



# The Environmental Orienteering Handbook



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# Why orienteer?

*“A smooth sea never made a good mariner.”*

*- English Proverb*

Orienteering is a managed event in which participants navigate through a natural area to checkpoints (called controls), using only a compass and a map with a course marked on it. After the event is over, the controls are removed.

At its core, the sport of orienteering is about building excellent backwoods navigators—outdoor enthusiasts with nothing more than a map and compass who are comfortable interpreting natural features and landmarks for fast, accurate navigation. It’s a full-immersion experience that builds a true appreciation of the beauty and value of our natural resources. And backwoods navigation is a critical skill. If someone gets lost in the woods, an orienteer is far more likely to be the competent rescuer than the lost individual needing assistance.

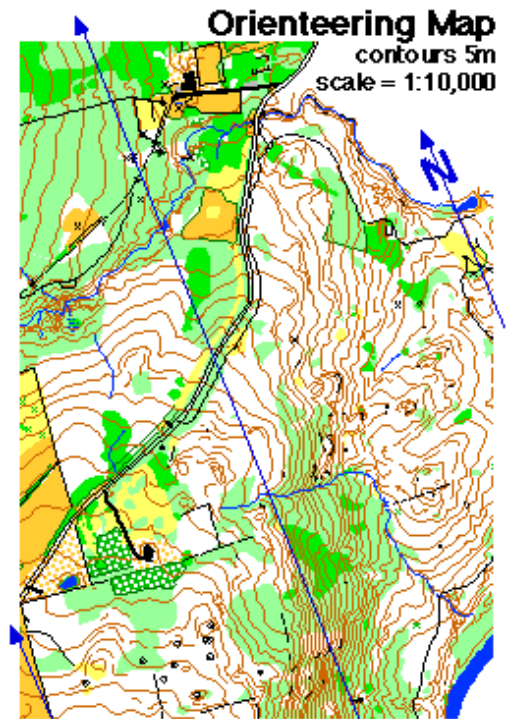
The skill of backwoods navigation is not built overnight. It must be nurtured, one lesson at a time, through increasingly complex route-selection challenges. Orienteers often start on trails in city parks, progress to mostly on trails in parks with fewer man-made features, then advance to expert courses in which the occasional trail is just another mapped linear feature.

Orienteering meets provide this graduated training, with recreational and competitive courses ranging from beginner to expert at participating parks. Often, small groups of individuals, such as families or scouts will participate in beginner or intermediate



courses together. Student leagues are a big part of this. Students who start as beginners in primary or middle school are often running expert courses by high school, competing in the national Interscholastics championship meet on behalf of their school or local orienteering club. These are active, environmentally-aware youth.

Whether your idea of a good day orienteering is a perceptive stroll through your local park or a high-speed challenge against similarly adept backwoods navigators, the sport has something for every outdoor enthusiast.



# The environmental impact of orienteering

*“Take only memories. Leave nothing but footprints.”*

- Chief Seattle

Through the seasons and years of natural processes, natural areas are in state of constant change. But the largest factor driving change is often human activity, through activities that increase erosion, invasive species, littering, and loss of habitat. It is essential that the relative impact and overall impact of human activities in parks are periodically assessed from a factual basis, with restrictions applied proportionately to the impact on the park.

Numerous studies in England, Australia, Denmark, Canada, and other countries with a high participation in orienteering conclude that orienteering has the lowest environmental impact of studied activities. No comparative study exists yet at an American park, but with American parks averaging one or two meets per each year instead of six for the UK study, environmental impact is expected to be even less.

## Comparative impact of twelve UK park activities<sup>1</sup>

	1	2	3	4	5	6	7	8	9	10	11	12
Activity	Rambling	Bird watching	Letter-boxing	Riding to hounds	Pony trekking	Beagling	Hashing	Rock climbing	Mountain marathon	Mountain biking	Hang-gliding	Orienteering
Formal/informal	Informal	Informal	Informal	Informal	Informal	Informal	Informal	Informal	Formal	Informal	Informal	Formal
Frequency	Daily	Daily	Daily	200 / year	Daily	10 / year	40 / year	Daily	Annual	Daily	Daily	6 / year
National Park control	None	None	Some	None	Some	None	Some	None	Some	Some	Some	Strict
Density	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Dispersed	Conc'd	Conc'd	Dispersed	Conc'd	Conc'd	Dispersed
Day visits	1,600,000	800,000	560,000	4000	16,000	125	1200	9000	7200	15,000	1000	800
Proportion off-track	25%	25%	100%	100%	25%	100%	100%	10%	100%	10%	10%	100%
Number off-track	400,000	200,000	560,000	4000	4000	125	1200	900	7200	1500	100	800
Duration hours	4	4	4	4	4	3	1	3	30	4	1	1
Total off-track hours	1,600,000	800,000	2,240,000	16,000	16000	375	1200	2700	216,000	6000	100	800
Ecological impact	Low	Low	Moderate	High	High	Moderate	Low	Low	High	Low	Low	Low
Erosion off-track	Low	Low	Moderate	High	High	Low	Low	Moderate	Low	Low	Low	Low
Wilderness intrusion	Moderate	Low	Moderate	Moderate	Low	Low	Nil	Low	High	Nil	Nil	Nil
Visual intrusion	Moderate	Low	Moderate	High	Moderate	Moderate	Moderate	Low	High	Moderate	Moderate	Low
Aural intrusion	Moderate	Low	Moderate	High	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low
Overall intrusiveness	Moderate	Low	Moderate	High	Moderate	Moderate	Moderate	Low	High	Moderate	Moderate	Low

At first glance, the conclusion of low impact is counterintuitive, because orienteers spend much of their time off-trail, but there are at least five organizational reasons why the impact is less than might be expected by a casual observer:

1. **Park manager input.** Before a course is set, the course setter meets with the local land manager to determine sensitive areas that must be marked out-of-bounds for environmental reasons and other areas more suitable for off-trail navigation.

<sup>1</sup> From the UK Dartmoor study. For a listing of this and other environmental studies, see Appendix B.

2. **Temporary objectives.** In most cases, all navigational objectives (controls) are placed in the morning and retrieved the same afternoon, eliminating any chance of long-term foot traffic.
3. **Route splitting.** Total participants in an event are divided among up to seven different courses. Within each course, participants select individual routes to the various controls, significantly reducing the likelihood of repeat foot traffic between controls even during the event.
4. **Informed participants.** Every participant carries and uses a detailed map of the park, including all out-of-bounds areas. Orienteers observed in restricted areas are automatically disqualified.
5. **Infrequent use.** Each park and natural area is used at most twice a year, and typically less than once per year.

Together, these make orienteering a uniquely low-impact sport. And yet, the overall impact is greater than zero. Individuals selecting the most efficient route through a forest may gravitate toward an existing social trail, if it goes the right direction. Ground coverage trampling near some controls can occasionally be visible up to two weeks later, so control placement is critical. And main trails that start out muddy can become far muddier if a lot of participants run through them on overlapping courses.

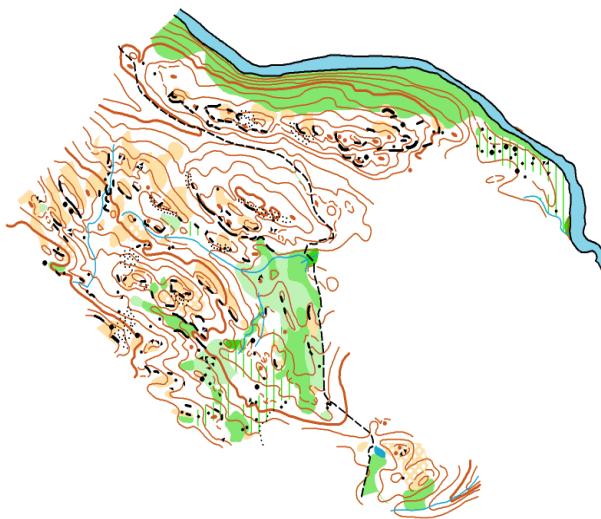
Even if this level of impact once a year is a concern, there are ways to offset this short-term impact with longer-term benefits of this managed off-trail activity in your park.

# Why host orienteering in your park?

*“The greatest discoveries have come from people who have looked at a standard situation and seen it differently.”*

*- Ira Irwin*

Orienteers are master observers of the natural environment. For every meet area mapped to orienteering standards, there is at least one expert mapper who has traversed the entire area, identifying all the notable features as small as individual boulders or rootstocks over several square kilometers. This detailed map is typically an investment in the park that the local orienteering club makes free of charge to the local land manager in exchange for an expectation of some level of future use, typically yearly. Orienteering meets pay back the map creation costs over time, with feedback from those meets helping to keep the map updated and accurate.



On the day of a meet, every participant also gets intimately familiar with a portion of that mapped area, identifying features specific to that individual's route selections along his or her course. A day of off-trail authorization once a year can therefore deliver significant benefits for land owners. These benefits differ based on the type of natural area.



*Orienteering in a big natural area can uncover unauthorized trails and unknown activity deep in the park.*

**County and state parks.** At a time of tight budgets, smaller grounds crews, and less ability to patrol a large park, land managers often ask orienteering clubs to help identify areas of misuse of the park, including rogue trails from ATVs, hunting camps, dumping sites, and other dangers to the park. Few activities can escape the notice of an entire orienteering meet.

This awareness isn't limited to human activity. For one day, the entire park can get checked for whatever is specified by the land manager, including trail access and overgrowth, storm damage and erosion, and previously unknown locations of common invasive species deep in the park.

**City parks.** Typically smaller, with more foot traffic, city parks are more sensitive to off-trail damage and more littered with trash. Volunteers are useful, but even the best volunteers are unlikely to identify the bottles and cans tossed off-trail or carried into remote areas of the park by partiers and dumped. In this case, the value of orienteers isn't about identification of rogue activity, but doing something about it.

Generally, picking up trash isn't part of an orienteering event. But each event does have volunteers who retrieve the controls from all over the park, as well as recreational participants who are less interested in speed and might be amenable to can-and-bottle pickup with the right incentives and equipment. Some cooperative brainstorming between the land manager and the course setter about the conditions for the event can result in an overnight improvement in the natural condition of the park.

Alternatively, some city parks may prefer to have events mostly or entirely on-trail and grassy areas. While this level of challenge is insufficient for expert or even advanced navigation courses, such an event can provide an opportunity to increase the number of beginners in this sport while increasing the number of paying visitors to the park in a safe, managed way. Even for parks that are free to visitors, this is a way to promote and monetize attendance for the benefit of the park.

**Wilderness areas.** Designated wilderness areas, as defined by the Wilderness Act of 1964, contain unique concentrations of flora and fauna, often endangered, that are significantly impacted by any group activity, including orienteering. These are areas for preservation, not conservation, and orienteering as a competitive sport is not recommended here, although the backwoods navigational skills developed from the sport are most valuable in this remote environment.

**TRAVEL: The unappreciated environmental factor.**

One of the most significant negative impacts of orienteering is the travel to and from often distant events. The environmental impact of car and plane usage is well-documented, ranging from air pollution to CO<sub>2</sub> emissions to copper in runoff water from brake pad wear.

Carpooling can help mitigate this problem, and is an issue for local orienteering communities to work out among themselves.

Equally important is the ability to schedule high-caliber local meets. Putting heavy restrictions around local park use increases the transportation load on the environment as entire groups of orienteering enthusiasts must travel longer distances to get the backwoods navigational training and experiences that are needed for competence in this activity.

In some cases, off-trail restrictions in urban parks may have a sound scientific basis, such as protecting delicate species populations or new replanting efforts. In other cases, when off-trail restrictions are simply to appease the non-scientific concerns of a vocal minority, the decision may have a net negative impact by increasing environmentally harmful travel without saving any specific attributes of the park.

Part of a land manager's job needs to be making informed, thoughtful, and objective tradeoff decisions about known activities and repercussions. An open decision process is critical.

# Orienteering club responsibilities

*"If your actions inspire others to dream more, learn more, do more and become more, you are a leader."*

*- John Quincy Adams*

In most venues, orienteers enjoy the privilege of going off-trail. That privilege must be earned and continuously re-earned through proper management of and participation in orienteering events. Environmental leadership inspires confidence, trust, and respect for the sport as a low-impact activity. In particular, these responsibilities apply:

**Club leadership.** Club leadership sets the tone for orienteering in the area, and it needs to be one of open, responsible honesty about the activities in the park. Do not run a “stealth” event or wait until after an event is promoted or in-progress before telling land managers about what it entails. Make sure land managers know exactly what type of activity will be occurring in their park, and address any concerns early that they may have about the size or nature of the event. This builds trust.

If off-trail use is prohibited in a park, and no benefits of off-trail use are of interest to that land manager, then either (1) limit the scope of the event to those restrictions for a more beginner focus or (2) take the event, its participants, and its resulting park revenue to another park that is easier to work with.

Finally, USOF environmental principles require that no damage from a meet be visible three months later. Visit the most heavily used control locations within 90 days after a meet to verify compliance.

**Land permission coordinator.** Maintain an updated contact listing of all land managers with responsibility for the club’s venues and the known, specific concerns at each park.

**Course setter.** Initiate a discussion with the local land manager about the upcoming course and get updated input about any concerns, park condition changes, or restoration projects planned. Set courses that incorporate this information, following these environmental principles as always:

- Avoid sending orienteers across generally accepted damaging routes, such as steep muddy or sandy slopes, areas with significant erosion potential, or marshy or other areas that will result in long-term damage.
- Do not place controls so that the fastest, most efficient route is through a known sensitive area.
- If a route has to go through a potentially sensitive area anyway, such as a main trail with switchbacks, mark the participant restrictions clearly on the map.
- Avoid “dog leg” routes that send each orienteer over the same ground twice.
- Check the number of orienteers on each course and going to each control, splitting load as much as possible.
- Place heavily-used controls in environmentally stable locations that can withstand a few hours of trampling.

- If any additional restrictions apply, such as on-trail requirements in specific parks, mark them clearly on the map.

**Meet director.** Make sure that any appropriate signage about restrictions is clearly visible. Collect any observations that participants have made about inappropriate use of the park, out-of-bounds activity, or condition of the park. Respond quickly to any violations of out-of-bounds rules. Ensure that the meet area is cleaner after the event than before. Finally, check in with the land manager after the event to identify any concerns from that may have arisen during the event. If they exist, share with the club leadership for follow-up.

**Participants.** All participants, whether or not they are members of the club hosting the event, need to remember that they are representatives of the sport of orienteering. Actions matter. Adhere to the restrictions on the map, even if you feel that no one is watching. If you see someone in an out-of-bounds area, report that individual to the meet director. Similarly, report to the meet director if you observe items or activities that should not be in the park, such as hunting or homeless camps, dumping or heavy littering areas, illegal logging, or creation of unauthorized trails or roads.

Just as a misplaced control might cause you to express concern, you should also be concerned with observed environmental damage of any type, even by rule-abiding orienteers on a course with design problems, and the meet director needs to know as soon as possible to mitigate the effects.

Route selections during the event should generally be restricted by the course setter to a choice between environmentally acceptable options. This does not mean that all options are good options, but the faster options tend to be more environmentally friendly:

- Hard ground is generally faster and leaves shallower footprints than soft ground
- Running through light green or white is generally faster, less disruptive, and less painful than attempting to run through dark green. (If you see an orienteer deliberately breaking branches to follow a route, report this behavior to the meet director).
- Running along a contour is generally more efficient and less environmentally damaging than attempting to scramble directly up a steep slope.

A simple and fun way to lessen your environmental impact is to carpool with others in the club. You'll have less pollution per person, make more friends, and enjoy the sport more. In fact, if your club doesn't have an easy way to make spontaneous carpooling happen, help the club make it a priority.

Finally, it goes without saying that no self-respecting orienteer would leave trash in the park. But you will likely see bottles and cans in the park from other groups of users. If it's convenient during your race, and particularly if you're orienteering recreationally at a walking speed, moving trash from deep woods to the nearest trail helps the park grounds crew clean up the park. Depending upon the agreement with the park staff, some meets may even have special collection bags for recreational orienteers to carry out others' trash during the course, further adding to the park value of an orienteering meet.



# Land manager responsibilities

*"The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired, in value."*

*- Theodore Roosevelt*

Paradoxically, the president who started our national parks system for the preservation of our great wilderness areas was also a hunter who believed in experiencing nature first-hand. This trade-off between protection and immersion exists today in every park and wilderness area.

From crew chiefs to parks department superintendents, anyone involved in the stewardship of a natural resource needs to consider value from a long-term sustainability perspective. Clearly, there is value in restricting access so that resources are not degraded by overuse. There is also value in exposing the beauty of natural areas to new generations of outdoor enthusiasts and advocates who know first-hand what is lost when a natural area starts to lose its natural splendor that made it worthy of preservation.

Orienteering, as a sport, is set up to interface directly with land managers to mitigate the negative impact of its participants. But that mitigation is only as good as the early communication between you and the course setter and meet director who are planning the meet. Important discussions include:

- What areas are environmentally sensitive, such as breeding areas and delicate foliage, and should be marked out-of-bounds to all courses?
- What areas are environmentally resilient, such as fast-growing native plants and areas of light undergrowth and stable soil, and can handle a few hours of individual off-trail use for advanced and expert courses?
- What areas, such as trails and grassy areas, are rugged enough to handle repeat foot traffic and common checkpoints (controls) across different courses for a few hours?
- In what ways can a few hours of off-trail usage improve the value of your land?

The first three discussion topics are self-explanatory and help create effective courses that blend into your land in an environmentally friendly way. The land manager benefits of off-trail usage are described in detail in the section *Why host orienteering in your park?*, and range from monitoring and discovery to outright clean-up. As the owner of park priorities, you are in the best position to initiate this discussion.

## **Pre-event communication**

Pre-event communication with the course setter and meet director is important. Equally important is communication with local "friends of the park" groups who are often responsible for the creation and maintaining of trails. They need to know of the duration of the meet, any restrictions or conditions

placed upon the event, and the fact that it won't be back for at least another year. An orienteering meet can even be a great way for trail volunteers to see how well they know their own park.

This communication is essential for setting expectations. People who devote their volunteer time to the important work of phasing out social trails and keeping the general public on the main trails can understandably be alarmed when they see dozens of people off-trail in a single morning. But once they understand the environmental preparation that goes into an orienteering meet, its short duration, and the infrequency of individual park use—all contributing to sustainability—they are typically less likely to send alarmist warnings about the meet.

Any remaining concerns are likely fact-based and important to address quickly, by putting any concerned individuals in touch with the meet director.

### **Post-event follow-up**

National orienteering environmental principles require that no plant or soil disruption be visible anywhere after three months, but many clubs follow a much stricter rule, looking for any signs of damage two weeks later. This is most likely to be seen at heavily-used controls and in the registration, start, and finish areas. Studies have found most damage to occur in the parking area if parking on grass. A joint follow-up tour of the park between orienteering representatives and park representatives two weeks after the event can be very useful, particularly in environmentally sensitive parks.

The end result of this effort should be the selected use of an outdoor immersion activity that is environmentally neutral to slightly positive, while introducing the connections that the community feels to the resource you manage. This increases its value for future generations—the definition of good environmental stewardship.

# Appendix A: National and International Standards

More than a decade ago, the International Orienteering Federation (IOF) adopted the following resolution on good environmental practices to ensure that orienteering remains a low-impact and sustainable use of natural areas:

- To continue to be aware of the need to preserve a healthy environment and to integrate this principle into the fundamental conduct of orienteering.
- To ensure that the rules of competition and best practice in the organisation of events are consistent with the principle of respect for the environment and the protection of flora and fauna.
- To cooperate with landowners, government authorities and environmental organisations so that best practice may be defined.
- To take particular care to observe local regulations for environmental protection, to maintain the litter-free nature of orienteering and to take proper measures to avoid pollution.
- To include environmental good practice in the education and training of orienteers and officials.
- To heighten the national federations' awareness of worldwide environmental problems so that they may adopt, apply and popularise principles to safeguard orienteering's sensitive use of the countryside.
- to recommend that the national federations prepare environmental good practice guidelines specific to their own countries

Council of the IOF, April 14, 1996<sup>1</sup>

In the United States, this environmental stewardship has been further clarified in US Orienteering Federation environmental standards, which state, in part:

The U.S. Orienteering Federation upholds the following environmental standards for all orienteering events conducted by its member clubs:

- Orienteering shall operate within all legal environmental standards, and also within any framework agreed upon with land managers.
- No long-term damage to animals, plants, landscape or archaeological features shall result from an orienteering event.
- Any temporary damage, such as plant trampling, should no longer be discernable after 3 months of a growing season.
- No litter, equipment or extraneous material shall remain once a venue has been vacated.
- Where a venue contains vegetation, wildlife, or features of special sensitivity, event organizers shall cooperate with land managers to provide special protection.

USOF board of Directors, August 18th, 2006<sup>2</sup>

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<sup>1</sup> <http://www.orienteering.asn.au/environment/science/>

<sup>2</sup> <http://www.us.orienteering.org/>

# Appendix B: Environmental Studies

These studies of different aspects of orienteering on three continents offer insight into the true environmental impact of orienteering and what to manage for maximum sustainability.

- [Dartmoor](#). Comparison of the environmental impact of orienteering and other off-track recreations in the Dartmoor National Park, UK.
- [Titterstone Clee](#). A study into the effect of an orienteering event on breeding wheatear (*Oenanthe oenanthe*) at Titterstone Clee, Shropshire, UK.
- [Namadgi National Park](#). A study on the impact of the 2007 Oceania Championships in the Namadgi National Park.
- [Bow Valley](#). A study on the impact on ground perennials of a major orienteering meet in the Bow Valley national forest in Alberta.
- [Julimar Forest](#). A brief study examining the vegetation impact of an orienteering event in Western Australia, as published in the OAWA newsletter.
- [Western Australia](#). A brief study of the impact of orienteering on lichen-covered granite rocks. Published in the Conservation and Land Management Newsletter, 1988.