Northfield Mountain Pumped Storage Project No. 2485-063

Study Plan Request

FirstLight Hydro Generating Company Relicensing Application

1. Describe the goals and objectives of each study proposal and the information to be obtained.

The goals for this study are to assess the need for and interest in mountain bike friendly shared-use trails for riders of all ability levels at Northfield Mountain, to determine whether the current trail system is suitable and adequate for mountain biking as defined by current standards of mountain bike trail design[1,2,3] or if new trails will have to be built in order to fill that need.

The objectives for this study are:

1. Survey user groups (i.e., NEMBA, Pioneer Valley Ladies MTB Group, mountain bike forums, bicycle shops) to assess interest in mountain biking opportunities at Northfield Mountain and to determine what type of trails would best complement existing area trail systems.
2. Evaluate trail networks in Franklin County for mountain bike access, degree of difficulty, available facilities and accessibility to determine if there is a need for additional mountain bike trails, in particular ones geared towards beginner, intermediate and family mountain bikers. Franklin County trail systems include Ashfield Trails, Charlemont Trails System, Erving State Forest, Greenfield Trails System, Kenneth Dubuque State Forest, Mt. Toby State Reservation and Wendell State Forest.
3. Determine if the 26 miles of trails currently available for recreation a Northfield Mountain are suitable and adequate for sustainable mountain bike use and if they follow best management practices as set forth by the International Mountain Bicycling Association, the USFS Trail Classifications and the MA Department of Conservation & Recreation's Trail Guidelines and Best Practices standards[1,2,3]. Evaluate existing trails for erosion, drainage, sustainability, width, flow, degree of difficulty, diversity, appeal and consistency of level of difficulty. If trails do not meet current standards, determine if maintenance and rerouting of existing trails alone will satisfy criteria for sustainable trails suitable for mountain biking or if additional trails will have to be built.

2. If applicable, explain the relevant resource management goals of the agencies or Indian tribes with jurisdiction over the resource to be studied.

Not applicable.

3. If the requester is not a resource agency, explain any relevant public interest considerations in regard to the proposed study.

Sections 4(e) and 10(a) of the Federal Power Act require the Commission to give equal consideration to all uses of the waterway on which a project is located.When reviewing a proposed action, the Commission must consider the environmental, recreational, fish and wildlife, and other non-developmental values of the project, as well as power and developmental values.

Current license requirements for FirstLight Hydro Generating Company include the operation and maintenance of the parks, facilities and trails on the Northfield Pumped-Storage Hydro Plant property. As part of the pre-application process for the new license, a study should be conducted to determine if the current trail network meets today's standard for shared-use trails and is sufficient to fill the need of the community as a recreational resource.

The Massachusetts Outdoors Statewide Comprehensive Outdoor Recreation Plan (SCORP, 2006-2011) stated that the greatest need for outdoor recreation in Massachusetts is for trail-based activities, with walking and biking being in highest demand[4]. While there are a number of mountain biking opportunities in the Pioneer Valley, most of them are geared primarily toward advanced intermediate and expert riders. There is strong interest in the community to make mountain biking available and enjoyable to a larger demographic. The existing trail network at Northfield Mountain provides a base that could easily incorporate additional trails to appeal to mountain bikers of all ability levels.

A 2009 FERC survey indicated that at Northfield, parks, trails and picnic areas were used only at 24-28% capacity and the Tour and Trail Center at 50% capacity[5]. This not only indicates that Northfield has the capacity to easily accommodate a substantial increase in visitors, but also that the current trail network is not meeting its potential. Biking makes up nearly 20% of all outdoor recreation[5], and a study evaluating the Northfield Mountain trail network's adequacy is highly relevant to the Commission's public interest determination.

The US Department of Agriculture Economic Research Report (2005) found that recreation and tourism development contributes to rural well-being, increasing local employment, wage levels, and income, reducing poverty, and improving education and health[6]. Franklin County has been branded the Outdoor Adventure Capital of New England: breath-taking scenery, an array of outdoor activities paired with a quaint New England charm could make this region a destination for many. However, there is a lack of shared-use trails appealing to recreationists of all abilities and suitable for introducing novice riders to mountain biking. Northfield Mountain is conveniently located on Route 63 near major highways, making it easily accessible from both Boston and New York, and already has facilities in place that can support a large number of visitors. A study evaluating if Northfield Mountain could become an outdoor recreation destination by updating and expanding the trail network is therefore relevant to the Commission's public interest determination.

4. Describe existing information concerning the subject of the study proposal, and the need for additional information.

At the time the trail system at Northfield Mountain was built, no consideration was given to mountain biking and sustainable trail design. While mountain bikers are allowed to use the trails at Northfield, many of the trails are inadequate and do not meet the current standard for safe, sustainable and enjoyable shared-use trails. So far, no study has been done to evaluate the existing trail network. Trail assessment and trail suitability analysis should be done using current techniques and standards offered by the International Mountain Bicycling Association, the USFS Trail Classifications and the MA Department of Conservation & Recreation's Trail Guidelines and Best Practices standards[1,2,3].

5. Explain any nexus between project operations and effects (direct, indirect, and/or cumulative) on the resource to be studied, and how the study results would inform the development of license requirement.

Federal Power Act and Amendments require that FirstLight offers recreational opportunities available to the public in the new license. Existing recreational opportunities under the current license are inadequate in that they don't include shared-use trails suitable for mountain biking, a sport that has gained a lot of popularity since the original license issue. We need the current study to evaluate if there is a public interest in having mountain bike trails at Northfield Mountain, whether the existing trails can be updated to meet the current standard in trail design, and whether additional trails will have to be built in order to meet the community's need for mountain bike trails for all ability levels.

6. Explain how any proposed study methodology (including any preferred data collection and analysis techniques, or objectively quantified information, and a schedule including appropriate filed season(s) and the duration) is consistent with generally accepted practice in the scientific community or, as appropriate, considers relevant values and knowledge.

Our study methodology will include online quantitative and qualitative user surveys to better understand the recreational needs of mountain bicyclist and others. Trail assessment and trail suitability analysis will be done using current techniques and standards offered by the International Mountain Bicycling Association, the USFS Trail Classifications and the MA Department of Conservation & Recreation's Trail Guidelines and Best Practices Standards [1,2,3]. The NY State Office of Parks Trail Conditions Assessments – Analysis and Maintenance Guidelines provides another example for trail assessment[7].

An online survey of user groups (i.e., Pioneer Valley NEMBA, Pioneer Valley Ladies MTB Group, MTBR Forum, NEMBA forum, bicycle shop Facebook groups) should be performed to assess interest in mountain biking opportunities at Northfield Mountain, to determine what type of trails exist in Franklin County, and what type of trails are sought after by the community. Groups and individuals familiar with local trail networks (i.e., area bicycle

shops, NEMBA, DCR) should be contacted to obtain additional information. Field-based studies may be warranted to assess levels of difficulty of area trail networks. Franklin County trail systems include Ashfield Trails, Charlemont Trails System, Erving State Forest, Greenfield Trails System, Kenneth Dubuque State Forest, Mt. Toby State Reservation and Wendell State Forest. Criteria of the evaluation should include mountain bike access, degree of difficulty of trails, available facilities and accessibility to determine if there is a need for additional mountain bike trails, in particular ones geared towards beginner, intermediate and family mountain bikers.

Field-based studies should be performed to determine if the trails currently available for recreation a Northfield Mountain are suitable and adequate for sustainable mountain bike use and follow best management practices as set forth by the International Mountain Bicycling Association, the USFS Trail Classifications and the MA Department of Conservation & Recreation's Trail Guidelines and Best Practices standards [1,2,3]. Existing trails should be evaluated for erosion, drainage, sustainability, width, flow, degree of difficulty, diversity, appeal and consistency of level of difficulty (i.e., does each trail have the same level of difficulty for its entirety, or is there great variability of difficulty between sections of the same trail?). If trails do not meet current standards, field-based or off-site studies should be performed to determine if maintenance and rerouting of existing trails alone will satisfy criteria for sustainable trails suitable for mountain biking, or if additional trails will have to be built.

7. Describe considerations of level of effort and cost, as applicable, and why proposed alternative studies would not be sufficient to meet the stated information needs.

The cost for preparing the study plan, conducting the study, and preparing the report is estimated to be between $10,000 and $50,000. One to two people would be expected to spend one to two days to prepare the study plan, three to four days of field work (evaluating 26 miles of existing trails at Northfield), an additional two to three days to survey area trail networks (if necessary), and three to four days to prepare and finalize reports. A desktop analysis should be conducted to assess the need for mountain bike trails and the levels of difficulty of these trails (assess surrounding trail networks, survey user groups).

Resources:

1. International Mountain Bicycling Association. 2004. *Trail Solutions: IMBA's Guide to Building Sweet Singletrack*. Boulder, CO.
2. US Department of Agriculture. Forest Service. *Trail Fundamentals and Trail Management Objectives.* US Forest Service excerpt 37-52, Trail Classification.
3. DCR's Trail Guidelines and Best Practices: http://www.mass.gov/dcr/stewardship/greenway/docs/DCR_guidelines.pdf
4. Massachusetts Executive Office of Energy and Environmental Affairs. Statewide Comprehensive Outdoor Recreation Plan (SCORP): Massachusetts Outdoor 2006. Boston, Massachusetts.
5. Outdoor Industry Foundation. 2004. *The Active Outdoor Recreation Economy.* Boulder, CO.
6. US Department of Agriculture. 2005. *Economic Research Report* ERR-7
7. NY State Office of Parks. April 2010. *Trails Technical Document 6 - Trail Conditions Assessments – Analysis and Maintenance Guidelines.* Albany, NY.
8. US Department of Agriculture. Forest Service. 2007. *Equestrian Design Guidebook for Trails, Trailheads and Campgrounds*. Missoula Technology and Development Center. Missoula, MT.

Mountain Biking is Popular!

- *Nationally*
  - Bicycling is **ranked #2** on list of most popular of all outdoor activities in terms of frequency of participation. [1]
  - Mountain biking had **50 million participants** in 2005, with 39 million riding on singletrack trails (507 million "outings"). [2]
  - Mountain biking has more participants and enthusiasts than kayaking, backpacking, rock climbing, bird watching, fly fishing, trail running, canoeing, and rafting . [1]
- *Regionally* [3]
  - In NH over 178,000 residents – **18.6% of the population** – rode on singletrack trails.
  - In MA, there are **over 1,000,000 riders**.

New Hampshire	178,670	18.6%
Mass.	1,021,633	20.9%
Vermont	95,853	20.0%
Rhode Island	158,875	19.2%
Maine	179,829	17.8%
Connecticut	349,997	13.2%

[1] The Outdoor Foundation Outdoor Recreation Participation Topline Report (2012). http://www.outdoorfoundation.org/
[2] The Outdoor Foundation Outdoor Recreation Participation Study, Trend Analysis for the United States. (2005) http://www.outdoorfoundation.org/pdf/ParticipationStudy2005.pdf
[3] Outdoor Recreation Participation & Spending Survey. A State-by-State Perspective. Outdoor Industry Foundation. (2006)

Economic Impact of Mountain Biking

- Moab, Utah: Bike trails produce a consumer surplus of about $205 per trail, $8.7 million dollars annually. Visits to National Forest Service lands generated $305 million in 2005.[1]
- Raystown Lake, PA: Mountain bike trails attract more than 25,000 visitors, 2.5 times more than predicted. Mountain bikers brought $1.2 million in spending to the region.[2]
- Fruita, Colorado: Mountain biking brings in $25 million to the local economy; that's 15% of the revenue for the entire county of Mesa.
- Carrabasset Valley, ME: The Town of Carrabassett Valley in partnering with Carrabassett Region NEMBA to promote summer visitation through mountain biking. We just received a $5,000 grant from Bikes Belong to develop trails.
- East Burke, VT: The Kingdom Trails' 49,000 riders pumped $5 million into the local economy in 2011, with the average visitor spending about $100 per day.[3] KT's boasts 110 miles of trails over a 10 sq mi area and has been open since 1994. Mountain biking has created a sustainable summer economy for local B&Bs, restaurants, pubs, campgrounds, grocery stores and retail outlets.
- Allenstown, NH: The *NEMBAFEST* event held at Bear Brook State Park (BBSP) in 2009, 2010 and 2011 generated in excess of $6,000 in direct revenue to the State with the balance of the proceeds used by NEMBA to fund materials for BBSP trail projects.

[1] Outdoor Freedom, The Economics & Benefits of Mountain Biking (2009).
[2] Bikes Belong Coalition.
[3] boston.com: http://www.boston.com/news/local/vermont/articles/2012/06/10/mountain_bikers_flock_to_northeast_vermont/

Destination Riding Location Characteristics

- 40+ miles of quality singletrack trails of varying level and ability with scenic vistas and a natural, backcountry feel
- Close proximity to population centers
- Stacked looped trail system with natural, enhanced and constructed technical features
- Effective Signage - trail maps, marked loops, signed intersections for ease of way-finding
- Supporting facilities – clean bathrooms, changing area, clean water, picnic areas, map boxes
- Accessible camping and lodging – mountain bikers love to camp!

Trails Technical Document #6

Trail Conditions Assessments – Analysis and Maintenance Guidelines

Prepared by
NYS Office of Parks, Recreation and
Historic Preservation
Planning Bureau
Agency Building 1
Empire State Plaza
Albany, NY 12238

April 29, 2010

Trail Conditions Assessments – Analysis and Maintenance Guidelines

A primary goal for all New York State Parks Trail Systems is to develop sustainable trails that have minimal impacts on the environment, require little maintenance, and meet the needs of the users. This document is one of a series of technical documents developed by State Parks to provide standards and guidelines for trail design and development, accessibility, and trail assessment and maintenance techniques that help ensure a sustainable trail system. Additional topics include guidelines for trail signage, trail monitoring, and trail closure and restoration. The complete list of technical documents is provided on the web at: http://www.nysparks.state.ny.us/recreation/trails/technical-assistance.aspx.

These documents were designed for use within New York State Parks but can be used as resources for trail projects outside of the Parks. Within State Parks, use of these documents for implementation of trail projects will be done in conjunction with a review and approval process as laid out in *Technical Document 7 - Trail Project Approval Process for NYS Parks.* These documents may be updated periodically. Additional documents will be developed in the future as part of this series.

This document presents general analysis and maintenance guidelines as a follow up to the trail assessment process (see *Technical Document 4 – State Parks Trail Assessment Process and Forms*). These are provided as very general guidelines to analyzing trail conditions assessments on natural surface trails and determining maintenance options to address specific situations. Final analysis and implementation steps should also consider the trail system as a whole, the natural resources of the park (including rare and endangered species and sensitive ecological communities, soil types), historic and cultural resources of the park, designated uses for the trail, and expected levels of use.

A trail maintenance plan is recommended to prioritize upgrades to the trail system. The following recommendations are specific to issues related to the trail tread. The *options* are not listed in any particular order. Different (or multiple) mitigation methods may be appropriate in different locations for the same type of issue. Additional information is generally collected during the assessment process. These are listed at the end of the document.

Water Assessment

A. Muddy Trail/Standing Water: muddy/wet area is isolated on the treadway. This is generally due to poor layout/design/location, poor construction, normal tread wear (compaction) and/or lack of trail maintenance. Water is trapped on the trail tread and does not flow off naturally.

1. Trail is located on a side slope

    Options:

    - Deberm (remove the built up soil along the trail edge next to the muddy/wet sections) on the down slope and reestablish an appropriate outslope
    - Construct knicks, rolling grade dips or water bars along section of muddy/wet trail

2. Trail is located in a flat area

Options:

- Reroute trail to a nearby side slope using sustainable grades and techniques
- Armor trail tread with placed large rocks
- Raise the trail tread by constructing a bridge (including bog bridges), boardwalk or turnpike or by use of geogrids/geocells

3. Trail is located along the fall line (going straight down a hill regardless of grade) or the trail tread grade is more than half the side slope grade. Note: A sustainable grade is generally considered to be less than half of the side slope grade with a maximum grade of 15%.

Options:

- Construct knicks, rolling grade dips or water bars
- Reroute trail to follow contours; close fall line trail (see Document 3 – OPRHP Guidelines for Closing Trails)

B. Soggy Area: the trail and surrounding area is wet and muddy (not isolated on the trail tread). This is generally due to poor layout/design/location, poor construction, and/or changing climate/hydrologic patterns.

1. Trail is located through a classified wetland
   - seek Natural Resource Staff advice

Options:

- Reroute the trail (generally a 100 foot buffer or more is considered appropriate for wetlands)
- Close the trail (see Document 3 – OPRHP Guidelines for Closing Trails)
- Raise the trail tread by installing turnpikes with culverts, boardwalks or bog bridges

2. Trail is located in general boggy area

Options:

- Reroute trail section to nearby side slope
- Armor the trail tread with placed rocks
- Raise the trail tread by installing turnpikes with culverts, boardwalks or bog bridges or by use of geogrids/geocells

Erosion Assessment

Erosion can be caused by a combination of trail use, gravity and water. It occurs most often and to a higher degree on trails with generally poor layout/design, poor construction, and/or lack of maintenance.

Determine the source of water. Usually, the source will be the watershed above the trail. In some cases it may be a storm water management issue if the trail is located near impervious surfaces/developed areas. Consider options to direct water away from the trail tread if applicable.

A. Erosion on/along the trail tread – water is trapped on the trail and has no way of flowing off of the trail tread.

1. Trail is located on a side slope and trail grade is less than half the grade of the side slope

Options:

- Deberm on the down slope and reestablish an appropriate outslope
- Construct knicks, rolling grade dips or water bars

2. Trail is located on a side slope and the trail grade is more than half the grade of the side slope

Options:

- Consider rerouting trail with sustainable grades (less than half the grade of the side slope but no more than 15%)
- Deberm on the down slope and reestablish an appropriate outslope AND construct knicks, rolling grade dips or water bars
- If trail is steep and cannot reroute, consider armoring trail tread

3. Trail is located along the fall line

Options:

- Consider rerouting trail along contours with sustainable grades
- If constraints exist, construct knicks, rolling grade dips or water bars
- If trail is steep and cannot reroute, consider armoring trail tread; may include constructing steps

4. Major erosion consisting of deep gullies in the trail tread (wash out of trail tread)

Determine the source of water and alignment of the trail section. If water is funneling down the trail and causing deep gullies, chances are the alignment is at an unsustainable grade and/or located along the fall line. In each case, refer to Erosion Assessment above.

Consult with Landscape Architect and/or Park Engineer.

- If the trail is located near impervious surfaces/developed areas, it may be a storm water management issue. If so, mitigate the water source if possible and repair the tread. If the damage is extensive you may consider rerouting, closing and revegetating the trail per trail closing standards. See Erosion Assessment above.
- If the erosion was caused by an unusually heavy storm event, repair damage but also consider exploring ways of diverting water runoff in case of future events. See Erosion Assessment above.
- If caused by gradual erosive process and lack of maintenance over long period of time, see Erosion Assessment above.

B. Erosion across (perpendicular to) the trail tread – could be caused by a seep, funneled runoff from the adjacent hillside, seasonal stream crossing, for example.

Options:

- Armor trail tread
- Install an open or closed culvert
- Raise the trail tread by installing a turnpike with a culvert or a bog bridge

Other Assessment Information:

Blazing:

A. Blazing is insufficient – it is hard to tell the alignment of the trail at a particular point.

- Mark trails such that the next waymark is clearly visible from the previous one. However, avoid placing waymarks so that more than one is readily obvious from the previous. One well-placed blaze or marker is better than several poorly placed blazes or markers.
- Be sure to check trail markers in both directions, first from one direction and then from the opposite direction, in order to gain each perspective. It may not be appropriate to simply put markers on opposite sides of the same tree.
- If cairns are used, they need to be constructed at similar intervals.

B. Blazing is missing – markers may have fallen off or been stolen (nails or posts may still be visible); tree with painted blaze or marker may have fallen.

- Replace marker or blazes as appropriate whereas the next waymark is clearly visible from the previous one.

C. Blazing is worn – Blaze or marker has faded enough that color and/or text is not distinguishable

- Refresh blazing or replace markers as necessary.

For additional information on **Signage**, see Document 2 - Trail Signage Guidelines for the NY State Park System.

Obstacles:

Downed trees and branches across the trail tread, `widow makers' (trees leaning above/across the trail) and any other obstacle that is blocking the treadway are noted in the assessment process. This information is critical for park staff and maintenance volunteers to know locations and diameters of tree trunks to plan for appropriate maintenance equipment.

Structures:

An inventory of all bridges, culverts and erosion control devices is captured during the assessment process. The size and condition of each structure is recorded and can be used by staff/volunteers to assess effectiveness of structures and on-going maintenance needs.

Unimproved Stream Crossings:

The locations of unimproved stream crossings are recorded during the assessment process. These areas will need to be analyzed on a case by case basis whether wading, armoring or structures are needed to accommodate the designated uses allowed on the trail and the seasonal water flow.

Additional Comments:

This category can contain a variety of items, structures, or highlighted resources. Cave openings, scenic vista points, historic structures, unique rock formations and locations of invasive species are examples of what might be incorporated under additional comments. Depending on what is noted along the trail, different options are available for follow up. These items may be addressed through master planning or trails planning and/or through specific staff consultation (e.g. park manager and regional biologist regarding cave opening considerations, regional biologist regarding invasive species).

Resources

International Mountain Bicycling Association. 2004. *Trail Solutions: IMBA's Guide to Building Sweet Singletrack*. Boulder, CO.

New York-New Jersey Trail Conference, Inc. 2007. *Trail Maintenance Manual, 7th Edition, Revised*. Mahwah, NJ.

Proudman, R.D. and R. Rajala. 1981. *AMC Field Guide to Trail Building and Maintenance, 2nd Edition*. Appalachian Mountain Club in association with the National Park Service, National Trails Program. Boston, MA.

State of Minnesota, Department of Natural Resources. 2007. *Trail Planning, Design, and Development Guidelines*. Trails & Waterways Division, St. Paul, MN.

US Department of Agriculture. Forest Service. 2007. *Equestrian Design Guidebook for Trails, Trailheads and Campgrounds*. Missoula Technology and Development Center. Missoula, MT.

US Department of Agriculture. Forest Service. 2007. *Trail Construction and Maintenance Notebook*. http://www.fhwa.dot.gov/environment/fspubs/07232806/index.htm.

Williams, Peter B. 1998. "A Manual for the Assessment of Backcountry Trails." Institute of Outdoor Recreation and Tourism. Utah State University. Logan, UT. July 1998.

The Active Outdoor Recreation Economy

A $730 BILLION ANNUAL CONTRIBUTION TO THE U.S. ECONOMY

OUTDOOR INDUSTRY FOUNDATION

Acknowledgments

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Sporting Goods Manufacturers Association (SGMA)
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Recreational Equipment, Inc. (REI)
Timberland

Portions of the study are based on the following published reports:

American Sportfishing Association – "Sportfishing in America: Values of Our Traditional Pastime," 2002
International Association of Fish and Wildlife Agencies – "The Economic Importance of Hunting in America," 2002
U.S. Fish and Wildlife Service – "2001 National and State Economic Impacts of Wildlife Viewing," Published 2003

This report was made possible through the financial support of REI, OIA, and Outdoor Retailer.

OUTDOOR INDUSTRY FOUNDATION

OUTDOOR INDUSTRY FOUNDATION® IS A 501(c)3 NON-PROFIT DEDICATED TO ENCOURAGING PARTICIPATION IN ACTIVE OUTDOOR RECREATION AND HEALTHIER LIFESTYLES.

What Is the Active Outdoor Recreation Economy?

IT'S A $730 BILLION ANNUAL CONTRIBUTION TO THE U.S. ECONOMY

More than three out of every four Americans participate in active outdoor recreation each year. Americans spend money, create jobs, and support local communities when they get outdoors. Simple, healthy outdoor activities such as hiking, biking, camping, or wildlife viewing generate enormous economic power and fuel a far-reaching ripple effect that touches many of the nation's major economic sectors.

THE RECREATION ECONOMY:

- **Contributes $730 billion annually to the U.S. economy**
- **Supports nearly 6.5 million jobs across the U.S.**
- **Generates $88 billion in annual state and national tax revenue**
- **Provides sustainable growth in rural communities**
- **Generates $289 billion annually in retail sales and services across the U.S.**
- **Touches over 8 percent of America's personal consumption expenditures—more than 1 in every 12 dollars circulating in the economy**

Many people don't realize that having fun and staying healthy in the outdoors is essential to the continued growth of our economy. In order to thrive, however, this burgeoning, often overlooked industry needs to be recognized, stimulated, and supported. In this report, we explain how we determined the impact of the Active Outdoor Recreation Economy, how it interacts with the national economy, and how it affects all Americans. A technical report, published online at **www.outdoorindustryfoundation.org**, provides more detailed numbers and information on our methodology and findings.

WHAT DOES ACTIVE OUTDOOR RECREATION INCLUDE?

BICYCLING
- Paved-road bicycling
- Off-road bicycling

CAMPING
- RV camping at a campsite
- Tent camping at a campsite
- Rustic lodging

FISHING
- Recreational fly
- Recreational non-fly

HUNTING
- Shotgun
- Rifle
- Bow

PADDLING
- Kayaking (recreational, sea, whitewater)
- Rafting
- Canoeing

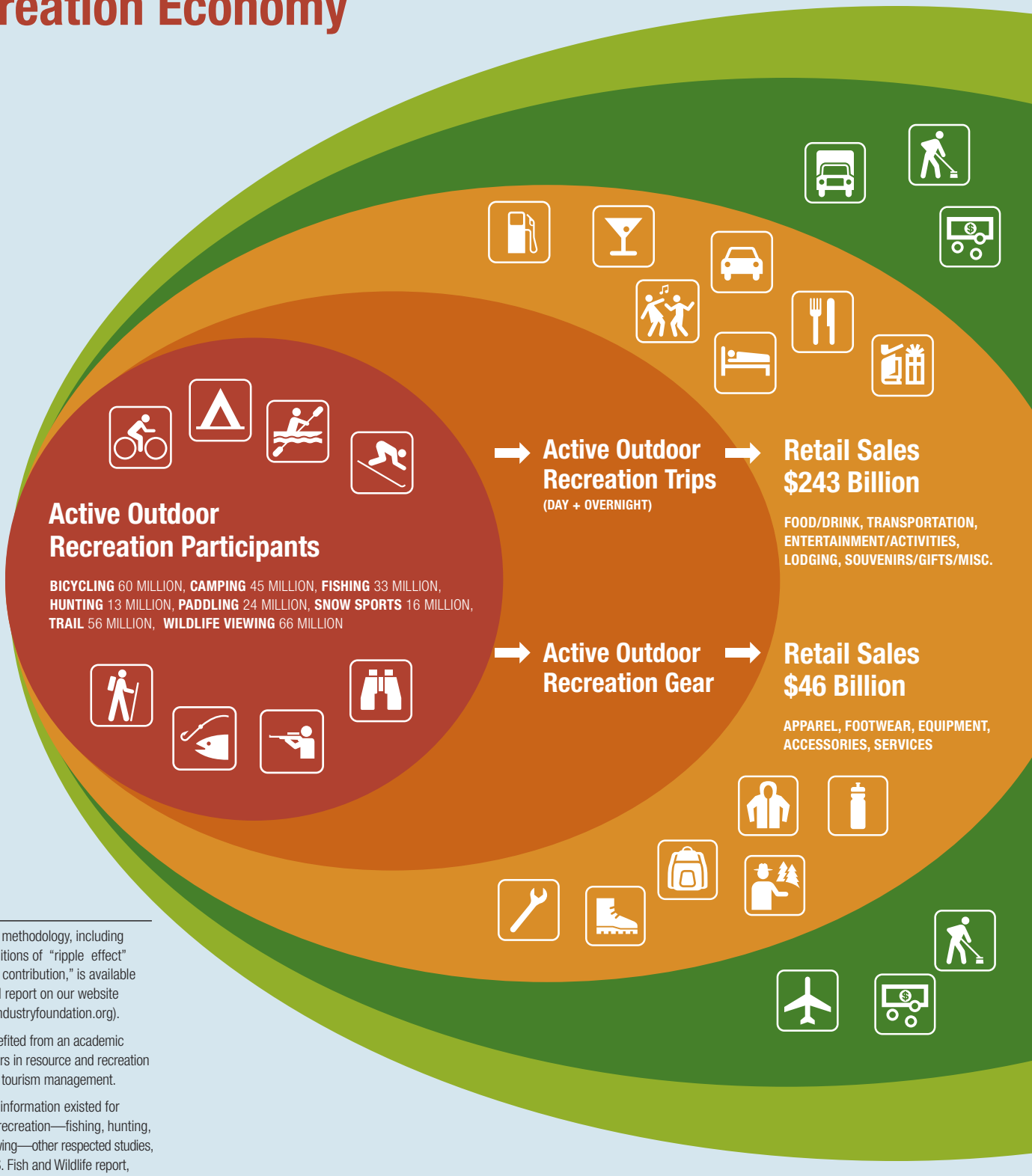
SNOW SPORTS
- Downhill skiing, including telemark
- Snowboarding
- Cross-country or Nordic skiing
- Snowshoeing

TRAIL
- Trail running on an unpaved trail
- Day hiking on an unpaved trail
- Backpacking
- Rock climbing (natural rock or ice)

WILDLIFE VIEWING
- Bird watching
- Other wildlife watching

Note: The Active Outdoor Recreation Economy Report does not take into account non-market benefits, the increased value of land associated with recreation opportunities or economic benefits from environmental consequences of reserving land for recreation opportunities.

Meet the $730 Billion Active Outdoor Recreation Economy



Note: Detailed methodology, including additional definitions of "ripple effect" and "economic contribution," is available in the technical report on our website (www.outdoorindustryfoundation.org).

This report benefited from an academic review by leaders in resource and recreation economics and tourism management.

Because great information existed for wildlife-based recreation—fishing, hunting, and wildlife viewing—other respected studies, such as the U.S. Fish and Wildlife report, were used to gauge these contributions.

Ripple Effect $379 Billion

SUPPLIERS, INTERMEDIARIES, AND EMPLOYEES CIRCULATE MONEY THROUGH THE ECONOMY, MULTIPLYING THE INITIAL EXPENDITURE IN OUTDOOR RECREATION TRIPS.

Total Economic Contribution $622 Billion

Ripple Effect $62 Billion

SUPPLIERS, INTERMEDIARIES, AND EMPLOYEES CIRCULATE MONEY THROUGH THE ECONOMY, MULTIPLYING THE INITIAL EXPENDITURE IN GOODS AND SERVICES.

Total Economic Contribution $108 Billion

Total National Economic Contribution $730 Billion

Note: This report used multipliers ("ripple effect") from the Minnesota IMPLAN Group, Inc. (MIG) database. MIG maintains over 1,500 active users, including federal government (Forest Service, Bureau of Economic Analysis, etc.), state government, numerous academics and private clients.

The "ripple effect" is a common economic tool that considers the economic process of bringing final product to market to determine total economic contribution. The components of the ripple effect are:

- *Direct effect:* the initial purchase made by the consumer
- *Indirect effect:* sales in one industry affect the various other industries that provide supplies and support
- *Induced effect:* wages and salaries paid by the directly and indirectly impacted industries circulate through the economy
- *Leakages:* occur at each component of the ripple effect when a business or individual spends money outside of the study region for products or services that are either imported into the study region or consumed outside of the region.

Economic Contribution of Active Outdoor Recreation by Census Division

NATIONAL TOTALS

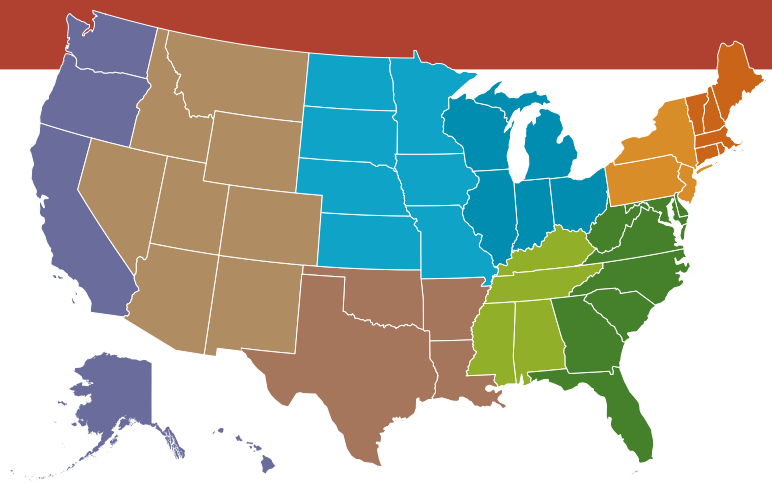
Total Contribution: $730,979 million

Jobs Generated: 6,435,270

Gear Retail Sales: $46,185 million

Trip-related Sales: $243,244 million

Taxes (federal, state): $87,867 million



DIVISION 1: NEW ENGLAND TOTALS

CT, ME, MA, NH, RI, VT

Total Contribution: $22,941 million

Jobs Generated: 271,196

Gear Retail Sales: $2,211 million

Trip-related Sales: $17,696 million

Taxes (federal, state): $3,369 million

DIVISION 2: MIDDLE ATLANTIC TOTALS

NY, NJ, PA

Total Contribution: $38,300 million

Jobs Generated: 357,258

Gear Retail Sales: $5,198 million

Trip-related Sales: $22,951 million

Taxes (federal, state): $4,499 million

DIVISION 3: EAST NORTH CENTRAL TOTALS

IN, IL, MI, OH, WI

Total Contribution: $61,953 million

Jobs Generated: 691,507

Gear Retail Sales: $7,007 million

Trip-related Sales: $34,665 million

Taxes (federal, state): $7,151 million

DIVISION 4: WEST NORTH CENTRAL TOTALS

IA, KS, MN, MO, NE, ND, SD

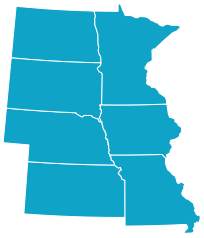
Total Contribution: $23,836 million

Jobs Generated: 272,654

Gear Retail Sales: $3,405 million

Trip-related Sales: $12,771 million

Taxes (federal, state): $2,609 million



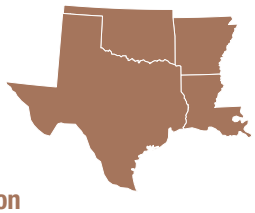
DIVISION 5: SOUTH ATLANTIC TOTALS
DE, DC, FL, GA, MD, NC, SC, VA, WV

Total Contribution: $67,595 million
Jobs Generated: 794,841
Gear Retail Sales: $8,243 million
Trip-related Sales: $43,143 million
Taxes (federal, state): $8,294 million

DIVISION 6: EAST SOUTH CENTRAL TOTALS
AL, KY, MS, TN

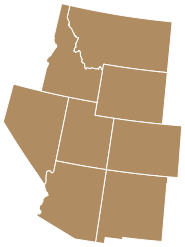
Total Contribution: $18,790 million
Jobs Generated: 215,126
Gear Retail Sales: $2,636 million
Trip-related Sales: $10,875 million
Taxes (federal, state): $2,545 million

DIVISION 7: WEST SOUTH CENTRAL TOTALS
AR, LA, OK, TX



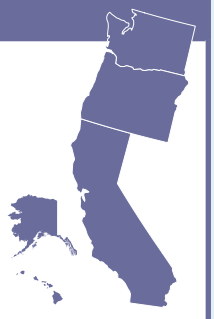
Total Contribution: $38,465 million
Jobs Generated: 379,933
Gear Retail Sales: $4,787 million
Trip-related Sales: $19,077 million
Taxes (federal, state): $3,782 million

DIVISION 8: MOUNTAIN TOTALS
AZ, CO, ID, NM, MT, UT, NV, WY



Total Contribution: $61,496 million
Jobs Generated: 617,186
Gear Retail Sales: $4,790 million
Trip-related Sales: $34,940 million
Taxes (federal, state): $8,906 million

DIVISION 9: PACIFIC TOTALS
AK, CA, HI, OR, WA



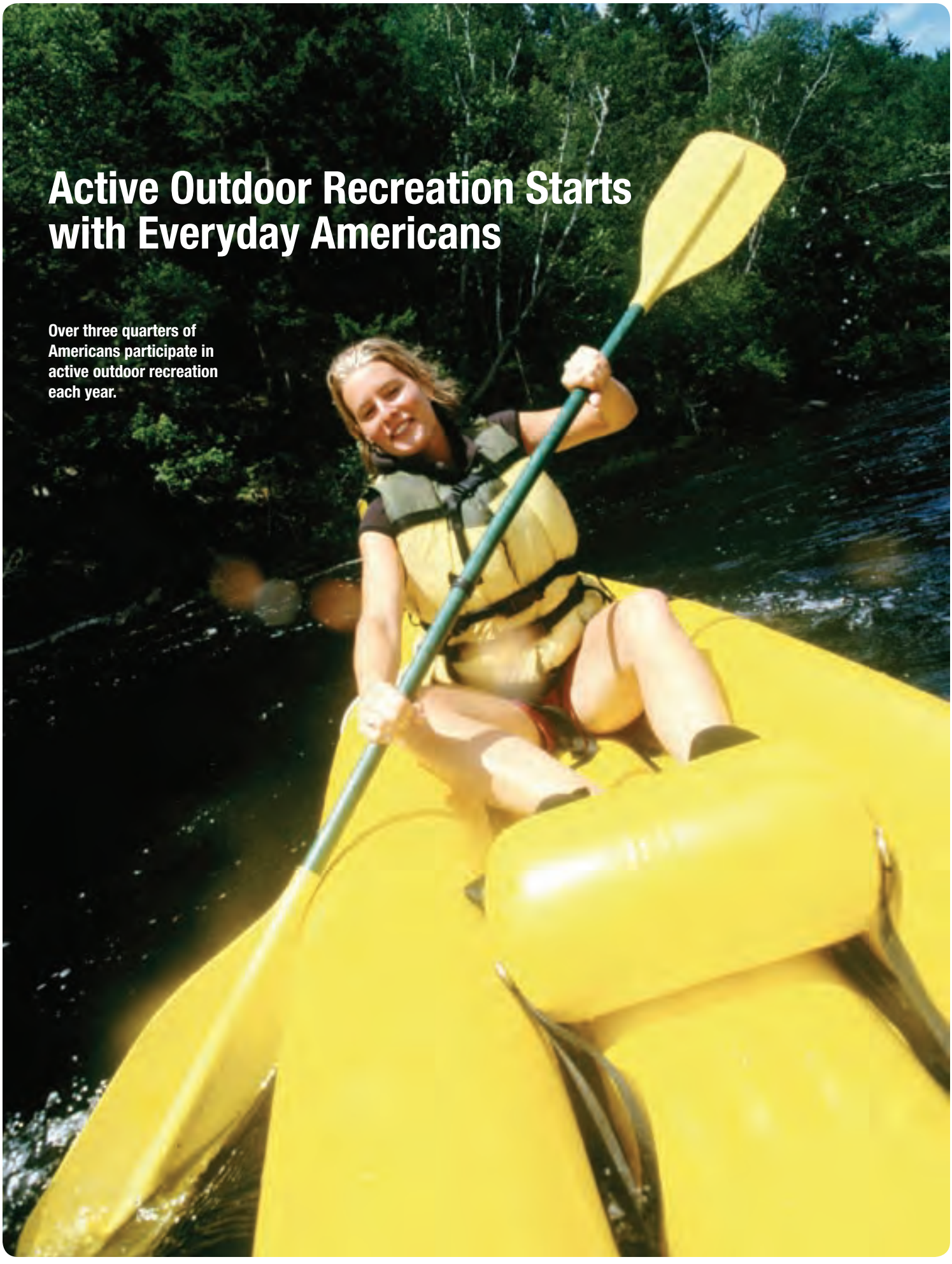
Total Contribution: $81,696 million
Jobs Generated: 762,247
Gear Retail Sales: $5,036 million
Trip-related Sales: $46,081 million
Taxes (federal, state): $9,369 million

ACTIVE OUTDOOR RECREATION TOTALS BY CENSUS DIVISION AND ACTIVITY CATEGORY

To review a comprehensive breakdown of totals by census division and activity category, please see page 19 of this report or visit www.outdoorindustryfoundation.org.

Active Outdoor Recreation Starts with Everyday Americans

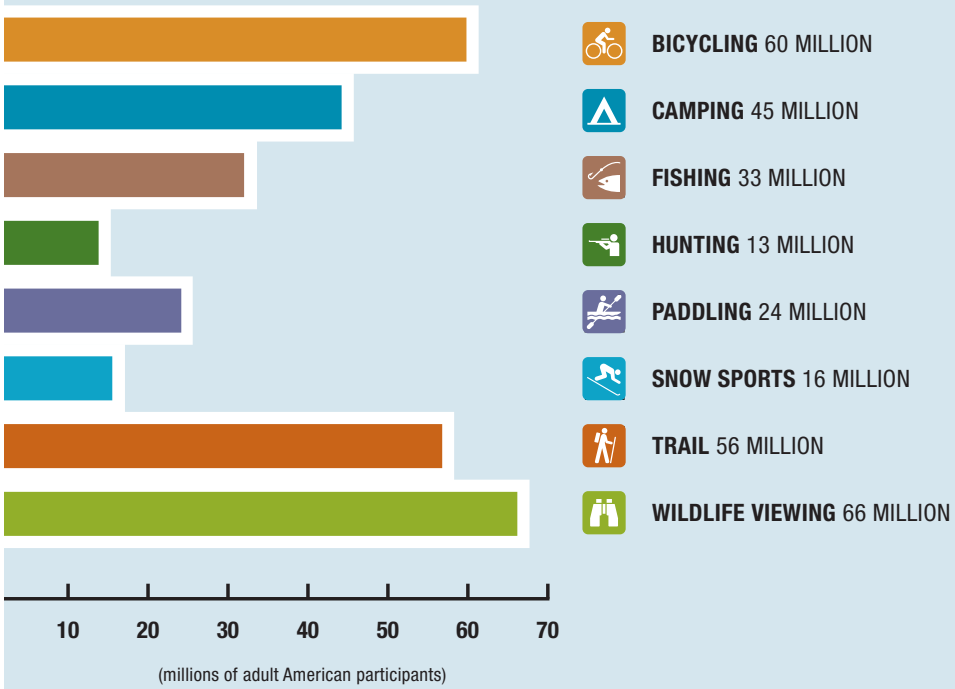
Over three quarters of Americans participate in active outdoor recreation each year.



Who Drives the Recreation Economy?

The Active Outdoor Recreation Economy begins with millions of Americans who come from all walks of life and geographical regions across the country. More than three out of every four Americans engage in healthy outdoor activities, ranging from bird watching to ice climbing, hiking to bass fishing. When Americans get out and participate in these activities, they aren't just having fun and staying fit, they're also pumping billions of dollars into the economy.

ACTIVE OUTDOOR RECREATION PARTICIPANTS BY THE NUMBERS



FAST FACTS

- ★ **More Americans camp than play basketball.[1]**
- ★ **The number of Americans who participate in bicycling is double the population of Canada.**
- ★ **More Americans paddle (kayak, canoe, raft) than play soccer.[2]**
- ★ **The number of Americans who recreate in the snow each year is greater than the combined populations of Ireland, Costa Rica, New Zealand, and Mongolia.**
- ★ **The number of New Englanders who participate in trail-based recreation annually is greater than the combined attendance for all 81 Boston Red Sox home games.[3]**
- ★ **The number of annual participants in snow-based recreation is more than double the combined annual attendance for NASCAR's two premier series.[4]**

[1] Sporting Goods Manufacturing Association (SGMA) estimates 32 million Americans 6+ played basketball in 2005.

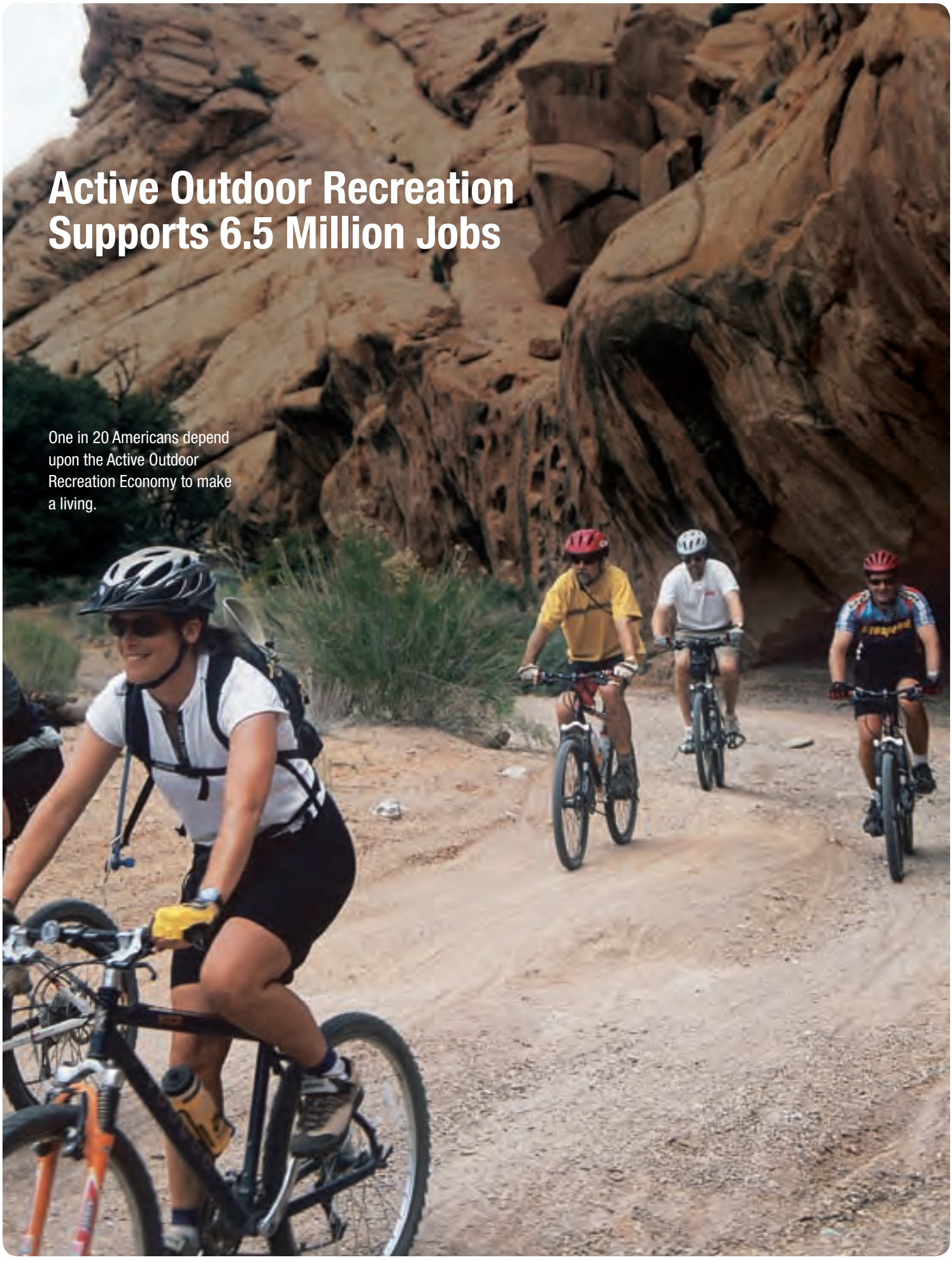
[2] SGMA estimates 17 million Americans 6+ played soccer in 2005.

[3] http://www.justmarketing.com/index.asp?pid=series, 2005

[4] NASCAR's premier series—the 2005 Busch Grand National Series and NEXTEL Cup Series; http://www.justmarketing.com/index.asp?pid=series

Active Outdoor Recreation Supports 6.5 Million Jobs

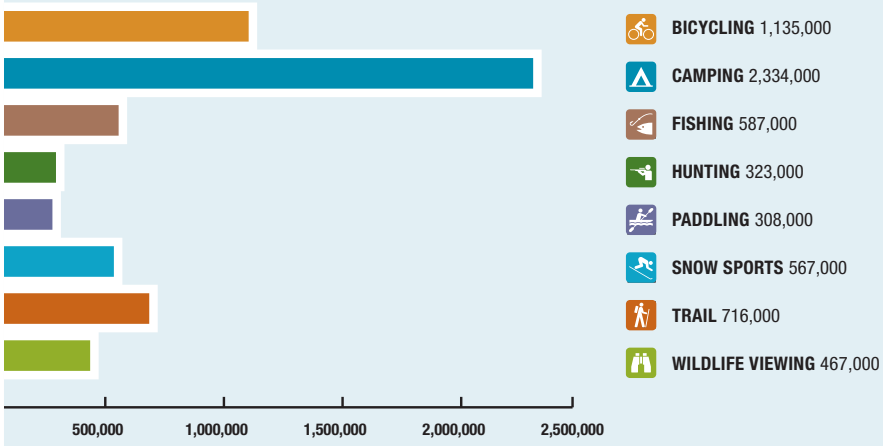
One in 20 Americans depend upon the Active Outdoor Recreation Economy to make a living.



The Active Outdoor Recreation Economy Employs America

Nearly 6.5 million Americans are working thanks to the Active Outdoor Recreation Economy. That's one out of 20 workers in the U.S. These are not just stereotypical seasonal jobs such as cleaning campgrounds or operating ski lifts. Instead, the economy supports a wide range of careers with diverse skills. These sustainable jobs are not confined to any single economic sector and they, in turn, support larger industries—manufacturing, leisure and hospitality, transportation, and wholesale and retail trade. In short, the Active Outdoor Recreation Economy is one of America's most important employers.

JOBS GENERATED BY ACTIVITY CATEGORY



FAST FACTS

- ★ More Americans owe their jobs to bicycle-based recreation than there are people employed as lawyers.[5]
- ★ More Americans owe their jobs to snow-based recreation than there are physicians and surgeons.[6]
- ★ The Active Outdoor Recreation Economy employs five times more Americans than Wal-Mart, the world's largest private employer.[7]
- ★ Camp-based recreation in the U.S. could employ the entire population of Utah.

Note: The jobs figures in the Report are termed "average annual employment" by the economic model. The jobs figures represent an average job for the industry impacted and do not represent full-time equivalent jobs.

[5] U.S. Department of Labor, Bureau of Labor Statistics, http://www.bls.gov/oes/2004/may/oes_00Al.htm

[6] ibid

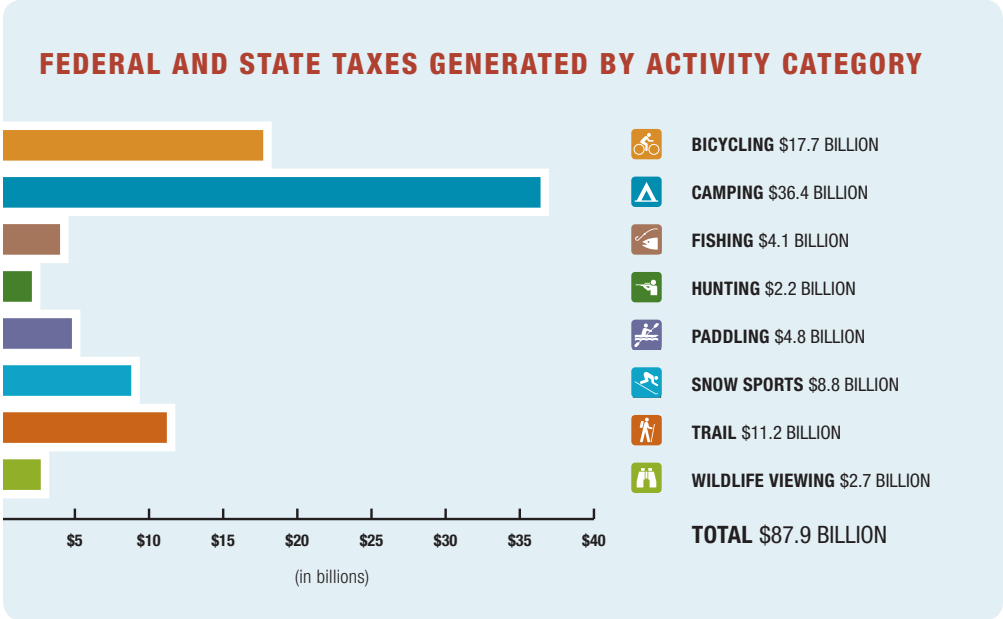
[7] Wal-Mart Annual Report

The Active Outdoor Recreation Economy Generates $88 Billion in Tax Revenues

The federal tax revenue generated by the Active Outdoor Recreation Economy ($48.5 billion) would cover the budget of the Department of Interior ($16.4 billion in 2005) for nearly 3 years.[8]

$88 Billion Coming Back to America: Tax Receipts

The cash spent by Americans in pursuit of active outdoor recreation benefits all Americans, generating $88 billion in state and federal taxes (sales tax and income tax). This tax influx, in turn, supports government programs that empower and develop communities.



Jump-starting Rural Economic Development

The jobs, tax revenues, and business created by the Active Outdoor Recreation Economy are the lifeblood of rural communities that rely on recreation tourism to enjoy a high quality of life.

According to the US Department of Agriculture, rural tourism and recreational development:

- Spikes employment growth rates
- Buoys earnings and income levels
- Lowers local poverty rates
- Shepherds improvements in local educational attainment and health[9]

Mining, logging, oil and gas, and agriculture are the traditional backbone of many rural economies. Today, the sustainable Active Outdoor Recreation Economy has joined that list as communities seek to create a balanced and stable base for long-term economic and community development.

CASE STUDY

FRUITA, CO

Eleven years ago, businessman Troy Rarick took a big chance and opened a bike shop in the struggling town of Fruita, Colorado. Over the Edge Sports was one of the few businesses in the mostly vacant downtown. But the shop encouraged the community to build mountain bike trails and organize an annual Fruita Fat Tire Festival. In the 10 years since, Fruita has earned a reputation as a world-class mountain biking destination that pumps $1.5 million a year into the local economy, according to the Bureau of Land Management. And Fruita's sales tax revenues have increased by 51 percent in the last 5 years, including an 80 percent increase in sales tax revenues from restaurants.[10]

MOAB, UT

In 1990, Western Spirit Cycling, based in Moab, Utah, consisted of two employees who ran three trips a year. In 2006, the company employed 35 people and ran hundreds of trips in states throughout the country, spending cash in hotels, grocery stores, restaurants, and bike shops in small towns across the U.S.

[8] Department of the Interior, http://www.doi.gov/facts.html

[9] U.S. Department of Agriculture, Economic Research Service, August 2005, "Recreation, Tourism, and Rural Well-Being," Richard J. Reeder, and Dennis M. Brown

[10] Bureau of Land Management North Fruita Desert Management Plan-November 2004.

The Active Outdoor Recreation Economy Means Business

Americans spend $289 billion each year on gear, trip-related items, and services to enjoy active outdoor recreation.

Ringing Up $289 Billion in Retail Sales

The most obvious boost the Active Outdoor Recreation Economy gives to the nation comes at the cash register. Participants spend their money on both gear and trips.

- Quality gear is key to a fulfilling outdoor experience, and Americans spend $46 billion each year on their equipment, apparel, footwear, accessories, and services.
- Americans want to spend money on active outdoor excursions, and they spend $243 billion on trips ranging from a summer camping vacation to an afternoon family bike ride.

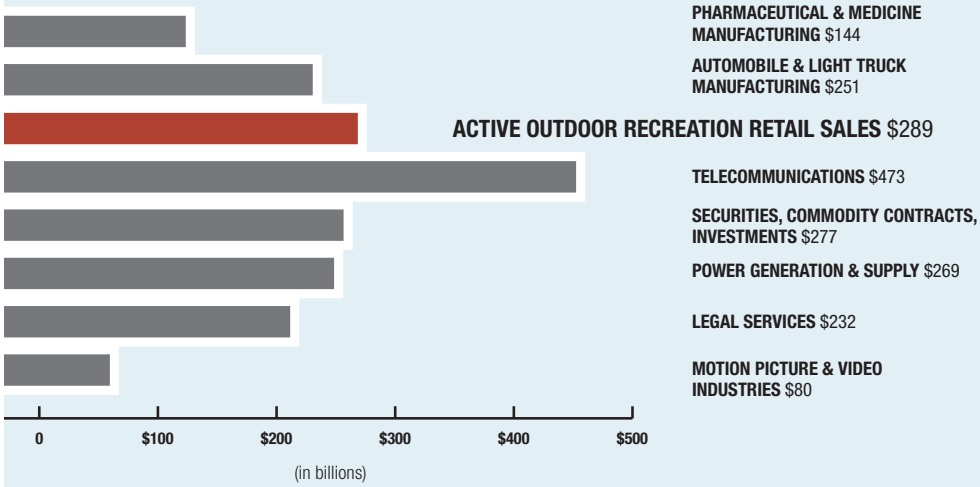
That adds up to a whopping $289 billion spent annually on active outdoor recreation gear and trips, a bigger direct expenditures contribution to the U.S. economy than that of the securities, commodity contracts, and investments industry ($277 billion).[11]

An Overlooked Economic Giant

The Active Outdoor Recreation Economy is big business. It ranks alongside and even dwarfs other major economic sectors in the U.S., such as telecommunications, hospitals and motion pictures and videos.

HOW ACTIVE OUTDOOR RECREATION STACKS UP[12]

Sales comparison to U.S. economic sectors.



CASE STUDY

Cuyahoga Valley National Park, OH

Do you think most visitors come to National Parks and National Forests for extended destination vacations? Think again. There were 273 million visits to National Parks in 2005, but only 13.8 million overnight stays.[13] Over half of recreation visits to National Forests are day trips.[14]

- Ohio's Cuyahoga Valley National Park welcomed almost 2.9 million recreation visits in 2003, yet less than five percent were overnight trips.[15]
- The 2.7 million day trippers spent over $44 million during their visits.
- Day trips stimulated 80 percent of the total visitor spending to Cuyahoga, supporting 1,296 local jobs.

Note: The following expenditures were not included: outdoor-lifestyle-inspired purchases made by non–participants, the portion of a purchase that would have been made even if the respondent did not participate, purchases by minors, purchases by foreigners for U.S. products (goods and services) and purchases by foreigners during outdoor trips in the U.S., U.S. resident travel abroad, and large durable purchases such as boats and RVs. (See technical report for more details.)

[11] Bureau of Economic Analysis, Industry Economic Accounts, http://www.bea.gov/bea/dn2.htm

[12] ibid

[13] National Park Service http://www2.nature.nps.gov/stats/

[14] Stynes, Daniel and White, Eric. Spending Profiles of National Forest Visitors, NVUM Four Year Report, May 2005

[15] National Park Service http://www2.nature.nps.gov/stats/

The Ripple Effect Multiplies the Contribution of Sales

No economy exists in a vacuum. The $289 billion Americans spend on active outdoor recreation gear and trips circulates further through the economy, creating a virtuous cycle, known as the "multiplier" or "ripple" effect, which adds up to another $441 billion to create the $730 billion Active Outdoor Recreation Economy. This dynamic economy is a sum total of economic interactions that benefit all of America's major economic sectors.

Think of a kayak slicing through the water. The kayak creates ripples in the water that move further away as they dissipate. Likewise, when a patron goes to an outdoor store and buys a kayak, the economic contribution is not limited to the money the consumer gives to the retail store. The purchase creates ripples that affect the suppliers of materials for the boat, the boat manufacturer, and the shipping company that transported the kayak.

Additionally, the outdoor store employee and the employees of the suppliers and manufacturers spend their paychecks on goods and services. This further economic contribution accumulates each time it passes through a different set of hands, yet is smaller at each touch point as the ripples grow smaller but continue to be felt.

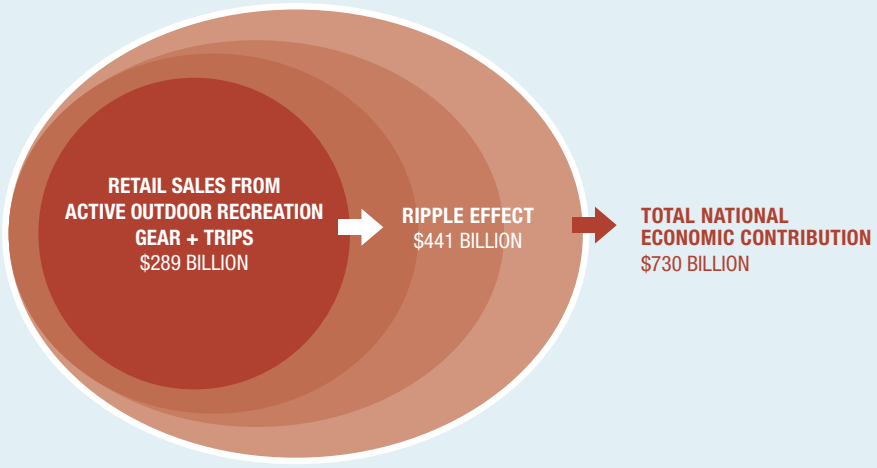
CASE STUDY ★

METHOW VALLEY, WA

The Methow Valley trail system in north-central Washington includes nearly 125 miles of groomed paths for cross-country skiing, off-road bicycling, and horseback riding, attracting visitors from across Washington state and beyond.[16]

- Trail user (local, resident, non-local) expenditures average $1,469 per party, per trip.
- Nearly $4.5 million in direct expenditures are made annually to the Methow Valley economy by trail users.
- The ripple effect creates an additional $4.1 million economic contribution to the local economy.

FAR REACHING RIPPLES



Note: A conservative 10% of "secondary" trip expenditures were included for non wildlife-based active outdoor recreation trips. Active outdoor recreation expenditures were made on the trip but the purpose of the trip was not primarily for recreation. However, expenditures would not have occurred unless recreation opportunities existed.

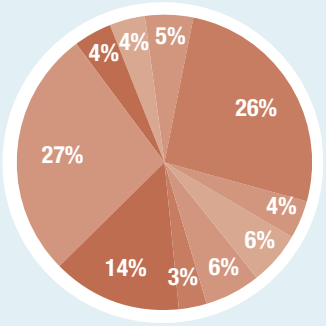
[16] Methow Valley Sport Trails Association, prepared by Resource Dimensions; "Economic Impacts of MVTSA Trails and Land Resources in the Methow Valley," July 2005)

Beyond the Outdoor Industry

The Active Outdoor Recreation Economy reaches far beyond the outdoor industry, making major direct contributions to all the building-block sectors of the American economy, including manufacturing, transportation, and real estate.

AN ESSENTIAL COMPONENT OF THE AMERICAN ECONOMY[17]

Active outdoor recreation spreads $730 billion to all U.S. economic sectors



MANUFACTURING 26.2%
TRANSPORTATION & WAREHOUSING 4.1%
RETAIL TRADE 6.4%
REAL ESTATE & RENTAL 6%
ARTS, ENTERTAINMENT & RECREATION 3.2%
ACCOMMODATIONS & FOOD SERVICES 13.6%
FINANCE & INSURANCE 4.9%
PROFESSIONAL – SCIENTIFIC & TECHNICAL SERVICES 4.2%
INFORMATION 4.2%
ALL OTHER SECTORS 27.2%

And $730 Billion Is Just the Beginning

This report took a conservative approach in defining expenditures related to active outdoor recreation. Many participants make additional big-ticket purchases that add to the national economy which were not included in this report.

- Over $30 billion of boat and other big-ticket sales from wildlife-based recreation were not added into this calculation of the Active Outdoor Recreation Economy.
- Only a small portion of the over $14 billion in recreation vehicle sales were included in this report.[18]
- Participants buy and lease land ($12 billion from wildlife based recreation alone), cabins, and second homes. This study does not take those property sales into account.

When you add in these big-ticket items and purchases for fishing, hunting and wildlife viewing, the Active Outdoor Recreation Economy pumps $900 billion into the U.S. economy each year.

FAST FACTS

★ **Americans spent 88 times more on bicycle-based recreation in one year than the total box office draw for *Titanic*, the top grossing movie of all time.[19]**

★ **The Great Allegheny Passage, connecting Pittsburgh to the C&O Canal towpath leading to Washington, D.C., generated $7 million in direct spending in 2002. Bolstered by the growth of trail-related businesses, the Passage will stimulate an estimated $12 to $15 million in direct spending in 2007.[20]**

★ **Studies estimate that physically inactive individuals have 24 percent higher health-care costs than active individuals.[21]**

[17] Bureau of Economic Analysis, Industry Economic Accounts, http://www.bea.gov/bea/dn2.htm

[18] Recreational Vehicle Industry Association-http://rvia.org/Media/ShipmentsData.htm

[19] http://movies.go.com/boxoffice?cat=2005

[20] Farber Ph.d, Stephen, "2002 User Survey for The Pennsylvania Allegheny Trail Alliance," University Center for Social and Urban Research, University of Pittsburgh; Allegheny Trail Alliance

[21] www.cdc.gov

Conclusion

Learn more on the web at:
outdoorindustryfoundation.org

The $730 Billion Active Outdoor Recreation Economy Offers a Healthy, Sustainable Future for All Americans

The Active Outdoor Recreation Economy is a vital force in the national economy, yet is often overlooked. It supports nearly 6.5 million jobs and impacts all geographical regions of the country. It is inclusive of all gender, racial, ethnic, and religious groups. It pumps capital into major sectors of U.S. industry. The Active Outdoor Recreation Economy is sustainable year after year.

Furthermore, the $730 billion figure established by this report is just a small fraction of the deeper value that Americans place on the opportunity to recreate in nature. Major corporations make decisions on where to build and invest based upon the quality of life they can offer employees. Real estate and land near outdoor recreation opportunities has been shown to increase in value. There are compelling non-market benefits to a healthy Active Outdoor Recreation Economy (education, science, research, biodiversity), which can also multiply the economic contribution.

Beyond business, active outdoor recreation improves the physical health of the nation. Over 30 percent of adult Americans and 16 percent of children and teens are obese. Increased participation in outdoor recreation is a natural solution to this obesity crisis. Getting more Americans to participate in a stronger Active Outdoor Recreation Economy also reduces health-care costs and creates a greater sense of well-being and happiness for everyone.

Active outdoor recreation's $730 billion contribution is essential to our economic foundation. The recognition and stimulation of this market force should be a prime concern to all Americans who value a flourishing, sustainable economy. But the true value of outdoor recreation cannot be quantified. It is a priceless American treasure.

ACTIVE OUTDOOR RECREATION TOTALS BY CENSUS DIVISION AND ACTIVITY CATEGORY

To review a listing of census divisions, please see pages 6 and 7 of this report, or visit www.outdoorindustryfoundation.org.

		CENSUS D1	D2	D3	D4	D5	D6	D7	D8	D9	NATIONAL
Bicycle-Based Recreation	# Participants (thousands)	2,496	8,161	11,329	42,351	10,715	1,592	6,491	4,078	10,313	59,837
	% Population Participating	23%	26%	33%	28%	25%	20%	26%	27%	29%	27%
	Gear Retail Sales* (millions)	$331	$677	$873	$310	$1,370	$219	$621	$429	$1,399	$6,230
	Trip Related Sales* (millions)	$2,814	$3,097	$11,209	$1,781	$8,272	$3,084	$3,941	$3,715	$9,024	$46,938
	Jobs Supported	40,121	44,298	190,972	31,615	134,881	43,828	66,290	59,939	135,422	1,135,268
	Taxes - Federal and State (millions)	$555	$623	$2,162	$359	$1,623	$310	$766	$1,007	$1,862	$17,701
	Total Economic Contribution (millions)	$3,372	$4,757	$17,024	$2,704	$11,337	$3,895	$6,884	$6,233	$15,001	$132,827
Camp-Based Recreation	# Participants (thousands)	1,874	4,910	8,687	3,441	7,258	1,374	4,203	4,934	8,479	45,161
	% Population Participating	17%	16%	25%	23%	17%	18%	17%	33%	24%	21%
	Gear Retail Sales* (millions)	$362	$901	$1,660	$606	$1,345	$290	$966	$864	$1,652	$8,676
	Trip Related Sales* (millions)	$6,646	$9,281	$14,687	$6,171	$19,867	$4,122	$9,454	$13,992	$16,393	$100,614
	Jobs Supported	89,384	119,512	258,363	102,475	296,727	58,549	151,838	214,870	234,468	2,333,638
	Taxes - Federal and State (millions)	$1,236	$1,681	$2,926	$1,164	$3,573	$1,207	$1,755	$3,611	$3,224	$36,387
	Total Economic Contribution (millions)	$7,513	$12,834	$23,031	$8,765	$24,940	$5,204	$15,767	$22,345	$25,972	$273,037
Fishing** ^	# Participants (thousands)	1,890	3,500	6,040	4,320	8,180	3,020	4,730	3,280	4,480	32,900
	% Population Participating	17%	11%	18%	28%	20%	22%	19%	23%	12%	18%
	Gear Retail Sales* (millions)	$271	$509	$845	$646	$1,478	$439	$749	$587	$893	$6,416
	Trip Related Sales* (millions)	$757	$1,119	$1,660	$1,426	$3,222	$1,013	$1,659	$1,862	$2,574	$16,205
	Jobs Supported	17,195	26,912	50,294	39,887	92,667	30,638	47,627	46,319	62,080	586,512
	Taxes - Federal and State (millions)	$140	$238	$388	$305	$659	$201	$333	$306	$529	$4,050
	Total Economic Contribution (millions)	$1,768	$3,073	$5,066	$4,003	$8,841	$2,862	$4,801	$4,454	$6,576	$61,429
Hunting *** ^	# Participants (thousands)	450	1,820	2,460	2,100	1,970	1,440	2,190	1,340	850	12,800
	% Population Participating	4%	6%	7%	14%	5%	11%	9%	10%	2%	6%
	Gear Retail Sales* (millions)	$159	$773	$1,072	$761	$886	$791	$1,101	$752	$592	$6,886
	Trip Related Sales* (millions)	$271	$401	$595	$511	$1,155	$363	$595	$667	$922	$5,528
	Jobs Supported	7,234	17,702	32,151	25,227	38,067	22,627	31,249	28,830	25,830	322,570
	Taxes - Federal and State (millions)	$46	$148	$231	$169	$266	$146	$211	$174	$200	$2,186
	Total Economic Contribution (millions)	$731	$2,174	$3,293	$2,431	$3,821	$2,315	$3,282	$2,605	$2,781	$34,090
Paddle-Based Recreation	# Participants (thousands)	1,586	3,356	4,607	1,462	4,410	702	1,637	1,586	4,246	23,596
	% Population Participating	14%	11%	13%	10%	10%	9%	7%	11%	12%	11%
	Gear Retail Sales* (millions)	$101	$356	$433	$181	$563	$105	$168	$175	$585	$2,668
	Trip Related Sales* (millions)	$631	$1,591	$1,781	$505	$1,757	$616	$712	$860	$3,324	$11,778
	Jobs Supported	9,331	22,844	34,999	10,393	32,457	9,571	12,781	14,976	50,805	308,469
	Taxes - Federal and State (millions)	$129	$321	$396	$118	$391	$197	$148	$252	$699	$4,810
	Total Economic Contribution (millions)	$784	$2,453	$3,120	$889	$2,728	$851	$1,327	$1,557	$5,628	$36,091
Snow-Based Recreation	# Participants (thousands)	1,473	2,160	2,274	1,176	2,141	224	776	1,858	3,505	15,587
	% Population Participating	13%	7%	7%	8%	5%	3%	3%	13%	10%	8%
	Gear Retail Sales* (millions)	$206	$461	$295	$213	$518	$46	$132	$490	$765	$3,125
	Trip Related Sales* (millions)	$4,091	$3,047	$1,672	$714	$1,590	$110	$0	$6,501	$5,685	$23,412
	Jobs Supported	54,801	41,172	31,085	14,021	29,485	2,080	1,914	101,115	83,815	566,629
	Taxes - Federal and State (millions)	$758	$579	$352	$159	$355	$43	$22	$1,699	$1,153	$8,835
	Total Economic Contribution (millions)	$4,606	$4,421	$2,771	$1,199	$2,478	$185	$199	$10,515	$9,284	$66,296
Trail-Based Recreation	# Participants (thousands)	3,048	6,648	8,122	3,407	9,642	1,746	5,250	5,433	12,538	55,834
	% Population Participating	28%	22%	23%	23%	23%	23%	21%	36%	35%	26%
	Gear Retail Sales* (millions)	$184	$401	$281	$209	$517	$133	$474	$361	$780	$3,340
	Trip Related Sales* (millions)	$2,065	$3,792	$2,136	$869	$5,486	$1,003	$1,792	$6,307	$6,726	$30,177
	Jobs Supported	28,686	49,218	38,208	16,292	83,978	15,073	32,916	96,450	97,523	715,661
	Taxes - Federal and State (millions)	$397	$692	$433	$185	$1,011	$311	$380	$1,621	$1,341	$11,159
	Total Economic Contribution (millions)	$2,411	$5,285	$3,406	$1,394	$7,058	$1,340	$3,418	$10,030	$10,802	$83,733
Wildlife Viewing **** ^	# Participants (thousands)	4,990	9,580	12,500	6,930	12,900	5,090	6,150	6,870	10,500	66,100
	% Population Participating	45%	31%	37%	46%	32%	37%	25%	49%	29%	30%
	Gear Retail Sales* (millions)	$597	$1,120	$1,223	$479	$1,566	$613	$576	$1,132	$1,538	$8,845
	Trip Related Sales* (millions)	$421	$623	$925	$794	$1,794	$564	$924	$1,036	$1,433	$8,591
	Jobs Supported	24,445	35,600	55,436	32,744	86,578	32,760	35,318	54,687	72,304	466,525
	Taxes - Federal and State (millions)	$108	$217	$263	$150	$416	$130	$167	$236	$361	$2,740
	Total Economic Contribution (millions)	$1,756	$3,303	$4,242	$2,451	$6,392	$2,138	$2,787	$3,757	$5,652	$43,476

* Sample sizes are detailed in the technical report.

** Source: American Sportfishing Association – "Sportfishing in America: Values of Our Traditional Pastime," 2002

*** Source: International Association of Fish and Wildlife Agencies – "The Economic Importance of Hunting in America," 2002

**** U.S. Fish and Wildlife Service – "2001 National and State Economic Impacts of Wildlife Viewing," Published 2003

^ Wildlife-based recreation activities (fishing, hunting, wildlife viewing) were derived from above sources which contain a greater level of details (including state information). Assumptions were made to align the methodologies of the wildlife-based studies with the Active Outdoor Recreation survey (other 5 activity categories). See technical report for details. Wildlife-based participation based on 16+ participation. Other 5 activity categories based on 18+. Wildlife-based participant populations used to derive incidence is the 2001 16+ population adjusted for each census division by the growth in national population from 2000 to 2005. Crossover participation data does not exist for wildlife viewing as defined by the USFW and the 5 Active Outdoor Recreation categories. Census division figures will not add to national figures due to larger national multipliers (greater leakages in smaller geographic region). D.C. wildlife figures are not included in the census trip expenditures but are included in the national figure.

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Trail Fundamentals
and
Trail Management Objectives

Training Reference Package

Updated 5/1/2011

Trail Class Matrix (FSH 2353.142, Exhibit 01)

Trail Classes are general categories reflecting trail development scale, arranged along a continuum. The Trail Class identified for a National Forest System (NFS) trail prescribes its development scale, representing its intended design and management standards.[1] Local deviations from any Trail Class descriptor may be established based on trail-specific conditions, topography, or other factors, provided that the deviations are consistent with the general intent of the applicable Trail Class.

Identify the appropriate Trail Class for each NFS trail or trail segment based on the management intent in the applicable land management plan, travel management decisions, trail-specific decisions, and other related direction. Apply the Trail Class that most closely reflects the management intent for the trail or trail segment, which may or may not reflect the current condition of the trail.

Trail Attributes	Trail Class 1 Minimally Developed	Trail Class 2 Moderately Developed	Trail Class 3 Developed	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Tread & Traffic Flow	◆ Tread intermittent and often indistinct. ◆ May require route finding. ◆ Single lane, with no allowances constructed for passing. ◆ Predominantly native materials.	◆ Tread continuous and discernible, but narrow and rough. ◆ Single lane, with minor allowances constructed for passing. ◆ Typically native materials.	◆ Tread continuous and obvious. ◆ Single lane, with allowances constructed for passing where required by traffic volume in places where there is no reasonable opportunity to pass. ◆ Native or imported materials.	◆ Tread wide and relatively smooth, with few irregularities. ◆ Single lane, with allowances constructed for passing where required by traffic volume in places where there is no reasonable opportunity to pass. ◆ Double lane where traffic volume is high and passing is frequent. ◆ Native or imported materials. ◆ May be hardened.	◆ Tread wide, firm, stable, and generally uniform. ◆ Single lane, with frequent turnouts where traffic volume is low to moderate. ◆ Double lane where traffic volume is moderate to high. ◆ Commonly hardened with asphalt or other imported material.
Obstacles	◆ Obstacles common, naturally ocurring, often substantial, and intended to provide increased challenge. ◆ Narrow passages; brush, steep grades, rocks and logs present.	◆ Obstacles may be common, substantial, and intended to provide increased challenge. ◆ Blockages cleared to define route and protect resources. ◆ Vegetation may encroach into trailway.	◆ Obstacles may be common, but not substantial or intended to provide challenge. ◆ Vegetation cleared outside of trailway.	◆ Obstacles infrequent and insubstantial. ◆ Vegetation cleared outside of trailway.	◆ Obstacles not present. ◆ Grades typically < 8%.

10/16/2008

Trail Attributes	Trail Class 1 Minimally Developed	Trail Class 2 Moderately Developed	Trail Class 3 Developed	Trail Class 4 Highly Developed	Trail Class 5 Fully Developed
Constructed Features & Trail Elements	◆ Structures minimal to non-existent. ◆ Drainage typically provided without structures. ◆ Natural fords. ◆ Typically no bridges.	◆ Structures of limited size, scale, and quantity; typically constructed of native materials. ◆ Structures adequate to protect trail infrastructure and resources. ◆ Natural fords. ◆ Bridges as needed for resource protection and appropriate access.	◆ Structures may be common and substantial; constructed of imported or native materials. ◆ Natural or constructed fords. ◆ Bridges as needed for resource protection and appropriate access.	◆ Structures frequent and substantial; typically constructed of imported materials. ◆ Contructed or natural fords. ◆ Bridges as needed for resource protection and user convenience. ◆ Trailside amenities may be present.	◆ Structures frequent or continuous; typically constructed of imported materials. ◆ May include bridges, boardwalks, curbs, handrails, trailside amenities, and similar features.
Signs[2]	◆ Route identification signing limited to junctions. ◆ Route markers present when trail location is not evident. ◆ Regulatory and resource protection signing infrequent. ◆ Destination signing, unless required, generally not present. ◆ Information and interpretive signing generally not present.	◆ Route identification signing limited to junctions. ◆ Route markers present when trail location is not evident. ◆ Regulatory and resource protection signing infrequent. ◆ Destination signing typically infrequent outside wilderness areas; generally not present in wilderness areas. ◆ Information and interpretive signing uncommon.	◆ Route identification signing at junctions and as needed for user reassurance. ◆ Route markers as needed for user reassurance. ◆ Regulatory and resource protection signing may be common. ◆ Destination signing likely outside wilderness areas; generally not present in wilderness areas. ◆ Information and interpretive signs may be present outside wilderness areas.	◆ Route identification signing at junctions and as needed for user reassurance. ◆ Route markers as needed for user reassurance. ◆ Regulatory and resource protection signing common. ◆ Destination signing common outside wilderness areas; generally not present in wilderness areas. ◆ Information and interpretive signs may be common outside wilderness areas. ◆ Accessibility information likely displayed at trailhead.	◆ Route identification signing at junctions and for user reassurance. ◆ Route markers as needed for user reassurance. ◆ Regulatory and resource protection signing common. ◆ Destination signing common. ◆ Information and interpretive signs common. ◆ Accessibility information likely displayed at trailhead.
Typical Recreation Environs & Experience[3]	◆ Natural and unmodified. ◆ ROS: Typically Primitive to Roaded Natural. ◆ WROS: Typically Primitive to Semi-Primitive.	◆ Natural and essentially unmodified. ◆ ROS: Typically Primitive to Roaded Natural. ◆ WROS: Typically Primitive to Semi-Primitive.	◆ Natural and primarily unmodified. ◆ ROS: Typically Primitive to Roaded Natural. ◆ WROS: Typically Semi-Primitive to Transition.	◆ May be modified. ◆ ROS: Typically Semi-Primitive to Rural ◆ WROS: Typically Portal or Transition.	◆ May be highly modified. ◆ Commonly associated with visitor centers or high-use recreation sites. ◆ ROS: Typically Roaded Natural to Urban. ◆ Generally not present in Wilderness areas.

[1] For National Quality Standards for Trails, Potential Appropriateness of Trail Classes for Managed Uses, Design Parameters, and other related guidance, refer to FSM 2353 and FSH 2309.18.

[2] For standards and guidelines on the use of signs and posters on trails, refer to the Sign and Poster Guidelines for the Forest Service (EM-7100-15).

[3] The Trail Class Matrix shows combinations of Trail Class and Recreation Opportunity Spectrum (ROS) or Wilderness Recreation Opportunity Spectrum (WROS) settings that commonly occur, although trails in all Trail Classes may and do occur in all settings. For guidance on the application of the ROS and WROS, refer to FSM 2310 and 2353 and FSH 2309.18.

USFS Trail Classes

Photo Examples

Updated 10/16/2008

The photos below provide visual examples of typical Trail Class scenarios. Remember that Trail Classes are general categories reflecting development scale, arranged along a continuum, with no hard and fast lines drawn between the classes. The photos below can be used as visual aids to assist in consistent application of trail classification.

Trail Class 1

TC1 – Tread: Tread intermittent and indistinct.

TC1 – Obstacles: Obstacles common, naturally occurring, often substantial

TC1 – Constructed Features: Constructed features minimal to non-existent.

TC1 – Signs: Route identification signing limited to junctions. Route markers present when trail location is not evident.

TC1 – Typical Rec. Environment / Experience: Recreation environment natural and unmodified.

Trail Class 2

TC2 – Tread: Tread continuous and discernible, but narrow and rough.

TC2 – Obstacles: Obstacles may be common and substantial. Blockages cleared to define route and protect resource. Vegetation may encroach into trailway.

TC2 – Constructed Features: Structures are of limited size, scale, and quantity.

TC2 – Signs: Route identification signing limited to junctions. Route markers present when location is not evident.

TC2 – Typical Rec. Environment / Experience: Recreation environment natural and essentially unmodified.

Trail Class 3

TC3 – Tread: Tread continuous and obvious.

TC3 – Obstacles: Obstacles may be common. Vegetation cleared outside of trailway.

TC3 – Constructed Features: Trail structures (walls, steps drainage, raised trail) may be common and substantial.

TC3 – Signs: Route identification signing at junctions and as needed for user reassurance. Route markers as needed for user reassurance. Destination signing likely outside of wilderness.

TC3 – Typical Rec. Environment / Experience: Recreation environment natural and primarily unmodified.

Trail Class 4

TC4 – Tread: Tread wide and relatively smooth, with few irregularities.

TC4 – Obstacles: Obstacles infrequent and insubstantial. Vegetation cleared outside of trailway.

TC4 – Constructed Features: Structures frequent and substantial. Trailside amenities may be present.

TC4 – Signs: Wide variety of signs likely present, informational signs likely, interpretive signs possible.

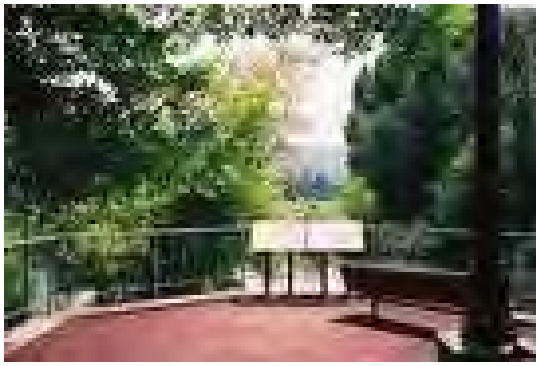
TC4 – Typical Rec. Environment / Experience: Recreation environment may be modified.

Trail Class 5

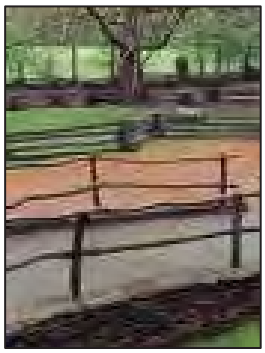
TC5 – Tread: Tread wide, firm, stable, and generally uniform. Commonly hardened with asphalt or other imported material.

TC5 – Obstacles: Obstacles not present. Grades typically < 8%.

TC5 – Constructed Features: Structures frequent or continuous; may include bridges, boardwalks, curbs, handrails, trailside amenities, and similar features.



TC5: – Signs: Wide variety of signs present, information and interpretive signs common.



TC5 – Typical Rec. Environment / Experience: Recreation environment may be highly modified.