AGENDA

COMMITTEE OF THE WHOLE

Tuesday, February 24, 2015
5:00 p.m.
Committee Room, Municipal Hall
355 West Queens Road,
North Vancouver, BC

Council Members:
Mayor Richard Walton
Councillor Roger Bassam
Councillor Mathew Bond
Councillor Jim Hanson
Councillor Robin Hicks
Councillor Doug MacKay-Dunn
Councillor Lisa Muri

NORTH VANCOUVER
DISTRICT

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District of North Vancouver
355 West Queens Road,
North Vancouver, BC, Canada V7N 4N5
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COMMITTEE OF THE WHOLE

5:00 p.m.
Tuesday, February 24, 2015
Committee Room, Municipal Hall,
355 West Queens Road, North Vancouver

AGENDA

1. ADOPTION OF THE AGENDA

1.1. February 24, 2015 Committee of the Whole Agenda

Recommendation:
THAT the agenda for the February 24, 2015 Committee of the Whole be adopted as circulated, including the addition of any items listed in the agenda addendum.

2. ADOPTION OF MINUTES

3. REPORTS FROM COUNCIL OR STAFF

3.1. Fromme Mountain - Trails Environmental Assessment Draft Report and Fromme Mountain Recreational and Trail Update p. 7-21

File No.

Recommendation:
THAT it be recommended to Council:

> THAT the memo dated February 17, 2015 of the Manager – Parks and the Section Manager – Environmental Sustainability entitled "Fromme Mountain - Trails Environmental Assessment Draft Report and Fromme Mountain Recreational and Trail Update" be received for information.

3.2. Single Family Organics and Garbage Collection

File No.

Materials to be circulated via agenda addenda.

4. PUBLIC INPUT

(maximum of ten minutes total)

5. RISE AND REPORT

Recommendation:
THAT the February 24, 2015 Committee of the Whole rise and report.

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REPORTS

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NORTH VANCOUVER DISTRICT

MEMO

TO: Gavin Joyce, GM – Engineering, Parks and Facilities
Bryan Bydwell GM – Planning, Properties & Permits

DATE: February 17, 2015

AUTHOR: Susan Rogers, Manager – DNV Parks
Julie Pavey, Section Manager – Environment Sustainability

SUBJECT: Fromme Mountain - Trails Environmental Assessment Draft Report and Fromme Mountain Recreational and Trail Update

PURPOSE OF REPORT :

The purpose of this report is to provide the key findings from the *Fromme Mountain Trails Environmental Assessment* draft report in a workshop format for discussion and to provide an update to Council on the implementation of recommendations from the *Fromme Mountain Trail Classification Study Update* (2008).

This report is organized in four sections:

1) ***Fromme Mountain Trails Environmental Assessment Report- Draft*** (2014) - To review the key findings from the draft of the *Fromme Mountain Environmental Trail Assessment Report* prepared by environmental consultant, Diamond Head Consulting Ltd in a workshop with Council)

2) ***Chronology of Planning and Operational Documents*** **from 2006 – 2014**

3) ***Fromme Mountain Trail Classification Study Update*** (Council approved in 2008) - To provide an update on the status of trail recommendations implemented between 2008 – 2014, and a summary of current challenges in the service delivery of environmentally sustainable recreational trails on Fromme Mountain.

4) ***Fromme Mountain Workplan*** for 2015 – To outline projects and initiatives targeted for 2015.

1. ***Fromme Mountain Trails Environmental Assessment Draft Report* Summary**

In Spring 2014, Council requested staff to initiate an independent environmental assessment of representative trails on Fromme Mountain. The purpose of the environmental assessment was:

1. To determine and evaluate if the District is on track implementing environmental goals and objectives, in accordance to the *Fromme Mtn Trail Classification Study*. This includes reviewing at a general level, the condition of habitat, vegetation, trees, riparian zones, terrestrial and aquatic systems including species and ecosystems at risk that may be impacted by the trails.

2. To assess whether that Best Management Practices (BMPs) are being followed as recommended in the *Fromme Mountain Trail Classification Study* and provide feedback on their effectiveness.

3. To determine if the trail approval and procedural processes between DNV Parks and volunteer trail maintainers (NSMBA) is effective in meeting environmentally sustainable trail and habitat objectives and supportive of stewardship goals.

4. To provide general recommendations to improve the existing Environmental Best Management Practices (BMPs)

The. *Fromme Mountain Environmental Assessment Report* went through a competitive RFP process and was awarded in June 2014 to Diamond Head Consulting Ltd. The field work was completed between July and September 2014.

The report summarizes data collected from 459 plots assessed on 8 trails selected by Parks staff to represent a cross-section of trails on Fromme Mountain. The draft report provides a series of recommendations that include guidance on improving implementation of Best Management Practices (BMPs) to more effectively manage environmental impacts to riparian habitats, old growth trees, species at risk, structural tree diversity, off trail impacts, tread wear, vegetation impacts and wildlife as a result of recreational trail maintenance and use.

The consultant provides professional recommendations for continued decommissioning of unauthorized trails that fragment the habitat and result in unmanaged access to environmentally sensitive areas. The environmental trail assessment undertaken in 2014 has shown that the new trail building and maintenance standards adopted in the 2008 study have improved environmental conditions on the trails that have received focus effort by DNV, volunteers and NSMBA. However comparisons between trails have shown that there have not been sufficient resources to effectively apply these standards to the entire 61 kilometre length of trails on a continued basis to keep up with growing recreational use levels.

The key issues identified in the environmental assessment review include erosion and sedimentation, water quality and habitat impacts to riparian habitats and unauthorized trail building and unauthorized tree cutting. The key areas highlighted for improvement are:

- Refine the existing Best Management Practices (BMPs) to improve environmental sustainability of trails
- Improve management and design,of creek crossings to minimize riparian impacts (ie bridges)
- Increase park monitoring of Fromme Mountain area and continue to decommission unauthorized trails
- Consideration of additional review process to ensure new trail realignments have been screened for potential impacts to species and risk and sensitive environmental habitats.

2) Chronology of Key Planning and Operational Documents

- ***Alpine Recreational Strategic Study*** **(2006)** - Council approved the Alpine Recreational Strategic Study which outlined a framework to formalize recreational trails on the mountain.
- ***Fromme Trails Classification Study*** (approved by Council, 2008) -The study included a Trail Classification Plan, Best Management Practices and Trail Construction Guidelines.
- ***DNV/ NSMBA Trail Maintenance Service Agreement*** *(pilot 2013)*

3) Fromme Trail Classification Study (2008) Update

Within an adaptive management framework, the 2008 study assessed the overall 61 kilometres of trail system and made recommendations for each trail in terms of improvements, management, decommissioning and/or consolidation.

- In the past five years, through a combined DNV staff and NSMBA volunteer effort, recommendations have been applied to an estimated 70 percent of the total authorized mountain bike primary trails. Many older trails have been decommissioned, and some sections of trails have been realigned to improve the riding experience, and to manage drainage and erosion more effectively.
- The remaining trail recommendations will continue to be planned and worked on, as resources and volunteers become available. The annual trail maintenance by volunteers has improved the quality of trails, making them more popular and accessible to beginner and intermediate riders, which results in more trail wear and tear.
- In addition, over the past 5 years, the Parks Department has undertaken a variety of capital projects to upgrade trails, boardwalks, bridges, signage, mapping, and to establish parking and drop off areas in the Fromme area.

Ongoing Challenges :

The high rainfall on the North Shore, combined with steep topography, and an increasing volume of use year round places pressure on the long term sustainability of the trails.

While the recommendations from the *Fromme Mountain Trail Classification Study* may have been implemented, commitment to regular trail maintenance is vital to keep the trails environmentally sustainable in the long term.

- **Increasing Trail User Volume and Potential User Conflicts**
  With the improvement and accessibility of trails over the past 5 years, the District has documented an increase in trail use. Specific mountain bike focused trails such as Expresso and Bobsled show a user rate of up to 2,500 – 3,000 riders a month. Each year, the District receives more requests for special events, races, commercial cycling events and workshops. The 2008 trail user classification map, in discussion with the public, identified the preference for all trails to be multi – purpose (between Mosquito Creek and Lynn Creek), with the identification of mountain bike "primary trails". All authorized trails have been signed by trail name and level of difficulty, along with maps and information kiosks at key staging areas. Over the past 5 years, with different styles of mountain riding emerging, the existing trail user classification is under preliminary discussion, with the need to revisit "pinch points" where conflicts between hiking and mountain biking are emerging. For the most part, trail users are compatible and respectful, and the District does not receive many reported incidents of user conflicts.

- **Ensuring Adequate Maintenance Service Levels to Support Environmental Sustainability**
  Service levels to maintain all the trails to a higher environmental standard will require a review of current resource levels. Currently, the maintenance of the mountain biking trails is largely volunteer-based through a partnership between the District of North Vancouver and the North Shore Mountain Bike Association (NSMBA), through a Trail Adoption Program (TAP). NSMBA provides a Trails Building Academy to their volunteers, which bases itself on the Best Management Practices, and mountain bike trail standards. Annually, the Parks Department discusses the NSMBA trail work plan requests, and if proposals meet specific criteria, park permits are issued to maintain specific trails, under the approval and monitoring of the Parks group.

- **Increasing Unauthorized Activities**
  In addition to trail management, there are a growing variety of issues that include homeless building structures, harvesting native species for commercial use, vandalism of creeks and waterways, tree removal and other emerging concerns. Despite efforts to centralize mountain biking trail agreements through NSMBA, there are groups outside the NSMBA who continue with no authority to build trails on Fromme. Many of these trails are kept under the radar to prevent dismantling by land managers. The intent of the 2008 Fromme Mountain Trail Classification Plan was to reduce the quantity of trails that existed, in order to reduce ecological fragmentation, with the caveat that the quality of trails and trail linkages would be improved over time.

***4)* Fromme Mountain Workplan for 2015**

The existing service levels and resources to manage the area effectively is currently under review, and in the long term, additional operational budgets may be critical to manage the 61 kilometre of trails and forestland. For 2015, the Parks Department requested 2 additional

seasonal rangers to focus on monitoring and decommissioning unauthorized trail activity, and to implement a combination of education and enforcement on Fromme. With approved funding for 2015, the Work Plan on Fromme Mountain for DNV includes the following items:

TASKS	2015
Fromme Mtn Parking/Staging area under construction	Summer Opening
Braemar Parking/Staging design – public process/ detailed design	Spring – Fall
Braemar Area Trail Modifications – improve trail linkages to new staging area, and review and modify trail user classification to minimize conflicts between hikers/bikers /signage and regulation	Spring/Summer
Set strategies to incorporate environmental recommendations from *2014 Environmental Assessment Report,* with respect to BMP's, to improve protection of environmentally sensitive areas	2015
NSMBA – Annual Volunteer Trail Adoption Program for Maintenance is ongoing – Parks issues Park Permits for estimated 25 trails	2015
Enforcement - Increase Ranger/Bylaw presence with 2 additional auxiliary rangers on Fromme and Alpine areas	Spring – Fall
DNV Web site – include info on NSMBA TAP 2015 Trail Maintenance Program	Summer

Conclusion:
The *Fromme Mountain Trails Environmental Assessment Report* identifies a number of recommendations related to trails and recreational use in the Fromme Mountain study area, and recommends specific areas to prioritize for improvements, within the Best Management Practices and Adaptive Management Framework.

Subject to Council discussions and direction, staff will further review the details of the report to develop strategies, and to quantify resources to support phasing in the recommendations.

Susan Rogers – Manager of Parks

Julie Pavey – Section Manager – Environmental Sustainability

Encl. Diamond Head Consulting Ltd. Draft Report – Executive Summary

District of North Vancouver
Fromme Mountain Trails
Environmental Assessment

February 12, 2014

Submitted to:

District of North Vancouver
355 West Queens Road
North Vancouver BC
V7N 4N5

Submitted by:

DIAMOND HEAD
CONSULTING LTD.

342 West 8th Ave.
Vancouver, BC
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1 Executive Summary

When the Fromme Mountain Trails Study (Trails Study) was adopted in 2008, it set a community direction to support recreation including mountain biking in the Fromme Mountain Area. As in any natural park area, it can be expected that the construction and use of recreation amenities will cause some level of impact to the environment. The Trails Study provides guidelines and best management practices (BMPs) that were developed with the intention of minimizing these environmental impacts.

One of the principles of the Trails Study was a commitment to adaptive management to support sustainable trail use. This principal calls for a monitoring function to evaluate the effectiveness of initiatives, the modification of actions as required, and the incorporation of new approaches and decision-making processes as necessary. As part of their response to this commitment, the District of North Vancouver (DNV) undertook this environmental assessment of representative trails in 2014.

The network of trails on Fromme is extensive and recreation use has been increasing since 2008. Quantitative data was collected in the field and has shown that new trail building and maintenance standards adopted as a part of the Trails Study have improved environmental conditions on the trails that have been focused on. However there has not been enough resources to apply them on a consistent and ongoing basis to the entire trail system. This report identifies opportunities to improve environmental conditions by updating certain BMPs and provides recommendations to prioritize resources.

Before and after photos of upgrades to Expresso (left) and Executioner (right).

The Fromme Mountain Trail Classification Study (Trails Study) was approved by Council in 2008. It has guided trail maintenance and upgrades, identified which trails to manage, consolidate or close and provides best management practices (BMPs) for trail construction and maintenance. Work has been carried out since 2008 in partnership between DNV, the North Shore Mountain Bike Association (NSMBA) and other independent trail builders.

Following a commitment to managing these trails using an adaptive management approach, the District has commissioned this independent environmental assessment of a sample of representative trails. The purpose of this environmental assessment is to provide an analysis of the current trail conditions, their impacts to the environment and an evaluation of the effectiveness of the BMPs and management recommendations adopted in the Trails Study.

For this environmental assessment, eight representative trails were studied in the field. These include newly built trails, trails that have been upgraded and older trails that have not been managed to the current standards. A total of 9180 m of trails were assessed representing approximately 18% of the total length of the recognized trail system (DNV Geo Web Data) on Fromme Mountain. 459 plot measurements were collected. Professional judgement was used to assess non-measurable impacts.

In park natural areas that are managed for recreation, the risk of environmental impacts typically increases with the level of use (Parks Canada 2010). Management of these park areas must achieve a balance between supporting the demand for recreation and minimizing the impacts on the environment. Environmental impacts resulting from trail management and use include direct impacts on environmental features and functions, as well as the indirect impacts resulting from recreation use. Sources of environmental impacts that have been identified from the trail on Fromme Mountain include:

- Damage to tree roots;
- Loss of ground vegetation;
- Spread of invasive species; and,
- Cutting of trees and stumps;
- Changes to natural hydrology;
- Soil erosion;
- Creation of borrow pits;
- Human and dog trampling of vegetation;
- Development of unauthorized trails;
- Reduced use by wildlife.

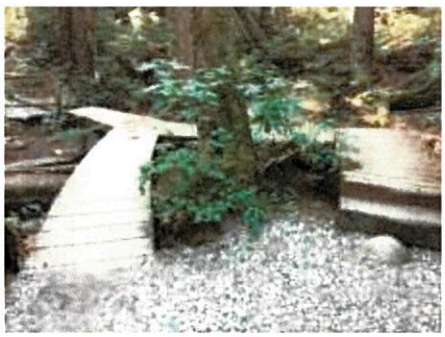
The eight trails studied vary in their recreation uses and condition. Dominant recreation uses in the study area include hiking, dog walking and mountain bike trails. Some trails have been recently built or ungraded to the standards specified in the Trails Study, while others have had limited maintenance. This variable condition allows for comparison between building and maintenance standards and levels of usage.

New and upgraded trails are being constructed differently that older trails. Trail design includes gentler grades, strategic alignment and features that prevent the concentration of surface water flow. Also trail surfaces are built up with rocks and mineral soil as opposed to creating cuts down into the topsoil horizon.

Fromme mountain experiences a high volume of rainfall. Subsequently, the greatest environmental risk observed from the trails is a result of changes to natural water flow patterns. Older trails generally are follow fall lines (aligned downslope). When subject high rain falls, these become channelized causing soil erosion. Newer trail design and construction methods avoid cuts that intercept ground water flows and incorporate features to manage surface water flow. The data collected shows that trails maintained to the Trails Study standards are causing less environmental impacts related to water flow.

Trails that are built up over natural grades provide more protection for tree roots and cause less cutting of structural roots. However, this method requires that high volumes of mineral soil be sourced from "borrow pits." These are holes in the ground that are 1 to 3m in diameter and up to 1.5m deep. Ground vegetation is removed and permanent depressions are made in the forest floor. The impacts of these borrow pits required for recommended trail construction are balanced against lower environmental impacts to trees, ground water flows, water quality and erosion. The impacts of these pits can be reduced through improved standards for their location and restoration.

The Trails Study BMPs require that all creek crossings comply with the BC Riparian Assessment Regulation and that an assessment report be completed by a Qualified Environmental. The newer and pre-existing creek crossings assessed generally do not comply with the BMPs which would require larger protection zones. Most have been constructed to the top of bank with little protection through the riparian zone. Steep slopes leading down to creeks cause surface water flow which along with skidding of bikes causes sedimentation into the creeks.



Creek crossings on the lower Baden Powell Trail

It has been recommended that all creek crossing structures extend to a sufficient distance beyond the creek banks. Also they should be designed to prevent people and dogs from accessing the creek bed. Trails within 30m from significant creeks should be made a priority for upgrading. These measures will greatly reduce the risk to water quality and better protect riparian habitat.

The level of recreation use on Fromme Mountain has increased dramatically since the 2008 Trails Study was adopted. Mountain biking, as a sport, has increased in popularity. In addition, new trail construction standards and maintenance of older trails has provided trail conditions more accessible to beginner and intermediate riders increasing the range of users. There are

now many families with children that use these trails. It is expected that the level of use will continue to grow.

As a part of this study, stakeholders representing local stewardship groups and recreation users were contacted. Most were concerned about the environmental impacts from the trails. Key concerns expressed were erosion, impacts on water flows and water quality in creeks and wetlands. A consistent message heard from stakeholders was that there are too many non-sanctioned trails that exist and continue to be constructed. These trails are not built to the standards in the Trails Study or follow BMPs and stakeholders have concerns that they are causing environmental impacts. Most stakeholders requested that there be better enforcement of illegal trail building and decommissioning of unauthorised trails.

Although outside the scope of the environmental assessment, consultation with stakeholders highlighted the importance of building trails for a wide range of user groups. The majority of the trails are currently used by mountain bikers. Hikers and dog walkers expressed their concern for the lack of trails designated for foot traffic only.

This assessment included a review of the management systems and working relationship between the District, the NSMBA, volunteer trail builders and volunteers. The working relationship established between the NSMBA and the DNV provides access to numerous volunteers and corporate sponsors. There is opportunity to build on this model to increase the level of volunteer involvement. Already, recognized volunteer trail builders provide guidance and oversee all work ensuring it is consistent with the Trails Study. However, there needs to be continued involvement of District staff to ensure permits are issued and work is monitored to ensure BMPs are followed and quality and safety standards are met.

With increased recreation use, the risk of impacts to natural features and function increases. To manage this risk, additional resources are needed for trail maintenance, monitoring and enforcement of non-sanctioned activities. Overall the trail condition data shows that new and maintained trails have had fewer environmental impacts compared to older trails that have not been upgraded or maintained. However, there are opportunities to better mitigate environmental impacts and improve the BMPs from the original Trails Study. Specific recommendations have been made in this assessment report including the following three priorities:

1. Upgrades to crossings of high value creeks;
2. Decommissioning of unauthorised trails; and,
3. Upgrading of all trails within 30m of significant creeks.

1.1 Summary of Recommendations

Table 1 provides a summary of recommendations made in this report. These are categories into the components of the Trails Study that were evaluated (Valued Ecosystem Components and Best Management practices).

Table 1 Summary of Recommendations

VEC/BMP	Summary of Findings and Recommendations
Streams, wetlands, riparian areas	**Findings** Fromme Mountain experiences a high amount of rainfall. This has created a large number of creeks. Primary tributaries are well defined within channels and ravines. In addition there are numerous smaller ephemeral and intermittent creeks found throughout the forest. The Trails Study BMPs require that all creek crossings comply with the BC Riparian Assessment Regulation (RAR) and that an assessment report be completed by a Qualified Environmental. A typical standard for protecting creeks following the RAR simple method would include 15m protection zones from high water mark from all creeks. No creek crossings were in compliance with this standard. One of the highest environmental impacts identified in this study was to creeks and water quality. Areas of greatest concern included trails with steep grades extending down to creek crossings. Skidding and surface water flow result in erosion and carry sediment to the crossing and often around its banks and into the creek. This problem is compounded where dogs and people walk down to the creek edges. **Recommendations** • Upgrade the requirements for creek crossings to the following: All creeks that are >30cm wide (at high water flow) should be protected by a clear-span boardwalk/bridge. The structure footings should be well anchored to an area at least 1m back from the top of bank of the creek. The entrance and exit of the bridge should extend a minimum 3m back for creeks 30cm to 1m wide and 5m back for creeks that are >1m wide. These structures should include design features (e.g., railings etc.) to prevent access down to the creeks. Creeks <30cm wide can be managed with culvert crossings as long as the inlet and outlet are well protected from trail impacts. • Where ever possible, new trails should be located further than 15m from all creeks that are greater than 1m wide. • All trails within 30m of creeks should be prioritised for upgrading and maintenance. • Disposal bins and dog waste disposal bags should be provided at the new parking facility and along the BP trail in Mountain View Park.
Old Growth Trees	**Findings** The only old growth trees (>250 years old) found during this study are growing along upper Dreamweaver. This is recommended to be primarily a hiking trail. There were no old growth trees identified near any of the other trails assessed. **Recommendations** • No additional trail building is recommended in the area of Mosquito creek which supports old growth trees. • All non-sanctioned trails that run through the old growth stand in the Mosquito creek area should be aggressively decommissioned. • The upper section of Dreamweaver should be rerouted further than 6m from the base of any old growth trees. • No old growth trees should be cut or pruned for hazard tree mitigation.

VEC/BMP	Summary of Findings and Recommendations
Structural Diversity	**Findings** Most stands on Fromme Mountain are even aged with a high canopy cover restricting sunlight from reaching the forest floor. These forests generally have a low structural diversity with few large canopy openings. There is a low cover of ground vegetation and a low density of trees in the understory. Trail construction generally requires no removal of mature trees and therefore the impacts on the forest canopy are minimal. There have been however the removal of suppressed western redcedar trees and dead standing trees that are used for boardwalks and TTFs. **Recommendations** • Avoid the removal of large dead standing trees (wildlife trees); these provide high habitat value to wildlife. • The cutting of any live trees for trail construction materials should not be permitted. • Under the direction of a biologist and the District community forester, consider creating small stand openings to enhance structural diversity and create wildlife trees.
Species at Risk	**Findings** The species listed by the Species at Risk Act (SARA) are continually changing and should be updated regularly. Impacts caused by the trails on Fromme to unique habitat features required by species at risk are generally associated with water quality in creeks and wetlands, as well as the loss of high value wildlife trees. Increased presence of human activity on Fromme also likely has a negative impact on these species. In particular the use of unauthorized trails further fragments the forest area and reduces the amount of refuge areas. **Recommendations** • A qualified Professional Biologist should review all new trail construction to ensure it does not impact habitat for species at risk. • Amend and enforce creek crossing standards to protect water quality. • Protect all high value wildlife trees that are not rated as a high risk to trails. • Prioritise the deactivation of trails within 30m of creeks or wetlands.
Off Trail Impacts	**Findings** Off trail impacts from older trails are primarily related to damage from water flow. These trails tend to be steep, making water control difficult. Skidding bikes rut trails, further channeling water. Visible impacts of trail from this water flow includes soil and gravel deposits. Newer trails built at gentler slopes and with frequent reverse grades have shown to manage surface water flow. Trails with the least impact are built up on grade without digging down into the soil profile preserving natural ground water flows. New trail construction methods require mineral soil to build up the trail surface. This is taken from areas adjacent to the trail called borrow pits which cause localized impacts to understory vegetation and some damage to the structural roots of nearby trees. Other off trail impacts observed include hikers walking on trial edges and staging areas near TTF where riders stop for viewing. **Recommendations** • Continue to upgrade older trails to new trail standards to reduce erosion and off trail water impacts. • Aggressively rehabilitate all off trail impacts including non-sanctioned trails. • Upgrade standards for borrow pits including location from trail, maximum size, graded edges and restoration requirements.

VEC/BMP	Summary of Findings and Recommendations
Surface Water Flow	**Findings** Impacts from surface water flow increases significantly with the grade of a trail. Upgraded trails have a gentler grade and are constructed with characteristics and features to better manage water flow. Trails with deep cut slopes had greater surface water flow as they intercept more ground water. Construction of trails above grade showed less impacts as they allow for more natural ground flows to continue below the trails surface. **Recommendations** • Upgrade older trails to new trail design standards that manage surface water flow. • Avoid or minimize the depth of cut slopes during construction. • Prioritise the upgrading and maintenance of trail sections that are within 30m of any creeks.
Tread Wear	**Findings** Tread wear general increases with the level of use and the steepness of the trail. Older mountain bike trails tend to be steeper and have the highest impacts from tread wear. Newer trails have a gentler grade and subsequently bikes do not skid as frequently and the tread wear is much lower. The areas that do show signs of tread wear include short sections before TTFs and steep corners. Placing obstacles strategically before these areas has been effective at slowing riders to prevent them from skidding. Traffic levels and experience level of riders play a large factor in tread wear. Popular trails such as Bobsled and Expresso experience high volumes of bikers and are impacted quicker. Problem areas on these trails require frequent maintenance. **Recommendations** • Continue to promote new trail design standards that control and reduce bike skidding • Increase resources for maintenance of trails that experience high wear and tear
Vegetation Impacts	**Findings** The trail surface itself amounts to a permanent loss of growing area. Creation of borrow pits also results in the loss of understory vegetation. The most common impact observed to vegetation was to trees. This includes the cutting and exposing of tree roots during trail construction. Old and steeper trails have high tread wear exposing and damaging the roots of trees adjacent to the trail. Upgraded trails did not have as deep a cut slope and were built up more on the pre-existing grade. This allows for surface roots to be protected by armoring them with rock and covering with mineral soil. Generally trail construction requires little direct cutting of mature trees. Understory cedar trees have been cut along trails for construction of TTFs. The spread of invasive species in the forest and away from Mountain Hwy is limited to primarily holly and laurel. The risk of spread of other invasive species will increase with use of these trails. The District is currently developing a **Recommendations** • Continue to promote building methods that minimize cut slopes and build up over existing grades to protect tree roots. • Only remove hazard trees that pose an extreme risk. The cutting of any live trees for trail construction materials should not be permitted. Post signage that trails should not be used during high wind storm events.

VEC/BMP	Summary of Findings and Recommendations
	• The Trails Study requires that trails be aligned out of the dripline of trees. Due to the density of the forest this is not possible. Amend the BMP to require that trails be located as far as possible away from mature healthy trees and so that trails are constructed above grade without severing or suffocating roots.
Wildlife	**Findings** The even aged second growth stands that dominate most of the Fromme Mountain area provide low habitat diversity and support a relatively lower level of wildlife species diversity compared to old forests and open shrub communities. Important habitat features for wildlife include patches of dense understory vegetation, large woody debris cover, large mature trees, large dead standing trees, streams, wetlands and their riparian areas. There was only one significant wetland observed in the study area in Mountain View Park. This is the only area observed that provides breeding for aquatic amphibians. The presence of trails and the increased presence of humans throughout the Fromme Mountain area causes habitat fragmentation and will have a negative impact on wildlife species that are not tolerant of human activity. **Recommendations** • Protect large dead standing conifer trees (wildlife trees). • Amend and enforce creek crossing standards. • Aggressively decommission non sanctioned trails. • Consider a long term wildlife behavior impact assessment from the trails
Use of Native Materials	**Findings** Native materials required for the construction of the trails include wood, mineral soil and rocks. New construction standards include trail surfaces that are built up with rocks and mineral soil as opposed to creating cuts down into the topsoil horizon. This provides more protection of tree roots and reduces ground water interception but also requires a high volumes of mineral soil sourced from "borrow pits." These are holes in the ground that create permanent depressions in the forest floor. Most are restored and covered with logs and organic debris. Due to the density of trees, most pits are within the drip line of trees. Also due to difficulty of transportation, most are within 5m of trails. Trail construction and maintenance requires the use of wood for boardwalks and retaining features. Western redcedar is used primarily as it is most resistant to rot. This has been sourced from dead standing trees, recently fallen trees, understory trees and heritage stumps. Live trees that are impacted include mostly smaller cedar trees that are growing under the canopy of the mature forest. **Recommendations** • Amend the BMP to allow borrow pits within dripline of trees but >2m from the trunk. Excavation towards the tree should stop as soon as roots >5cm are encountered. • No pits can be within 15m of creeks. • Pits should be located greater than 3m from trails edges. • The District should provide a source of cedar for structures being built. • Cedar snags that remain in the forest have heritage value and must be protected. • The cutting of any live trees for trail construction materials should not be permitted.

VEC/BMP	Summary of Findings and Recommendations
Technical Trail Features	**Findings** Technical Trails Features (TTFs) include obstacles requiring concentrated negotiation. These can be natural and man made. Many are constructed of wood but do not include boardwalks and creek crossings. Most TTFs are found on trails that are designed to be moderate or difficult. New trails that have been constructed have fewer TTFs and were built to include easily accessible ride-arounds. Where no alternative routes are provided, off trail impacts were observed. Viewing areas for high use TTFs on busier trails have caused off trail impacts due to users leaving the trail. **Recommendations** • As TTFs are built or reconstructed, ensure safe alternative routes are provided • Design and construct TTFs using wood that is not from native sources • Provide appropriate viewing areas for high use TTFs
Management Systems and Resources	**Findings** There is a Trail Maintenance Service Agreement in place between the DNV and the NSMBA. The District staff and recognized trail builders oversee all work on Fromme. All proposed work is presented to the DNV in the field and in work plans. The NSMBA works with the Trail Adoptees to prepare and submit a trail work plan to the DNV for review and approval. The management agreement in place allows for a large amount of volunteer resource to be used in a cost effective way under the supervision of an NSMBA recognized trail builder. This program is well established and has the potential to greatly enhance the trail system on Fromme. However, stakeholders raised concerns about the resources available for DNV to oversee all trail work and to evaluate the cost effectiveness of the TAP program. There is ongoing construction of non sanctioned trails. These include builders that are not a part of the NSMBA or any other organization approved by the District. There are great concerns from the NSMBA and the DNV about this illegal activity and the resulting environmental impacts. **Recommendations** • The DNV should work together with the NSMBA and other volunteers to establish a template for all proposed trail work. This should build on the proposals submitted and include targets and budgets that will allow for easy follow up monitoring. • Once complete, a follow up report should be submitted with a summary of targets achieved, changes to the original scope and resources used (volunteers hours, materials etc). Photos plots should be included in each to show before and after images. • Follow up monitoring should be completed by the NSMBA and submitted to the DNV. • The TAP program is a cost effective program that should be expanded to improve the trail network on Fromme. • Provide resources and funding to construct creek crossings on all managed trails. These should be completed as a separate program to TAP. Building materials should not be sourced from Fromme Mountain. • DNV, the NSMBA and other volunteers should work to enforce rules against illegal trail building. Signs should be posted of fines that will be issued if caught. District bylaw officers should patrol the Fromme Mountain area and/or respond to reports of illegal activity. • An ongoing understanding of the level of usage will continue to help the District to manage the trails more effectively. Counters should continue to be used to monitor trail usage. • For high use trails that are prone to damage during the rain season, temporary closures should be considered. This should be determined by DNV staff, the NSMBA and other volunteers based on ongoing assessments of trail conditions. • There should be more defined trail uses. Hiker only trails should include barriers to better communicate with riders. Enforcement by DNV bylaw officers should be considered to keep riders off of trails designated for hiking only.

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Single Family Organics and Garbage Collection

Materials to be circulated via agenda addendum.

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