



Lake O'Hara Trails Club Newsletter

2023
Issue

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The changing colours of alpine lakes

Your experiences of Lake O'Hara are likely suffused in shades of blue—the impossible aquamarine of Lake O'Hara, the translucent turquoise of Lakes Oesa and McArthur. But those brilliant colours — so much a part of what makes the Lake O'Hara area memorable — may change in the future. Recent research indicates that the colours of alpine lakes are shifting due to climate change.

Rolf Vinebrooke of the University of Alberta says the changes became apparent when researchers reviewed historical photographs of the mountain parks. "Aerial photographs of lakes along the Icefields Parkway dating to the 1940s and 50s show many lakes that are turbid or turquoise in colour. In more recent photos, these same lakes are darker, or clearer in colour." A professor in the Biological Sciences department, Vinebrooke's research focuses on the impacts of environmental stressors on mountain, boreal, and arctic lakes.



*The colour of Lake O'Hara's iconic lakes is subtly shifting over time.
Photo: Paul Zizka.*

The distinctive turquoise colour of alpine lakes is a result of 'rock flour' suspended in the water. Vinebrooke explains that as glaciers recede, less sediment is carried into alpine lakes. "The turquoise fades and lakes become clearer, closer to the ordinary blue colour you would see anywhere in North America."

In addition to analyzing photographic evidence, Vinebrooke and his team have also been able to document ongoing changes in the composition of sediments at the bottom of alpine lakes. "We retrieve sediment cores which we can then analyze in a similar way to studying tree rings," he explains. "You can

see the history of the lake by looking at how the sediment changes from the top to the bottom of the core."

"I was surprised," Vinebrooke adds, "by the number of lakes that are currently a clear non-glacial blue that, when we analyzed the

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2022 Trail Report: snow, steps and graffiti

A big snow year delayed the opening of the O'Hara campground in 2022, and required many days of shoveling pathways to keep hikers on route. Heavier traffic on the Opabin Plateau trails required the trail crew to work hard on strategies to block or discourage the development of informal trails.

General trail maintenance included removing snow-downed tree and avalanche debris, defining trail routes in the snow in June, clearing rockfall from the alpine routes, re-installing trail signs at Oesa/Abbot Pass and Oesa/Yukness junctions, trimming overhanging branches, re-painting faded alpine route markers, repairing damaged trail tread and steps, and clearing and repairing drains and waterbars.

Notable accomplishments included the following:

1. **Huber Ledges:** Our trail crew was very disturbed to find bright blue painted graffiti on a rock wall along the Huber Ledge alpine route. A combination of grinding, scraping, and chipping removed the offending writing. Along this route our crew also installed rock steps at two different eroding sections and added handrails at confusing spots.

2. **West Opabin:** 29 new steps on West Opabin trail between All Souls and Opabin Prospect junctions were installed to make this steep section easier to navigate and to prevent erosion caused by rainfall.
3. **Schaffer Lake:** A new bridge was installed over the outlet creek, and a rough section of the adjacent trail saw new trail mix applied.
4. **Opabin Plateau:** Our crew blocked new informal trails and installed 'handrails' to keep hikers on route at the 'split rock' section on Opabin Prospect east side.
5. **All Souls, west end:** Our crew installed 11 steps/speedbumps on a steep section between the high point on the shoulder of Mt. Shaffer and the Big Larches trail.
6. **Lakeshore trail:** Where the trail crosses both avalanche gullies, rebuilding was required, with retaining walls and more stepping stones.

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2022 Trail Report (continued)

LOTIC provides \$20,000 annually to cover the cost of one trail crew member for the entire working season from mid-June to early October. 64 person-days of work were recorded in 2022. Supervisor Steve Bertollo and crew member Megan Burns did an outstanding job in 2022 in keeping our trails in tip-top shape.

Thank you as always to our LOTIC members and donors for their contributions to our annual trail budget!

Sue Webb



For the first time in the history of Lake O'Hara painted graffiti was found defacing a rock face. Trails foreman Steve Bertollo uses a grinding tool to remove the damage on the Huber Ledges alpine route. Photos: Sue Webb

Five-Year Trail Plan aims high

The new Five-Year Lake O'Hara Trails Plan sets high goals to maintain O'Hara trails as a model for best practices in the mountain parks. This spring, LOTIC submitted the 2023-2028 plan to Parks Canada for approval.

There are elements that set O'Hara's trails apart. The blocky nature of the area's quartzite and quartzose sandstone means local rock can be used as the main building material for trails and retaining structures. Durable rock steps and drystack stone walls are a defining element of the area's character. Trails and alpine routes have been threaded through natural rock ledges in ways not possible in most of the Rockies' more friable limestone and loose scree.

The unique character of the area's trails has also been defined by the legacy of historic trail builders, including early Swiss Guides, Italian stonemason Lawrence Grassi, American visionary George Link, as well as many dedicated Parks Canada trail crews. Building upon this unique legacy and character is key to maintaining the O'Hara experience.

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 mountain parks backcountry, it benefits from increased trail funding due to the on-going LOTIC-Parks Canada partnership. Having a permanent trail crew foreman provides a superior level of knowledge, care and commitment.

2. *Retain and build on the unique character of O'Hara's trails and trail 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 intent is to continue to offer this range of experiences, 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 maintained to provide a durable, secure, even trail.

Trails radiating out from the O'Hara Lakeshore will be managed and maintained to provide a backcountry (wilderness) experience with a more uneven trail and some steeper grades. These include the trails to Lake Oesa, Opabin Plateau, Schaffer Lake, McArthur Lake, Odaray, Linda Lake, Morning Glory Lakes, and the

Cathedral/Duchesnay basin.

The Wiwaxy Gap, Huber Ledges, Yukness Ledges and All Souls routes make up the renowned 'O'Hara Alpine Circuit'. Alpine routes will continue to be maintained to provide an experience for experienced hikers that is challenging, and more exposed to heights. In places, alpine routes are closer to scrambles than trails.

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, such as through annual fall volunteer 'work bees'.*

Priorities and Challenges

The 2023-2027 plan does not propose any major trail construction projects. Rather, it concentrates on improvements to address recurring challenges at Lake O'Hara. These include:

- 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.
- 2) Increased trail impact, especially on Opabin Prospect and Opabin Plateau. These specific locations, often identified in social media, are experiencing high impact.
- 3) Trail etiquette issues, such as increased inappropriate latrine locations, tissue litter, and even graffiti. LOTIC supports all Parks initiatives to improve hiker compliance with minimum impact behaviors. The funding of a greater position by LOTIC has helped educate hikers about trail etiquette.
- 4) Increased use of packed-in watercraft: if this trend continues, there may be environmental impacts at desirable launching sites on Lake O'Hara. Monitoring this trend and developing mitigation strategies will be key.
- 5) Wayfinding: Replacing old trail signs with the new Parks Canada standard is a high priority for LOTIC.
- 6) Interpretive media: LOTIC supports Parks' development of upgraded interpretive signage.

The 2023-2027 plan was prepared by the LOTIC Trails Committee with input from Parks Canada staff including O'Hara trail crew foreman Steve Bertollo and 2022 crew person Megan Burns.

The changing colours of alpine lakes (continued)

sediments we recovered, had in the past contained lots of glacial material indicating they had once been closer to turquoise in colour.”

Vinebrooke points out that it isn't just the colour of the lakes that changes. “There are ecological effects as well. As the waters become clearer, sunlight can penetrate deeper into the lake, gradually raising the temperature of the water. The lakes become more productive, because the increase in sunlight fuels the growth of microscopic plants or algae.”

At lower altitudes, some lakes undergo 'brownification.' Vinebrooke explain that this occurs as the tree line advances due to warming temperatures. “More brown organic material from conifers and from accumulated soil is carried into the lakes.” Though gradual, these changes are readily apparent. “The human eye can perceive the difference between three milligrams and zero milligrams of organic material in a litre of lake water,” Vinebrooke points out.

Shifting colours at O'Hara

Mark Olson and Janet Fischer have been documenting the colour and transparency of lakes in the O'Hara region since 2006. Professors in the Biology Department at Pennsylvania's Franklin and Marshall College, their research indicates that the colour of lakes varies according to the characteristics of each lake's catchment basin.

“The colour of Hungabee Lake,” Olson points out, “is largely driven by decaying vegetative material from the area surrounding the lake that is washed into the water. That material absorbs the blues, and the effect is that the lake appears greener. In contrast, lakes with glaciers within their catchment basin are influenced by how much glacial or rock flour is suspended in the water.”

Olson notes that colour and transparency vary widely from year to year due to differences in the snowpack. During years with more

snow, lake waters are more turbid the following summer. “As an extreme example, in 2012 an avalanche carried a large amount of snow and debris into Lake Oesa, and for that whole year Oesa was much more turquoise than normal.”

After almost two decades of study, Olson and Fischer's research indicates that the shade of some O'Hara lakes is subtly shifting. “Our data shows that both Opabin Lake and Lake O'Hara are becoming more transparent. They are losing their turquoise colour and becoming more sapphire. This change can be seen in our data, and also in photographs through time.” Olson and Fischer are interested in hearing from long-time Lake O'Hara visitors who have photographs of O'Hara lakes over the years. Email: jfischer@fandm.edu and molson@fandm.edu

In an effort to raise public awareness about these changes, Olson and Fischer are collaborating with Canmore filmmaker Leanne Allison on a film about the colours of alpine lakes. *Losing Blue* will be released later this year.

Debra Hornsby

Support the trails you love. Become a LOTC member.

Be part of O'Hara by becoming a member of the Lake O'Hara Trails Club (\$35 for a lifetime membership) and/or making a donation (fully tax-deductible). Your support will help us to preserve and enhance the Lake O'Hara area through trail maintenance and public education.

For more information on how to join or donate, go to www.lotc.ca. You can also forward your name, address, phone number, and membership fee and/or donation to:

Lake O'Hara Trails Club
Box 98, Lake Louise, Alberta, Canada, T0L 1E0

A friendly face and timely advice

If you've visited Lake O'Hara in the past few years, you've likely met the LOTC greeter. Perhaps it was when you boarded the day bus in the parking lot. Or perhaps you were hiking the Lake Oesa trail. For the past seven years, the Lake O'Hara Trails Club has worked with Parks Canada to support the salary for a greeter as part of the Parks Canada Visitor Services team. The purpose of the position is to provide information, and guidance on trail and wildlife etiquette, for all visitors.

Since 2016, LOTC has provided between \$8,000 and \$10,000 annually to Parks to fund the greeter position from mid-June to early October. The greeter duties are rotated through the five-person Visitor Services team. Greeters spend their mornings at the bottom of the Lake O'Hara road. Their aim is to speak to everyone travelling on the Parks Canada and Lodge buses, answering questions and providing trail information. Key points include wildlife safety, leave-no trace, and the importance of staying on the trails. Greeters also inform walk-in

visitors about the challenges of walking the road and offer alternative destinations.

In the afternoon, greeters move uphill to hike popular trails such as the shoreline trail, Lake Oesa, Opabin Plateau and McArthur, picking up litter and providing information and advice to visitors.

Year-end reports indicate that this position is having a positive impact on the Lake O'Hara experience. Visitors indicate they are pleased to see a Parks Canada presence on the trails. Parks staff noted a significant difference in the behaviour of hikers who arrived before the greeters began work at 7 am, versus those who received information before beginning their trek to Lake O'Hara. Greeters were successful in redirecting between 10 to 20 per cent of potential walk-in visitors to alternate hikes in other areas of the Park.

Hats off to the dedicated 2022 Visitor Services team – Jessica, Lorraine, Sophie, Angela and Julie — for their great work!

Debra Hornsby



Angela Gillies of the Lake O'Hara Visitor Services team, working as a greeter during summer 2022. Photo: Jessica Stichelbout.

A cold-weather woodpecker

They are North America's most northerly woodpecker, with a range that stretches to the limits of the tree line and along the spine of the Rockies. The American three-



An American three-toed woodpecker uses a sideways strike to pry insects from under tree bark. Photo: Amar Athwal.

toed woodpecker is also the woodpecker you are most likely to encounter at Lake O'Hara.

Perhaps you've heard the rapid tapping of their drumming while hiking to Linda Lake in the early summer or glimpsed a streak of black and white flitting between the trees behind Le Relais. American three-toed woodpeckers are slightly smaller than a robin, with black wings, and dark backs with white barring. Their heads are boldly striped. Males sport a yellow patch on their forehead, although this can be difficult to see.

American three-toed woodpeckers are year-round residents of northern Canada. Their diet consists of mountain pine beetle larvae, ant larvae, moth pupae, and spiders. They forage on trunks of dead or dying trees by striking sideways to remove bark and expose the insects beneath.

Most woodpeckers have four toes. Researchers speculate that the evolutionary

loss of the fourth toe means these birds can lean farther back from a tree, allowing them to strike a more powerful blow than other woodpeckers their size.

American three-toed woodpeckers build a nest in late spring, excavating a cavity in a dead tree, and laying four to five white eggs. They form pair bonds which sometimes last over several seasons. Both sexes incubate the eggs and feed the young. Eggs hatch in 10 to 12 days, and young birds fledge after three weeks. Their short nasal calls — a sharp 'pik' — are most often heard during breeding season.

American three-toed woodpeckers are relatively unwary of humans. Absorbed in their quest to pry beetles from under the bark of a tree, they often offer photographers an ideal opportunity to capture images of one of Lake O'Hara's hardiest feathered residents.

Debra Hornsby

Abbot Hut removed, new hut planned

In Summer 2022, on the 100th anniversary of its construction, Parks Canada and a contractor crew dismantled Abbot Pass Hut. Sadly, over the past decade the permanent snow and ice below the hut receded due to rising temperatures, rendering the structure unsafe. A commemorative



plague now marks the location where the hut once stood. In February, plans for the construction of a new hut in a more secure location were announced. Photo: Tangiers Mountain Construction.

2023 Annual General Meeting

Banff Community Foundation
Board Room
214 Banff Ave, Banff

5:00 p.m.
Monday, June 19, 2023

All Members Welcome!

Prefer to attend via Zoom? Email: info@lotc.ca for meeting link.
Prefer to vote by proxy? Download proxy form at lotc.ca/agm



Preservation Through Appreciation

Save a Trail. Send us your Email.

In an effort to reduce our environmental impact, and devote as much funding as possible to trail work, we're asking LOTC members to opt for an e-version of this newsletter. If you are a LOTC member, and if you would like to switch from a paper to an email newsletter, please send your name, current mailing address, and email to newsletter@lotc.ca with the subject line "E-newsletter".