- Slash should not be significant enough create a "wall" of slash.

Tips:

- Cut vegetation flush to the ground to prevent hazards
- Do not cut tree/stump on an angle…NO "punji sticks"
- Softwood bole within desired ski line: cut down tree
- Softwood bole out of ski line w/ encroaching branches:
  - Prune dead/dying branches
  - Trees < 15' tall: Leave at least top 5' of live branches unless still encroaching-then cut down tree
  - Trees >15': Leave top 1/3 of live branches
  - Limit pruning to the ski line side of the tree
- Leader role: monitor line visibility, safety, completeness, checks for accidentally left dangers, and helps direct bucking activity.

Chapter 6 Safety and Risk Management

Tier 1: Emergency Response Plan
Tier 2: Landowner/Ski Zone Manager Response Preparedness
Tier 3: Skier Responsibility

Justin Cash

Safety and Risk Management

Backcountry skiing involves inherent risks that require conscious planning, preparation, and self-awareness on the part of the skier. Ski zone managers, too, need to consider risk management and emergency response when developing backcountry terrain. Accidents will happen and planning should be done to assess risks, consider the unique site challenges of a zone, and prepare for emergency response. Risk management occurs on different levels and in different stages. The sections below briefly describe strategies relevant to backcountry ski zones.

Tier 1: Emergency Response Plan

Most mountain communities in Vermont have a local Fire or Emergency Management Service (EMS). However, many areas lack the resources and adequate training and equipment to launch a winter Search and Rescue (SAR) response. Landowners with a backcountry ski zone on their property should contact their local EMS department to discuss emergency preparedness, response plans, and to identify gaps that may exist. This can be addressed clearly as part of the pre-plan ning process - creating a plan prior to an incident that outlines how responses will be handled.

Create a Pre-plan with your local First Responders and Search & Rescue groups. This entails reaching out to these groups and discussing the location of the backcountry ski zone and all potential access points, including areas that may not be used by the public. This will also include a detailed assessment of resources- on-site and off-site- that can be utilized during an emergency response as well as restrictions or limitations that might impede or complicate such a response. Compile this information into a clear map of the backcountry ski zone with all locations mapped. If there are access points on the map that are for emergency use only, consider creating two maps. One for internal use and understanding of emergency access and the other for external use that clearly shows the backcountry ski zone.

Tier 2: Landowner/Ski Zone Manager Response Preparedness

In addition to coordinating with Search and Rescue/ Local Emergency Personnel, landowners should make efforts to increase awareness, particularly about safety and emergency response. It is important to have clear communication with the user group about safety protocols and skier preparedness. Using the Vermont Backcountry Ethics signage consistently at trailheads

What to include in a Pre-Plan

Activation of the plan (this may be calling 911 or other locally specific action)

- Injury report
- Lost/Missing Report
- Communications location (for SAR/1st responders)
- Incident command post (if needed for extended operation)
- Area Description (detailed description of backcountry ski zone & skiable lines)
- Primary Incident Access – Staging, Communication, Equipment
    - (This includes identifying cellular and existing repeater coverage or lack thereof)

Include as attachments

- a USGS Topographic Map w/ & w/out Backcountry Zone Demarcated
- E911 Map Overview
- SAR Callout & Contact
- Local CTA members available to assist

helps to spread the message that when going into the backcountry be prepared for what you might encounter.

Having a clear map of the backcountry ski zone with a 911 (trailhead) address and labeled ski lines is essential. Many ski areas use numbered trail junctions- marked in the woods and on the map- to orient skiers to their location. Including trail signs and a small map board with 'you are here' indicators at 'pause points' is also helpful (i.e. junctions and transition points). Skin tracks should also be marked. For example, both the Brandon Gap and Willoughby State Forest backcountry zones use small 3"x3" trail markers to identify access trails and ski line entry points.

If cell phone service is not available, this should be noted. Likewise, if cell service is available in a limited area and it is possible to indicate this on a map or in your messaging, this is helpful information, as well.

Rescue sleds/cache in woods

As you move through creating your pre-plan it will be important to figure out if part of your plan includes keeping rescue sleds or a rescue cache on site in the woods. It is important to identify a logical location for your rescue sled and, if one does not exist, consider alternative options. Ensure that both SAR and landowners are satisfied with the final plan.

Tier 3: Skier Responsibility

There is inherent risk whenever one enters the backcountry. Know and follow the Vermont Backcountry Ethics. Backcountry skiers should be prepared for a variety of terrain and weather conditions and be able to self-rescue, if necessary. Skiers should be self-aware, ski within their limits, and know when to turn around. Education, helmet use, respect, and common sense are all important when skiing.

The National Ski Areas Association (NSAA) has developed a Responsibility Code that promotes common sense. While it is provided for ski area downhill skiing, it is easily applicable to many of the conditions that backcountry skiers will encounter in the woods. NSAA developed Your Responsibility Code to help skiers and boarders be aware that there are elements of risk in snow sports that common sense and personal awareness can help reduce.

Although uncommon in Vermont, users should take into consideration the potential for avalanches and small slides that are possible in steep areas, gullies, and ravines. If you have any questions about whether or not a place is safe to ski, walk away. For more information on Avalanche Safety and Snow Science contact The American Institute for Avalanche Research and Education (AAIRE).

Your Responsibility Code

1. Always stay in control, and be able to stop or avoid other people or objects.
2. People ahead of you have the right of way. It is your responsibility to avoid them.
3. You must not stop where you obstruct a ski line, or are not visible from above.
4. Whenever starting downhill or merging into a ski line, look uphill and yield to others.
5. Observe all posted signs and warnings. Keep off closed ski lines and out of closed areas.

KNOW THE CODE: IT'S YOUR RESPONSIBILITY.
Adapted from the National Ski Areas Association

Justin Cash

Chapter 7 Maintenance

Ember Photography

Maintenance

For backcountry clubs and chapters, serving as a corridor manager for approved backcountry ski zones is a long-term commitment that requires annual maintenance just like other trail systems. This includes communication with the land manager/owner before beginning work and, if possible, walking every line and skin track to remove hazards, clear blowdowns, and trim brush. While maintenance can occur any time of year, it is best to organize work days during the fall 'stick season' (before snow is on the ground), when the lines are easily visible, stumps can be trimmed to the ground, and work conditions are more pleasant.

Annual Maintenance

Annual maintenance should include monitoring of terrain for illegal/unauthorized cutting, residual vegetation conditions, skier-caused damage to residual stems, etc. If illegal/unauthorized cutting is found, notify the landowner. Volunteers should follow appropriate safety protocols and risk management practices, including using PPE.

- Designate one leader per group depending on group experience, and consider pairing new members with experienced members. Teach and learn by doing together.
- Ensure all volunteers know their role and are performing work within their skill level, training, and equipment. Ensure appropriate tool use, chainsaw certification, and PPE
- Stagger and rotate tasks, if practical:
  - Cut and clear blowdowns
  - Remove large brush and storm debris
  - Trim hobblebush within skiable lines
  - Potential adjustment of brush and debris piles to fill low spots, 'cushion' rocks and stumps, and buffer islands and edges
  - Scout lines for future review
  - Sign maintenance
  - Monitor ski zone boundaries and vegetation islands for indications of 'creep' (this will most likely be observed as unauthorized vegetation removal)

Out-Year Maintenance

Tasks to consider over the long-term include those that might affect the entire ski zone: adjusting & improving skin tracks, making line adjustments, ensuring seasonally appropriate use, and monitoring for creep.

- Making potential adjustments and shifting of skiable lines. Conditions may require changes in ski line locations over time to:
  - Allow cleared areas to regenerate
  - Address changes to site and vegetation conditions over time
  - Add/remove lines to provide terrain for variety of skill levels
- Supplementing natural regeneration by delineating regrowth areas (with flagging, stakes, or rope) or planting trees/shrubs, if necessary
- Controlling the potential spread of non-native invasive species
- Updating written plans and maps to reflect any changes in the backcountry ski zone

Chapter 8 Monitoring

State of Vermont – Continuous Forest Inventory (CFI)
U.S. Forest Service – Field Inventory & Analysis (FIA)
How might you use this CFI and/or FIA Data?
Usage Data
User Surveys (In-person)

Justin Cash

Monitoring

Monitoring is a key component of Adaptive Management, which is the kind of management that public land practitioners aspire to implement. Adaptive management focuses on learning and adapting, through partnerships of managers, scientists, and other stakeholders who learn together how to create and maintain sustainable resource systems (US Dept. of the Interior). All of the steps identified earlier in this document detail the planning and assessment that occurs prior to implementation of a management action. Once the action is implemented, it is necessary to establish monitoring protocols to ensure that land managers and/or landowners understand the outcomes of their implementations. It creates a space to allow for questions and alterations to the current implementation plan.

When talking about recreation there are a couple kinds of monitoring that will help inform landowners about how their current plan is working. You can collect ecological data, which helps ensure that a use is not altering a location beyond benchmarks established during implementation. You also will want to think about how to collect User data since ecological impacts are often linked to human presence on the landscape.

User data can take the form of counting the number of users, which is frequently accomplished by using infrared sensors. You may also want to understand more about your users, where they are coming from, how long they spend at the location, etc. This information can be collected through surveys. The U.S. Forest Service has extensive data on forest health that is generated through the national Forest Inventory and Analysis Program (FIA). The State of Vermont has historic forest data on specific locations and is currently ramping up a state wide forest monitoring program called Continuous Forest Inventory (CFI) that uses modified FIA plots to collect data on forest health. All of these monitoring tools and strategies are described below.

State of Vermont – Continuous Forest Inventory (CFI)

CFI is a data collection program based on permanent plots that serves as a comprehensive measure of tree growth, mortality, decay, and ingrowth. This data is open access and is available to the public for free.

The data collected from CFI allows land managers to:

- Understand changes in the forest ecosystem
- Understand how fast the forest is growing
- Understand the rate at which disturbance events (wind, harvest, ice storm, etc.) cause trees to die

U.S. Forest Service – Field Inventory & Analysis (FIA)

The FIA program has been in continuous operation since 1930. Its mission is to:

> *"Make and keep current a comprehensive inventory and analysis of the present and prospective conditions of and requirements for the renewable resources of the forest and rangelands of the US."*

The FIA program collects, analyzes, and reports information on the status and trends of America's forests. There are some rules around accessing this data because some plots are on private land, but a majority of the data is open access and available to the public for free.

What kinds of information does this data provide:

- How much forest exists?
- Where forest exists?
- Who owns the forest

- How the forest is changing
- How are the trees and other forest vegetation growing and how much has died or been removed recently?

What kinds of information does this data provide:

- Evaluating wildlife habitat conditions
- Assessing the sustainability of ecosystem management practices
- Supporting planning and decision making activities on public or private land (the data is available for anyone to use)

How might you use this CFI and/or FIA Data?

When working with a public agency or a private landowner CFI or FIA plots may not exist exactly in your backcountry ski zone. However, there are likely CFI/FIA plots that have similar forest characteristics to your ski zone. You can work with a representative of the public agency, the private landowner, and/or a licensed forester to build a monitoring plan based on the CFI/FIA data available that is relevant to your chosen location. You may also be able to design a monitoring program in your ski zone that aligns with the CFI/FIA plot design in a way that allows you to compare your backcountry ski zone and surrounding matrix forest with an undeveloped comparable forest type. This is a great way to get a better understanding of the impacts that the ski zone is having on overall forest health.

If you are part of a group that is interested in doing this and do not have the internal capacity or expertise you may want to work with the landowner to reach out to a university or contractor that may be able to help you design a solid monitoring program. Many University and Colleges have service-learning components, where students work with people from the community on semester long projects. Creating a monitoring program would likely be a good fit for a service-learning project.

Usage Data

Usage data can be gathered by direct observation or with stationary infrared sensors. The infrared sensors cast a cone of infrared radiation in one direction and anything with a heat signature that passes in front of the sensor will create be counted. The model that is currently widely used is called TRAFx. It is straightforward to operate and comes with extensive instructions on how to set-up and install the sensor. This type of sensor allows you to collect data in a handful of ways including – by the hour, day, etc. TRAFx Sensors typically cost between $500-$800 dollars and typically come with access to TRAFx software that allows quick data download. You then upload it to the TRAFx website where the data can be quickly processed into graphic outputs relaying use over certain spans of time (daily/monthly/annually). Infrared sensors can be a great way to understand not only how many people are using your backcountry ski zone, but what the use patterns look like. Are a lot of people skiing in the morning? Are you only seeing high counts on powder days? Weekends? You can combine this user count data with survey data to get a fairly robust picture of who is accessing your backcountry ski zone. You may find that you realize you're not capturing any beginner skiers and you can use that information to reflect on the skiable lines you've created. Do you need to adjust existing lines? Add a beginner line? Etc. A well-designed study will collect data in certain locations at a decided frequency that is generalizable over a larger area.

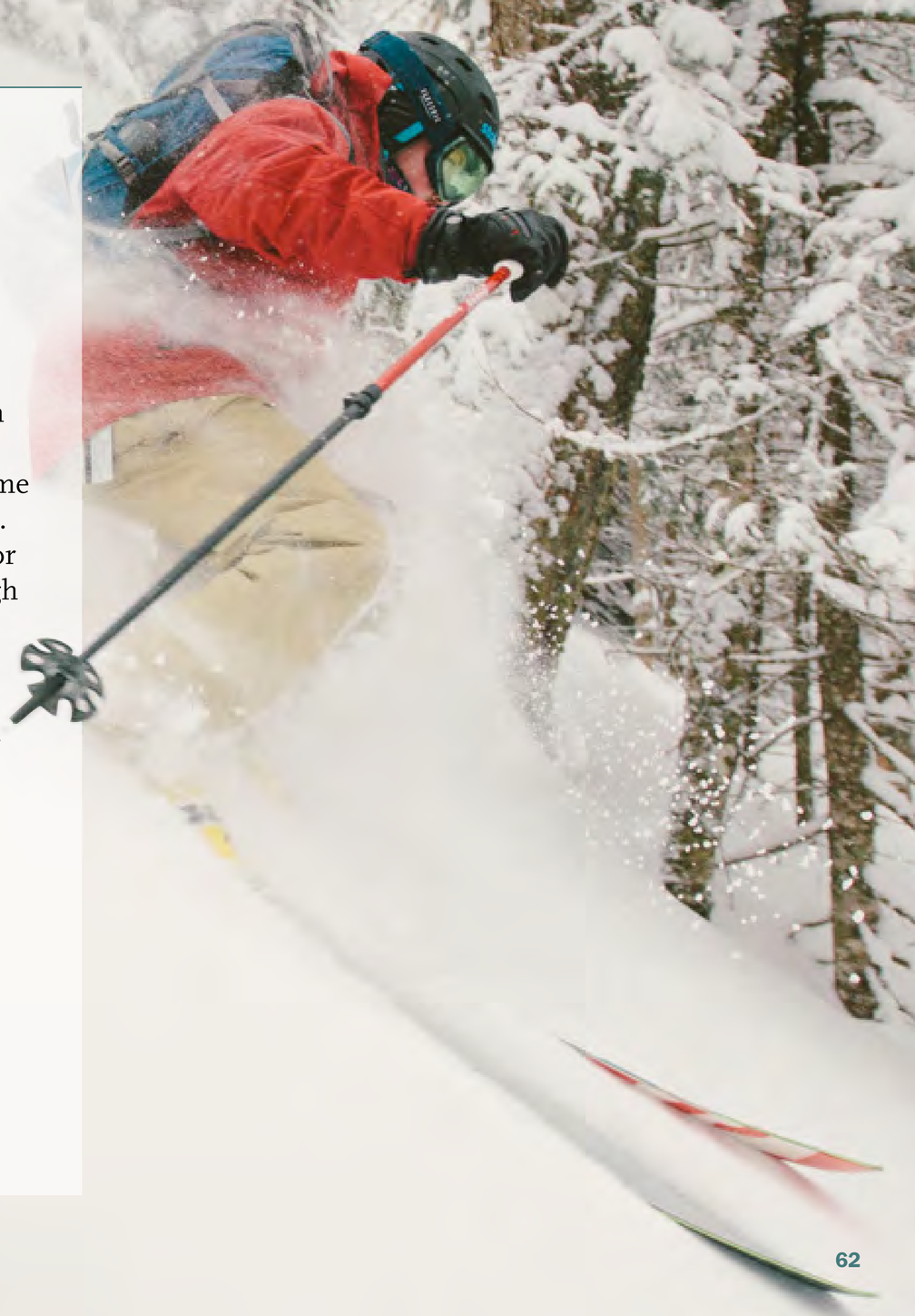
Placing sensors to capture backcountry ski zone use needs to be done strategically. Ideal locations are on flat plateaus along the access route. Strava heat map data or a skier knowledgeable of the use patterns of the area can help identify the location that will capture most skiers entering and exiting the backcountry ski area. It is important to factor in continued snow accumulation when installing the sensor or to have someone committed to repositioning the sensor throughout the season. You will also want to think about the amount of time it takes to get to the sensor because you often have to replace their batteries every few weeks in the winter.

User Surveys (In-person)

User surveys require an investment of time, but the data helps develop a better understanding of who is using a resource and what their experience is like using the resource. User surveys can be used to:

- Determine the amount of time a user spends at a location
- Record the user expectation vs. actual experience: Did the experience meet the user's desired outcome?
- Determine user satisfaction with the resource: A Likert scale can be used in questions about specific aspects of the recreation opportunity
- Understand who the user is through demographic questions
- Determine the degree of economic impact: How far did the user travel? Did they travel in a group? Are they on a vacation or local to the resource?

It is important to have a well-designed study when you are collecting user data. The design will help you create a robust survey that asks questions that provide answers that help with future management. A well designed study will also maximize your resources. Ideally in person surveys are conducted at a trailhead at random days and times with parameters that ensure some of those days and times will be during high use. You can collect data by filling out paper forms or using digital tablets to answer questions through a Google Form, Survey Monkey, or some other digital format. What kind of format you use for collection will likely be linked to both your survey design and your resources. For example, sometimes paper forms are preferred because you are not limited by the number of tablets needed for an electronic form. These details can be fleshed out while going through a study design process.



Justin Cash

Ember Photography

Chapter 9 Overnight Use

Shelters, Campsites, Huts, and Cabins

Overnight Usage

Shelters, Campsites, Huts, and Cabins

Overnight campsites and shelters provide opportunities for prolonged, multi-day backcountry skiing- particularly in remote areas that are not serviced by plowed winter roads. Overnight sites in Vermont fall on a spectrum of style, size, and (relative) luxury and may include tent sites, yurts, lean-tos, shelters, cabins, huts, and inns. Regardless of the amenities found at an overnight site- whether it is a partner Inn or B&B along the Catamount Trail or an open-sided lean-to in a remote state forest- they have the potential to change use patterns around backcountry ski zones and may contribute to issues related to parking, waste management, and concentrated use.

The lack of regular maintenance at first come, first-served overnight locations, especially during the winter months, may contribute to landowner concerns. If there are overnight facilities near (or within) an existing or proposed backcountry ski zone, it is important to include this in your thinking process for the proposal. The landowner that you are working with is likely aware of the site and will have questions related to your proposal and the nearby overnight accommodations.

The following impacts should be considered for a back-country zone proposal if overnight sites are present:

- Water - Not all sites have access to clean water and nearby water sources will likely be frozen. Will visi-tors need to provide their own water? Will they need to melt snow/ice? Is there guidance or signage to address this issue?
- Human waste - If not properly disposed of human waste can significantly impact both human health and aesthetics. How will waste be managed? Is there a privy? How will it be maintained? If not, will guidance be provided for Leave No Trace practices?
- Fires - Both indoor woodstoves and outdoor camp-fires have the potential for significant site impacts. If wood is not provided, extensive denuding of the surrounding woods can occur as visitors cut limbs and trees for fuel. Over time, this can have dramat-ic impacts to forest structure and habitat. If wood is not provided, guidance should be provided to address this issue. Fire safety equipment (smoke alarms, fire extinguishers) should be provided and maintained regularly.
- Camp stoves/lanterns - Internal sources of flame such as stoves, lanterns, and candles pose a risk of catastrophic damage and/or possible carbon monoxide poisoning. Guidance on proper use and ventilation, along with vigilance, can help mitigate these risks.
- Trash - Pack it in, Pack it out. Promote Leave No Trace user ethics and include regular site visits in your annual work plan to address trash clean-up.
- Parking - Overnight parking in winter can impact access for other users and restrict winter plowing and maintenance and emergency access. Parking areas should be monitored and maintained regularly and should be able to accommodate both day use and overnight visitors. Coordination with the municipal highway department and/or land manager may be necessary.

By addressing these issues proactively in your proposal and providing guidance through appropriate signage and outreach, you will help foster a better relationship with landowners and partners.

Appendices

Glossary of Terms
The Birder's Dozen Graphic & Key
VT Backcountry Ethics
VT Backcountry Ethics (Long)
Vermont Limitations on Landowner Liability Statute
Maps of Current 2020 Sanctioned Zones
FPR "Pre-Proposal"
FPR "Full Proposal"
Recreation Project Proposal Public Information Sheet
VT FPR - NEK BC Backcountry Ski Zone Guidelines
USFS Backcountry Ski Zone Guidelines
Sample CTA Chapter MOU from NEKBC
Sample CTA Chapter Bylaws from MRVBC

Justin Cash

Appendix A

Glossary of Terms

Cross-country or Nordic Skiing

Also referred to as ski touring, cross-country skiing typically occurs on wide trails with gentle curves and mild slopes that provide a wide range of opportunities for skiers of all ages. Managed trails are often regularly packed or groomed to maintain an even surface and consistency of snow conditions. Groomed trails are typically 10-20 feet wide with a flat or corduroy surface for skate skiing and set tracks for 'classic' style skiing. Downhills and curves are typically wider to allow for snowplowing and turning.

Backcountry Skiing

Generally defined as skiing which takes place off of a defined trail system (or 'off-piste'), often in remote areas or outside the boundaries of a developed ski area. Backcountry skiing is generally suited for intermediate to advanced skill levels and includes a variety of challenging terrain in an unmanaged setting. More broadly, backcountry skiing may refer to any off-trail ski touring where natural conditions prevail or, in the situation of down-mountain skiing, where one must navigate around trees and other obstacles by turning.

The equipment used for backcountry skiing varies widely and has developed rapidly in recent years. Boot-binding-ski combinations include leather or plastic boots attached to classic 3-pin, NNN, NNN BC, telemark, alpine touring (AT), or tech bindings mounted to metal-edged skis that are straight or shaped with flat or fish scale (wax less) bases. Climbing skins are textured adhesive strips attached to skis that enable skiers to go uphill. Snowshoes or split boards that attach/detach are often used by snowboarders seeking to explore off trail, mountainous terrain.

Resort-accessed Skiing

Resort-accessed skiing known to some as side-country skiing is skiing that takes place adjacent to a developed ski area- either on managed glade terrain or naturally open terrain- accessed by lift service or uphill skiing.

Skin Track

Skin tracks are named for climbing skins: the devices fastened to the bottom of skis that enable skiers to travel uphill more easily (at one time in history these were made from animal skins). Skin tracks are relatively narrow uphill routes with a steady slope that enables skiers to readily access downhill, backcountry terrain. They are often designated one-way trails and may be purpose built or utilize existing hiking trails, logging roads, or other established routes.

Line or Skiable Line

A line or skiable line is the path taken by a skier/rider as they ski through trees or around obstacles. A ski trail or glade can have myriad skiable lines, or routes, by which a skier can navigate. Skiers often seek untracked lines through fresh snow and, consequently, tend to prefer 'fresh tracks' after a snow event and/or gravitate towards (or make their own) secret or 'stash' areas.

Trail

Backcountry ski trails are designated, purpose-built trails that provide opportunities for down-mountain tree skiing. VT FPR sanctioned trails are generally up to ~30-feet wide (unless otherwise authorized) and feature a variety of challenging natural terrain and obstacles. Trails include space for skiable lines separated by retention trees or 'islands' of vegetation that maintain a continuous forest canopy.

Braided Trail

A braided trail is a trail or multiple trails separated by vegetated buffers or 'islands' that intersect each other to create a braided effect.

Glade

Glades are discrete areas where vegetation management is used, consistent with forest management guidelines, to enhance the terrain for tree

skiing, including the removal (thinning) of vegetation, trimming of brush or limbs, and removing shrubs, saplings, poles, and blowdowns. Glades can consist of a single backcountry trail or multiple, parallel or braided trails separated by vegetated buffers.

Zone

A backcountry zone is a landscape-scale area designated or otherwise identified for tree skiing. Zones are geographically distinct areas that may contain one or more glades. As an example, the NEKBC is proposing to manage gladed tree skiing in the pilot Willoughby State Forest Backcountry Zone on Mount Hor and Bartlett Mountain; this is distinct from the Jay Backcountry Zone or the Brandon Gap Backcountry Zone or other geographically separate backcountry areas.

Ember Photography

Appendix B

The Birder's Dozen Graphic

Audubon VERMONT

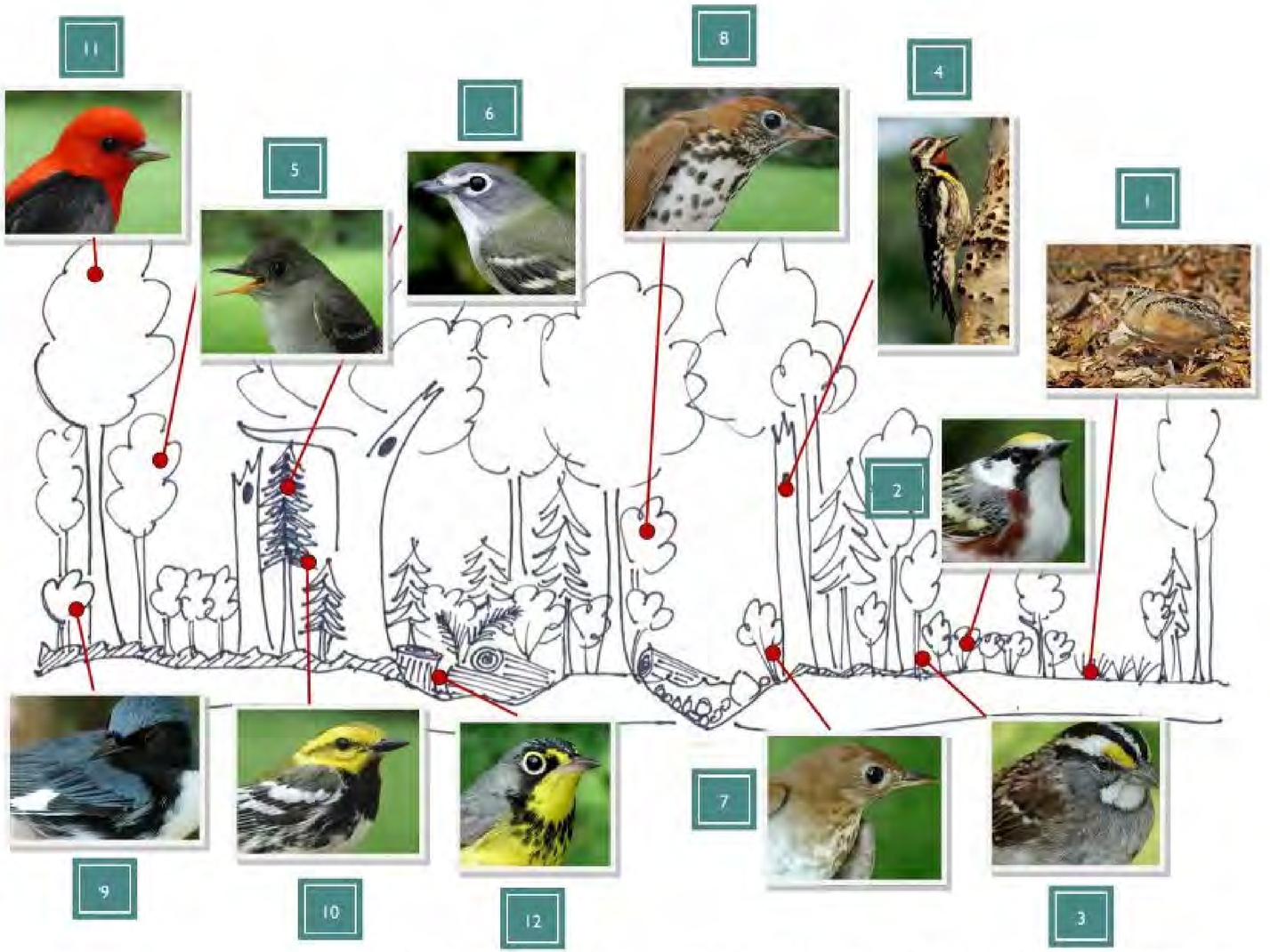
The Birder's Dozen

The Birder's Dozen is twelve of the 40 forest birds that the Audubon Vermont Forest Bird Initiative is working to protect. These twelve birds:

- Have a high percentage of their global breeding populations in our Northern Atlantic Forest.
- Use a variety of forest types and conditions for feeding and breeding. Most nest in complex, diverse mature forest habitats.
- Show serious, long-term declines in their global populations in the case of some species, including wood thrush and Canada warbler.
- Are simple to identify by sight or sound.

We encourage you to get to know the Birder's Dozen and to explore your woods to find out who is residing there!

Bird photos provided courtesy of the Powdermill Avian Research Center, US Fish & Wildlife Service, Charley Eisman & Roy Pilcher.



Audubon Vermont ©2013 vermont@audubon.org 802-434-3068 vt.audubon.org

Appendix B

The Birder's Dozen Key

The Birder's Dozen

VT trends source: The Second Atlas of Breeding Birds of Vermont, 2013. Shown as percent change between first atlas (1977-1981) and second atlas (2003-2007).

1. American Woodcock

Scolopax minor

Habitat: Patches of openings, young forest, and mature forest—preferably near alder swales

VT Trend: Increased 7%; Audubon WatchList

ID Tips: A plump bird with a long bill, no neck & short legs; mottled cryptic coloration

Song: A nasal beeping *peent* heard mostly at dusk; also twittering wing sound when in flight

Management: Create a mix of openings, young forest, and mature forest near alder wetland

2. Chestnut-sided Warbler

Dendroica pensylvanica

Habitat: Young forest or old fields with dense shrub cover & scattered perch trees

VT Trend: Increased 2%

ID Tips: Yellow crown, black moustache stripe & chestnut sides following contour of wings; tail held cocked above wingtips

Song: Fast *Please-please-pleased-to-meet-cha* with emphatic ending

Management: Maintain or create >1 acre patches of young forest

3. White-throated Sparrow

Zonotrichia albicollis

Habitat: Coniferous & mixed forests with openings and shrubby, dense undergrowth

VT Trend: Decreased 8%

ID Tips: White throat with yellow in front of eyes, white & black stripes on head, gray chest

Song: Clear whistled, *Poor Sam Peabody Peabody Peabody*

Management: Create openings with low cover, scattered trees, and brush piles in mixed or coniferous forests

4. Yellow-bellied Sapsucker

Sphyracpicus varius

Habitat: Mature forest with snags

VT Trend: Increased 8%

ID Tips: Messy barring on back, yellowish wash across belly. Vertical white stripe on side distinguishes it from other woodpeckers

Song: Drum burst of 5 rapid taps followed by gradual slowing double taps; call a *QUEEah*

Management: Retain standing deadwood leaving birch & aspen trees for cavity nesting habitat

5. Eastern Wood-Pewee

Contopus virens

Habitat: Deciduous forests & edges of openings

VT Trend: Decreased 4%

ID Tips: Slender, small headed, & grayish-olive above with dull, white wing-bars; "sallies" for insects (flying out from perch & then back again)

Song: *Plaintive pee-ahh-weee*

Management: Create canopy gaps & dense understory for good foraging

6. Blue-headed Vireo

Vireo solitarius

Habitat: Moist coniferous forests, also may be found in deciduous forests

VT Trend: Increased 10%

ID Tips: Bluish-gray head with strong white spectacles (circles around eyes), greenish back with white belly & yellow-olive flanks

Song: *See you…be-seeing ya'*…so long…repeat; slow with pauses in between phrases

Management: Maintain a closed canopy in coniferous forests

7. Veery

Catharus fuscescens

Habitat: Damp deciduous woods with dense understory

VT Trend: Decreased 1%

ID Tips: Tawny-brown above, weakly spotted on breast; least spotted of all the thrushes

Song: Flute-like & ethereal; ball spiraling down a tube; call an emphatic *vreer*!

Management: Create a broken canopy & dense understory, especially in riparian areas

8. Wood Thrush

Hylocichla mustelina

Habitat: Mature, moist deciduous woods with dense understory & heavy layer of leaf litter

VT Trend: Decreased 6%; Audubon WatchList

ID Tips: Brown back, heavily spotted on white breast; large thrush a little smaller than a Robin

Song: A flute-like *ee-oh-layyy*, ending in a sound like shattering glass

Management: Maintain a closed canopy, well-developed vertical structure, & moist leaf litter in deciduous forests

9. Black-throated Blue Warbler

Setophaga caerulescens

Habitat: Interior hardwood & mixed deciduous-coniferous forests with dense understory

VT Trend: Increased 3%

ID Tips: Deep blue on top with black mask & throat, white wing-patch "handkerchief"

Song: A thick & buzzy I'm-so-la-zeee with endnote rising up to the "blue" sky

Management: Create a dense understory for nesting under a broken canopy

10. Black-throated Green Warbler

Setophaga virens

Habitat: Coniferous and mixed forests

VT Trend: Increased 10%

ID Tips: Bright yellow face, olive head & back, black throat drips down sides onto white belly, two white wing-bars

Song: For females males sing *zee-zee-zee-zoo-zee* (also known as *I'm-black-throated-green*); to defend territorial boundaries *zoo-zee-zoo-zoo-zee* (also known as *trees-trees-murmuring-trees*)

Management: Maximize forest interior especially for spruce, fir & white pine

11. Scarlet Tanager

Piranga olivacea

Habitat: Interior deciduous and mixed forests, especially oaks and hemlock

VT Trend: Decreased 2%

ID Tips: Slim, bright red bird with jet black wings & tail ("A black-winged red bird")

Song: Like a robin with a sore throat; call an abrupt chick-burr

Management: Maximize forest interior; maintain a closed canopy

12. Canada Warbler

Cardellina canadensis

Habitat: Mixed forests, cedar swamps, riparian forests. Favors dense shrubby growth.

VT Trend: Decreased 31%; Audubon WatchList

ID Tips: Necklace of black stripes on bright yellow throat & belly, complete white eye-ring

Song: Often has soft introductory chips, then *I'm-IN-here, but-you-CAN'T-SEE-ME*

Management: Protect forested wetlands; improve vertical structure in mixed forests

Audubon VERMONT

 vermont@audubon.org 802-434-3068 vt.audubon.org

Appendix C

VT Backcountry Ethics (Trailhead Sign)

VERMONT BACKCOUNTRY ETHICS

LEAVE NOTHING BUT TRACKS

1 _ Plan Ahead & Prepare

- Practice safety first.
- Know where you are going.
- Know your own and your group's limits, and minimize risks.

2 _ Travel On Durable Surfaces

- Stay on deep snow cover whenever possible.

3 _ Dispose of Waste Properly

- Pack it in. Pack it out.

4 _ Leave Things As They Are

- Leave only tracks. No unauthorized cutting.

5 _ Minimize Campfire & Hut Impacts

- Use a lightweight stove for cooking and enjoy a lantern for light.
- Leave huts and cabins in better shape than you found them.

6 _ Respect Wildlife

- Observe wildlife from a distance. Do not follow or approach wildlife. Winter is an especially vulnerable time for animals.

7 _ Be Considerate of Others

- Any maintenance cutting can be done only with permission, as part of an suthorized project or program. Respect landowners, both public and private.
- Respect other skiers/riders and all other users.
- When ascending trails, keep clear and yield to downhill traffic. Avoid booting and snowshoeing in skin or ski tracks. When descending always stay in control, go one at a time, and slow down near others.
- Respect designated areas, signs and wildlife.

CATAMOUNT TRAIL ASSOCIATION · LONG TRAIL · VERMONT · UAS · WINTER WILDLANDS ALLIANCE · Leave No Trace

www.vtbc.org | www.catamounttrail.org

Appendix D

Leave No Trace Ethics – Backcountry Snowsports

1. Plan Ahead and Prepare

- Practice Safety First. Be prepared; plan your trip and be self-reliant. Have extra warm layers, carry first aid, emergency gear, headlamp, whistle, watch, and a lighter or matches. Check the weather and snow conditions, and set and stick to a turnaround time. Know your equipment and its limits, have extra food and water, get training in wilderness first aid and avalanche safety. Never fully depend on any electronic device, especially a cell phone, personal locator beacon or GPS. Carry extra batteries or other means to recharge critical electronic devices. Plan for changes in weather, and have the gear to survive a night in the mountains.
- Know where you are going. Have a map, compass, and GPS and know how to use them; mark a waypoint at the trailhead or backcountry access point. Study area maps in advance of your adventure; consider going with someone with experience in the area. Allow plenty of time for your adventure. Know emergency exit routes, and be sure to tell someone where you are going, when you plan to return, and stay with that plan.
- Know your own and your group's limits, and minimize risks. Always default to the least skilled member's ability for maximum safety. Groups of three or more are encouraged but do not exceed group size limits for the area. Don't push yourself or others to take risks. Stay within your fitness and skill level. Stay together and use the buddy system. Check your watch and map regularly to keep track of your progress and location.

2. Travel on Durable Surfaces

- Stay on deep snow cover whenever possible. Respect springtime trail closures. Stay on snow, rock, or walk in the middle of the trail if conditions are muddy or icy to avoid creating new trails and damaging trailside plants. Consider additional traction and/or flotation as necessary for trail conditions. Travel away from avalanche paths, cornices, steep slopes, and unstable snow.

3. Dispose of Waste Properly

- Pack It In, Pack It Out. Pack out everything you bring with you. Burying trash and litter in the snow or ground is unacceptable. Pick up all food scraps, wax shavings, and pieces of litter. Pack out all trash: yours and others'. Bury human waste deep in snow at least 50' away from travel routes and at least 200 feet (70 adult steps) from water sources or pack it out with you.

4. Leave What You Find

- Leave only tracks. Leave all plants, rocks, animals, and historical or cultural artifacts as you find them. Take only pictures. Avoid introducing or transporting non-native or invasive species.

5. Minimize Campfire and Hut Impacts

- Use a lightweight stove for cooking and enjoy a lantern or headlamp for light. Where fires are permitted, use established fire rings. Keep fires small. Burn only downed wood that is smaller than your wrist. Never cut live plants. Burn all wood and coals to ash, put out campfires completely, and leave a clean fire site.
- Leave huts and cabins in better shape than how you found them. It is always best to cook outside whenever possible. Use extra care when cooking or heating inside huts. Be considerate of other users and observe any rules or instructions related to the shelter. Clean up before leaving. Don't leave food or other trash behind – it only encourages the mice!

Appendix D

6. Respect Wildlife

- Observe wildlife from a distance. Do not follow or approach wildlife. Winter is an especially vulnerable time for animals.
- Never feed wildlife or leave food behind to be eaten. Protect wildlife and your food by storing rations and trash securely.
- If you choose to bring your dog keep it under control and do not let it harass wildlife. Consider leaving pets at home.

7. Be Considerate of Others

- Respect landowners, both public and private. Ask permission before entering private land and stay clear of homes, buildings, and equipment. Respect all land postings. Leave access gates as they are found.

- Respect other skiers/riders and all other users. Keep noise to a minimum when near others, and let nature's sounds prevail. Promote friendly cooperative attitudes, share safety information, and help others if needed. Please keep your journey's end celebration activities respectful. In popular areas, "spoon" downhill tracks to conserve opportunities for others to enjoy fresh snow.
- When ascending trails, keep clear and yield to downhill traffic. When descending always stay in control, go one at a time, and slow down near others. Avoid booting and snowshoeing in skin or ski tracks. Ski and ride conservatively to avoid accidents.
- Respect designated areas, signs, and wildlife. Obey local guidelines, follow ski area boundary rules, and stay out of sensitive natural areas. Park in designated areas; do not block gates, roads or driveways, and car pool if possible. Respect other activities.

This information was adapted from the Seven Leave No Trace Principles in conjunction with the Winter Wildlands Alliance and the Vermont Backcountry Alliance, both partners of the Leave No Trace Center for Outdoor Ethics.

Appendix E

Referenced Vermont Statutes

Timber Trespass

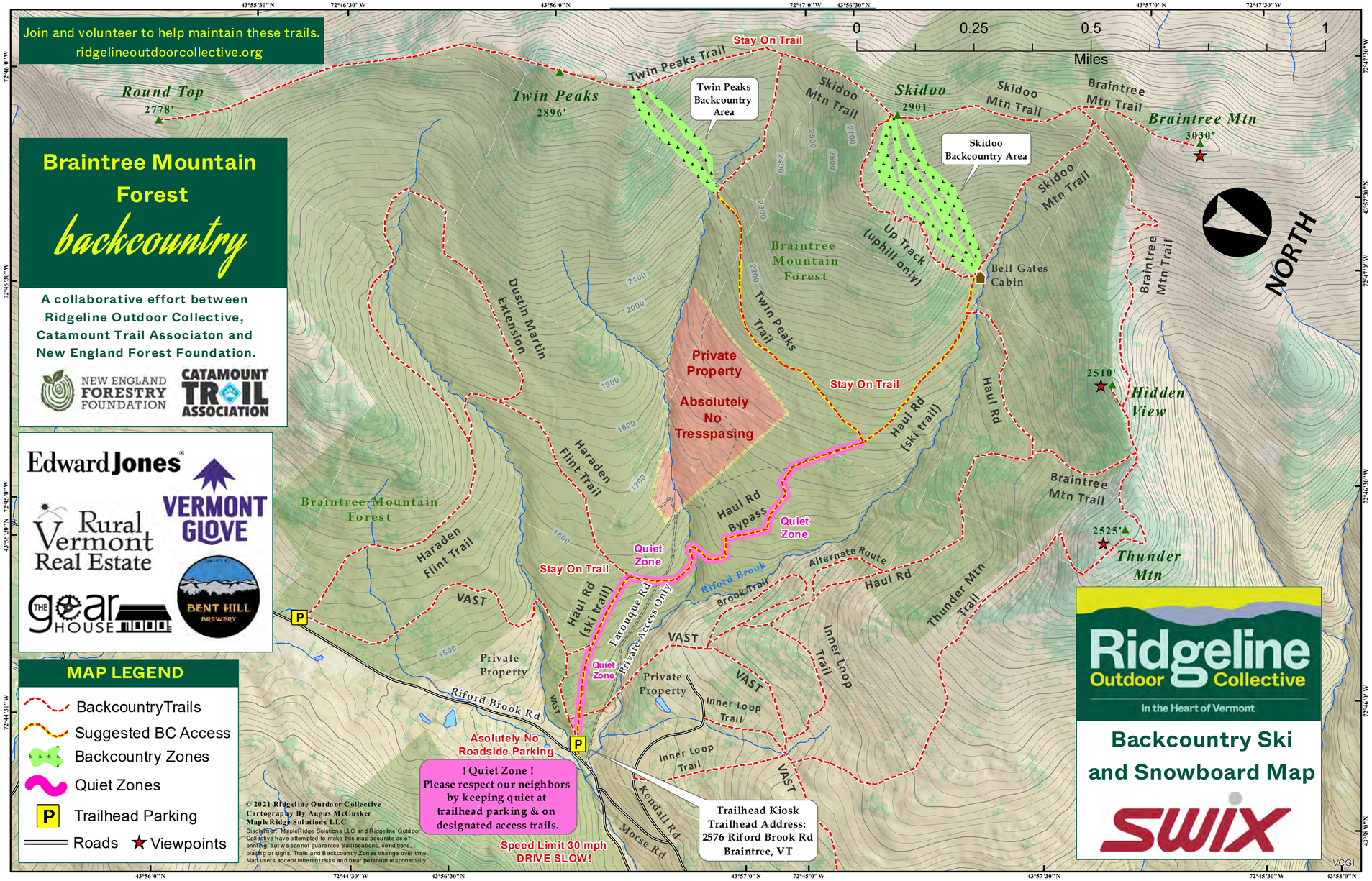
Link to Statute

Limitations on Landowner Liability

Link to Statute

Appendix F

Maps of Current 2020 Sanctioned Zones (Public & Private Land)

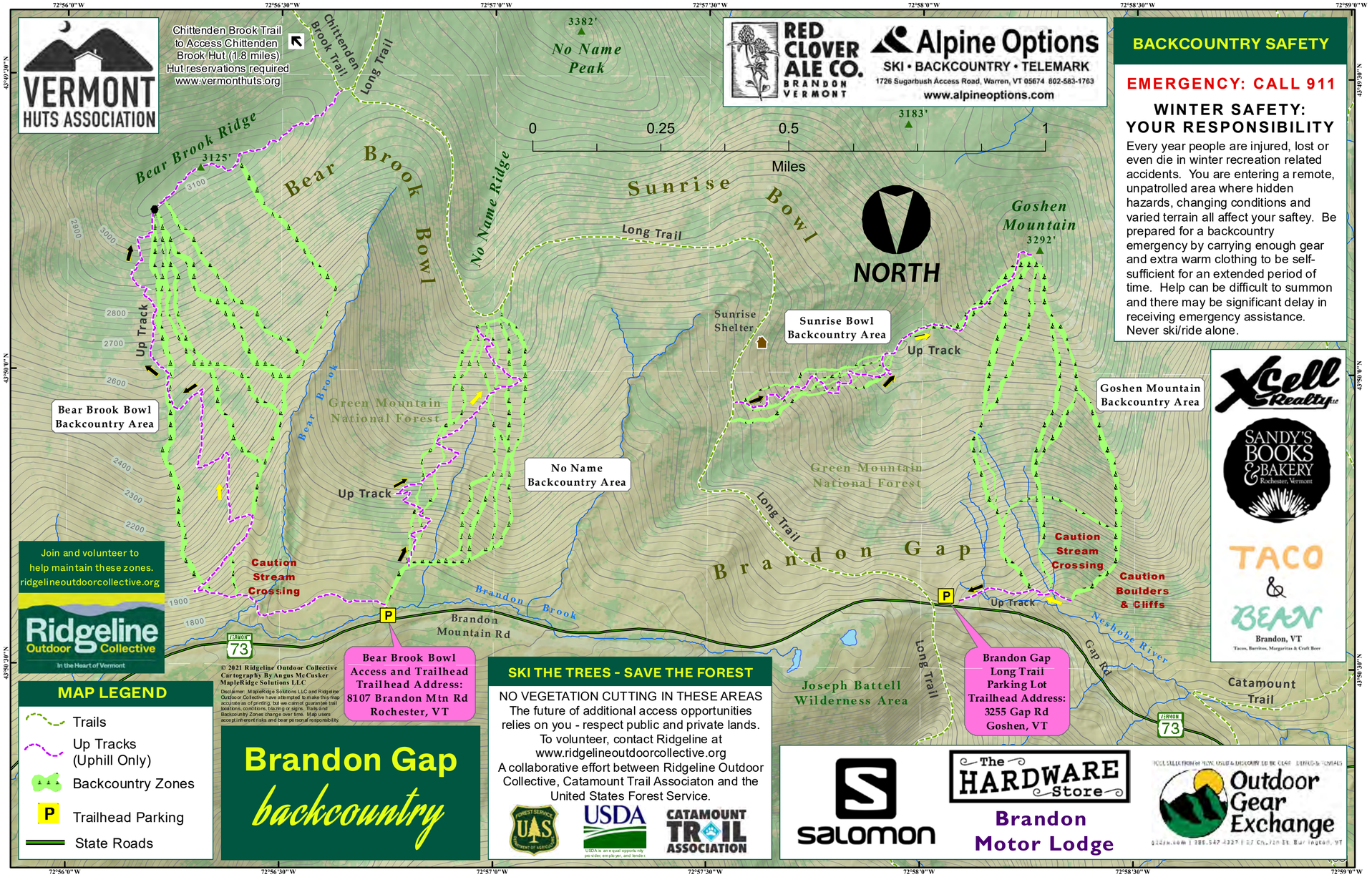


Braintree Mountain Forest

Braintree Mountain Forest is a designated Backcountry Ski Zone on Private Land

Appendix F

Maps of Current 2020 Sanctioned Zones (Public & Private Land)

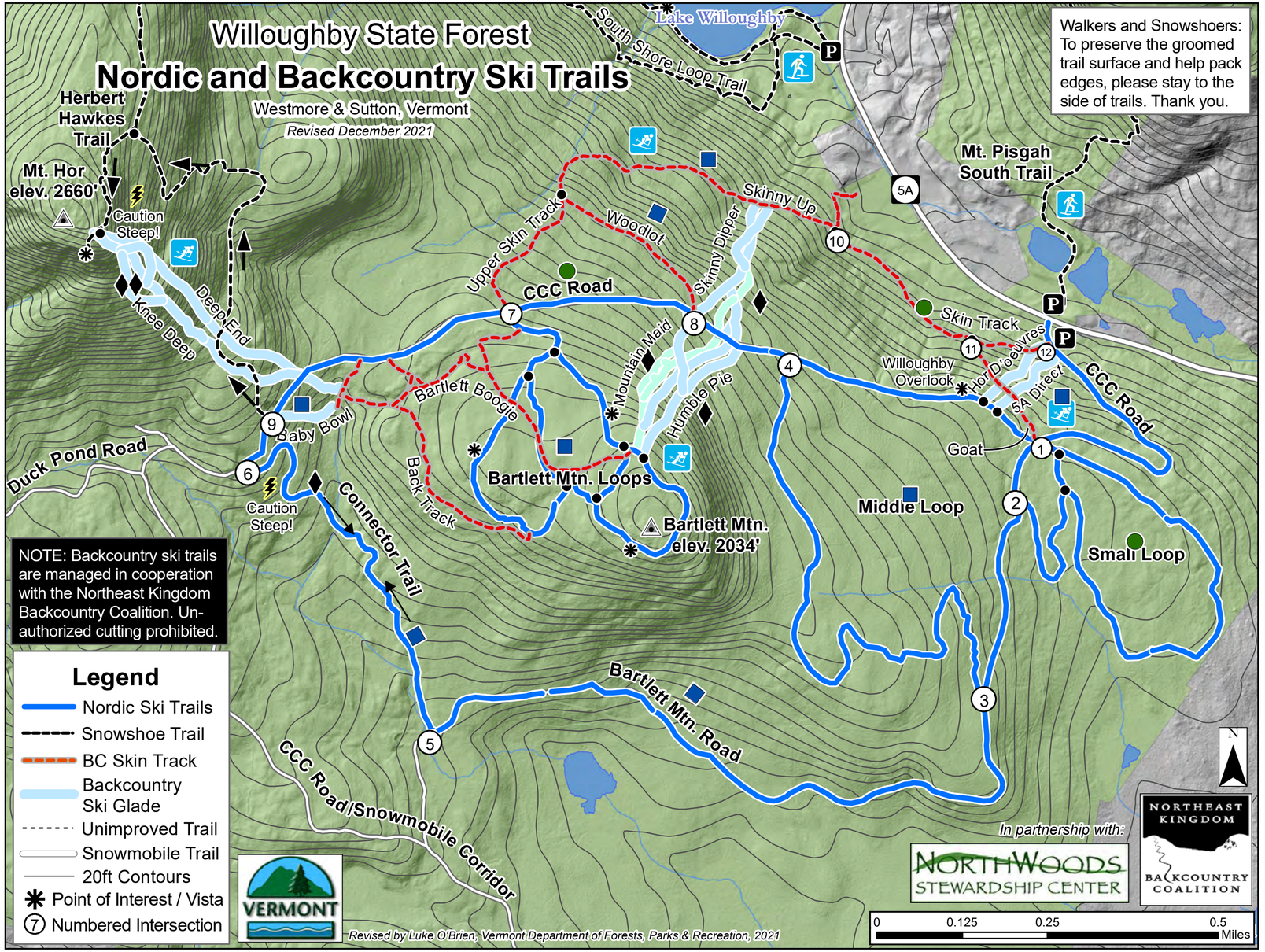


Brandon Gap

Brandon Gap is a Designated Backcountry Ski Zone in the Green Mountain National Forest

Appendix F

Maps of Current 2020 Sanctioned Zones (Public & Private Land)



Willoughby State Forest

Willoughby State Forest has a designated backcountry ski zone that is managed by the VT Dept. of Forests, Parks and Recreation and the NEK Backcountry Coalition

Appendix G FPR "Pre-Proposal"

Vermont Department of Forests, Parks and Recreation (VT FPR)

Recreation Project/Use Pre-Proposal Form

Pre-proposals are an early step in the process of requesting a new use or trail on state land. Using this form provide information on the use or project you'd like to propose. This pre-proposal is submitted to the appropriate stewardship staff and will be reviewed for initial compatibility with the management goals and objectives of the property, compatibility with legal constraints and ANR policy. You will receive a response within 30 days and may be invited to submit a full proposal for the project.

Please attach a map and a sketch/site plan/schematic drawing of your project and submit any associated shapefiles. See below for map guidelines.

1. ***Requester's Information and Contact***

2. ***VT FPR Contact (who have you been in touch with about this project?)***

3. ***Description of Proposed Project/Use***
   Upgrade of existing ( ) Relocation of existing ( ) New ( ) Change in Use ( )

   Length: _____

4. ***Location of Proposed Project/Use*** (Specify the location of the proposed project as exactly as possible. Also attach a topographic map showing location)

5. ***Detailed Description of Project (use up to one page to describe what you would like to see happen)***

6. ***Context and Objective of project/use***
   If the project/trail exists, who does it serve?

   Who will the new or improved project/use serve?

   Please explain the significance, need or value of this project/use and the reason(s) for the proposed change:

Map Criteria:

Basic Cartographic Elements

- Map Title
- Date of Map
- North Arrow
- Appropriate Scale
- Map Legend (specify "existing" vs. "proposed")

Map Type	Map Elements
Geographic Location Map *(Used to navigate to site within its setting and for environmental and archaeological reviews)*	• Basic Cartographic Elements • Title: "Geographic Location Map for *Project Name*" • Roads • ≤ 100ft contours • Town/County Boundaries • Potentially Significant Natural Communities (if known) • Potentially Significant Archaeological Areas (if known) • Waterways/bodies • Prominent Landmarks • Box with simple directions

Map Type	Map Elements
Site Plan Map *(Used to show a detailed layout of proposed and existing structures and development)*	• Basic Cartographic Elements • Title: "Site Plan for *Project Name*" • Existing and proposed structures and development • Site amenities • Roads • Waterways/bodies

Appendix H FPR "Full Proposal"

Vermont Department of Forests, Parks and Recreation (VT FPR)

Recreation Project/Use Full Proposal Form

Please include map and send shapefiles to appropriate district staff.

Date Received: _____

Support and Success of Recreation Project

Who supports this initiative?

What is the evidence for the demand for this project?

What other uses are currently occurring on the property?

Is there demonstrated support from other types of users?

Who will build, or improve this project site?

What costs are associated with this project and how will this project be funded

Who will maintain this recreation project for future use?

If this is a trail project, have you reviewed acceptable trail standards? (Click here for a list of suggested resources)

Which one(s) will you use to construct or maintain this project?

Management and Construction

What are the potential short and long term management issues associated with this project?

Are there any known design, construction or maintenance issues?

Are there any known management concerns (abutter concerns, user conflicts, safety, resource impacts)?

Would this trail need to meet ADA accessibility standards?

Yes/No? Why? List Conditions for Departure

Site Evaluation

Description of topography:

0-15% slope ( ) 15-30%slope ( ) > 30% slope ( )

Soil description:_____

Does the proposal involve any rehabilitation, demolition, removal, or use of a structure or building which is more than 50 years old? ☐Yes ☐ No

Does the project include a stream crossing? If yes, describe below and include width and length of ground disturbance and depth of excavation. ☐Yes ☐ No

Are there any visible or recorded archeological sites in the area (i.e., cellar holes, foundations, mill ruins, historic ruins or areas of historic importance in the project area (i.e., roads or other historic features)? If yes, please describe on a separate page how these sites will be avoided. ☐Yes ☐ No

Do you know of any Native American sites or artifacts in the project area? ☐Yes ☐ No

Does this project include repairs to deteriorated historic features or structures? ☐Yes ☐ No

If yes, please note: According to the Secretary of the Interior's Standards for Rehabilitation, deteriorated structures shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the feature shall match the old in design, color, texture, and other visual qualities and where possible, materials.

Has F&W investigated the project area to see if there are any rare, threatened or endangered species occurring within the project area? ☐Yes ☐ No

Other potential impacts or conflicts:

How will the project be constructed, maintained, and managed to prevent soil erosion and discharges to state waters?

Explain how the proposed trail or activity will be managed or built to minimize impact on forest management, natural resources, including natural communities, fish and wildlife habitat, unique ecological features, Rare, Threatened or Endangered species and their associated habitats, wetlands, and waters of state?

Explain how the proposed trail or activity will be managed or built to minimize impact on water resources, shorelands (click here for link), riparian areas, water quality, and flood resiliency values associated with ANR lands. How does the project meet or exceeds Vermont Water Quality standards (click here for link) and other relevant water quality standards?

How will this activity or use impact privately held land abutting the project area?

Are there established trails or project areas on non-ANR land adjacent to the project area? Are they permitted by the adjoining landowners? What type of permission exists (verbal, written, easement, etc.)?

How will the proposed trail or activity minimize new trail construction to the greatest extent possible? Will you utilize established roads and trails?

How will you address mitigation of unauthorized use if applicable? For example, if this proposal is for a winter only trail, how will you address unauthorized summer use?

Is there a demonstrated lack of regional public supply for this recreational resource/need? Explain.

What are the current and future use trends for this activity/activities? (Resources for trend data: SCORP, Outdoor Industry Association, USFS research, etc.)

Stewardship Team Review Complete: Date_____

Note: a response is due to applicant within 60 days of receipt of application

Signature:_____ Date:_____

Stewardship Forester

Stewardship Team Recommendations: These should include a list of needed assessments, site visits and other next steps, and include who will do each step and when.

List Next Steps:

Step:	**Who Will Do it?**	**Timeframe**

Please submit a copy of completed form to the appropriate District Stewardship Forester

Appendix I

Recreation Project Proposal Public Information Sheet

Vermont Department of Forests, Parks and Recreation (VTFPR) Recreation Project Proposal Review Process and Evaluation Criteria

Thank you for your interest in a new recreation project or trail on Vermont Department of Forests, Parks and Recreation lands (for a list of these lands and associated planning documents click here). In the interest of communicating a cohesive statewide review process, VTFPR staff have developed this flow sheet to show how we will make a determination about your project. We carefully consider new and existing uses, resource protection, management goals and objectives, legal constraints, etc. in the management of our state forests and state parks.

This information is intended to clarify the process which we regularly undertake when the public or a user group submit a proposal.

NOTE: this information is for new recreation infrastructure, facilities or designation of a new use. If you are looking to use state lands for an event, commercial operation or for your group, please apply for a Special Use License or Permit on FPR's website.

Have an Idea for a new Recreation Project, Trail or Use? Here's what to do:

1. Contact Appropriate District Stewardship Forester:
    - You can find this information under the State Lands Link at https://fpr.vermont.gov/forest/vermonts-forests/meet-team
2. Fill out Pre-Proposal Form.
3. Submit to FPR Staff/Stewardship Team Review.
4. Response from contact person **within 30 days of receipt of pre-proposal.**
5. You may receive an Invitation to submit Full Proposal for eligible projects.
6. Stewardship Team Review of Full Proposal which might include:
    - Resource Assessment/Inventory
    - Site Visit(s)
    - Public Involvement (could be at various points in the process)
    - Amendment to LRMP
    - Lands Team (Agency of Natural Resource) Review
    - Town Involvement
    - Feasibility Studies
    - Design/Engineering/Planning
    - Timeline shifts
    - Modify/Development of Proposal

7. A response with next steps outlined will be given to all Full Proposals **within 60 days.**

8. If project is approved, then it will be put in the District Annual Stewardship Plan which is put together in late fall/early winter (typically done by March 1).

Submitted VTFPR Pre-Proposals Evaluation Criteria:

1. Is there a Long Range Stewardship Plan (LRMP) or Interim Stewardship Plan (ISP) for the state forest or park you are interested in?
2. Is the project consistent with the classifications in the Long Range Management Plan? Will the project change the land use or recreational experience in the area? Are there any known resource constraints? (i.e. Deer Wintering Areas or Rare, Threatened or Endangered Species)
3. Does the project meet the goals of the property?
4. Does VTFPR policy support the proposal?
5. Is the use allowed by legal/statutory constraints on the parcel?

NOTE: *All projects on properties which do not have a Long Range Management Plan or Interim Stewardship Plan will be reviewed for resource and legal impacts and compatibility by the appropriate stewardship staff.*

6. Is this a new use on this property?

Submitted VTFPR Full Proposal Evaluation Criteria:

Based on District Stewardship Team Review of your submitted pre-proposal, you may be invited to submit a full proposal. The following criteria will help guide the review of your proposal and determine the necessity of making modifications:

1. Resource constraints (ie. Wildlife impacts, presence of Rare, Threatened or Endangered species, erodible soils, riparian zones, archeological/cultural concerns, etc.)
2. Use or management conflicts (for example: new trail by a remote campsite or a license for some other use of the parcel)?
3. Impacts to adjacent parcels
4. Project/Trail Design Standards
5. Long and short term capacity to maintain this use/resource
6. Funding or fundraising capacity for this project
7. Public demand for this project
8. Demonstrated lack of regional public supply for this activity/use
9. Formal agreement with a partner
10. Whether this activity is established and growing

Appendix J

VT FPR-NEKBC Backcountry Ski Zone Guidelines

Vermont FPR – NEK Backcountry Coalition Backcountry Ski Glade Guidelines

Revised November 2017

LAYOUT of TRAILS within each GLADE

Flagging:

- Pink Striped Flagging: Skier's right boundary
- Orange Striped Flagging: Skier's left boundary
- Blue Flagging: retention island or tree (w/in trail)

General Requirements:

- A glade will be comprised of several to multiple braided trails.
- Lay out trails within the approved glade (see map and GPS)
- To the extent practical, trails shall be no more than ~30' wide with a closed overstory canopy, unless specifically approved by VT FPR
- Trails may merge and braid to create additional skier options but, in general, the trails should be dispersed and separated by ~30' vegetated buffers.
- The Mount Hor glade will contain no more than six backcountry trails.

CLEARING

Vegetation-Cutting Restrictions:

Do not remove:

- Vegetation less than 1 meter (3.2 feet) in height, except hobblebush
- Mountain ash
- Red Spruce and Hemlock
- Mature trees (≥6"dbh)

Limit cutting of:

- Sapling sized (1/2" to 3"dbh) yellow birch
- Pole sized (3-6"dbh) hardwood trees, ALL species
- Standing dead trees (snags), unless they pose a safety risk and can be taken down safely
- Softwood tree bole w/in desired line w/ encroaching branches:
  1. Prune dead and dying branches
  2. Trees < 15' tall: Leave at least top 5' of live branches unless still encroaching-then cut down tree
  3. Trees >15' tall: Leave top 1/3 of live branches

Vegetation-Cutting Allowed:

- Retaining groups- If practical, retain small groups of trees- especially if located downslope and 'protected' by a larger retention tree. This will increase survivability and future regeneration of desired species.

Blow Downs and Slash

- Downed trees: cut up to max height 2' off ground
- Cut limbs and woody slash into short lengths and scatter along edges of retained islands, within islands, or in the trail to buffer from skier traffic. The placement of brush will increase ground cover, protect seedlings, and reduce potential erosion by stabilizing soils.
- Pile excess slash into uneven terrain undulations, to cover holes/rocks, or in the undersides of cliffs, rocks, and stumps.
- Slash should not be piled high enough create a "wall" of brush.

Appendix J

GENERAL

- Cut branches flush with the tree stem.
- Cut vegetation stems flush to the ground to prevent hazards and reduce sprouting.
- Don't cut trees/stumps on an angle… No "punji sticks".
- Prune shrubs/woody veg >3' in height to ground level but retain root structure.
- When removing vegetation, emphasize stems that are poorly formed, show signs of disease, or are hardwoods overtopping softwoods. Favor/retain high quality, healthy stems.
- Leaders: SAFETY FIRST! Set/review goals and monitor group safety. Spread out, adjust flag line as needed, to maintain visibility, check quality and completeness, identify potential hazards, and help direct bucking activity. Delegate tasks, as needed, and reinforce high quality work and attention to detail.

Appendix K

USFS Backcountry Ski Zone Guidelines

FLAGGING SPECIFICATIONS

- Pink Flagging: Skier's right-side boundary
- Pink & Black striped Flagging: Skier's left boundary
- Blue Flagging: Top of NO CUT zones (islands)

INFORMATION ON TEAM LEADER PLACARDS

Vegetation - to Cut:

- Mid to low story hardwood shrubs and trees
- Hobblebush
- Shrubs/woody veg greater than 1 meter in height: prune to ground level but retain root structure
- Live and dead branches where posing a hazard: cut the branch to preserve the branch collar. Do not cut into the collar but cut as close as you can to it...see diagram and pictures to right.
- Standing dead trees that pose a safety risk
- When removing vegetation, emphasize removing stems that are poorly formed; show signs of disease; or are hardwoods overtopping softwoods

Vegetation – Cutting Restrictions:

Do not remove:

- Any vegetation less than 1 meter (3.2 feet) in height except hobblebush
- Mountain ash

Limit cutting of:

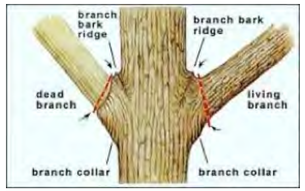
- Saplings/pole size spruce and fir if healthy/vigorous
- Large yellow birch trees unless a safety risk
- Mature trees that maintain the closed canopy unless a safety risk

BLOW DOWNS AND SLASH

- Downed trees: cut up to max height 2' off ground
- Scatter slash along edges of retained islands (and within islands) to buffer from skier traffic
- Pile excess slash into uneven terrain undulations, to cover holes/rocks, or in the undersides of cliffs
- Slash should not be significant enough create a "wall" of slash.

Tips:

- Cut vegetation flush to the ground to prevent hazards
- Do not cut tree/stump on an angle...NO "punji sticks"
- Softwood bole within desired ski line: cut down tree
- Softwood bole out of ski line w/ encroaching branches:
  - Prune dead/dying branches
  - Trees < 15' tall: Leave at least top 5' of live branches unless still encroaching-then cut down tree
  - Trees >15': Leave top 1/3 of live branches
  - Limit pruning to the ski line side of the tree
- Leader role: monitor line visibility, safety, completeness, checks for accidentally left dangers, and helps direct bucking activity.



Appendix L

Sample CTA Chapter MOU from NEKBC

Memorandum of Understanding
Between Catamount Trail Association (CTA) And
Northeast Kingdom Backcountry Coalition (NEKBC)

This *Memorandum of Understanding* (MOU) is entered into on this 22nd day of August 2019, by and between the Catamount Trail Association (CTA), a Vermont non-profit corporation with its principal place of business in Burlington, Vermont and Northeast Kingdom Backcountry Coalition (NEKBC) of Orleans, Vermont and hereby establishes NEKBC as a chapter of the Vermont Backcountry Alliance (VTBC), a program of the CTA, under the terms and conditions described below.

RECITALS

WHEREAS, the CTA is a non-profit, member-driven organization that develops, manages, and conserves the Catamount Trail, a public-access ski trail that runs the length of Vermont from Massachusetts to Canada. The CTA builds partnerships to support the Trail, and fosters awareness and stewardship of Vermont's diverse landscapes through promotion and use of the Trail. Founded in 1984, the organization also advocates backcountry and cross-country skiing for the quality of life, recreational, health, economic and educational benefits they provide;

WHEREAS, the VTBC is a CTA program that facilitates public access to backcountry terrain while promoting the conservation and responsible stewardship of our mountain environment;

WHEREAS, NEKBC exists to secure, maintain, and protect public access to legal, non-motorized, backcountry snow sports, while promoting proper user education, and sustainable conservation practices in Essex, Orleans, and Caledonia County, Vermont;

WHEREAS both CTA and NEKBC are seeking to promote, protect, advance and advocate for human powered backcountry skiing and snowboarding in Vermont.

NOW THEREFORE, in consideration or the forgoing premises and for other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

TERMS AND CONDITIONS

1. Purpose

NEKBC shall become a chapter of the Vermont Backcountry Alliance (VTBC), a program of the CTA. The CTA and NEKBC agree to work together to promote backcountry skiing in Essex, Orleans, and Caledonia Counties, and more generally, throughout the state. CTA and NEKBC will work together to help unify the voice of backcountry skiers and riders, to develop and responsibly manage additional terrain for backcountry skiers, to link backcountry glade skiing to existing portions of the Catamount Trail, to streamline and organize backcountry terrain development statewide by creating a parent organization with local chapters, to educate backcountry users and encourage safe and sustainable practices, and to help the CTA broaden its clientele and base of support.

2. Benefits

This partnership will allow NEKBC and CTA to explore the concept of a chapter model. CTA will provide NEKBC with basic administrative support, and NEKBC will help CTA further its goals by reaching a broader audience of backcountry skiers as it pursues its local

terrain development and management projects.

3. Target Population

The Target population consists of backcountry skiers and riders in the Northeast Kingdom area and beyond, as well as general community members and business people.

4. Benefits to Target Population

The joint work of the CTA, VTBC, and NEKBC will provide access to an increased variety of terrain for all abilities, promote greater awareness of backcountry programs and projects in the region, promote safe and responsible backcountry travel in the region, connect skiers and riders with supporting local businesses, and develop a template from which other chapters and sustainable backcountry zones may be developed. Benefits will also accrue to Vermont's forest landowners and managers by providing more responsible planning and development of ski trails and glades on both private and public lands.

5. Term

The term of this MOU is for a period of 5 years from the effective date of this agreement and may be extended upon written mutual agreement. It shall be reviewed at least annually to ensure that it is fulfilling its purpose and to make any necessary revisions.

6. Official Contacts

Each party will appoint a person to serve as the official contact and coordinate the activities of each organization in carrying out this MOU.

7. Establishment and Bylaws

A copy of NEKBC's bylaws shall be submitted to the CTA Board of Directors for approval, and shall be kept on file at the headquarters of the CTA. Any NEKBC by-law or other governing document or part thereof that conflicts with the Articles of Association or Bylaws of the CTA is void.

8. Structure

NEKBC will have at least a President, Secretary, and Treasurer for officers.

NEKBC must have a written nomination and election procedure within its bylaws and on file at the CTA.

9. Membership

The Board of Directors of the CTA shall establish a dues remittance schedule and may adjust that schedule as deemed appropriate in the future. Individuals and families may join NEKBC and CTA jointly at all five membership levels, with dues to be collected and managed by CTA. NEKBC will receive 35% of all CTA/ NEKBC joint membership dues. The NEKBC portion of membership funds will be distributed to NEKBC on a monthly basis. These membership funds will be attributed to the NEKBC restricted account. CTA and NEKBC will share ownership of NEKBC /CTA joint membership data. CTA will manage the membership data and share it with NEKBC at regular intervals, on a schedule to be determined by the two parties. NEKBC will also share any member data that comes in directly through NEKBC with CTA at regular intervals.

10. Duties

The President of NEKBC or his or her designee shall report orally or in writing on membership and activities at the annual meeting of the members of the CTA.

Appendix L

11. Activities

NEKBC will co-sponsor activities with the CTA to further the goals of this partnership. Co-sponsored NEKBC activities will include organized trail and glade maintenance events, organized ski tours, and organizational meetings and events.

12. Financial and Grants

Ultimately, NEKBC will control its own funds and other assets, and the Association shall not be liable for the debts of NEKBC. NEKBC will be responsible for periodic and year-end financial reporting to the Association in accordance with the Association's fiscal year and generally accepted accounting principles. Initially CTA will manage NEKBC's funds while proper chapter accounting policies are established.

NEKBC will adhere to all internal controls in place at CTA. NEKBC will work with CTA staff to develop grant applications and other fundraising efforts. CTA will review and approve all grant proposals, and have copies of all grant related documents. If NEKBC receives restricted grant funds, CTA will manage such funds in order to ensure compliance and maintain CTA's tax-exempt status. CTA reserves the right to assess an administrative fee if annual receipts from NEKBC related activities exceed $10,000.

13. Intellectual Property

NEKBC and CTA agree that by virtue of this MOU, NEKBC shall not acquire, and CTA shall continue to retain, any and all rights to CTA's Intellectual Property should this MOU be terminated. Upon termination, NEKBC shall cease use of all intellectual property and return it to CTA. For the purposes of this agreement, Intellectual Property shall be defined as CTA's membership lists, logos, web sites, web content, databases, marketing and development tools and strategies.

14. Insurance

CTA holds both general liability and directors and officers policies. NEKBC will be covered by CTA's general liability policy effective at the signing of this MOU. CTA covers the cost of insurance for each chapter at a rate of $2 per member per year. In the event of unexpected major increases, or if NEKBC incorporates elements that are not covered by CTA's existing policy, the CTA reserves the right to remove NEKBC from its policy or to increase the premium percentage paid NEKBC. The insurance coverage for NEKBC covers trail work events, winter backcountry tours lead by NEKBC leaders, and organizational meetings and events.

15. Assets and Liabilities

If NEKBC is disestablished or dissolved, it shall transfer to the Association all of its tangible and intangible property pertaining to trails and glades which are located in the State of Vermont and have the approval of the Board of Directors. Any other assets remaining at the time of disestablishment or dissolution after the payment of debts shall be transferred to the Association unless the chapter has arranged to transfer such assets to a different corporation which has qualified under Section 501(c)(3) of the U. S. Internal Revenue Code.

16. Marketing and Outreach

CTA and NEKBC will include the NEKBC and CTA logo, links, and contact information as appropriate in all communications, and will work together to promote mission, membership, backcountry skiing and riding opportunities, and events.

17. Termination

Termination for Cause: If either party shall be in material breach of any other obligation hereunder, the other party may terminate this MOU by giving ten (10) days' written notice specifying the basis for termination.

Termination for No Cause: Either organization may

terminate this MOU upon thirty (30) days written notice without penalties or liabilities.

18. Severability

The parties agree that if any part, term, or provision of this Agreement shall be found illegal or in conflict with any valid controlling law, the validity of the remaining provisions shall not be affected thereby.

19. Governing Law

This MOU shall be construed in accordance with the substantive laws of the State of Vermont. Any dispute arising as a result of this agreement shall be heard in the courts of Chittenden County Superior Court.

20. Indemnity

NEKBC shall indemnify, defend and hold harmless CTA, its officers, employees and agents from and against all actions, claims demands, costs and expenses (including the costs of defending or settling any action, claim or demand) made sustained, brought or prosecuted in any manner based upon, occasioned by or attributable to any injury to any property or person (including death) which may arise from or be a consequence of any tortious or negligent action or inaction or omission of NEKBC, its officers, employees or agents in connection with or in association with this MOU.

Appendix M

Sample Bylaws from MRVBC

Article I Name and Location

The name of this organization shall be the "Mad River Valley Backcountry Coalition" (MRVBC). MRVBC shall have no principal office, and shall meet at various places within and around the Mad River Valley. MRVBC shall be a chapter of the Catamount Trail Association (CTA).

Article II Purposes

The Mission of the Mad River Valley Backcountry Coalition is to provide safe and sustainable non-motorized multiple-use trails and backcountry ski/snowboard zones (herein referred to as "glades") for the enjoyment of area residents and visitors. MRVBC is organized exclusively for charitable purposes under CTA's 501(c)(3)status to:

- Serve as a voice for those who value access to non-motorized recreation opportunities in the Mad River Valley and adjacent areas.
- Promote self-propelled, winter recreation such as backcountry skiing, snowboarding, and snowshoeing on public and private lands by maintaining trails, glades and trail access in an ecologically responsible manner.
- Promote environmental awareness, responsible trail use, and backcountry safety.
- Assist, where requested or appropriate, through information gathering, education and public service, in the management of glades and trails.

Notwithstanding any other provision of these By-Laws, no Member, Trustee, Officer, employee, or representative of MRVBC shall take any action or engage in any activity by or on behalf of MRVBC not permitted by an organization exempt under Section 501(c)(3) of the Internal Revenue Code (the "Code") or any corresponding provision of any future federal tax code.

Article III Officers

Section 3.1 Number of Officers

MRVBC shall have a minimum of four Officers: President, Vice-President, Treasurer and Secretary. A single individual may not hold the office of President and Secretary simultaneously. Only a Member in Good Standing is eligible to hold Office.

Section 3.2 Elections and Terms

A full term for Officers shall be from one Annual Meeting to the next Annual Meeting. Elections shall be held at the Annual Meeting. A slate of Officers will be included with the notice of the Annual Meeting, and nominations will also be accepted from the floor at the Annual Meeting. A majority of Members in Good Standing present at the Annual Meeting is required for election to an Office. All Officers shall serve until a successor shall have been duly elected, or until death, resignation, or removal.

Section 3.3 Removal of Officer

An Officer may be removed by a two-thirds majority vote of the Members in Good Standing present at the Annual Meeting, a Regular Meeting or a Special Meeting, as long as a Notice of the Removal Vote is included in the Meeting Notice.

Section 3.4 Vacancies

A vacancy in any Office may be filled by a majority vote of Members In Good Standing present at a Regular or

Special Meeting. A vacancy filled in this manner will run until the next Annual Meeting. While there is a vacancy in any Office, the remaining members of the Board shall fulfill those duties.

Section 3.5 President

The President shall be the principal Executive Officer of MRVBC who shall, when present, preside at all meetings. Between meetings, the President is empowered to make decisions for MRVBC consistent with MRVBC's mission. The President will keep Officers informed of decision. The President will put significant decisions, which due to time constraints must be made outside of a regularly scheduled meeting or special meeting, to an email vote.

Section 3.6 Vice-President

In the absence of the President, the Vice-President shall perform the duties of the President. The President may assign duties to the Vice-President.

Section 3.7 Secretary

The Secretary of MRVBC shall record all votes and proceedings of Regular, Special or Annual Meetings of MRVBC, which records shall always be available for inspection and copying by Members of MRVBC. The Secretary shall perform all duties incident to the Office of Secretary from time to time as shall be appropriate or assigned to the Secretary by the President. The Secretary shall keep record of the names of Members attending each Regular, Special or Annual Meeting.

Section 3.8 Treasurer

The Treasurer shall, in coordination with the CTA Main Office, keep accurate accounts of all receipts and disbursements of MRVBC-specific funds in books belonging to MRVBC, which shall at all times be available to CTA and Members of MRVBC for inspection and copying. MRVBC's funds shall be kept in an account managed by the CTA for MRVBC's benefit.

Section 3.9 Compensation

No Officer shall be paid any salary or compensation for services to MRVBC. The Executive Committee shall have the authority, however, to pay Members, Officers, or employees' reasonable compensation for bona-fide services rendered for MRVBC and to reimburse Members, Officers, or employees for reasonable approved expenses actually incurred for the benefit of MRVBC.

Article IV Committees

Section 4.1 Executive Committee

The Executive Committee shall consist of the President, Vice-President, Secretary and Treasurer, and shall include other appointed Officers. The affairs of MRVBC shall be managed by the Executive Committee.

Section 4.2 Special Committees

Special Committees of one or more Members In Good Standing, who do not have to be Officers, may be appointed by the President or the Executive Committee as needed.

Article V Appointed Officers

The Executive Committee may appoint additional Officers to serve for one-year terms as appropriate.

Article VI Fiscal Year

The Fiscal Year of MRVBC shall coincide with the fiscal Year of the CTA.

Article VII Membership

Section 7.1 Members

Any individual, business or organization may become

a voting member of MRVBC upon application to the CTA and specifying MRVBC as their local chapter, and payment of the appropriate dues.

Section 7.2 Voting

Each Member shall have one vote on each matter presented to the Members for a vote. The outcome shall be determined by a majority of those present at a Noticed meeting, unless a different proportion is required by law or these By-Laws. Family Membership shall entitle holders to two votes. Business and organization Members are entitled to one vote.

Section 7.3 Members in Good Standing

Only a Member who has paid MRVBC chapter dues for the current Membership Year is considered a Member in Good Standing. Only a Member In Good Standing is eligible to hold Office and vote at any Regular, Special or Annual Meetings.

Section 7.4 Dues and Membership Year

Membership dues are for the Membership Year in which they are paid, based on the CTA Membership Year. Membership dues shall be established by CTA, and CTA will determine what portion of those fees will be allocated to MRVBC.

Article VIII Meetings

Section 8.1 Time and Place of Meetings

Meetings of MRVBC's Members shall be held at a time and place determined by the President.

Section 8.2 Regular Meetings

Regular Meetings may be established.

Section 8.3 Annual Meeting

The Annual Meeting will be held at a time and place determined by the Executive Committee. No more than fourteen months shall transpire between Annual Meetings.

Section 8.4 Special Meetings

A Special Meeting may be held if business needs to be conducted that cannot be delayed for the next Regular or Annual Meeting.

Section 8.5 Notice

Notice of all Regular, Annual and Special Meetings will be made to all Members by email at least seven days prior to such Meeting.

Article IX Grants and Donations

Section 9.1 Donations

Members and non-members may from time to time make additional donations to MRVBC, paying the same to the CTA Main Office.

Section 9.2 Grants

On approval of the Executive Committee, MRVBC may be a co-applicant with CTA or other groups for grants from any and all sources requiring non-profit status, to be used in the furtherance of its purposes. MRVBC may directly apply for and accept grants not requiring Section 501(c)(3) non-profit status.

Section 9.3 No Financial Benefit

No Officer, or other person exercising supervisory power in MRVBC, or any of their close relatives can individually benefit financially from the receipt of grant funds or donations.

Article X Amendment of By-Laws

These By-Laws may be altered, amended or repealed and new By-Laws may be adopted by a two-thirds vote of the Members In Good Standing present at any Noticed Meeting of MRVBC.

The Notice for such Meeting must contain the wording of the proposed By-Law amendments.

Article XI Dissolution

Section 11.1 Vote of Dissolution

MRVBC may be dissolved by a two-thirds majority vote of the Members In Good Standing at any Meeting. The Notice of such Meeting must inform the Members that a Vote of Dissolution is proposed.

Section 11.2 Debt, Liabilities and Assets

All of MRVBC's debt and liabilities, to the extent of MRVBC's remaining assets, must be paid for or provided for. The remaining assets shall be distributed to an exempt organization under Section 501(c)(3) of the IRS code, and which has goals and objectives comparable to the goals and objectives of MRVBC, as set forth in these By-Laws.

Article XII Precedence

MRVBC shall abide by the By-Laws of the CTA. In the case of conflict of any Article or part of MRVBC's By-Laws with the By-Laws of the CTA, the respective part of the CTA's By-Law shall take precedence. The MRVBC Executive Committee shall take steps to discuss with the CTA any conflicting articles and parts of MRVBC's By-Laws, and seek appropriate amendments by the next MRVBC Annual Meeting after the conflict has been recognized.

Adoption of Bylaws

We, the undersigned, are all of the initial Officers of "Mad River Valley Backcountry Coalition" (MRVBC), and we consent to, and hereby do, adopt the foregoing bylaws, consisting of four preceding pages, as the bylaws of MRVBC. This date will serve as the first Annual Meeting of MRVBC.

Justin Cash

References

References

Access Fund. (2008). Climbing Management: A Guide to Climbing Issues and the Development of a Climbing Management Plan.

Blumstein, D.T., L.L. Anthony, R. Harcourt, and G. Ross. (2003). Testing a key assumption of wildlife buffer zones: is flight initiation distance a species-specific trait? Biological Conservation. 110:97-100.

Boonstra, R. et al. (1998). The impact of predator-induced stress on the snowshoe hare cycle. Ecological Monographs. 68:371-394

Butler, S.M., B.J. Butler, and J.H. Hewes. (2014). Vermont Woodland Owner Survey 2014: Final Project Report. USDA Forest Service.

Creel, S. et at. (2007). Predation risk affects reproductive physiology and demography of elk. Science. 315:960

Creel, S. and D. Christianson. (2008). Relationships between direct predation and risk effects. Trends in Ecology and Evolution. 23(4)194- doi:10.1016/j.tree.2007.12.004

Creel, S., Winnie, J, Maxwell, B., Hamline, K., and M. Creel. (2005). Elk Alter Habitat Selection as an Antipredator Response to Wolves. Ecology 86(12)3387-3397.

Czech, B., P.R. Krausman, and P.K. Devers. (2000). Economic associations among causes of species endangerment in the United States. Bioscience. 50(7):593-601.

Flinn, K.M., M.J. Lechowicz, and M.J. Waterway. 2008. Plant species diversity and composition of wetlands within an upland forest. American Journal of Botany 95(10): 1216–1224.

Gander, H., and P. Ingold. (1997). Reactions of male alpine chamois Rupicapra r. rupicapra to hikers, joggers, and mountain bikers. Biological Conservation. 79:107-109.

Goodman, D. (1989). A Guide to the Best Ski Tours in New England.

Goodman, D. (2010). Best Backcountry Skiing in the Northeast.

Goodrich, J.M., and J. Berger. (1994). Winter recreation and hibernating black bears Ursus americanus. Biological Conservation. 67:105-110.

Grafton, R. Quentin. (2000). Governance of the Commons: a Role for the State. Land Economics 76(4): 504-517. Hebblewhite, M. et al (2005). Human activity mediates a trophic cascade caused by wolves. Ecology. 86:2135-2144

Hendee, J.C, G.H. Stankey, and R.C. Lucas. (2005). Wilderness Management. Honolulu, HI: University Press of the Pacific.

International Skiing History Association. (2020). *https://www.skiinghistory.org/*

Knight, R.L., and D.N. Cole. (1991). Effects of recreational activity on wildlife in wild lands. Transactions of the North American Wildlife and Natural Resources Conference. 56:238-247.

Knox, Holly. (2015). Trial Backcountry Skiing Project – Decision Memo. GMNF, Rochester and Middlebury Ranger Districts, Towns of Rochester, Chittenden and Goshen, Addison, Rutland, and Windsor Counties, VT.

Lucas, J. (1979). Perceptions of non-motorized recreational impacts: A review of research findings. Recreational Impacts on Wildlands, 24-31. WA: USDA Forest Service and USDI National Park Service.

Malo, J.E., P. Acebes, and J. Traba. (2011). Measuring ungulate tolerance to human with flight distance: a reliable visitor management tool? Biodiversity Conservation. 20:3477-3488. doi: 10.1007/s10531-011-0136-7

Marvier, M., P. Kareiva, and R. Laslasz. (2012). Conservation in the Anthropocene. Breakthrough Journal.

McArthur, K.L. (1983). Habituation of Grizzly Bears to People: A Hypothesis. International Conference on Bear Research and Management. 5:322-327. doi:

McCutchen, H.E. (1989). Cryptic behavior of black bears in Rocky Mountain National Park. International Conference on Bear Research and Management. 8:65-72.

Miller, S.G., R.L. Knight, and C.K. Miller. (2001). Wildlife responses to pedestrians and dogs. Wildlife Society Bulletin. 29:124-132.

Neumann, W., Ericsson, G., and H. Dettki. (2010). Does off-trail backcountry skiing disturb moose? European Journal of Wildlife Research.
56: 513-516. DOI 10.1007/s10344-009-0340-x

Ostrom, E. (2009). Governing the Commons: The Evolution of Institutions for Collective Action. NY: Cambridge University Press.

Papouchis, C.M., F.J. Singer, and W.B. Sloan. (2001). Responses of Desert Bighorn Sheep to Increase Human Recreation. The Journal of Wildlife Management. 65(3):573-582.

Ruxton, G.D. (1997). Predator-induced breeding suppression and its consequences for predator-prey population dynamics. Proc. Biological Science. 264:402-412.

Schmitz, O.J. et al (1997). Behaviorally mediated trophic cascades: effects of predation risk on food web interactions. Ecology. 78:1388-1399.

SE Group. (2018). Catamount Trail Annual Trail Counting and Economic Impact Report.

Sorenson E. and R. Zaino. (2018). Vermont Conservation Design: Summary Report for Landscapes, Natural Communities, Habitats, and Species. Vermont Fish and Wildlife Department.

Splitboard. (2020). *https://en.wikipedia.org/wiki/Splitboard*

Stankowich, T. (2008). Ungulate flight responses to human disturbance: A review and meta-analysis.
Biological Conservation.
141: 2159-2173. doi:10.1016/j.biocon.2008.06.026

Sutherland, W.J., A.S. Pullin, P.M. Dolman, and T.M. Knight. (2004). The need for evidence-based conservation. TRENDS in Ecology and Evolution.
19(6):305-308. doi: 10.1016/j.tree.2004.03.018

Taylor, A.R., and R.L. Knight. (2003). Wildlife Responses to Recreation and Associated Visitor Perceptions. Ecological Applications. 13(4)951-963.

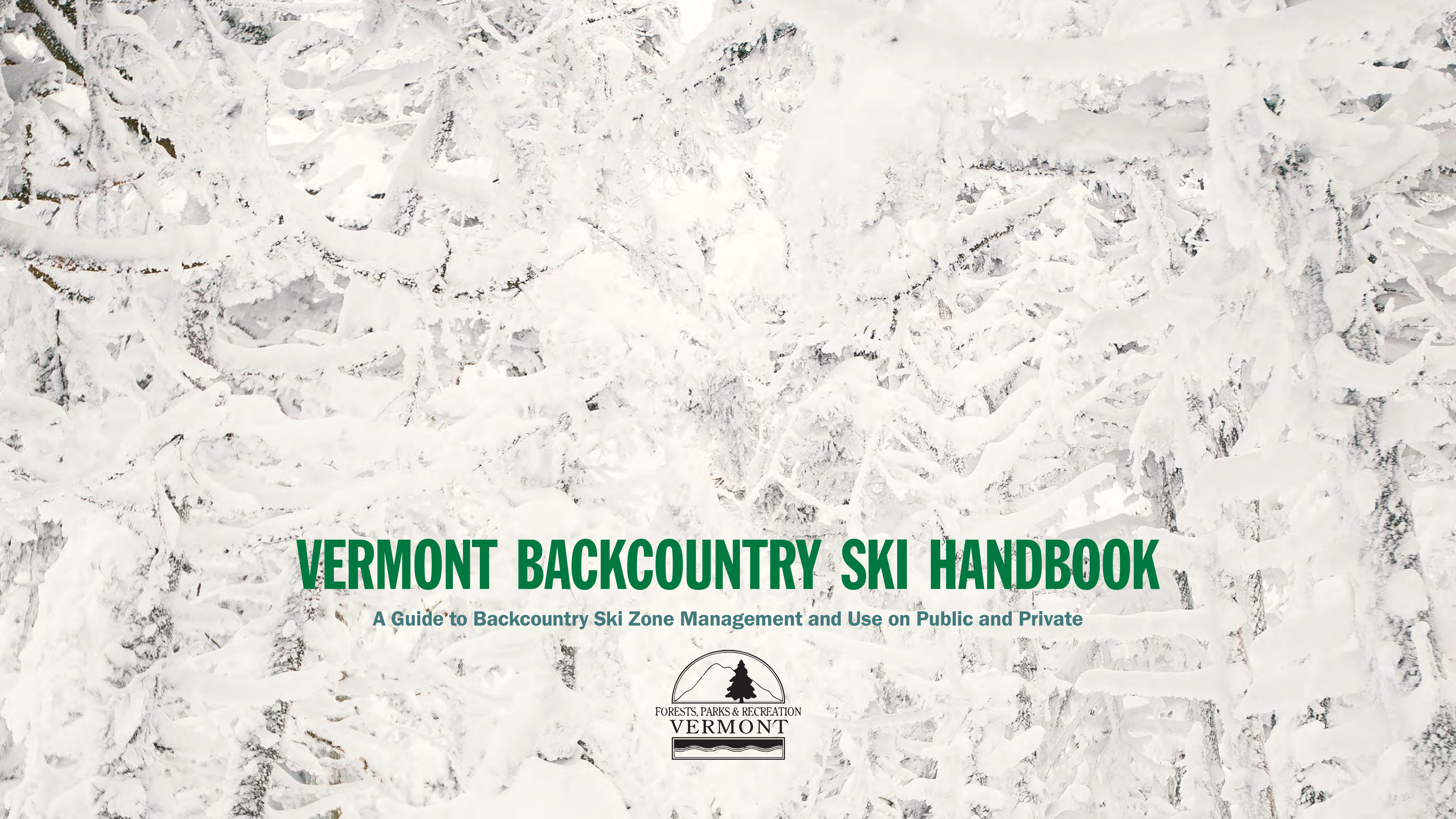
Thiel, D., Jenni-Eiermann, S., Braunisch, V., Palme, R., and J. Lukas. (2008). Ski tourism affects habitat use and evokes a physiological stress response in capercaillie Tetrao urogallus: a new methodological approach. Journal of Applied Ecology. 45:845-853.
doi: 10.1111/j.1365-2664.2008.014655.x

Thompson, E.H., E.R. Sorenson, and R.J. Zaino. (2019). Wetland, Wildland, Woolland. VT: Chelsea Green Publishing.

Unauthorized Trails. International Mountain Biking Association. (2020). *https://www.imba.com/resources/land-protection/unauthorized-trails*

Whittaker, D., and R.L. Knight. (1998). Understanding wildlife responses to humans. Wildlife Society Bulletin. 26(2):312-317.

Wrigley, K. (2015). “Master’s Project: An Ecological Assessment of Backcountry Ski Trails at Bolton Backcountry in Bolton, VT. “ Rubenstein School Masters Project Publications
https://scholarworks.uvm.edu/rsmpp/8Wrigley



VERMONT BACKCOUNTRY SKI HANDBOOK

A Guide to Backcountry Ski Zone Management and Use on Public and Private

FORESTS, PARKS & RECREATION
VERMONT