COWICHAN
TRAIL STEWARDS

Mt. Tzouhalem Trail Assessment

PREPARED FOR:

The Municipality of North Cowichan

PREPARED BY:

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EXECUTIVE SUMMARY

The Mt. Tzouhalem Trail Assessment was initiated for the Staff and Council of the Municipality of North Cowichan (MNC) in January 2014 by the Cowichan Trail Stewardship Society (CTSS). The purpose of this assessment is to set direction and priorities for the adoption and future management of the Mt. Tzouhalem trail network.

This assessment is driven by the need for the Municipality of North Cowichan to manage the liability risk of administering 36 kilometers of trail network on their Municipal Forest lands, and to improve the safety of trail users.

"Duty of Care" obligations are addressed in Section 4 and 5 through the identification of evident trail hazards, trail alignment concerns, high speed high-use intersections, unsafe wooden structures/obstacles; as well as through the use of appropriate trail signage, proposed trail direction (i.e. Is it a 1-way or 2-way trail) and identification of trail use suitability (i.e. Hiking only, mountain bike only or mixed-use). Priority recommendations are listed below:

- ✓ The CTSS recommends the immediate adoption and management of 12 existing trails (42% of the trail network). This includes installation of orientation and safety signage, and trail maintenance
- ✓ The CTSS proposes demolition or improvement to flagged wooden trail structures
- ✓ The CTSS proposes construction of one 212 meter bypass trail to re-route users off Cowichan Tribes land back onto Municipal Forest Land
- ✓ The CTSS recommends improvements to the Kaspa Road and Nevilane Road public access points, installation of map kiosks, proper washroom amenities and privacy fencing for adjacent neighbors
- ✓ The CTSS proposes that the MNC host one public meeting to share the proposed trail management recommendations with the Mt. Tzouhalem trail use community and provide opportunity for feedback
- ✓ The CTSS suggests that open communication is established with adjacent neighboring landowners: The Nature Conservancy of Canada, The Providence Farm Community Association and the Cowichan Tribes.

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1. INTRODUCTION

Over the past 25 years, Mt. Tzouhalem has witnessed a steady increase in trail traffic, primarily in the form of hikers and mountain bikers. However, it has become apparent that ongoing trail building, trail braiding, user conflicts and fragmented corridors in the area, that the mountain may be outgrowing its lifespan as an unmanaged resource. The popularity of the area, combined with an absence of trail management, has created challenges with regard to parking, public safety, orientation, environmental impact, and safe codes of conduct.

Recognizing a need for trail management, the Cowichan Trail Stewardship Society (CTSS) proposed to complete a Mt. Tzouhalem Trail Assessment in a three year funding proposal that was presented to the Municipality of North Cowichan (MNC) in January 2014. The following document is that assessment, and is intended as important background information required for the consideration of trail network management on Mt. Tzouhalem.

This report was written for all audiences: municipal staff, Council and the general public, with the intention to provide a comprehensive report for all readers. The introductory section serves to provide background information about Mt. Tzouhalem, a description of contemporary biking culture, and some particulars about the sport of mountain biking, within a global, regional and local context.

1.1 Historical Context

The Municipal Forest was established in 1946 by an act of Municipal Council. At 5,000 hectares it is one of the largest Municipal Forests in North America. Most of the land was acquired through nonpayment of taxes. The Mount Tzouhalem Forest Reserve area is 510 hectares; the remaining land base is comprised of Mt. Prevost, Mt. Richards, Maple Mountain, Stoney Hill, Mt. Sicker, Grace Road and other land holdings throughout the valley.

1.2 Geographic Details

Mt. Tzouhalem is a well-known landmark overlooking Maple Bay, Cowichan Bay and Quamichan Lake. The 503 meter summit is located on Cowichan Tribes land at the top of the steep rocky bluffs on the southwest side. Bordering on the west side of the mountain, adjacent landowners include: Providence Farm, The Nature Conservancy of Canada and BC Parks. North of the MFR boundary is the Properties subdivision and the currently under-development "Kingsview" subdivision (***Appendix 1, Study Area Map***).

1.3 Public Access

Authorized public access to Mt. Tzouhalem is via the parking lot at the end of Kaspa Road, or via the Municipal Trail that runs along the eastern boundary of the cleared residential land at the top of Nevilane Road. Both access points are marked as yellow stars on ***Appendix 1, Study Area Map***. It is assumed that the majority of trail users access the mountain using one of these two points of entry.

1.4 Who uses the Mt. Tzouhalem trails?

The Mt. Tzouhalem trail network is a treasured recreational area for local residents of the Cowichan Valley. A mix of outdoor enthusiasts use the trails daily, including: hikers, walkers, trail runners, mountain bikers, geocache explorers, naturalists, dog walkers, rock hounds, and religious/spiritual seekers. During the weekends, the overflowing parking area buzzes with tourists visiting from the neighboring communities of Victoria, Sooke, Langford, Nanaimo, Parksville and Cumberland.

For many long time users, daily users, and trail builders, there is a culture of ownership and protection of the Mt. Tzouhalem trails.

1.5 Who Builds and Maintains the Trails?

The Mt. Tzouhalem trails have been built and maintained over the years by volunteer trail builders. The trail builder demographic spans generations, with some builders being well-known to the trail community, while others remain a mystery. Most of the newer trails have been (and are currently) built by mountain bikers; however, there are also many historic hiking trails that were built by hikers, for hikers.

For the passionate trail builder, a good trail is a work of art designed to create a harmonious interaction between sport and nature's beauty. For others, it can be an exhilarating connection between two destinations. With modern trail building practices and advancements in bike technology, there is a push toward trails that are purpose-built with a specific end-user in mind; trails that suit a particular style of riding, a given bike's capabilities, or a rider's skill level. The Mt. Tzouhalem trails have changed and adapted over time, with the result being a diverse network of trails that suit many riders regardless of age, style of bike, ability level or riding preference.

Each trail on Mt. Tzouhalem has a story behind it, and in some cases, many—and at times conflicting--stories abound. While the origins of all trails are uncertain, we do know that the Mt. Tzouhalem trail network materialized organically over a number of years, and, it is a much-loved and highly valued local resource that is appreciated by many.

1.6 Why is the Mt. Tzouhalem Trail Network so Popular?

The Mt. Tzouhalem trail network is a high-use area. The central island location, easy paved access, extensive trail network, panoramic views, wildflower meadows, access to Cowichan Valley amenities, and the destination of the historic Cross at its peak, all make it an appealing place to

visit. There is also a sense of safety on Mt. Tzouhalem, likely because it is so well-used, and because it is situated in a highly populated area.

In addition to these factors, the sport of mountain biking continues to evolve and grow in popularity. Local and visiting mountain bikers represent a significant percentage of the demographic that is building trails and recreating on Mt. Tzouhalem.

1.7 Mountain Biking as a Sport - Impact

The sport of mountain biking is "young," only coming onto the scene in the early 1970s. The sport continues to increase in popularity as trail networks become adopted, sanctioned, and developed.

Advances in mountain bike technology have made the sport more accessible and entry level bikes have become lighter, more user-friendly and affordable. There is an increase in women entering the sport, demonstrated by an upsurge in women's specific mountain bike products on the market, as well as a continued rise in women's bike clinics, camps and social groups. Cycling BC, the non-profit organization that serves as the governing body for the sport, now offers the "iride" program which introduces students to mountain biking at the elementary school level. In towns like Whistler, Squamish and the North Shore, there are numerous kids biking programs, school mountain biking clubs and summer instructional camps.

The development of mountain bike parks has contributed to the interest and growth in mountain biking. Urban Bike and Skills Parks are recognized as recreational amenities, and are being built in communities throughout BC. The family oriented mountain bike experience is also growing, as mountain biking parents seek child-friendly trails, programs and parks.

The City of Powell River along with the Powell River Community Forest recently invested in the state of the art bike and skate park pictured below:

**Image Source: http://bikepowellriver.ca/trails-maps/bike-park/*

1.7.1 Global Context

Globally, British Columbia is recognized as one of the most sought after mountain biking destinations in the world. With mountain biking epicenters in Whistler, Squamish and the North Shore only a drive away, Vancouver Island is also becoming a well-known go-to destination in the mountain bike community. In addition to the epicenters mentioned, The Sunshine Coast, Chilliwack, Kamloops, Fernie, Rossland, Nelson, Golden, Prince George, Williams Lake, Campbell River, Cumberland, Comox Valley, Nanaimo, Parksville, Sooke, Victoria, as well as Saltspring Island, Saturna Island, Quadra Island and Hornby Island are all areas with a growing network of coordinated and sanctioned mountain bike trails.

Within the mountain bike community, Mt. Tzouhalem trails are well known and sought out. A search for "Tzouhalem" on the *www.pinkbike.com* website (the premier mountain biking website in English), reveals 846 videos and 25 articles featuring the Tzouhalem trail network. In addition to being a well-known riding area, the Cowichan Valley is similarly renowned for the production of two world cup downhill racers: Mark Wallace and Steve Smith. Both these young men have put the world spotlight on our region with consistently high ranking finishes, and an overall world cup win in 2013.

1.7.2 Regional Context

Regionally, Southern Vancouver Island is a hotbed for the sport of mountain biking. In January 2015, Bear Mountain was designated as the official high-performance training center for the Canadian national mountain biking team (*http://bearmountain.ca/Bike/Training-Centre*). The Canada Cup Trail is currently

under construction, and will be used to host the first Canada Cup National cross-country mountain bike race beginning in 2016 (*http://bearmountain.ca/Bike/Bike-Trails*). Bear Mountain is now home to a bike park where they are marketing tickets and passes, bike camps, lessons and events.

In 2015, the Cowichan Valley saw athletes that are currently training on the Canadian National Team entering local races hosted at Cobble Hill Mountain and Maple Mountain. Being a short distance from Victoria, it can be assumed these athletes travel here to train, as well as ride for pleasure.

1.7.3 Local Context

Locally, the sport of cycling has seen a general increase in popularity throughout the Cowichan Valley. During the past five years there has been a three-fold increase in retail bike shops, with a similar growth in organized cycling groups. Municipal cycling projects such as the completion of the Cowichan Valley Trail and the installation of designated cycling lanes have also been undertaken, and community initiatives such as Cycle Cowichan and the annual "Bike to Work Week" are now well established.

This mini dirt pump track at the Cobble Hill Bike Park was designed with small kids in mind. Like the 3 & 4 year olds in this photo, the sport appeals to even the youngest of bikers.

Numerous local recreational and competitive riding groups have emerged, as can be seen in the photo below of the "Dirt Divas." This particular group ranges in age from 15 to 60 years, with 20 to 30 members turning out for each scheduled Monday night ride. Similarly, Experience Cycling has been hosting a Sunday "Biking for Boys" group that introduces young teens to the trails and the techniques required to ride them.

No longer on the recreational fringe, mountain biking has become an extremely popular new sport—one with a demonstrated economic value—that is widely participated in by people of all ages and walks of life.

The remainder of this document focuses on an assessment of current Mt. Tzouhalem trails, an analysis of the data and suggested management recommendations.

1.8 Purpose of the Mt. Tzouhalem Assessment

The Mt. Tzouhalem trail network is a recreational asset in need of management.

The purpose of this assessment is as follows:

- Map and inventory the trails on Mt. Tzouhalem
- Provide effective land management recommendations

2. Background Research & Fieldwork

Prior to completing the assessment and field work, the CTSS researched what other communities have done with regard to trail assessment and trail management plans. From October 2005 to December 2007 the District of North Vancouver completed the **"Fromme Mountain Sustainable Trail Use Classification Plan"** (*http://www.dnv.org/article.asp?c=988).*

The Mt. Fromme project is an example of a comprehensive trail assessment and management plan that was completed over two years with multiple phases, funding and Consultants. Although much broader in scope than what was intended for Mt. Tzouhalem, the Mt. Fromme study has served as a primary resource in developing the field work plan and determining what kind of information should be collected.

Another document of relevance is **The Whistler Trail Standards** *(http://www.mbta.ca/assets/pdfs/trail_standards_first_edition.pdf)*. This document provides guidelines and standards for trail building in BC and was used to classify the trails into the green, blue and black difficulty ratings.

The Tourism BC, Tourism Business Essentials; Mountain Bike Tourism Manual (*http://www.mbta.ca/assets/pdfs/mbtguide08_web.pdf)* and the **BC Mountain Bike Tourism Plan** *(http://www.mbta.ca/assets/pdfs/trail_standards_first_edition.pdf)* were resources that were reviewed in proposing recommendations through a tourism lens.

The International Mountain Biking Association (IMBA) website (*https://www.imba.com/*) and the **IMBA Canada** website (*http://www.imbacanada.com/*) were reviewed for recommendations regarding risk management and duty of care.

2.1 Data Acquisition

To avoid data duplication, Geographic Information System (GIS) data covering the Tzouhalem trail network was purchased for $1500.00 from local resident and GIS Specialist James Mackay. James is well-known in the GIS and outdoor community, and has been mapping the Mt. Tzouhalem trail network for several years. He offers a digital version of the Tzouhalem map on his website (*https://mtzoo.wordpress.com/*)**.** This website has been visited by over 155,671 users and is currently the number one resource for visitors or locals seeking a map of the trails on Mt. Tzouhalem.

Base data used for the assessment includes: contours, roads, water features, cutblock boundaries and lot lines. This data was already in the possession of the CTSS from previous data sharing agreements with the Municipality of North Cowichan Forestry Department.

2.2 Field Data Forms

Using the Mt. Fromme field data form as a reference, a field form was designed for assessing the Mt. Tzouhalem trail network *(**Appendix 2, Field Form**)*. Table 1 summarizes the attributes that were collected for each trail:

Table 1. Field Form Data

Attribute	Description of Data
Trail Name	Determined via local knowledge, purchased GIS data and historic trail map
Trail Difficulty	Classified into Green/Blue/Black based on Whistler Trail Standards
Trail Use Frequency	Apparent frequency of use: Rare/Low/Moderate/High
Trail Use Suitability	Best use for the trail: Mixed-use/Hiking Only/MTB Priority
Trail Direction	Optimal trail direction: one-way up, one-way down or 2-way trail.
Trail Tread Width	30-50cm/50-100cm/>1m
Trail Condition	Poor/Good/Very Good/Excellent
Number of technical trail features (TTFs)	Number of ramps, wooden structures
Condition of TTFs	Rotting/ride-able but unsafe/good sturdy/very good
Trail Maintenance Class	Mild/Moderate/High – how easy the trail is to maintain
Water Present	Creek seasonal/creek perennial/pooling/swamp or wetland
Number of bridges present	Number of bridges
Bridge Condition	Rotting/ride-able but unsafe/good sturdy/very good
Comments/ Recommendations	Overview and specific issues, priority actions

2.3 Field Data Collection

A team of 5 CTSS members conducted the field assessment portion of the project in the first two weeks of January 2015. The weather during those weeks was rainy and overcast, which proved an ideal time of year to assess trail pooling, drainage and/or erosion issues.

Using the purchased GIS data, a field map was created showing the trails, roads and ownership boundaries overlaid with 5 colored polygon areas (***Appendix 3, Field Map***). Each field crew member was assigned an area of the mountain, and made responsible for the assessment of all trails intersecting their assigned (colored) area.

Equipped with the georeferenced field map loaded into the PDF Maps Application *(http://www.avenza.com/pdf-maps)* on mobile devices, and the field forms, the field crew either hiked or rode the trails, stopping to collect spatial and aspatial data, coordinates and images. The crew recorded GPS tracks for all of the trails so that the spatial data could be cross-checked against the purchased data as an accuracy check.

Based on observations, a field form was filled out for each trail. The field crew compared field forms and went over example trails as a group to ensure that the data was collected and interpreted consistently.

Trails that were not included in the assessment were those that the CTSS classified as connectors (short pieces of un-named trail that connects users to named trails) or trails that were abandoned and/or overgrown.

3. PROJECT LIMITATIONS

The Mt. Tzouhalem trail network is a spider web of intersecting corridors, connectors, roads and trails. Historically, and at present, trails have been re-routed and modified to accommodate landscape changes caused by logging, residential development, erosion, windstorms and ongoing trail construction. Because there has never been a trail management organization (such as the CTSS) overseeing the "big picture", the trails have been developed organically and do not follow any particular order or plan.

3.1 Maintaining Historic Trail Names

The expanding and braiding of trails has created confusing centers of intersection and redundancies where multiple trails intersect. Popular "flow" trails such as "Double D" have divided the landscape and re-directed foot and bike traffic in new directions. These ongoing changes to the trail network make it challenging to identify exactly where a trail currently (or historically) begins and ends, and what the name of that trail is. It is important to the CTSS that historic trail naming is honored; this historic trail map

(***Appendix 4, Historic Trail Map***) combined with local knowledge, were the sources used in assigning the trail names that appear in this document and on the map.

3.2 GPS Positional Accuracy

Many of the trails on Tzouhalem run parallel to each other within 5 to 15 meters. Due to the close proximity, the GPS tracks and points collected during field work often overlapped and crisscrossed, making it difficult to interpret and separate the data. The data purchased from James Mackay, was collected and mapped using the same "PDF Maps" application. This application does an adequate job of mapping and collecting data; however, the positional accuracy was found to be unreliable within 10 to 12 meters.

3.3 Teamwork Dynamic

One further limitation to the assessment of all Tzouhalem trails was the sheer volume of work facing volunteers working with scarce resources. Mapping a project of this size with a keen though limited group of volunteers, proved a significant challenge.

The remainder of this report is an interpretation of the trails, connectors and intersections to the best of our ability and knowledge.

4. Results and Observations

The majority of the trails in the Mt. Tzouhalem trail network are a well-used mix of historic cross-country (XC) style trails that have withstood the test of time (25+ years), and newer trails that either follow the XC design of the original trails, or represent the newer downhill (DH) or "Flow" style of trail that has been made popular by the Whistler Mountain Bike Park. The remainder of the network is made up of forestry roads, skid roads and trails that are rarely used, abandoned or overgrown. Detailed results of the data collected have been compiled in the following sections: basic trail statistics, land ownership, technical trail features, trail obstacles, drainage issues, trail condition and trail difficulty ratings.

4.1 Basic Trail Statistics

A total of 36.6 kilometers (kms) of singletrack trail was assessed and mapped. This total does not include roads, skid roads, game trails, abandoned or overgrown trails. A total of 56 trails (34.2kms) were identified as "Named" trails. These are trails that are identified and referred to by a known name.

Of the 36.6 kms, 2.4 kilometers (6%) were classified as "Connector" trails. These trails are primarily well-used, short sections of trail that connect users throughout the trail network. Due to time constraints and mapping challenges, these pieces of trail were not named or rated for difficulty. It was observed that oftentimes these connectors used to be a part of a "named trail" but due to landscape changes and new construction they have been intersected or truncated and are now connectors.

4.2 Land Ownership

As shown in Appendix 1, there are 4 major land owners that share a property boundary with the Municipal Forest Reserve (MFR). The trail sections described here fell outside of the MFR boundary:

- 1319 meters of the popular "Danalyzer" trail crosses onto land owned by the Providence Farm Society. This property is also crossed when travelling along the Viewpoint Trail (493 meters).
- 701 meters of the "Cross Trail" falls within the property boundary of the Chase Woods land, owned by The Nature Conservancy of Canada.
- The popular summit trail: "Rocky Mountain Ridge" has a 529 meter section that encroaches on Cowichan Tribes land. There is also a 363 meter section of the "Cyclops" trail that crosses onto Cowichan Tribes land.

4.3 Technical Trail Features – Wooden Ramps, Structures and Bridges

A total of 76 wooden structures/ramps/bridges were pinned in the field. Of these 76 structures, 53 were classified as "Ride-able but unsafe". This category is for wooden structures that are currently in use but could be partially rotting, lacking a surface treatment for traction, have protruding nails or are structurally unsound (or all of the above). Eighteen of the 76 structures were classified as "Rotting/in disrepair". Most of the structures under this classification are no longer ride-able and are often cast off to the side of the trail or avoided by users. 5 of the structures mapped were recorded as sturdy and safe.

The following four pages show example photos of a variety of the bridgework and woodwork that can be found on the trails. Each photo has a summary describing the structure, which category it is classified under and the rationale behind the classification.

The image at right shows an old elevated wood structure located on the T-Bone trail. This structure is classified as "Rotting/in disrepair" due to wood rot.

The photo at left shows woodwork in the "Rotting/in disrepair" category. This is an example of an old ramp cast off to the side of the trail "M-One". Mt. Tzouhalem is littered with old woodwork like this.

The image at right, taken on “Toxic Tea Cup”, is an example of a well built structure that has been marked as “Ride-able but unsafe” due to the lack of a grippy riding/walking surface. The milled lumber becomes extremely slippery in wet or icy conditions. There are 3 other milled lumber bridges on the trail “Double D” as well.

This dual bridge feature is located on a popular trail called “Danalyzer”. It is considered “ride-able but unsafe” due to aging wet wood and on the left, a lack of mesh for grip.

The wood work shown on the right is located adjacent to the Schools Out trail. This is an example of woodwork that is classified as “rotting/in disrepair”.

This sunken bridge at right is located on the trail “Luke Skywalker”. This bridge is no longer in use and has been classified as “Rotting/in disrepair”. The forest around this feature is littered with old rotting wood structures. This particular creek draw only fills up in the wet season and saturates any trails crossing its path. Just south of this spot, the Lower YBA Roadie trail crosses this same draw and is flooded in the wet season.

This technical trail feature is located on the “Chicken Run” trail. This structure has been considered “Ride-able but unsafe” due to the exposed rotting wood, combined with an off camber surface.

This elevated bridge is located on the upper “YBA Roadie trail”. This structure has been classified as “Ride-able but unsafe” due to old rotting wood, a lack of structural integrity, protruding nails and a lack of grip.

These wood structures are located on the trail “Chicken Run 1”. These structures are marked as “Ride-able but unsafe due to protruding nails, and old slippery woodwork.

4.4 Trail Obstacles

Besides raised ramps and bridges, there are a number of trail obstacles scattered all over Mt. Tzouhalem. These could be described as purposely placed obstacles (such as a rock) or natural obstacles (such as a fallen tree) that provide a challenge for the mountain biker to overcome. These types of features are identified and flagged in the field notes if there is a safety concern. For the most part, these types of features are small, low to the ground and do not pose an immediate risk to trail users. Two examples of these type of features are pictured below.

This is an example of a tree that has fallen across the trail "Boogeyman". The obstacle has been built up with a small log and a rock to make it ride-able. This feature has been marked as "Ride-able but unsafe" due to the slippery wood and steep downhill landing.

The photo at right shows a fallen tree that has been purposely left as an obstacle to ride over. The terrain on either side of the log is level. Features like this are not considered a safety concern.

This log feature located on the trail "Crankenstein", is another example of an obstacle that mountain bikers appreciate having on the trail and are not considered a safety concern.

The milled 2x4 board shown in the photo at right is an example of an optional trail obstacle. This is an older feature called the "Log Ride" that doesn't see much use anymore. This is an example of a feature that would be rated as "ride-able but unsafe" due to the slimy/slippery board.

4.5 Drainage Issues

Twenty-three trails were flagged as having water present; this was further broken down into categories: Creek seasonal/creek perennial/pooling/swamp or wetland. Some of the water issues that need to be addressed have been identified and pictured below.

The trail pictured at left is the main route taken to get to the Cross. This part of trail is a known flood zone in the wet season. It also pools lower down and creating a substantial expanse of water (not pictured).

The drainage issue pictured at right is located on the popular “Danalyzer” trail. The water pictured here is present for much of the year with the exception of a dry spell.

The seasonal pooling shown in the photo at left appears on the “Chicken Run” trail during the wet season.

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There are two spots high up on the Mt. Tzouhalem mainline (road) where water pools in the wet season creating large ponds that have to be navigated. The photo at right shows one of these areas.

4.6 Trail Condition

For each trail, information was collected to reflect the trail condition and was rated as excellent, very good, good or poor. Factors that impact the trail condition rating are listed below:

- Trail Erosion (ruts and brake bumps, drainage issues, potholes, unsustainable high traffic zones)
- Trail Alignment (fall-line trail design, trails in low-lying areas, bad corner design)
- Drainage Issues (major prevalent water issues)
- Lack of ongoing maintenance (vegetation removal, blowdown removal, buildup of trail debris)

The results of the trail condition data is summarized below:

- 58% of trails were classified as being in Good condition
- 27% of trails were classified as being in Very Good condition
- 8% of trails were classified as being in Poor condition
- 7% of trails were classified as being in Excellent condition

The photo at left was taken on the trail "A Grand Traverse." This recently built climbing trail was rated as being in excellent condition. This bench cut trail was built to shed water naturally by following the up and down contour of the land. At major stream crossings large culverts with sinks have been installed to capture and drain the water.

4.7 Trail Difficulty Ratings

Based on the information gathered, and with reference to the Whistler Trail Standards, each trail was assigned a color rating to reflect trail difficulty. The results have been listed below:

- 9% of trails within the MFR are rated Green Circle – easy
- 86% of trails within the MFR are rated Blue Square – more difficult
- 5% of trails within the MFR are rated Black Diamond – most difficult

Refer to the Trail Assessment Map for a visual of the trails symbolized by color to reflect their difficulty ratings (***Appendix 5, Trail Assessment Map)***.

5. RECOMMENDATIONS

The following sections identify trail management recommendations, discussion and suggestions for the MNC staff and council. These recommendations have been formed with the responsibility of "Duty of Care" in mind, public safety and the overall improvement of the trail network for all. Based on the "Duty of Care" guidelines found on the "International Mountain Biking Association of Canada" (IMBA) website (*http://www.imbacanada.com/resources/insurance/liability-mountain-biking*), "Duty of Care" is addressed through the following 4 tasks:

1. Design and construct the trail appropriately
2. Inspect and maintain the trail appropriately
3. Address unreasonable hazards and post warnings
4. Anticipate foreseeable activities and take reasonable steps to protect users

5.1 Trail Management Recommendations

To break this project down into manageable pieces, a trail management strategy was created to organize the trails into groupings. Each trail has been assigned into one of the management priority groups listed below; the resultant group percentage is shown in bold red font.

ADOPT – Manage and maintain the trail as per the Whistler Trail Standards. These trails have been prioritized for adoption based on their popularity as high use travel corridors, combined with inherent safety issues that need to be addressed immediately. The adoption and management of these trails will immediately improve public safety, orientation and environmental impacts. Besides the initial field work completed for this assessment, a further detailed reconnaissance is required for each trail to determine

priority maintenance issues, work schedule, signage placement and any re-routing or decommissioning to achieve more sustainable alignments. **Adopt 42% of existing trails or 15.2 kilometers**

PROPOSE – This classification includes trails that are proposed as new trail construction projects. **Build 212 meters of new trail or 1% of the current total length**

REVISIT – These trails are active, well used trails that will be adopted in the future. At this time they have not been prioritized to adopt due to limited CTSS resources. **Revisit 38% of the remaining trails as time and resources permit**

OMIT – Three types of trails fall into the "Omit" category:

1.) Connector trails (described in Section 4.1) – omitted for now, due to lack of resources to accurately map and install signage.
2.) Trails that are classified as low use, are not perceived as adding value to the Mt. Tzouhalem trail network, and at the same time do not pose a significant risk to the user (no unsafe woodwork, gap jumps or high speed intersections).
3.) Trails that fall outside of the municipal forest reserve property boundary (exception being the Cross Trail which intersects the Nature Land Conservancy land and is recommended to adopt). **20% of the mapped trails fall into this category.**

5.2 Trail Adoption Priorities

The CTSS recommends the immediate adoption and management of 12 existing trails, proposed construction of one bypass trail and installation of a mid-mountain map kiosk. These items have been identified in the following table (**Table 2. Trail Adoption Priorities**) with a map identifier that corresponds to a text box on the Trail Assessment Map (***Appendix 5, Trail Assessment Map***).

Table 2. Trail Adoption Priorities

Map ID	Trail Name/Project	Rationale
1	**Danalyzer**	Popular well used trail that traverses the south facing slopes of Mt. Tzouhalem from mid-mountain down to the Kaspa road parking lot.
2	**Resurrection**	Fast high use jump trail with safety issues and high speed intersections that need to be addressed.
3	**Double D**	Fast high use flow trail with bermed corners, jumps and high speed intersections; has safety issues that need to be

		addressed.
4	**Toxic Tea Cup**	A popular well-used trail that could be potentially renamed and joined into Resurrection. Trail features and jumps are a safety hazard that needs to be rectified.
5	**M-One**	An original "old-school" cross-country trail that has somehow survived all the landscape changes, bypass trails and intersections. Serves as a main route up the mountain and would benefit the whole by being adopted.
6	**Schools Out**	A popular, fun and low-grade green trail that is great for riders of all ability levels.
7	**YBA Roadie**	A high use 2-way trail that is often used as a climbing trail through the mid-mountain elevations.
8	**Chicken Run(s)**	A confusing grouping of trails referred to as Chicken Run 1, 2 and 3. Adopting and signing these trails will help with orientation around this area of the mountain. Popular and well used cross country trails.
9	**Field of Dreams**	One of the most popular trails on the mountain and an old-school original cross-country track.
10	**A Grand Traverse**	This is a fairly new and extremely well-built climbing trail that is a pleasure to ride.
11	**Muni Trail**	This is a fun, fast, flowy downhill trail that is well-used. Some safety issues to need to be addressed around high speed intersections and "jump" features.
12	**Cross Trail**	A popular destination for local hikers.
13	**Mid Mountain Map**	This is a high traffic intersection where people can get lost trying to access the Cross Trail. Installing a mid-mountain overview map at this location will help with the public with orientation.
14	**New Trail Construction**	This trail would create a route to the summit on MFR lands without having to trespass on Cowichan Tribes land.

5.3 Trail Use & Trail Direction Recommendations

As part of the trail assessment field work, trails were assigned an optimal trail direction and a trail use suitability rating. This information addresses "Duty of Care" by improving public safety on the mountain.

Trail Direction recommendations have been applied to trails where it is considered a hazard to have a hiker or biker ascending a trail when a bike may be descending at high speeds. An example of this scenario is on high speed downhill trails such as "Double D", or "Resurrection". The CTSS recommends appropriate signage on these trails, and others, listed in **Table 3. Trail Use & Trail Direction Recommendations.**

Table 3 also lists trails that should be prioritized for hikers only, bikers only, or for uphill climbing only. Once adopted, it is recommended that the trails outlined in Table 3 are signed to reflect these trail use and direction guidelines. Trails that were assigned a proposed trail direction have been symbolized with arrows overlaid in **Appendix 5, Trail Assessment Map.**

Table 3. Trail Use & Trail Direction Recommendations

Trail Name	Status	Trail Use	Trail Direction
Awesome	Revisit	Hiking Only	2-way trail
Viewpoint Trail	Revisit	Hiking Only	2-way trail
Lower Finality	Revisit	Mixed-use	1-way downhill trail
Twist & Shout	Revisit	Mixed-use	1-way downhill trail
Cyclops	Revisit	Mixed-use	1-way downhill trail
A Grand Traverse	Adopt	Mixed-use	1-way uphill trail
T-Bone	Revisit	Mountain Bike Only	1-way downhill trail
Double D	Adopt	Mountain Bike Only	1-way downhill trail
Showtime	Revisit	Mountain Bike Only	1-way downhill trail
Resurrection	Adopt	Mountain Bike Only	1-way downhill trail
Lower Toxic Tea Cup	Adopt	Mountain Bike Only	1-way downhill trail
Emmas Express	Revisit	Mountain Bike Only	1-way downhill trail
Fluid	Revisit	Mountain Bike Only	1-way downhill trail
Bisecticon	Revisit	Mountain Bike Only	1-way downhill trail
Muni Trail	Adopt	Mountain Bike Only	1-way downhill trail
Loam Line	Revisit	Mountain Bike Only	1-way downhill trail

5.4 Land Use Agreements

It is recommended that the MNC opens up communication with adjacent landowners: The Providence Farm Community Association, The Nature Conservancy of Canada and The developers/owners of the future Kingsview Subdivision and Cowichan Tribes (***Appendix 1***). These neighbors should be made aware of future plans to adopt and promote the Mt. Tzouhalem trail network due to the potential impact on their lands and liability. This is an important step in showing respect for and acknowledgement of neighboring properties, and establishing goodwill within the community.

In particular, it is recommended that a land use agreement is immediately pursued with the Nature Land Conservancy of Canada to establish a legitimate route to the Cross. It is recommended that the Providence Farm Society is approached with regard to the popular Danalyzer and Viewpoint trails that cross their land. The result of these communications

will determine whether or not signage is required, or a re-route of trails back onto MFR lands.

Continued communication with the Kingsview Subdivision developers would be beneficial for establishing trail and green space connectivity, and potential parking for the Nevilane Road public access point.

Whether these partnerships result in collaboration or just raise awareness, open communication will ensure that all parties are clear with regard to insurance and liability, public access and land use planning.

5.5 Summary of MNC Recommendations

Suggestions to improve the infrastructure, amenities and public access for the trails are covered in **Table 3: MNC Recommendations**. These recommendations are outside of the scope of the CTSS, requiring the resources and decision making of the MNC. These items can be found on the map by matching the corresponding Map ID with the numbered **red** text box on the map.

Table 3. MNC Recommendations

Map ID	Recommendation
1	Expand and improve the Kaspa road parking lot, install proper washroom facilities, a map kiosk and bike wash station.
2	Work with the Kingsview Developers to improve the Nevilane Road access point.
3	Install privacy fencing along the boundary of the residential land owner whose property is directly adjacent to the Nevilane Road access point.
4	Possibly pursue a future trails partnership with the Cowichan Tribes; in the meantime install appropriate land ownership signage.
5	Enter into a land use agreement with the Nature Conservancy of Canada to allow the public formal access to the Cross Trail.
6	Enter into a land use agreement with the Providence Farm Society that would allow the public formal access to the Viewpoint & Danalyzer trails.

5.6 Recommendations for Rotting Structures

It is important that the MNC collaborates with the CTSS to come up with a plan to address the removal or improvement of the 71 wooden structures discussed in Section 4. The CTSS suggests prioritizing the “ADOPT” trails with structures that were considered “Ride-able but Unsafe”, followed by the structures that were rated as “Rotting/In disrepair”. Once those are complete, prioritize the next set of trails falling under the “REVISIT” category.

5.7 Trail Maintenance Plan & Log

It is recommended that a trail maintenance plan and log is established for the future works to be completed on Mt. Tzouhalem. This may be something that is maintained by the CTSS or the MNC or both. The importance of tracking trail improvements and maintenance shows due diligence in duty of care.

5.8 Signage

The CTSS recommends implementation of a signage system that starts in the parking lot and continues to engage the trail user as they navigate through the trail network. Signage should reflect trail etiquette, trail name, trail difficulty ratings, trail direction, trail usage, high speed intersections and any other information that is deemed relevant to share. The posting of appropriate signage plays an important role in managing risk, enhancing the trail network and improving public safety.

5.9 Public Involvement

As described earlier in this report, the public has expressed an interest in what happens on Mt. Tzouhalem. The CTSS suggests that the MNC host one public meeting, in collaboration with the CTSS to share the proposed trail management recommendations with the Mt. Tzouhalem trail use community, and provide an opportunity for feedback. This meeting should take place prior to any works being complete on the mountain.

5.10 Improve Map Data

As described earlier in Section 3: Project Limitations, it is recommended that the Mt. Tzouhalem Trail Network and associated roads are re-mapped with a more accurate GPS unit. This will capture all the trails and intersections accurately and allow for more accurate future trail maps and improved GIS planning.

5.11 Recreation Tourism

Imperative to the trail management conversation is the discussion regarding the viability of promoting Mt. Tzouhalem, and the Cowichan Valley in general, as a mountain bike tourism destination.

The Cowichan Valley has an opportunity to capitalize on this tourism market by joining communities like Whistler, Squamish, and North Vancouver. These communities have recognized the value of mountain bike tourism and have targeted marketing and purpose

built trail networks in place, that are drawing cyclists to their communities from all over the world.

Vancouver Island is only 4 hours away from the more established biking communities, with many additional tourism features to offer visitors. By employing a similar mountain biking recreation strategy, the Cowichan Valley can capitalize on the spin-off tourism created by these already popular destinations. In addition to spin-off tourism, if thoughtfully planned, the Cowichan Valley could become a destination that attracts and hosts large provincial, national or international races, such as the eminently popular BC Bike Race.

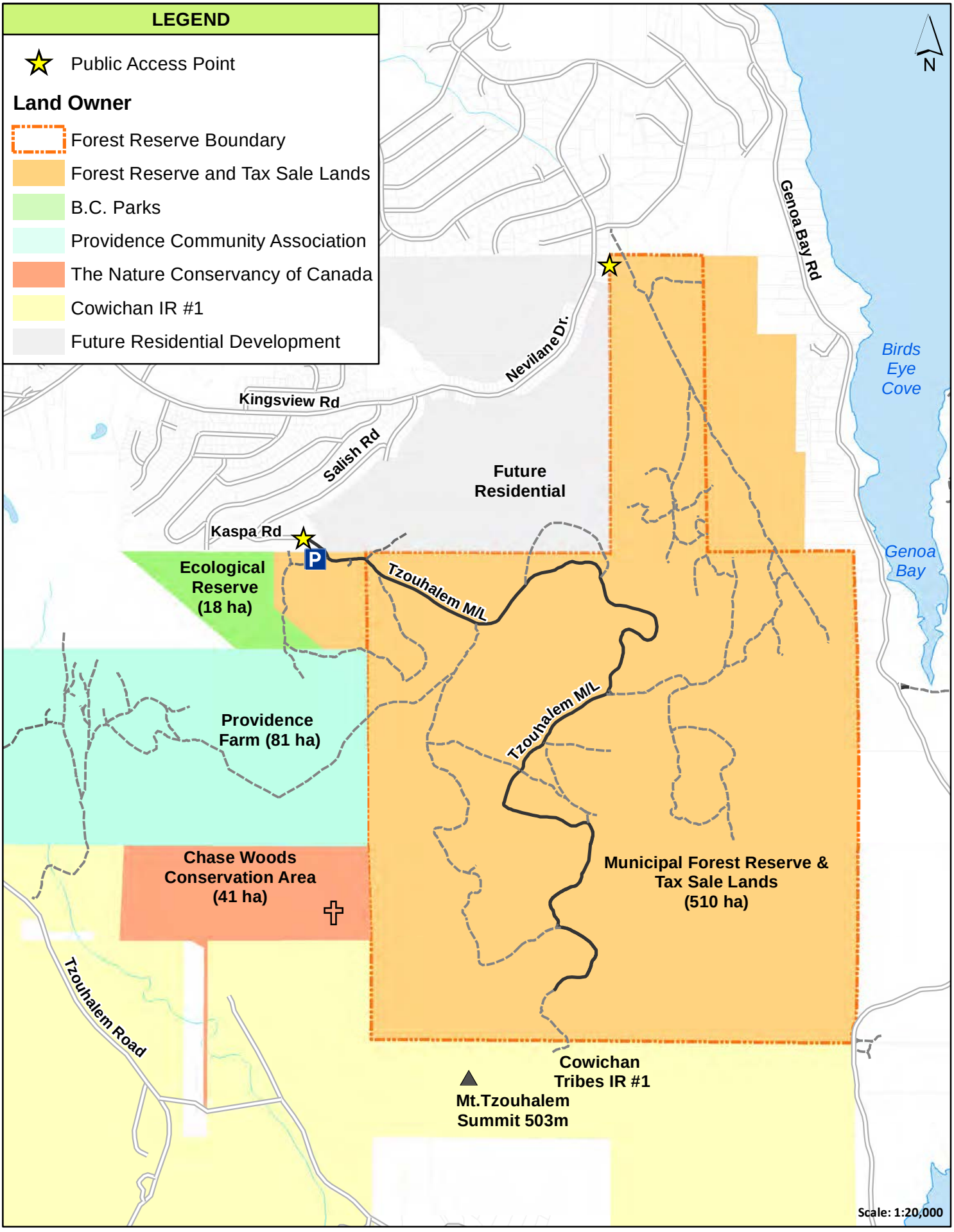
6. CONCLUSION

In closing, the Cowichan Trail Stewardship Society intends this assessment and its recommendations to serve as a starting point and guide for discussions concerning the administration of the Mt. Tzouhalem Trail Network by The Municipality of North Cowichan.

The CTSS is happy to meet with the MNC staff at any time for additional information on the material presented in this report.

APPENDIX 1: STUDY AREA MAP

- APPENDIX 1: MT. TZOUHALEM STUDY AREA -

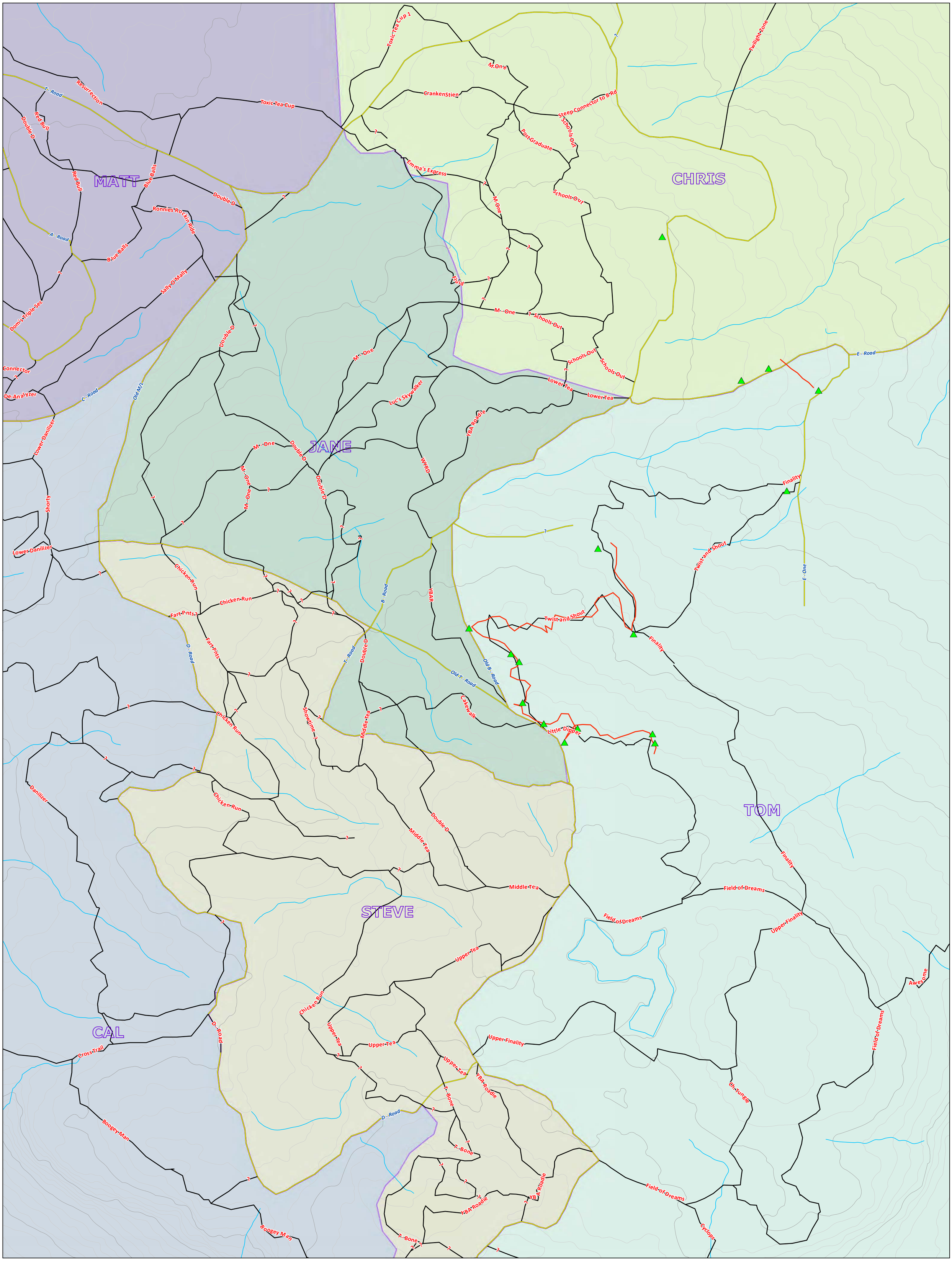


APPENDIX 2: FIELD FORM

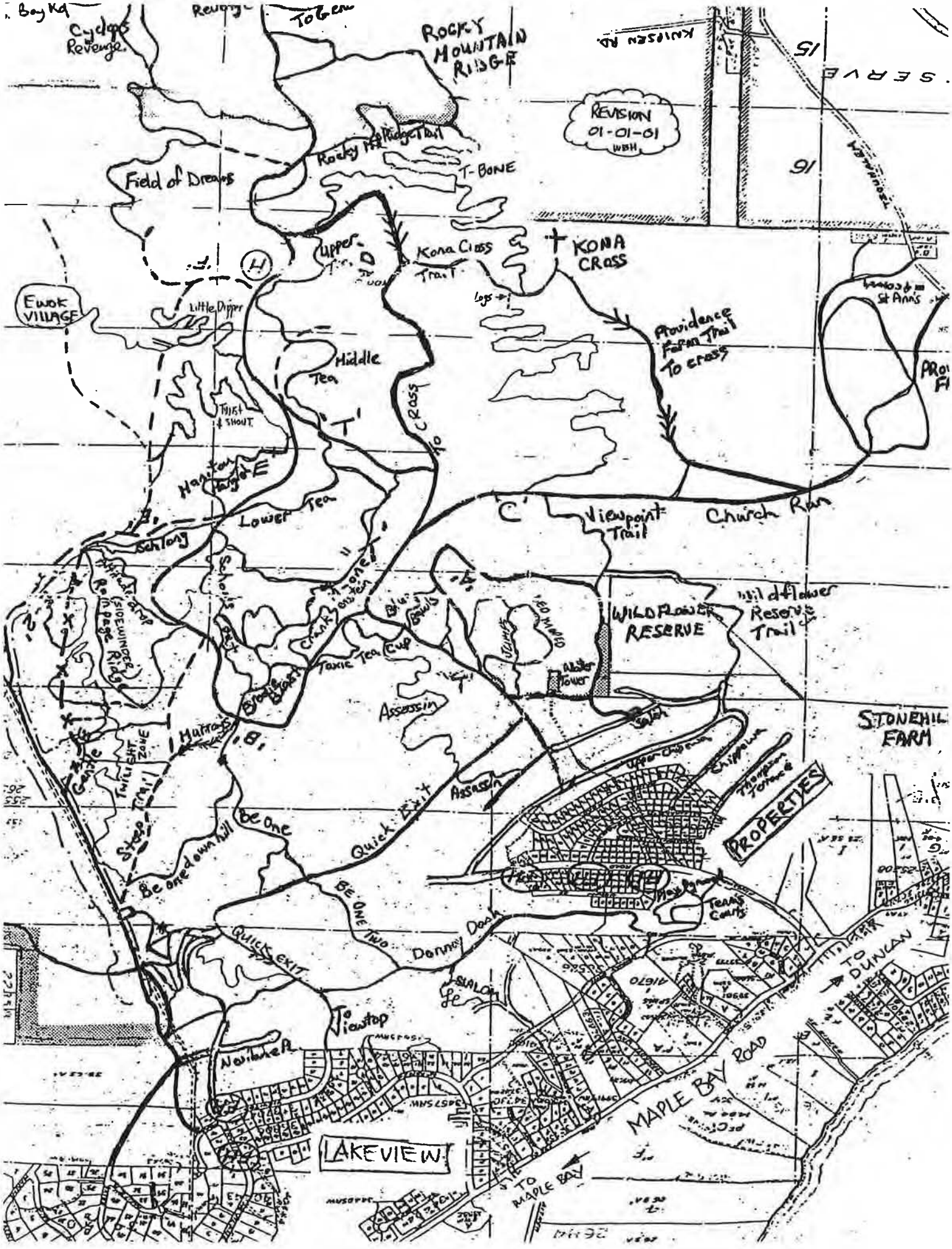
Date:	Trail Name:		Initials:
Trail Difficulty: ☐ Green ☐ Blue ☐ Black ☐ Double Black	Frequency of Use: ☐ Rare ☐ Low ☐ Moderate ☐ High	Trail Use Suitability: ☐ Mixed-use ☐ Hiking Only ☐ MTB Only	Trail Direction: ☐ 2-way ☐ 1-way - Up ☐ 1-way - Down
Trail Tread Width: ☐ 30-50cm ☐ 50-100cm ☐ >1m	Trail Condition: ☐ Poor ☐ Good ☐ Very Good ☐ Excellent	# of TTFs Present:	Condition of TTFs: ☐ In disrepair/rotting ☐ Rideable but unsafe ☐ Good sturdy safe ☐ Very good
Trail Maintenance: ☐ High ☐ Moderate ☐ Mild ☐ N/A	Water Present: ☐ Creek Seasonal ☐ Creek Perennial ☐ Pooling Seasonal ☐ Swamp/Wetland	# of Bridges Present:	Condition of Bridges: ☐ In disrepair/rotting ☐ Rideable but unsafe ☐ Good sturdy safe ☐ Very good
Trail Notes (Overview and specific issues):			
Trail Recommendations (Priority Actions and possibilities):			

**Other attributes that will be considered in trail assessment via voting poll and GIS include trail popularity, elevation (start, finish, difference), trail length.*

APPENDIX 3: FIELD MAP


MATT
JANE
CHRIS
TOM
STEVE
CAL
Toxic Tea Cup 1
M One
Twilight Zone
Resurrection
T - Road
Toxic Tea Cup
Red Bull
Double D
Red Bull
Blue Balls
Ronnies Rockin Ride
A - Road
Blue Balls
Sally O Mally
Dom s Triple Sec
Connector
De-Analyzer
C - Road
Old M/L
Lower Danilizer
Shorty
Lower Danilizer
Danilizer
Cross Trail
Boogey Man
GrankenStien
Steep Connector to B Rd
Post Graduate
Schools Out
Emma's Express
M One
Schools Out
Fluid
M - One
Schools Out
Schools Out
Schools Out
Lower Tea
Lower Tea
E - Road
Luc's Skywalker
YBA Roadie
M - One
Double D
M - One
M - One
Double D
WWRD
Finality
Twist and Shout
E - One
Chicken Run
Chicken Run
Fart Pnts
Fart Pnts
D - Road
B - Road
YBAR
Twist and Shout
Finality
T - Road
Double D
Old T - Road
Old B - Road
Chicken Run
Showtime
Middle Tea
Cakewalk
Little Dipper
Chicken Run
Middle Tea
Double D
Middle Tea
Field of Dreams
Field of Dreams
Upper Finality
Upper Tea
Chicken Run
Upper Tea
Upper Tea
Upper Tea
Upper Tea
T - Bone
YBA Roadie
D - Road
T - Bone
YBA Roadie
YBA Roadie
T - Bone
Boogey Man
Field of Dreams
Cyclops
Upper Finality
Chi Tungle
Field of Dreams
Awesome

APPENDIX 4: HISTORIC TRAIL MAP


Cyclops Revenge
ROCKY MOUNTAIN RIDGE
REVISION 01-01-01 WBH
Rocky Mt. Ridge Trail
T-BONE
Field of Dreams
Upper Tea
Kona Cross Trail
KONA CROSS
EWOK VILLAGE
Little Dipper
Providence Farm Trail To cross
Middle Tea
TWIST & SHOUT
To Cross
Lower Tea
Viewpoint Trail
Church Run
WILDFLOWER RESERVE
Wildflower Reserve Trail
Sidewinder Ridge
Blue Bird
Toxic Tea Cup
Assassin
Salish
STONEHILL FARM
PROPERTIES
Twilight Zone
Steep Trail
Be One
Quick Exit
Be One Two
Donny Dash
To Viewtop
Nowhere
LAKEVIEW
MAPLE BAY ROAD
TO DUNCAN
TO MAPLE BAY

APPENDIX 5: TRAIL ASSESSMENT MAP

Mt.Tzouhalem Trail Assessment Map

COWICHAN TRAIL STEWARDS

TRAIL FEATURES

- Public Access
- Parking
- Hiking Trail
- Mixed-use Trail Green
- Mixed-use Trail Blue
- Mixed-use Trail Black
- Connector
- Top 10 Trail as per the online trail popularity poll
- Red crosses indicate trails that the CTSS does not choose to adopt

BASE MAP SYMBOLS

- Forestry Gate
- The Cross
- Mainline
- Gravel Road
- Non-active Road
- Paved Road
- Forest Reserve Boundary

ELEVATION MODEL

- 0-100m
- 100-200m
- 200-300m
- 300-400m
- 400-500m

Drawn By: Jane Kaiser
Date Revised: Nov 20, 2015
Projection: UTM Zone 10

Scale: 1:4,000
0 100 200 400 600 800 Meters

Nevilane Drive Parking:
-Limited un-marked parking available.
-Users either park in this paved pull out (future road intersection) or along the Nevilane drive road side.

2.) RECOMMENDATION FOR MNC STAFF & COUNCIL
-Work with Kingsview Development team to improve this access point with purpose built parking, green space connectivity and amenities.

3.) RECOMMENDATION FOR MNC STAFF & COUNCIL
-Install privacy fencing along the boundary of this land owners property - similar to what was done for the land owners along the Crofton Seawalk Hayhurst Rd. access point.

Nevilane Drive MFR Public Access:
-This is a public access point to MFR Lands.
-A sign here indicates entrance onto land within the Municipal Forest Reserve.

Future Residential Development: Kingsview Subdivision

Nevilane Dr.

10. A GRAND TRAVERSE:
-Sign as a one-way uphill trail
-Install orientation signage at intersections
-Complete construction to the Mainline (~500m) after T110 is logged

11. MUNI TRAIL:
-Sign as a one-way DH mtn bike only trail
-Properly label/sign all jumps

Muni Trail
A Grand Traverse
Loam Line
Branch J
BC Hydro ROW

Kingsview Rd
Sansum Dr.
Chippewa Rd
Salish Rd

Future Residential Development: Kingsview Subdivision

1.) RECOMMENDATION FOR MNC STAFF & COUNCIL
-Expand the Kaspa Road parking lot
-Create a 1-way loop in/out of parking lot
-Install: a map kiosk, bike wash station, washroom
-Consider installation of residential privacy fencing

Kaspa Rd

2.) RESURRECTION:
-Properly label/sign all jumps
-Sign trail as 1-way DH mtn bike only
-Create a safer exit onto the mainline

4.) TOXIC TEA CUP (Lower):
-Consider renaming to Resurrection
-Sign trail as 1-way DH mtn bike only
-Assess all wooden structures
-Attempt to control some braiding

5. M-ONE:
-Sign as 2-way mixed-use trail
-Attempt to close redundant trail braids
-Remove/pile burn rotting wood features
-Address seasonal pooling

4.) TOXIC TEA CUP (Upper):
-Sign as 2-way mixed-use trail

Resurrection
Toxic Tea Cup
Toxic Tea Cup
Crankenstein
M-One
Post Graduate
Emma's Express
Fluid
M-One
Schools Out
M-One
Lower T
Branch E
Branch E-2
Branch E
Tzouhalem Mainline
Finality
Branch E-5
Twist & Shout
Twist & Shout
Little Dipper
Lower Finality
Awesome (Hiking only)

Mt. Tzouhalem Ecological Reserve Owned & Managed by BC Parks

Jumps
Double D
Danalizer
Bisecticon
Dead Moped
Dan's Triple Sec
Branch A
Red Bull
Tzouhalem M/L
Ronnie's Rockin Ride
Blue Balls
Danalizer
To The Max
Sally O'Malley
Branch C
Viewpoint Trail
Danalizer
Old Mainline (T-Road)
Double D
M-One
Fluid
M-One
Lower T
Luke Skywalker
YBA Roadie
YBA Roadie
Chicken Run3
Old M/L
Branch D
Shownuff
Cake Walk
Jaw Bones
Chicken Run 2
This Way
That Way
Danalizer
Middle T
Double D
Chicken Run 1
Chicken Run 1
Upper T
Field of Dreams
Upper Finality
Chocolate Jungle
Field of Dreams
Field of Dreams
Boogey Man
Branch D
T-Bone
Rocky Mtn Ridge
Santa Cruz
Roys Revenge
Cyclops
To The Cross

Providence Farm
Municipal Forest Reserve Boundary

Inukshuk Village

Cutblock T110
To be harvested Nov 2015

1.) DANALIZER
-Sign as a 2-way mixed-use trail
-Install orientation signage at all intersections
-Address seasonal pooling
-Assess stability/safety of wood bridges

3.) DOUBLE D (Upper/Lower):
-Sign as 1-way DH mtn bike only
-Install safety signage at intersections
-Consider re-routing current high speed exit
-Address drainage issues
-Add mesh to bridges

6.) SCHOOLS OUT:
-Sign as 2-way mixed-use trail
-Clean up old rotting wood along trail
-Install signage at confusing intersections

7.) YBA ROADIE:
-Sign as 2-way mixed-use trail
-Address seasonal pooling
-Orientation signage at intersections
-Install 20 foot bridge where water pools knee deep over winter or re-route

6.) RECOMMENDATION FOR MNC STAFF & COUNCIL
-Enter into a formal agreement with the Providence Farm Society for permission to use the Viewpoint and Danalizer trails crossing their land.

13.) MID MOUNTAIN MAP
-Install a mid-mountain map kiosk at intersection of Old M/L and Br. D
-Remove logs that are blocking trail connections to the road

9.) FIELD OF DREAMS:
-Sign as 2-way mixed-use trail
-Address seasonal drainage
-Orientation signage at intersections
-Assess wooden structure, add mesh

12.) CROSS TRAIL
-Sign as 2-way mixed-use trail
-Construct a bridge where water pools at the intersection of boogey man
-Install signage/directional arrows that guide users to the cross as per yellow highlighted route

Chase Woods Conservation Area
Owned & Managed by Nature Conservancy of Canada

5.) RECOMMENDATION FOR MNC STAFF & COUNCIL
-Enter into a formal agreement with the Nature Conservancy of Canada to allow formal public access to the Cross Trail.

8.) CHICKEN RUN(S):
-Sign as 2-way mixed-use trails
-Consider less confusing naming convention
-Orientation signage at intersections
-Assess wooden structures
-Assess seasonal drainage

14.) NEW TRAIL CONSTRUCTION
-Currently trail users trespass on CT land to access the summit and ridge trails
-CTSS proposes to construct a bypass (blue dash line) re-routing trails users to stay on MFR land

Municipal Forest Reserve Boundary
Cowichan Tribes IR#1

4.) RECOMMENDATION FOR MNC STAFF & COUNCIL
-Pursue a partnership with the Cowichan Tribes Band
-Possibly via a youth program similar to the House of Friendship
-In the meantime, install appropriate trespassing signage.

COWICHAN TRIBES LAND
-The "red x" trails and roads shown here are displayed for information purposes only
-These trails/roads will not be shown on any map products without the permission/agreement of Cowichan Tribes

-The Big Dog (aka Mad Dog) is an incredibly scenic well-used mixed-use trail that travels South down the spine of Separation point to Genoa Bay
-Also accessed by some hikers from Khenipsen Road

The Big Dog