

# Assessing the Impacts of an Orienteering Competition at Bow Valley Wildland Park, Alberta, Canada, from 2002 to 2005

A report prepared for the

**Alberta Orienteering Association**



By  
Angeles Mendoza  
2102, 12 Avenue NW  
Calgary, Alberta, T2N 4X1  
E-mail: [angeles@angelesmendoza.com](mailto:angeles@angelesmendoza.com)  
September 20, 2008

# GLOSSARY

**AOA** – Alberta Orienteering Association.

**APOC** – Asia Pacific Orienteering Championships.

**Assessment** - each one of the visits conducted to determine the condition of the plots after the competition.

**BVWP** – Bow Valley Wildland Park.

**Control** - orienteering flag to be visited by competitors.

**Herbs** - the layer of live vegetation closest to the surface of the soil.

**Impact** – Impact and effect are used as synonyms. This study focused on the impacts to the vegetation and soil within the 40 plots.

**Perennials** – In this study, this refers to the perennial shrubs in BVWP, namely juniper and bearberry.

**Plot** - any of the 4 x 4 m areas used to assess the impacts of the competition, with or without a control inside its perimeter.

**Plot, competition (c)** - the 4 x 4 m area, used for the study, that had the control at the centre and which the competitors would cross to reach the control.

**Plot, non-competition (nc)** - the 4 x 4 m area located adjacent or near the competition plot with which it was paired. The non-competition plot was used as a reference.

**Site** - a pair of plots, consisting of a competition plot and its corresponding non-competition plot. Each site was identified by the number assigned to the control (placed in the centre of its competition plot) used in the competition. There were 20 sites in the study, each with 2 plots: one competition plot and one non-competition plot.

**Staging Area** - the area where the competition organizers set up parking, toilets, tents/tables for registration, inquiries, finish officials, results tabulation, volunteer services and concessions. For APOC 2002, the staging area included the actual finish line and finish chutes funnelling runners into the finish line, but not the start locations.

# EXECUTIVE SUMMARY

The Alberta Orienteering Association (AOA) held the 2002 Asia Pacific Orienteering Championship (APOC 2002) at the Bow Valley Wildland Park (BVWP) on July 7 and 8, 2002. APOC 2002 was one of the largest orienteering events to have ever been held in Alberta.

AOA took this opportunity to conduct an environmental assessment to:

- o determine the impacts on the vegetation resulting from a major orienteering event and to better understand the susceptibility to disturbance of different areas of the BVWP;
- o gain information to support future applications for orienteering events in both the Bow Valley region and elsewhere; and
- o provide organizers of orienteering events with data to help plan and design future orienteering courses, place controls, and select staging areas.

This is the first comprehensive multi-year study to evaluate the impacts of orienteering in the montane eco-region of North America and it complements studies carried out in Northern Europe in different bio-geographical terrain

The total number of competitors was 1313, consisting of 793 on Day 1 and 520 on Day 2. Both days used the same orienteering map, but the competition area of Day 1 only partially overlapped with that of Day 2. Twenty of seventy-six control locations were chosen based on three main criteria: vegetation cover (pine, pine/aspen, open grassland, meadow), landform (slope, depression, hill, spur), and expected number of competitors visiting the site. Each site consisted of a pair of 4 x 4 m plots marked on the terrain. The competition plot (c) had the orienteering flag (control) as its centre and was used to determine the impacts of the competition. The corresponding non-competition plot (nc) was adjacent or nearby and in conditions as similar as possible (e.g. vegetation and slope). This plot was used for comparison. The composition and state of the vegetation of all c and nc plots was recorded. The 4 x 4 m plots were used to determine shrub and tree species. At the centre of the plots, a 1 x 1 m square was used to determine the herbs and non-vascular plant species (e.g. mosses). The orienteering flag was located at the centre of the 1 x 1 m square on the c plots. A total of seventy-nine species was recorded. None of the species was among the rare plants reported by the Alberta Natural Heritage Center.

Based on the previous studies conducted in Europe, the possible impacts expected ranged from very light, with recovery over a few weeks, to moderate, with recovery over one or more growing seasons. In fact, the impacts of the APOC 2002 at BVWP changed over the three years of the study (2002-2005). This highlights the need to conduct multi-year assessments to follow vegetation recovery and provide a more objective evaluation of the significance of impacts over both short and long term.

Right after the competition, the impacts were categorized as negligible. There was no apparent damage except for bent vegetation along paths followed by competitors. Two months after the competition, the impacts were categorized as significant. Trampling had caused removal of bark on some branches. Affected branches showed foliage decay. The resulting visual impact was categorized as significant and was evident on the c plots and some of the routes used by competitors to go from one control to another.

After the APOC 2002 competition, the area was not used again by AOA and the vegetation had time to recover. The various types of vegetation covering the soil showed different recovery times. The grass suffered short-term impacts which were vanishing after eleven months (2003). Some perennial shrubs (juniper and bearberry) suffered middle-term impacts and took longer to recover. During the second year (2004), the damage that the perennial shrubs suffered on the bark and foliage suggested that the impact would be irreversible. At this time the visual impact was still significant. The dead branches and foliage left bare patches of soil. However, by the third year (2005), there was no evidence that the competition had affected the area. The visual impact from the competition blended with the natural disturbance and the bare patches were being filled with herbs and grass. In addition, some branches of juniper presumed dead actually recovered from the loss of bark and grew new foliage. On close examination, however, other branches were still showing the damage associated with the competition.

Initially, the semi-aquatic and aquatic vegetation on sites by the shore of ponds was considered very fragile. However, it had minimum damage after the competition and by the first year these sites were close to their pre-competition state. The perennial shrubs, mainly juniper and bearberry, were initially considered very resilient. However, these shrubs were the most susceptible to trampling. Overall, the impacts were mainly visual and the general composition of the vegetation in the survey plots did not change. No impacts were observed on rare plants or aquatic environments.

The results provided valuable information for planning and designing future events. The following are some of the recommendations for orienteering events in general:

- o In cooperation with land managers, identify –and if possible map- spots or elements that should be protected not only by orienteers but also by other users.
- o Consider the susceptibility of the different types of vegetation when choosing control sites and designing orienteering courses.
- o Keep records of the characteristics and use of control sites to alternate them among different events, thus allowing for vegetation recovery.
- o Place controls in a way that avoids locations with susceptible vegetation or other elements needing protection.
- o When needing to isolate small areas to protect fragile elements, place barriers high enough to restrict transit.

- o Identify and record the location of fragile areas or elements (e.g. rare plants). Consider indicating them as out-of-bounds area on course maps if they are large enough.

The following are some of the recommendations specific to BVWP:

- o Consider including orienteering in the list of acceptable recreational activities in the management plans of protected areas in the Bow Valley.
- o Consider permitting orienteering events of similar magnitude to APOC 2002 in the BVWP while allowing the following minimum recovery times before using the same control sites: one year for sites with aquatic/semi-aquatic vegetation, two years for sites with grass, and three years for sites with perennial shrubs.
- o Evaluate the cumulative impacts that the various recreational activities have on the BVWP.
- o Communicate to all users the sensitivity to disturbance of the different types of vegetation and educate them regarding ways to minimize impacts.
- o Conduct more extensive surveys or inventories of rare plants and other rare elements within the BVWP.

This study concludes that the impacts of APOC 2002 on the BVWP are negligible in the long term, in spite of having been mildly significant in the short term. The impacts were mitigated naturally, localized, and fully reversible. However, it should be emphasized that the vegetation recovery time was a key factor. There should be enough time left for the vegetation to recover before the same sites (for controls, start and finish) are used in another event of similar magnitude.