

Lake O'Hara

Trails Assessment and Plan 2023 - 2027

Prepared by: The Lake O'Hara Trails Club
January 2023

Table of Contents

Introduction.....	2
Strategic Priorities/New Challenges	2
Highlights of 2018 - 2022	4
Trails Program 2023 - 2027	6
• Goals.....	6
• Annual Trail Clearing.....	8
• Trail Work Project List.....	8
• Trail Work Map.....	13
• Funding.....	14
Visitor Information, Education, and Management.....	14
• Trail signs	15
• Trail etiquette messages.....	15
Trail Plan Implementation, Monitoring, and Reporting.....	16
Proposed Year 1 Work Plan.....	17
Best Practices Trail Manual – The How-To’s.....	18

LAKE O'HARA TRAILS PLAN 2023 - 2027

Introduction

The Lake O'Hara Trails Club (LOTC) is a non-profit organization with the mission to inspire and facilitate the stewardship of the Lake O'Hara area's trail system, as well as the appreciation of the area's cultural and natural history. One of the Club's main activities is to fund an annual trail work program for Lake O'Hara, through a formal agreement with Parks Canada. With the expiry of the current Memorandum of Agreement on October 30, 2022, this updated Trails Assessment and Plan outlines updated goals, a trail work program and priorities for the upcoming five-year period (2023-2027). It is intended to serve as the basis for a renewed LOTC-Parks Canada agreement covering this time period, and as a reference for implementing and monitoring the agreed-to trail work.

This report was prepared by the Trails Committee of the LOTC, with input from Parks Canada staff (most notably O'Hara trail crew foreman Steve Bertollo and 2022 crew person Megan Burns). The program outlined for the next five years does not propose any major trail construction projects. Rather, it concentrates on improvements to address recurring challenges at Lake O'Hara and implementing trail repair and maintenance practices that are best suited to the area's terrain and use patterns.

Strategic Priorities/New Challenges

Through its attention to best practices in correcting and mitigating trail impacts (Best Practices Trail Manual, p.17), and suggestions for improvements in information dissemination (Visitor Education, p. 14), this Trail Plan is designed to address the following issues. Some of the issues have been addressed in the last few years, most notably through the establishment of a Parks Canada "greeter" position funded by LOTC.

- 1) Increase in walk-in day users: Lake O'Hara has seen a 19% increase in the average yearly count of walk-in day users over the last five years (average 2620 per year 2018-2022 compared to average 2207 per year 2013-2017). This represents those who choose to walk up the road, due to the limited quota and difficulty of "winning" the bus reservation lottery. The LOTC continues to support the daily quota set by Parks Canada, and thus supports any Parks initiatives to maintain it.
- 2) Increased trail impact, especially on Opabin Prospect and Opabin Plateau. Social media is a powerful motivator of hikers' goals; these specific locations often identified in social media are experiencing high impact.
- 3) Trail etiquette issues: increased inappropriate latrine locations, tissue litter, and even graffiti. LOTC supports all Parks initiatives to improve hiker compliance with minimum impact trail techniques. See Visitor Education (p.14) for how the development of a "greeter" position funded by LOTC has significantly helped educate hikers about trail etiquette.

- 4) Increased use of packed-in watercraft: if this trend continues, there may be environmental impacts on sensitive ground cover at desirable launching sites on Lake O'Hara. Monitoring this trend and developing mitigation strategies will be key during this 5-year plan.
- 5) Wayfinding: Replacing old trail signs with the new Parks Canada standard is a high priority for LOTC.



Old sign



New signage standard

- 6) Interpretive media: Old (and some damaged) interpretive signs are in need of modernizing. LOTC supports Parks' development of upgraded interpretive signage at Lake O'Hara.



Damaged sign near Elizabeth Parker Hut.

Highlights of 2018 - 2022

This five-year period saw the completion of most of the work items outlined in the plan. Outstanding items are listed at the end of this section and are included in the Trail Work Project List (p.8). One new proposed project that was not in the previous plan (re-opening of the Cataract Brook Trail) was withdrawn following a more detailed assessment (details below). Regular trail clearing and maintenance remains a big part of the crew's duties, especially in years with major events such as late-lying winter snow accumulations, large spring avalanches, rockfall, high water levels and flooding, and wind events causing tree blowdown. There were several of these events over the past five years.

Highlights from 2018 - 2022 include:

- New trail mix: LOTC Board researched and procured a supply of good quality trail mix with the correct proportions of gravel and clay, essential for creating a durable and long-lasting trail surface. The 2500 tonnes of trail mix was purchased from Lafarge Calgary and is stored at the Km 5 widening on the access road.
- "Best practices" workshop: LOTC Board set up a practical onsite workshop for the trail crew, led by trail expert Don Gardner (contributing author of the 2018 – 2022 Trail Plan). Various maintenance techniques were reviewed. Additional planned workshops were unfortunately unable to be completed due to Mr. Gardner's health challenges.
- Seven Veils Falls Viewpoint: New stone steps installed around the final switchback to the viewpoint.
- McArthur Lake Trail: Installed a stone culvert to solve a drainage problem.
- Volunteer workbee, 2019: 10 volunteers and additional trail crew spread 10 tonnes of new trail mix on prepared sections of the Lakeshore Trail to cover rooty sections. Low (6") retaining walls were built along the trail to contain the trail mix prior to the workbee.
- Lakeshore Trail: 2020 spring avalanches caused washouts in the two gullies between the Wiwaxy and Oesa junctions, requiring new stepping stones and rock culverts as well as repairs to the retaining walls as described above.
- Lake Oesa Trail: Heavy snow and rain in spring of 2020 caused a major rockslide near Victoria Lake on the Oesa Trail. Using some of the fallen boulders as steps, trail crew built a beautiful staircase through the rockslide. A 70-meter section of braided and eroded wet trail near the upper end of the Oesa trail was repaired with 28 new steps.
- All Souls Prospect: Built 7 new steps and improved trail definition on the steeper section of the west approach, and rebuilt a section of the 2014 re-route on the east approach, including a new stairway of five large rock steps.
- Huber Ledges Alpine Route: Major improvements were accomplished at the steep section near Wiwaxy Gap, including improved trail definition, and some new steps and waterbars installed for erosion control. "Speedbumps" (rock steps at 10 – 15 ft intervals) installed as "rest stops" for descending hikers. A cliffy section was rebuilt for improved route definition. Painted graffiti (first occurrence at O'Hara) on a quartzite wall adjacent to the trail was removed.

- Schaeffer Lake Trail: Eroded section resurfaced with 5000 lbs of trail mix; new bridge installed over the creek.
- Linda Lake Trail: Filled in an eroded section of trail with 3500 lbs of trail mix.
- Opabin Plateau: Improved trail definition on braided sections, with major step-building and measures to keep hikers on the Opabin East trail heading toward Opabin Lake. New natural “handrail” installed to keep hikers on route at the split rock near Opabin Prospect.
- West Opabin: 29 new stone steps installed between All Souls and Opabin Prospect junctions for improved trail definition and drainage.
- Yukness: Rehabbed an eroded section and installed four new steps.
- Cataract Brook Trail (new initiative not in the plan): LOTC was interested in the possibility of re-opening this trail as an alternative for hikers who choose to walk the road. LOTC board members and Parks Canada Land Use Specialist for LLYK Field Unit Todd Keith walked the trail in 2021. It was decided not to re-open the trail in order to maintain low human use on the west side of Cataract Brook drainage to allow for wildlife movement through this important corridor.

Outstanding issues from the 2017 – 2022 plan to be addressed in this trail plan

1. Side slope migration on Upper Big Larches trail (pg. 8 from previous plan).
2. Trail proliferation at Lake McArthur (pg. 10): Identify which trails should be formalized and which should be blocked off and/or rehabilitated, taking into account visitor preferences (popular lunch and photos spots) along with environmental and visual impacts. Install low-key signs to inform visitors that certain trails are closed for rehabilitation.
3. Opabin Plateau timber staircase (pg.15): Ensure the step boxes are filled with appropriate trail mix, crowned for proper drainage, and the timber frames are in good repair.
4. Seven Veils Falls bridge (pg.15): replace railing.

TRAILS PROGRAM 2023 - 2027

Overall Goals

1. *Make the Lake O'Hara trail network a model for best practices in trail construction and maintenance.*

The Lake O'Hara area is in a unique position to be a leader in demonstrating best practices because:

- Unlike most of the backcountry, the Lake O'Hara area benefits from adequate trail funding and attention due to the on-going LOTC-Parks Canada partnership.
- Limits to use help to reduce pressures on trails and the area's environment.
- The area has a high public profile and a caring constituency who take a direct interest in the well-being of the area's trails.
- No major trail construction projects are foreseen for the next 5 years, allowing trail crew to concentrate on addressing outstanding trail maintenance issues.
- Having a permanent trail crew foreman in place, along with consistent and dedicated crew members, allows for a superior level of knowledge, care and commitment to O'Hara's trails.

2. *Retain and build on the unique character of O'Hara's trails and trail experience.*

There are elements that set O'Hara's trails, and the associated trail experience, apart from others in the mountain parks. Trail building has been largely controlled by the area's geology. The blocky, cubic nature of the area's quartzite and quartzose sandstone lends itself to local rock being used as the main building material for trails and retaining structures. Beautifully laid and durable rock steps, stepping stones, drainage features and drystack stone walls are a defining element of the area's character. Several trails and alpine routes have been threaded imaginatively through natural rock ledges in ways not possible in most of the Rockies' more friable limestone and loose scree. These routes challenge experienced hikers with a sense of airiness and exposure not commonly found on other maintained mountain park trails.

Hydrology also greatly influences the area's character and trail system. Trails have evolved to lead visitors to the myriad of exceptionally scenic lakes, streams and waterfalls. Maintaining access to these area highlights while maintaining their visual and ecological integrity will continue to be a challenge for the next 5 years.

Finally, the unique character of the area's trails has been defined by the legacy of historic trailbuilders (early Swiss Guides and railwaymen at the behest of the CPR, Italian stonemason Lawrence Grassi, American visionary Dr. Link, as well as many dedicated Parks Canada trail crews and contractors). An extraordinary amount of vision, expertise and dedication has been put into O'Hara's trail system. Recognizing and building upon this unique legacy and character is key to maintaining the O'Hara experience.

3. *Recognize and retain the historic range of trail experiences and difficulties, and clarify these for visitors.*

Lake O'Hara's approximately 40 km of trails offer a broad range of experiences, from mellow lakeshore rambles to steep, airy alpine routes. The level of maintenance, construction techniques and trail difficulty varies accordingly. The intent is to continue to offer this unique range of experiences to O'Hara visitors, and to address trail maintenance accordingly.

The O'Hara Lakeshore (Adeline Link) trail is the most heavily used, and generally by the least experienced users. It will continue to be managed and maintained to provide a durable, secure, even trail tread and gentle grades. The experience offered will be closest to (but not formally) a frontcountry trail experience.

Trails radiating out from the O'Hara Lakeshore will be managed and maintained to provide a backcountry (wilderness) experience with a more uneven trail tread and some steeper grades. These include the trails to Lake Oesa, trails to and around the Opabin Plateau, the Schaffer Lake, McArthur Lake, Odaray, Linda Lake, Morning Glory and Cathedral/Duchesnay basin trails. These trails are generally well defined and have drainage features, rock steps, stepping stones etc to ensure trail durability. Trail junctions are clearly signed.

The Wiwaxy Gap, Huber Ledges, Yukness Ledges and All Souls alpine routes make up the renowned "O'Hara Alpine Circuit". Alpine routes will continue to be managed and maintained to provide a distinctive experience for experienced hikers that is challenging, occasionally steep and more exposed to heights than other O'Hara trails. In places, alpine routes are closer to scrambles than trails. Some route-finding ability is needed to follow the blue and yellow paint markers that define the routes.

O'Hara visitors have a broad range of backcountry experience, knowledge and abilities. The distinction between the different types of trail experiences offered at Lake O'Hara is not always clear. For safety and enjoyment, it is critical that visitors are able to find the trail experiences that are best suited to their personal abilities.

- 4. Continue to mitigate any adverse environmental effects of O'Hara's trail system, with a focus on protection of alpine areas due to escalating day use.***
- 5. Maintain a level of flexibility in the program to address natural occurrences such as late-lying snow, rockfall, avalanches and flooding, as well as annual trail clearing.***
- 6. Continue to foster support for the trails program by offering opportunities for visitors to contribute to and engage directly in stewardship of the trail system.***

Develop a list of potential projects that could be completed by an annual late fall volunteer "work bee". Objectives should be identified in the fall of each year, with a work plan including funding requirements developed prior to the end of each fiscal year so that both LOTC and Parks Canada can plan and commit funds accordingly for the upcoming season.

Annual Trail Clearing

In addition to implementing the trail program outlined below, the Parks Canada crew assigned to Lake O'Hara is charged with clearing trails of accumulated debris and small-scale annual maintenance required to re-open the trails at the beginning of each hiking season and keep them open. This work can take up a significant amount of the crew's time, and must be recognized as an integral part of the program. Trail clearing requirements vary each year and are impossible to forecast. They include:

- Clearing accumulated debris from waterbars and other drainage features
- Addressing trail flooding and drainage issues resulting from high water levels in lakes and streams
- Removing fallen and hazardous trees
- Clearing avalanche debris (snow, ice, rocks and broken trees) from trails
- Replacing damaged trail signs and other infrastructure
- Brushing to clear trails and sightlines, especially in the subalpine areas (Linda/Morning Glory/Cathedral/Duchesnay Basin areas)

The first priority for annual clearing is the Lake O'Hara lakeshore circuit. This gives early-season visitors at least one quality experience in the area. Second priority is the trail to Lake Oesa, which is the next most popular trail and usually the next one sought out by visitors in early season. Once these two trails are cleared and open, trail clearing and other annual maintenance are to be based on environmental considerations, visitor demand and safety, and ease of access by the trail crew.

Trail Work Project List

No large-scale trail construction projects are anticipated for the duration of this plan. Rather, the program focuses on improvements to address recurring trail issues and implementing repair, maintenance, and construction practices based on the "Best Practices" Manual attached. **It should be noted that while an effort has been made to identify as many of the locations as possible, fine-tuning the inventory of trail issues on-site, along with specific locations and best solutions will be an important part of the trail crew's work over the next five years.** This allows for trail crew to address the nuances of specific ground materials, drainage, etc. and creatively apply the best solutions.

Priorities (High-H, Medium-M and Low-L) will be assigned to each identified problem area, based on the following criteria:

- Use levels – higher use trails have a higher priority than low use trails, e.g. O'Hara lakeshore is a high priority, Linda Lake is low.
- Visitor safety – a high priority is given to issues with the most potential risk to visitor safety, e.g. tripping hazards, tippy rocks and hazardous structural failures (bridge railings etc.)
- Impacts – addressing issues with environmental (e.g. erosion, wildlife) or visual impacts is the highest priority.
- The severity of the issue, and whether it can be readily addressed.

- The standard to which the trail is being maintained and the level of user experience - e.g. fixing a tripping hazard on an alpine route (generally used by more experienced hikers) is a lower priority than fixing a tripping hazard on the lakeshore trail (mostly used by less experienced hikers and maintained to a higher standard).

1. East Opabin: Bridge repair 4"x12"x19' PHOTO
2. East Opabin: Trail mix, 12 steps (1 Lite bag)
3. East Opabin: Straighten stepping stones and strategically place debris to discourage use PHOTO
4. East Opabin: Stepping stones and trail mix PHOTO
5. Elizabeth Parker/West Opabin Junction: Retaining wall, trail mix and rock culvert
6. Huber Ledges: Slanted rock should be fixed and steps added
7. Lakeshore trail: Add trail mix, retaining wall where ground is rocky
8. Lakeshore Trail: Jack up sloping rock culvert
9. **Lakeshore Trail: Repair bridge over Seven Veils Falls creek (outstanding from previous plan)**
10. Lower east Opabin: Stairs require repair PHOTO
11. Lower east Opabin: Stairs require repair PHOTO
12. Lower east Opabin: Waterbar replace x2
13. Lower West Opabin: Consider an embedded handrail.
14. Lower West Opabin: Pull out step stones and re-centre PHOTO
15. Lower West Opabin: Trail widening; pulls step stones out and re centre PHOTO
16. McArthur Highline: Stairs to be built
17. McArthur: Waterbars to be added to help drainage
18. McArthur: Widening of trail needs mitigation
19. Morning Glory trail: Bridge is needing a repair PHOTO
20. Morning Glory trail: Bridge is needing a repair PHOTO
21. Opabin Plateau: Fix stones to centre
22. Opabin Prospect: Add steps x2
23. Opabin Prospect: Build steps and uglify on the flat area
24. Opabin Prospect: Trail widening, pull out stone steps and reapply steps PHOTO
25. Trail to Oesa: Steps and gravel on trail through the trees just below Oesa
26. Cathedral Lakes bridge (not on map)
27. Fix steps towards Elizabeth Parker Hut from Le Relais (not on map)
28. **Big Larches trail migration (outstanding from previous plan; not on map)**
29. **Lake McArthur trail proliferation (outstanding from previous plan; not on map)**
30. **Opabin Plateau timber staircase (outstanding from previous plan; not on map)**

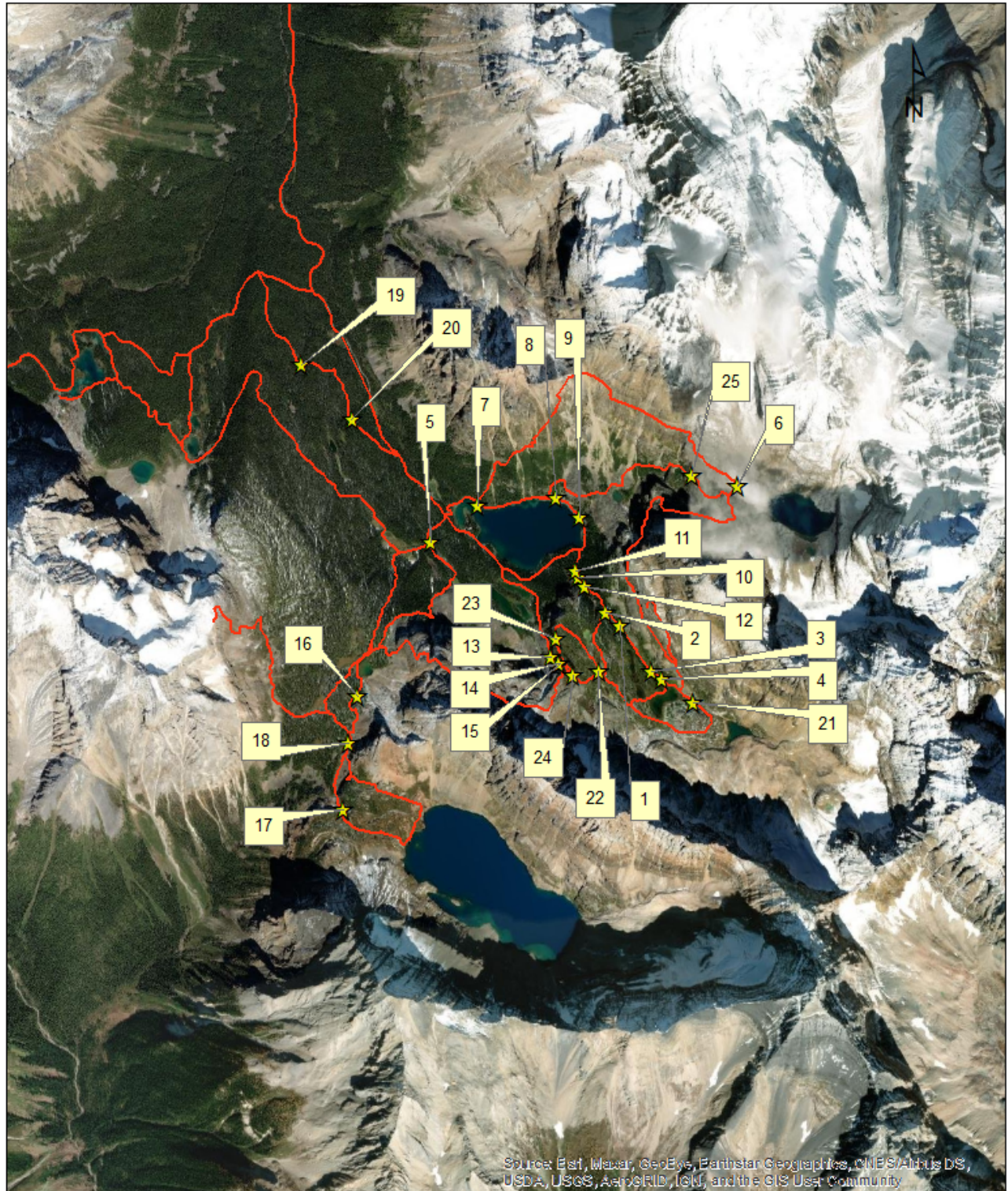


10





Lake O'Hara Trail Maintenance Review 2022



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

1 cm = 380 meters
0 0.375 0.75 1.5 Kilometers

Author: MBURNS
Date Saved: 2022-09-23 1:21:43 PM

Coordinate System: NAD 1983 BC Environment Albers
Projection: Albers
Datum: North American 1983
False Easting: 1,000,000.0000
False Northing: 0.0000
Central Meridian: -126.0000
Standard Parallel 1: 50.0000
Standard Parallel 2: 58.5000
Latitude Of Origin: 45.0000
Units: Meter

Funding

LOTTC provides \$20,000 per year in operational funding to support the work of one trail crew member for the full summer/fall season with a minimum work commitment of 60 person-days (details in the attached Specified Purpose Agreement). LOTTC may be able to support additional capital trail costs such as helicopter time, bridge structural components, trail mix, etc. These items and costs should be identified prior to the end of each fiscal year so that both LOTTC and Parks Canada can plan and commit funds accordingly for the upcoming season.

Visitor Information, Education, and Management

Visitor education is critical in achieving the goals of this trail plan. Hiking off established trails results in trail impacts (braiding, erosion) that are difficult and costly to repair. Poor visitor behaviour (littering, defacing signs, removing rock route markers installed by trail crew, etc.) impacts others and requires extra work by the trail crew. Uninformed hikers may choose routes beyond their capability, leading to potential safety issues. Hiker experience would be improved with better wayfinding (replace old trail signs, maps for sale at Le Relais with distances noted).

Visitor Information and Education

The “greeter” team of Parks Canada staff that oversee bus reservations at the base of the road is currently doing an excellent job of the following items. LOTTC applauds this attention to detail and supports the continued excellence in delivering these essential services:

- 1) Speaking with those intent on hiking up the road, to ensure they are adequately prepared.
- 2) Advising day-trippers without reservations about alternative hiking options nearby.
- 3) Orienting those on the bus about trail etiquette (using international symbols on “flash cards” for non-English-speaking groups).
- 4) Identifying Le Relais as an information centre for trail conditions, refreshments, toilets, etc.
- 5) Hiking common destinations between last incoming and first outgoing buses, communicating with hikers, litter picking, etc.
- 6) Trail crew interaction with hikers: Trail crew does an excellent job of helping hikers with basic orientation information. We encourage the continuation of this important personal engagement between trail crew and visitors.

Recommendations for Improvements in Visitor Information

- 1) **Gem Trek map for sale at Le Relais:** Future printing of the Gem Trek map should include trail distances on the map itself, just like the Gem Trek “Lake Louise and Yoho” map which does include distances on Lake O’Hara trails. Additionally, trail difficulty ratings could be added to the map, using the standard green circle (easy), blue square (moderate), and black diamond (difficult).
- 2) **Defecation/urination messaging:** With only one outhouse at Le Relais, hikers are relieving themselves using inappropriate techniques, leaving visible piles of feces and/or tissues. Parks “greeter” staff need to add minimum impact toilet techniques to their bus orientation (see Trail Etiquette list below).

- 3) **Trail etiquette messages with bus reservation confirmation.** Investigate what messages (if any) are sent to visitors with their reservation confirmation. See list at end of this section for possible additions.
- 4) **Wayfinding:** Replacing old trail signs with the new Parks Canada standard is a high priority for LOTC.
- 5) **Interpretive media:** Old (and some damaged) interpretive signs are in need of modernizing. LOTC supports Parks' development of upgraded interpretive signage at Lake O'Hara (see page 3).
- 6) **Signs to help compliance in staying off "closed" routes:** LOTC feels that small signs in strategic locations explaining that routes are "closed for rehabilitation" help to educate hikers and gain their support for trail crew's efforts. Although no one wants the landscape littered with signs, we **highly** encourage more use of signs such as this one, and are prepared to assist with their purchase.



Small signs such as this help to gain compliance from hikers to stay on established trails.

Trail signs

Signs are currently being replaced gradually by Parks, as part of a new national signage program. New sign icons now clearly distinguish between alpine routes and hiking trails, improving user recognition of route difficulty (see photo below). LOTC supports any Parks initiatives to increase the pace of sign replacement.



Trail Etiquette Messages

When using this list of desired behaviour in our communications, consideration must be given in “positive wording” for maximum compliance.

- Familiarize yourself with the trail system by buying a map at Le Relais; read the information on the Le Relais display board; ask for trail advice from Le Relais staff.
- Stay on designated trails, even when snow-covered.
- Do not rely solely on your phone for trail distances and directions.
- Do not “correct” trail wayfinding arrows on trail signs; refrain from “helping” trail crew by moving brush and log barriers.
- Refrain from building rock cairns or inukshuks.
- Do not remove rock route markers placed by trail crew to clarify wayfinding (Lake Oesa slabs).
- When taking rest and lunch breaks, choose rock surfaces over vegetation to minimize damage.
- Do not pick flowers, berries, mushrooms, or any other vegetation.
- Do not approach or feed wildlife.
- Refrain from using a sound system with external speaker.
- Pack out what you pack in; consider picking up other hikers’ litter.
- Wear good hiking shoes; bring cold weather gear, food, and water with you.
- If defecation away from outhouse is required, dig a “cat-hole” several inches deep, bury the feces, and carry out used paper. Do not discard tissue used for urination; carry it out.

Trail Plan Implementation, Monitoring and Reporting

- Prior to each construction season, a list of trail projects (based on priorities in the 5-Year Trail Plan) is developed by the LOTC Trails Committee and Parks Canada, and discussed with trail crew.
- Where needed to better define trail issues and required actions, joint Parks Canada/LOTC meetings are held on-site at Lake O’Hara.
- The LOTC Trails Committee reviews trail work progress several times over the construction season.
- Trail crew completes a daily log, which is sent to the Chair, LOTC Trails Committee by November 30.
- The LOTC Trails Committee prepares an annual Trail Report based on observations and the log book, and provides this report to Parks Canada
- At the end of the 5-year trail program, an overview of accomplishments, changes and outstanding issues for the entire period is provided to Parks Canada by the LOTC Trails Committee.

Proposed Year 1 Work Plan

These work items are based on outstanding issues from the previous plan.

1. Lakeshore Trail bridge repair over Seven Veils Falls creek.
2. Side slope migration on Upper Big Larches trail (pg. 8 from previous plan).
3. Trail proliferation at Lake McArthur (pg. 10): Identify which trails should be formalized and which should be blocked off and/or rehabilitated, taking into account visitor preferences (popular lunch and photos spots) along with environmental and visual impacts. Install low-key signs to inform visitors that certain trails are closed for rehabilitation.
4. Opabin Plateau timber staircase (pg.15): Ensure the step boxes are filled with appropriate trail mix, crowned for drainage, and the timber frames are in good repair.
5. Additional items from the above Trail Work Project list identified by Parks trail crew as High Priority.

Best Practices Trail Manual – The “How-To’s”

Trail repair/construction issues can be broadly categorized as: trail widening; proliferation of informal trails; erosion; unstable rock work; and structural failures. Descriptions and actions for addressing each of these issues are provided below.

Priorities (High-H, Medium-M and Low-L) will be assigned to each identified problem area, based on the following criteria:

- Use levels – higher use trails have a higher priority than low use trails, e.g. O’Hara lakeshore is a high priority, Linda Lake is low
- Visitor safety – a high priority is given to issues with the most potential risk to visitor safety, e.g. tripping hazards, tippy rocks and hazardous structural failures (bridge railings etc.)
- Impacts – addressing issues with environmental (e.g. erosion, wildlife) or visual impacts is the highest priority
- The severity of the issue, and whether it can be readily addressed.
- The standard to which the trail is being maintained and the level of user experience - e.g. fixing a tripping hazard on an alpine route (generally used by more experienced hikers) is a lower priority than fixing a tripping hazard on the lakeshore trail (often used by less experienced hikers and maintained to a higher standard).

1. Trail widening/migration

Trail widening occurs when hikers circumvent mid-trail obstacles such as exposed roots, rocks, standing water or late-lying snow. Increased use of certain trails and poor initial trail tread definition or poor (often overly steep) initial trail alignment are other contributing factors. Many of the mid-trail obstacles/tripping hazards and resulting trail widening have been identified as issues for some time, but have yet to be addressed.

Many sections of O’Hara’s trails traverse side-hills of organic or unstable ground material (scree, clay, loose fines etc) and tend to migrate and widen on the downhill side. Anchors such as trees or large rocks will eventually stop this downhill migration, but action is required to encourage hikers to use a single defined tread.



Side slope migration on Upper Big Larches trail

Actions:

Mid-trail obstacles

- Remove roots and moveable rocks up to about 20cm from the centre of trails. This is particularly important on high-use trails, such as the O'Hara Lakeshore circuit. Following removal, fill and compact remaining cavities to create an appealing, smoother walking surface. To further discourage trail widening, partially embed excavated rocks in a natural-looking scatter along the edge of the trail.
- Add trail surfacing where needed on the Lakeshore trail to further define the tread to a width of 0.8 – 1.0 m (see Trail Surfacing – below).

Side-hill trails

- Define (grub out) a single trail tread between anchor points that flows with the terrain, and is appealing as a hiking surface.

Trail surfacing

- Use trail surfacing material sporadically on high use trails such as the Lakeshore trail and Opabin Plateau, to raise, smooth out and harden the trail tread. Using the right trail mix is essential to keeping this surfacing maintenance-free. **Trail mix should consist of various**

sizes of aggregate ranging from 15 mm diameter through descending sieve sizes to a small percentage of clay. Clay is essential for its ability to “glue” the mix together and allow it to harden. A crowned or cross-sloped profile should be used along with the right mix of gravel.

Overly steep trail alignment

- Address trail widening on overly steep sections (grades over 30%) by refining the grade and layout of switchbacks or, where suitable large rocks are available, building rock steps. Overly steep trails sections occur mostly on the alpine routes, and on the West Opabin and Big Larches trails.

2. Trail Proliferation

O’Hara’s scenic lakes are among the area’s main visitor attractions, making them prime destinations. Most of these lakes are located in the alpine, where the vegetation is particularly fragile. While most trails leading to the lakes have been well-defined and hardened, visitors tend to wander cross-country to preferred viewpoints or picnic spots. Confused visitors also create new trails when there is no defined trail terminus or the connection to other trails is not clearly marked. Over the years, this has resulted in the proliferation of informal trails and trampled areas in several areas.

Efforts have been made to address informal trail proliferation on Opabin Plateau, Lake Oesa and at Mary Lake. These efforts need to be continued and monitored. The McArthur lakeshore is of particular concern due to its soft lakeshore soils and fragile vegetation.



Trail proliferation at McArthur Lake

Actions:

- Map and conduct on-site assessment of trail proliferation.
- Develop a site-specific strategy, identifying which trails should be formalized and which should be blocked off and/or actively rehabilitated. This strategy should take into account visitor preferences (popular lunch and photo spots) along with environmental and visual impacts.
- Block off the first 10m at each end of redundant lakeshore trails with partially embedded rocks and/or deadfall mimicking a natural scatter as much as possible.
- Install ground-level signs to inform visitors that the trail is closed for rehabilitation. Such signs are an important part of educating trail users, and may be removed once trails become re-vegetated.
- Establish a simple monitoring program to evaluate the success of closures and rehabilitation.

Lake Oesa:

- Trail crew has made significant progress toward keeping hikers on-route to Yukness Ledge Alpine Route with new signage, paint markers and construction of low rock walls to guide visitors.

Opabin Plateau:

- Continue to monitor the success of recent actions to block off random trails on Opabin Plateau and Opabin Prospect, and take necessary action to address any deficiencies.



Small signs such as this help to gain compliance from hikers to stay on established trails.

3. Erosion

Trail erosion is the result of poor drainage, high-use foot traffic in poor ground materials, poor trail alignment or narrow rock steps placed on open steep slopes. Trail erosion can take the form of water running along the trail and water running across the trail. These processes are often of little consequence but when they are ignored over time the results can range from eroded trail bed to large washouts making travel difficult and at times risky. Where local ground materials and trail

surface are of mineral soils (ranging from fines through to gravel and rock) there will be little impact from most water flow. Large flood events can cause major erosion which will not be addressed here.



Actions:

Water running along the trail

- Install cross ditches, water bars or culverts (preferably made of rock), to direct water off the trail. In most situations, cross ditches are the best choice due to ease of construction, ease of maintenance, and natural appearance.



Example of water bar repairing water running along trail

- A more expensive and intensive option for high use trails like the Lakeshore trail is construction of either a crowned trail in flat areas, or a sloping trail of 3 to 5% in side hill areas. The choice of these options depends on ground materials, grade of trail, grade of slope, volume of water and availability of appropriate rock. However, forming the desired tread profiles usually requires extra and/or imported materials.

Water running across the trail

- Construct a collection drainage ditch on the upper side of the trail and where terrain allows, direct the water to the lower side of the trail with cross ditches, water bars or culvert, preferably of rock.

4. Unstable rock work

Rock work is a defining element of the O'Hara trail experience. While much of the rock work at O'Hara is very solid (the Grassi steps on the Oesa trail have lasted about 80 years with minimal intervention), unstable rock steps, slabs and rock retainer walls must be consistently monitored. Remedial work has been done in the past 5 years to improve stability on the Big Larches, West Opabin and Yukness Ledges trails.



A good example of solid rock steps, Oesa Trail

Unstable stepping stones and loose retainers can be a safety concern. Erosion and trail widening can also result when hikers constantly circumvent unstable rocks. Issues at O'Hara usually result from poorly placed or rounded rocks being used for individual steps, or unstable base rocks used for retaining walls.

Actions:

Constructing New Rock Steps

- Select slab or block shaped rocks of large but reasonable size for a 3 person crew to safely move and place.
- Excavate pit to receive base rock. The placement of the lowest step is most important since its failure will result in the failure of above steps. If ground materials are unsuitable add compacted granular material to set base rock.
- Working upwards place step rock overlapping lower rock.
- The rise of about 250 mm should be relatively consistent.
- When using slab rocks, fill will usually be visible below the slab. This material erodes quickly by abrasion from the toe of boots and creates overhanging steps that may lead to failure. Line this vulnerable spot with fit rock.
- Required step widths vary with the level of trail use. High use trails will often require side by side rocks to attain a suitable width.
- Place cobbles and boulder to the side of narrow steps where, in extreme cases, deep erosion of the trail side will occur.

Repairing existing rock steps

- Existing stone steps often require replacement or adjustment of the base step, as described above.
- Ensure that the second step is well propped during base step construction, to avoid slippage.

Repairing or constructing rock walls

- The most crucial task is to bury below grade the base rocks for the wall. In good mineral materials (non-organic) the rock needs to be buried about to about a quarter depth and in poor soils half burial is needed, with added clean mineral materials. Other factors such as rock dimensions, orientation, set back of rock tiers and in-slope of rock wall play a part in the stability of the wall. These are best understood by observing existing rock walls.

5. Structural failures

While rock is the most commonly used trail building material at O'Hara, treated timber has also been used – most notably for drainage (East Opabin, Schaffer, and Linda Lake waterbars), turnpiking where trails cross wet organic ground materials on Opabin Plateau, for a few bridges (e.g. Lakeshore trail, Schaffer meadow, Linda Lake) and to contain material on staircases (e.g. to Alpine Club meadow and on Opabin Plateau). These wooden structures need to be assessed periodically for damage due to water action, wood rot and use/abuse. Several issues currently need to be addressed at O'Hara. Concerns are related to visitor safety, poor drainage, and disintegrating trail treads.

There is also the issue of whether some of the wooden structures are appropriate in the O'Hara setting, especially the wooden staircase leading from Cascade Lakes to East Opabin trail.



Concrete failure on Opabin Plateau



Turnpike failure on Opabin Plateau



Inappropriate timber construction, Opabin

Actions:

Bridges

- Inspect all timber components for issues, particularly railings as they are a safety concern.
- Inspect all abutments for undercutting and degradation of structures such as gabions and timbers.

Turnpikes

- Re-install damaged log retainers on Opabin Plateau, adding trail surfacing where cement and fill have parted from timber edgers. Cover filter fabric with surfacing and re-align edgers. Cement should not be used in future as it settles unevenly, leaving a very rough walking surface.

Timber Water Bars

- Finish replacing rotten timber water bars on the Linda Lake trail.
- Where new water bars are needed, rock is the preferred building material or replacement with cross ditches. These are more in keeping with the O'Hara experience, and less slippery when wet (a hazard for hikers)
- When replacing timber water bars, it is essential to install at the correct height and angle so that water flow increases in speed across the trail. This reduces the need for maintenance by reducing the buildup of waterborne particles in front of the timber bars.
- Score existing water bars to reduce slip hazard.

Fill Boxes and Timber Steps

- Fill boxes on Opabin Plateau were cupped and holding water. They are not considered appropriate to the O'Hara setting and were not serving their purpose. They have recently been modified to enhance drainage, and should eventually be considered for replacement. No new fill boxes should be constructed in the O'Hara area.
- The large timber staircase on Opabin Plateau is nearing the end of its life cycle. More years of use can be gained by ensuring the step boxes are filled with appropriate trail mix, crowned appropriately for drainage, and the timber frames are in good repair. In the future, removal and replacement with a series of gentle switchbacks is recommended.