

Health Benefits of Outdoor Recreation on OSU Research Forests

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Forests provide a variety of ecosystem services and benefits to people. And when there is public access, they provide opportunities for outdoor recreation. Outdoor recreation is one mode for people to be physically active—a key component to living a healthy lifestyle. Along with good nutrition, access to health care, and other preventative measures, physical activity may decrease the risk of many chronic ill-



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nesses such as heart disease, stroke, depression, dementia, diabetes, and several cancers. These chronic conditions make up five of the top 10 leading causes of death in the US. In addition, daily physical activity may also increase memory function and quality of sleep.

The U.S. Department of Health and Human Services recommends adults get at least 150 minutes a week of moderate-intensity, or 75 minutes a week of vigorous-intensity aerobic physical activity, or an equivalent combination of moderate- and vigorous-intensity aerobic activity to receive substantial health benefits. People may meet or exceed this recommendation by recreating outdoors or indoors, doing work on the job or at home, commuting by walking or bicycling, and even exercising at the gym or at home. About 60% of adults in Oregon meet this recommendation

and 63% of adults in Benton County, Ore., meet this recommendation.

Oregon State University (OSU) Research Forests provide opportunities and access for people to be physically active through their outdoor recreation program. The McDonald-Dunn Research Forest is close to Corvallis and OSU's main campus (a short 15-minute drive). The forest is managed for clean air and water, habitat for wildlife, research and discovery, education, forest products, and outdoor recreation. Hikers, dog walkers, trail runners, mountain bikers, and equestrians enjoy recreating on nearly 30 miles of single-track trail and over 100 miles of roads. What level of health benefits do people obtain when they recreate on the OSU Research Forests?

From recreation visits to health benefits

Visitation data, including frequency and duration of recreation activity participation, were collected in a year-long survey on the OSU Research Forest in 2017. Recreation visitation is restricted to day-use only. The primary activities that visitors engage in include walking/hiking, dog walking, trail running/jogging, mountain biking, and horseback riding. This study estimated that there were 17,271 individual recreation visitors participating in 155,446 total visits. Total visits were apportioned by primary recreation activity as 80,478 visits for walking/hiking, 29,982 visits for dog walking, 25,248 visits for trail running/jogging, 18,936 visits for mountain biking, and 802 visits for horseback riding.

The health benefits of these recreation visits were derived using the Outdoor Recreation Health Impacts Estimator tool (see sidebar). Health benefits are measured as Cost of Illness savings—an economic measure of reduced health care expenditures and worker productivity losses. As people increase their physical activity, their risks for several chronic illnesses decline, which in turn may result in lower health care expenditures. These Cost of Illness savings generally accrue

Oregon's Outdoor Recreation Health Impacts Estimator Tool

The Outdoor Recreation Health Impacts Estimator tool was built on the base of the Transportation Options Health Impact Estimator (TO Estimator). The TO Estimator itself was built on the base of the Integrated Transport and Health Impact Model (ITHIM) by calibrating it to Oregon's county-specific health information and population distributions by the Oregon Health Authority.

ITHIM is a comprehensive health impact assessment model that uses comparative risk assessment to quantify the estimated change in life expectancy and quality of life for a population due to changes in active transportation participation. ITHIM's physical activity pathway estimates health effects based on quantified relationships (dose-response functions) between physical activity (i.e., walking and cycling active transportation) and chronic illnesses such as cardiovascular disease, diabetes, and some cancers. These estimated health effects are then converted into monetary units via Cost of Illness savings meta-analysis functions. These Cost of Illness savings estimates include disease-specific direct treatment costs and lost productivity costs.

OSU researchers adapted the TO Estimator by integrating outdoor recreation participation data by urban/rural status from the 2017 Oregon Resident Outdoor Recreation Survey conducted as part of Oregon's 2019-2023 Statewide Comprehensive Outdoor Recreation Plan (SCORP). Outdoor recreation activities' levels of physical intensity were measured using the Ainsworth Compendium, a collection of energy expenditures for numerous types of activities measured as Metabolic Equivalent Tasks (or METs).

The Outdoor Recreation Health Impacts Estimator tool for Oregon enables estimation of Cost of Illness savings by 31 different outdoor recreation activities at the county level. To estimate values for the OSU Research Forests users, the Benton County participation rates were adjusted to reflect the forest user population.

to health insurers, providers, and outdoor recreation participants.

The Metabolic Equivalent Tasks values, or MET-values, in the Outdoor Recreation Health Impacts Estimator tool were modified to better fit the topography and intensity of physical activities associated with the OSU Research Forests. Conservative MET-values were ascribed in the tool for use in deriving statewide Cost of Illness savings estimates, and are therefore not necessarily reflective of physical activity intensities on the OSU Research Forest. The typical user on the OSU Research Forests has a skill level that is intermediate or higher, in particular for trail running/jogging and mountain biking. The trail systems are dirt or gravel, and challenging in their slope and elevation changes throughout the forest. The corresponding MET-values used in the Outdoor Recreation Estimator tool reflect these differences in skill level and intensity of activity participation in OSU Research Forests relative to baseline MET-values used in the Oregon SCORP analysis.

OSU Research Forests' contributions to healthy people

Total recreation visits to OSU McDonald-Dunn Research Forests in 2017 are estimated to result in \$754,395 in Cost of Illness savings, or health benefits, associated with eight chronic illnesses, which are 14% of the total health benefits estimated for Benton County (\$5.4 million). The breakout by activity type is \$278,421 for walking/hiking, \$82,951 for dog walking, \$199,582 for trail



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The McDonald and Dunn Forests are popular with long-distance trail runners and people training for ultra-marathons. Sixteen percent of forest visitors list running or jogging as their primary activity.

running/jogging, \$190,769 for mountain biking, and \$2,671 for horseback riding. These estimates are conservative and underestimate the total health benefits derived from physical activity because they do not include other physical activities engaged in by these individuals or the impacts of physical activity on other illnesses/diseases or mortality, and are based on the use of conservative modeling assumptions.

Parks and recreation providers have an important role in the health and wellbeing of Oregonians by providing places for people to be physically active through outdoor recreation activities. The statewide health benefits estimate is \$1.42 billion per year, which is about 4% of total health care expenditures in the state, and about 17% of expenditures in treating cardiovascular diseases, cancers, diabetes, and depression. Estimates of the

health benefits associated with outdoor recreation may be compared to the costs of providing recreation opportunities on public and private forests, and demonstrating the broad community and social returns on these investments. Investments in recreation opportunities and infrastructure are investments in building social well-being. ♦

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OSU Research Forests contribute nearly 25% of Benton County's health benefits derived through mountain biking.

To Learn More

For more information on the studies behind this article, see the following reports:

OSU Research Forest Health Benefits report: <https://bit.ly/2ZsX4zT>

Statewide Health Benefits Report: <https://bit.ly/2vg1FYk>

2018 OSU Forest Recreation Survey report: <https://bit.ly/2DqfBmT>

2019-2023 Oregon Statewide Comprehensive Outdoor Recreation Plan report: <https://bit.ly/2u9e6Fp>