

MAPPING THE MYSTERIOUSLY UNDEVELOPED HIKER'S DESTINATION: THE TRAILS OF NORTHWEST BRITISH COLUMBIA'S BULKLEY VALLEY

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ABSTRACT

Northern British Columbia's Bulkley Valley has both an active resource extraction economy and a growing identity as a non-motorized recreational destination for hikers, backpackers and mountain bikers. The area features spectacular alpine landscapes and many trails. Prior to a few years ago, trails mapping available for this area had a style that suggested that the wild lands here were primarily resource extraction zones. An effort to produce recreationist maps using free and open-source software is described, maps whose styles suggest that the primary identity of these wild lands is a recreational destination where conservation values dominate.

KEYWORDS: trail mapping, Bulkley Valley, British Columbia, Northword magazine, Hesperus Arts



Figure 1: The location of the Bulkley Valley within the province of British Columbia, Canada

1. An Undeveloped Hiking Area

The Bulkley Valley of northern British Columbia is a corridor through the Coast Mountains from the interior plateau to the Pacific and the port of Prince Rupert. For this reason the valley was chosen as a route by the Grand Trunk Pacific Railway in the early 1900s, and this opened the area to settlement by non-First Nations people. The town of Smithers was founded as a railway switching point, and Euro-Canadians began to move to the Bulkley Valley.

The eponymous Bulkley River, an important salmon-bearing river that attracts fishermen from all over the world, was originally the Wedzenkwe, or Blue-Green river, in the language of the Wet'suwet'en people. It was re-named for a Colonel Bulkley in the late nineteenth century.

For hikers, the Bulkley Valley is an attractive place. The valley is about 15 km wide, and down most of its 100 km length it has mountains on both sides, and several glaciers. Mountain groups on either side of the valley include the Telkwa Range, the Hudson Bay Mountain group, the Babine Mountains, and the Rocher Deboule Range. Its 10,000 inhabitants live at the lower elevations along the central axis of the valley, while higher elevations are public land (termed “Crown Land” in Canada). Residents or visitors in Smithers, Hazelton, Telkwa, or the ages-old settlement of the Wet'suwet'en people in Moricetown, are within an hour of trailheads that lead to spectacular places.

While an extensive network of old pack trails and mining roads exists, the supporting trails infrastructure – trailhead signage, parking areas, directions to trailheads, as well as on-trail signage -- is generally underdeveloped. On-trail signage is largely posted by volunteers (although sometimes funded by the provincial government agency Rec Sites and Trails BC) and trailheads are predominantly indicated by pieces of flagging tape, or small wooden signs. Trails are rarely indicated on the old NTS topographic mapping (available at both 1:50,000 and 1:250,000) which in most cases have not been updated since the 1970s.

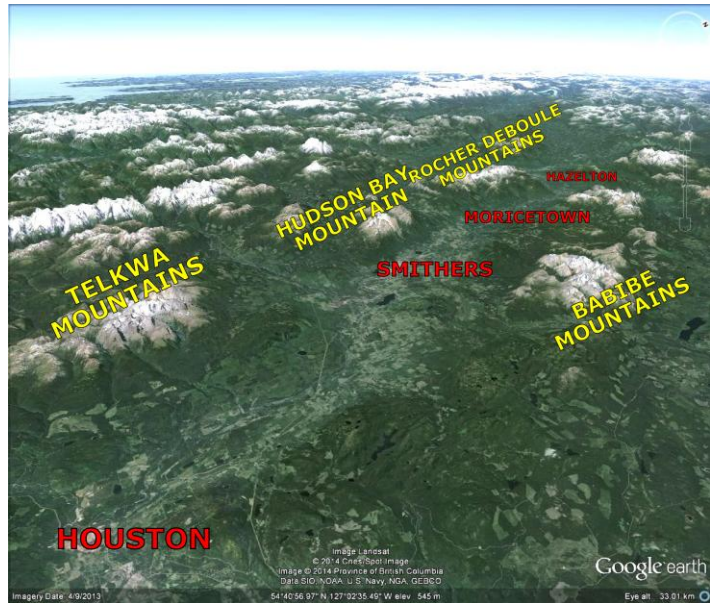


Figure 2: A Google Earth shot of the Bulkley Valley, looking northwest, showing mountain groups that flank the valley



Figure 3: This sort of low-expense signage for Bulkley Valley trails reflects the essentially grassroots effort that has gone into maintaining and publicizing them

The typical pattern whereby mining or logging towns in North America have turned into ski destinations, or hiking and mountain biking centres (e.g., Aspen, Jackson, Whistler, Telluride), involves two key conditions: 1) resource extraction in the area has, for the most part, ceased; and 2) there are nearby urbanites with disposable income who seek to get out and experience nature. Under these conditions, old trails built to bring resources out of the mountains are typically re-purposed to take people into the mountains. Parks and protected areas are established, with budgets to maintain and sign these trails. And, importantly, mapping is produced to support recreation in the area. This mapping characteristically celebrates the place as both unspoiled and protected, highlighting natural features to be visited.

The Bulkley Valley can be seen as presently being stalled in this transition. On the one hand, urbanites with disposable income *are* beginning to arrive, bringing with them the view that the mountains are wild places to be explored for recreational purposes, and to be managed for conservation values. However, because of the remoteness of the Bulkley Valley from the major population centre of Vancouver, these people are not arriving in large numbers, although they are joined by significant numbers of immigrants moving in from Europe and Australia/New Zealand.

On the other hand, resource extraction in the area isn't ready to let go. The British Columbia government continues to promote the northwest quarter of the province as the location of untapped billions in mineral resources, and Smithers is farthest north significant town where exploration and mining companies can stage their operations. Although forestry companies are criticized for cutting trees faster than the replacement rate, the provincial government encourages the industry and authorizes the construction of logging roads further north. Coincidentally, the self-proclaimed "world's largest lumber mill" is located in the Bulkley Valley town of Houston.

In summary, the Bulkley Valley hosts two quite different ways of seeing wild lands. It has hikers outfitted in gear from Mountain Equipment Co-op, Patagonia and Deuter, and not one

but five outdoor gear stores on the Main Street in Smithers. Yet at the same time, on the way to the trailhead, these people are dodging oncoming, loaded, logging trucks as they try to spot a piece of flagging tape that marks the start of the trail.

2. Previous Mapping

When I first moved to the Bulkley Valley in 1995, I found already in print a locally-produced trail guide, *Trails to Timberline*. This was written by an engineer, Einar Blix, who had catalogued all the old Bulkley Valley mining roads and pack trails he had been able to explore. The title expressed an essential fact about trails in the Bulkley Valley: trails typically go go to timberline, and then you're on your own.

Blix did an excellent budget job with the maps in the book: he took 1:50,000 scale topos and drew on them. He not only added trails, but also forestry roads that might be necessary to get to the trailhead. He included GPS coordinates as an aid in locating trailheads. The maps were printed in greyscale.

To someone used to the commercial mapping available for national parks or popular wilderness areas, these maps are strikingly different. They do not suggest that one is looking at a premier wilderness, preserved so that it remains untouched by man, a pristine adventure destination. Instead they suggest that one is looking at a little-known place where, with a topographic map drawn on by a previous explorer, one might take advantage of this year's logging plan to access some alpine areas (see figure 4).

3. New Mapping

After using Blix's maps quite a bit, and experiencing the way the valley was hosting both the latest in hikers and the latest in logging, I became interested in what would happen if mapping were produced for these trails *as if* the area had entered a post-industrial phase.

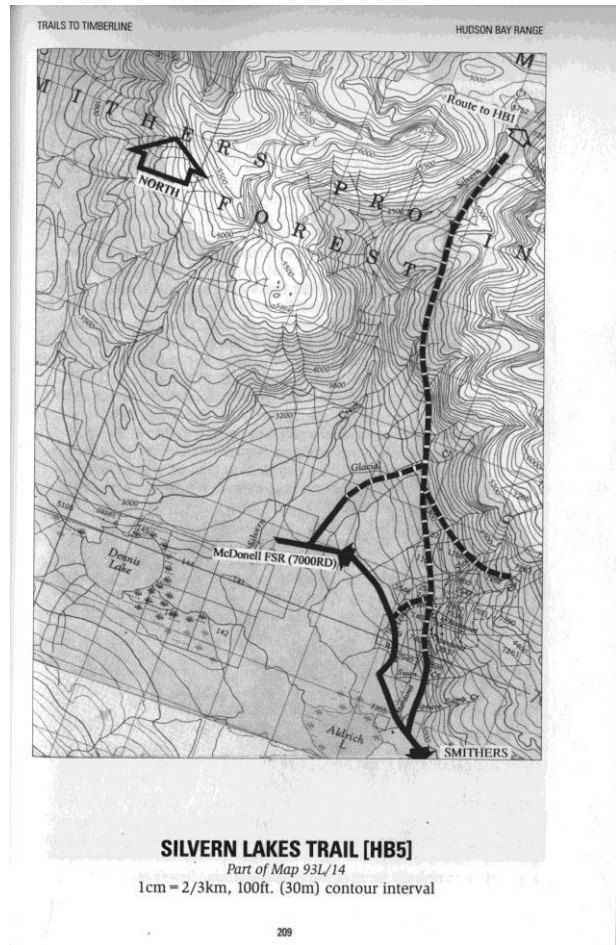


Figure 4: The Silvern Lakes Trail map from *Trails To Timberline*, a local hiking guide, 3rd Edition, published 2009

A local magazine, *Northword* (<http://northword.ca>), which is distributed every two months for free across northern BC, provided the initial venue. Its articles -- about local food, history, exploring and recreating, as well as environmental issues -- are generally tailored to the new arrivals described above. *Northword's* editor Joanne Campbell gave me a column in each issue where I would have one page to provide a map and a 500-word write-up on a trail. The magazine could afford to pay me \$125 for each map, so this experiment in *As-If* mapping was strictly a budget operation.

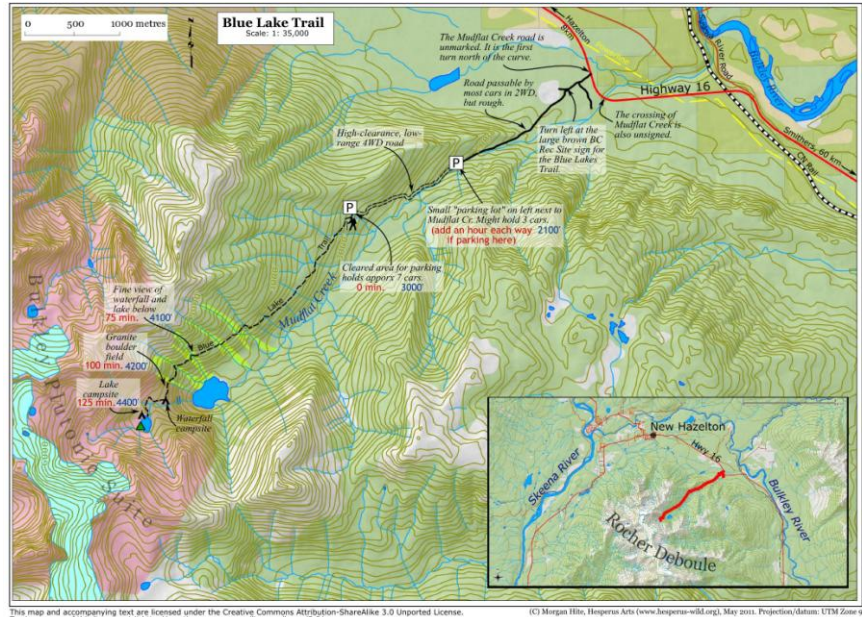


Figure 5: The first *Northword* map: the Blue Lakes Trail

The first map I produced for *Northword* was fairly typical of what was to come. The *Blue Lakes Trail* was in colour at 1:35,000, and included directions to the trailhead, the locations of two parking lots based on the clearance of one's vehicle, some aspects of the geology, estimated hiking times, avalanche chutes (as landmarks), and campsites.

The styling used most often in the *Northword* maps is inspired by adding shaded relief to the colours used in

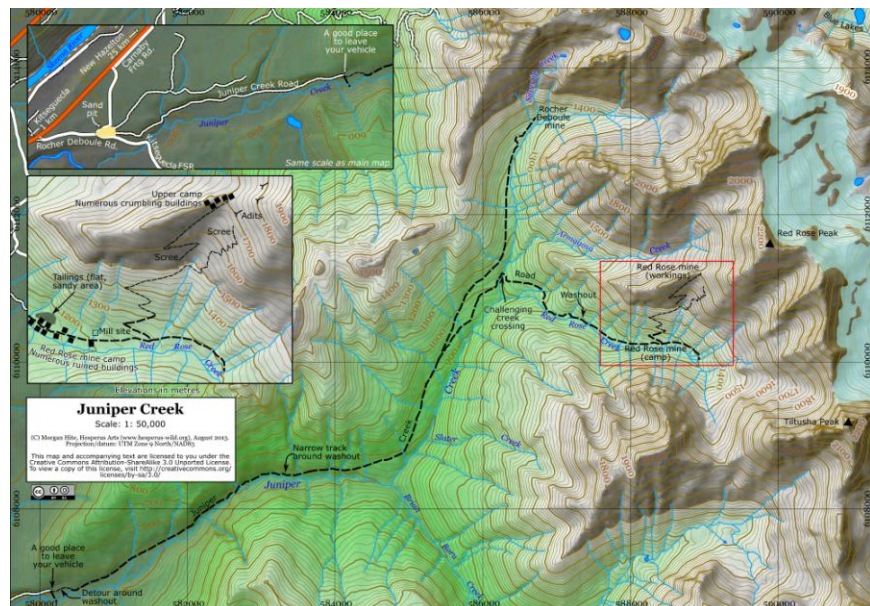


Figure 6: Later map showing different styling. This map combined shaded relief with a hypsography whose green became less saturated with increased elevation. It goes completely transparent at 1500m, which is treeline in this area.

USGS topo maps: contour lines and pale green vegetation shading. I commonly place small textual notes around the trailhead and along the featured trail – these being inspired by historical maps that National Geographic produced in the 1960s and 70s (e.g., *Lands of the Bible Today*) which were covered with little textual notes, so you could read them like a comic book as well as like a map. The notes often include hiking times and elevations. The map also indicates private land.

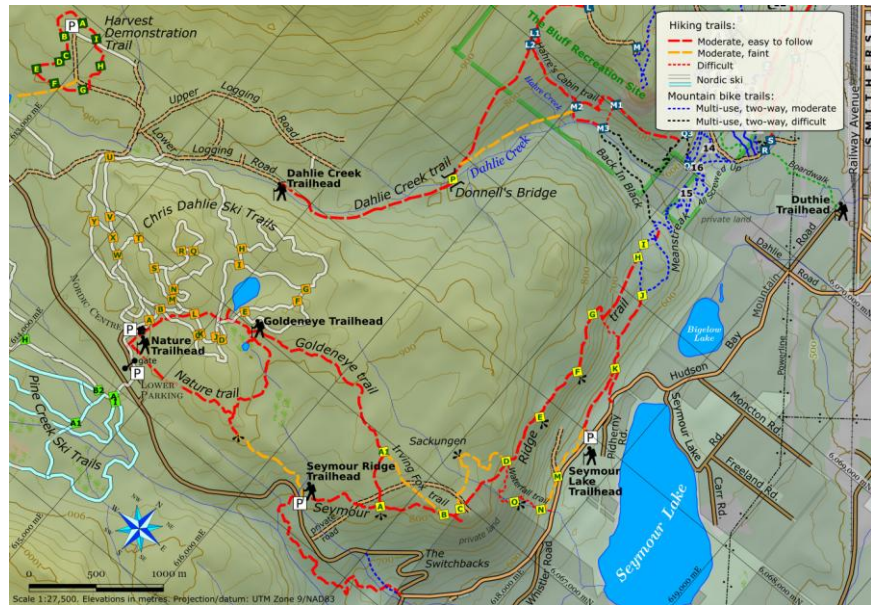


Figure 8: Yet a third style, highlighting trails and private land

Most of these maps are at scales of 1:50,000 to 1:25,000. The standard model for how they are used is that people clip them from the magazine, or download them from the Hesperus Arts website (see below), and print them at home. As a result they are designed for the home printer using 8½ x 11 inch paper.

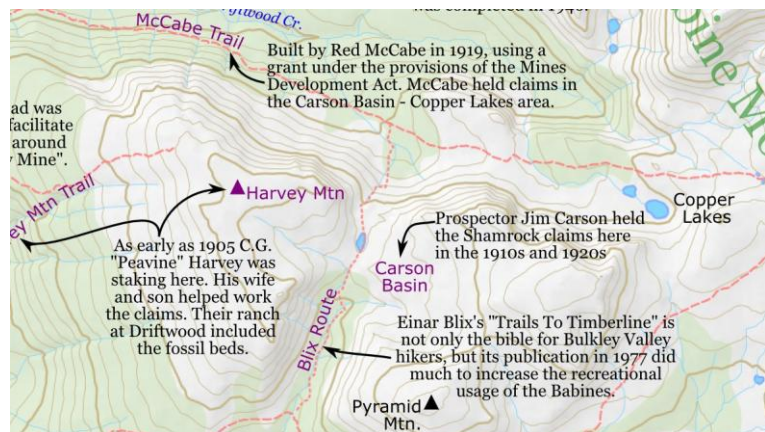


Figure 7: Textual notes have become the main story in this map of historical place names of Babine Mountains Provincial park.

After the *Northword* experiment had been going on for a few years, a local hiking club, the Bulkley Valley Backpackers, received a grant to pay for the production of maps for eleven more trails that they were interested in, and they then approached me to do the work. This represented an exciting transition, where local hikers are now involved in the creation of a large local mapset to support their hobby. It is grant-funded, as it does not yet appear economically feasible to sell these maps.

As of early 2014, thirty maps have been made and published for Bulkley Valley trails.

4. Techniques Of Production

As indicated above, the production of maps for Bulkley Valley hiking trails is a budget operation. So it fits with the spirit of the project to see if it can be done entirely with free data and free software.

The maps are made under Ubuntu Linux using Quantum GIS (QGIS; <http://qgis.org>), and finished in Inkscape (<http://inkscape.org>). A typical map begins with five components: 1) free digital elevation models available from Geobase (<http://www.geobase.ca/>); 2) free vector data (intended for 1:20,000 scale mapping) available from the province of British Columbia through its Data Distribution Service

(<https://apps.gov.bc.ca/pub/dwds/home.so>); 3) free vector data (intended for 1:50,000 scale mapping) available from Natural Resources Canada through its CanVec website (<ftp://ftp2.cits.rncan.gc.ca/pub/canvec/>); 4) a hillshade image served up via WMS from DataBC (<http://www.data.gov.bc.ca/>); and 5) a GPS track of the trail captured by a local hiker.

Although the free provincial vector data includes high quality (1:20,000 scale) layers for roads and water features, it does not include contours, so QGIS is used to generate contours from the DEMs. Map layers include shaded relief, contours, vegetation, streams, lakes, rivers, wetlands and roads. Key landmarks, such as the kilometre markers on forestry roads, sometimes have to be GPSed as well.

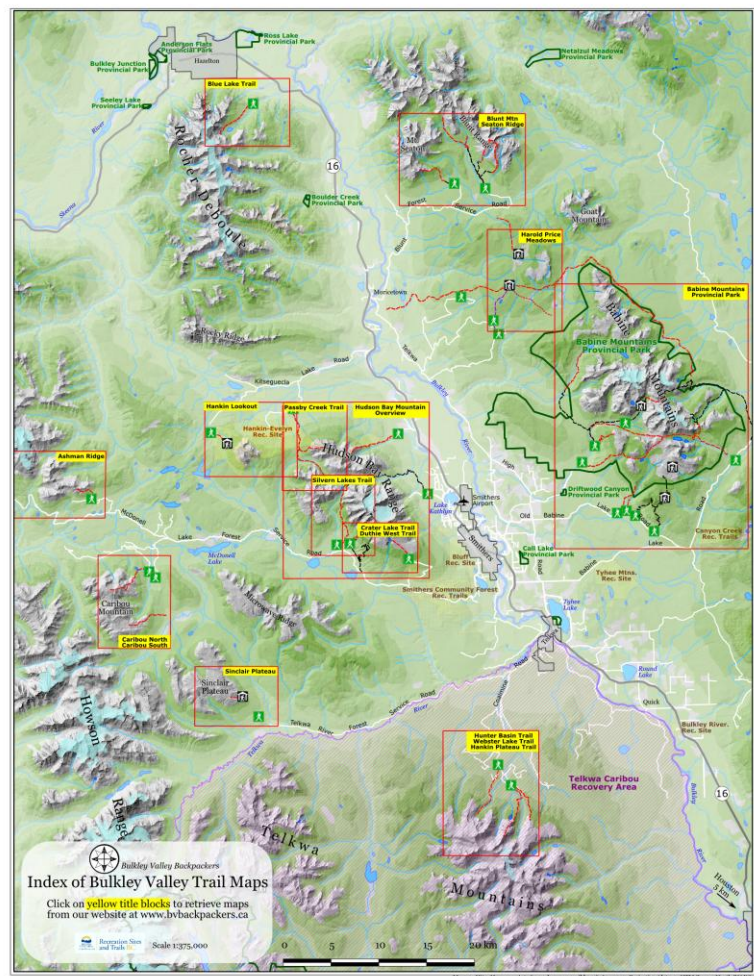


Figure 9: Location map for trail maps produced for the Bulkley Valley Backpackers

There are a few other pieces of software that may come into play. When scree fields are an important part of a map I use Bernhard Jenny's ScreePainter (<http://www.screepainter.com/>).

QGIS includes a GRASS plug-in with most of the GRASS functionality, so I can use GRASS's **r.denoise** module to denoise DEMs, and its **r.shaded.relief** module to create my own hillshades. This is useful if, for example, the area portrayed is small and I need the hillshade to have more exaggerated relief.

DataBC's WMS service offers two black & white hillshades, as well as an airphoto mosaic for much of the province, as well as a private land layer. This is a fairly robust WMS in that you can produce a page-sized map at 300 dpi and the service does not balk.

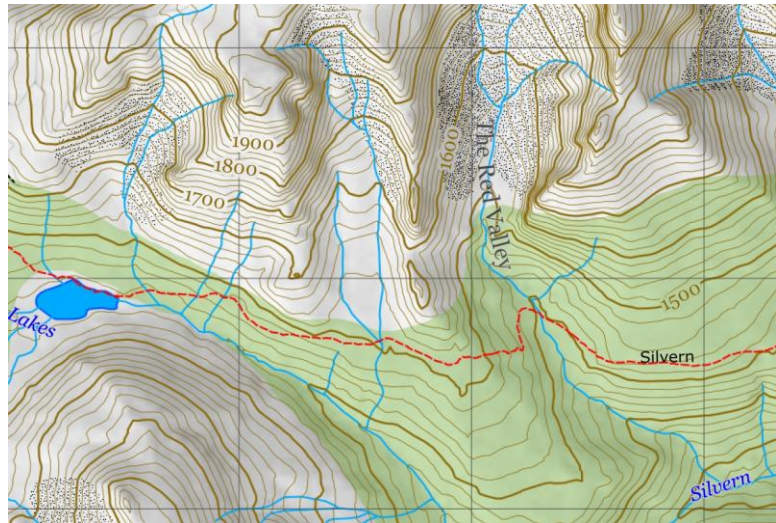


Figure 10: Portion of the Silvern Lakes Trail map showing scree and labelling

After building the map in QGIS, I generally continue the workflow by creating a QGIS print composer set to the size and orientation of paper I want, and exporting a raster image at 300dpi. This is then opened in Inkscape and scaled to the final page size. In Inkscape I add curved labelling using Bezier curves and the Add Text To Path feature. Labels can also be made semi-transparent. Legend, title and scale bar can all be exported from QGIS as SVG files, and read into Inkscape as their own layers. All of this makes Inkscape a handy finishing tool where many details can be finely controlled.

5. Future

Unfortunately, I do not have a way of quantifying whether the maps have increased visitor numbers on these trails, or whether they have altered public perception of the value of the trails.

Although the maps appear in *Northword* magazine, and are available to download from my website (http://hesperus-wild.org/GIS_carto/BVTrailMaps.html), it seems likely that relatively few people are aware of this resource. To increase the visibility of these maps three projects are in the works. One is a poster map of the valley in this same style; the second is a poster map of the Hudson Bay Mountain group showing all trails – a map that will hopefully be posted in local visitors' centres; and the third is a *Hikers Atlas of the Bulkley Valley*, combining under one cover all of the maps that have been made.

In conclusion I should say that it is exciting to live in a community undergoing a transition like this and to be involved in it in some way.