



Grouse Mountain Regional Park

Management Plan 2018

Grouse Mountain Regional Park Management Plan

Grouse Mountain Regional Park Management Plan was approved by the MVRD Board October 26th, 2018.

That the MVRD Board approve the Grouse Mountain Regional Park Management Plan, as presented in the report dated September 11, 2018, titled "Grouse Mountain Regional Park – Public Engagement Results and Management Plan".

The management plan confirms a vision for the park and outlines a long-term framework for resource management, park improvements, and ecosystem protection.

Metro Vancouver acknowledges the input and feedback that contributed to the development of the Grouse Mountain Management Plan. Local First Nations, agencies, partners, and the public shared their knowledge, time, and insight for the park which informed the management plan. The plan includes opportunities for ongoing engagement and collaboration. The support and guidance of Metro Vancouver's Regional Parks Committee is gratefully acknowledged.

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Executive Summary



Grouse Mountain Regional Park protects 74 hectares of steep mixed conifer forest in the District of North Vancouver. The regional park was created in May 2017.

The management plan process began in July 2017 and included research, analysis, and engagement with local First Nations, the District of North Vancouver, partners, non-profit organizations, and the public. Key opportunities and constraints that emerged during engagement included habitat protection, trail user safety and etiquette, trail surfacing, trail loop opportunities, an updated seasonal closure strategy, improved signage, and an interest in volunteer contributions to the park.

This input informed the plan and implementation priorities.

The plan proposes enhancements to existing trails and routes, a reorganized trailhead area, a new seasonal closure strategy, and new connector trails. The plan also identifies opportunities for programming, interpretation, partnerships, and community engagement. Implementation prioritizes safety and upgrades to existing trails.

1.0 Introduction



FIGURE 1 – REGIONAL PARKS AND GREENWAYS SYSTEM MAP

Grouse Mountain Regional Park is part of the regional parks system managed by Metro Vancouver, including 22 regional parks, 5 regional greenways, 2 ecological conservancy areas and 3 regional park reserves.

1.1 Management Plan Purpose

The purpose of this management plan is to state the program, services, development, and conservation priorities for Grouse Mountain Regional Park. The plan expresses a long term vision for the park. It provides management strategies for natural area protection and for the management and development of facilities to enable visitors to connect with, enjoy, be active in, and learn about the environment.

1.2 Planning Process

Planning for Grouse Mountain Regional Park began in the summer of 2017 with outreach and engagement. Engagement results, along with research, site analysis, and policy, guided the development of a draft park management plan framework. This framework was tested through a second round of outreach and engagement held in summer 2018.

As shown in Figure 2, engagement included meetings with local First Nations, the District of North Vancouver, partners, and non-profit organizations.

1.3 Metro Vancouver Policy Context

Metro Vancouver is a federation of 21 municipalities, one electoral area, and one treaty First Nation. It is committed to delivering essential utility services (drinking water, sewage treatment, recycling, and garbage disposal) economically and effectively on a regional basis; and to maintaining and enhancing the quality of life in our region by managing and planning for development and by protecting air quality and green spaces.

Metro Vancouver operates the regional parks system on behalf of the federation. The regional parks system was established in 1972 and currently protects approximately 13,612 hectares.

The *Metro Vancouver Regional Parks Plan (2016)* describes the vision, mission, goals, and strategies for the delivery of the Regional Parks Service, and provides a framework for the development of management plans for individual parks.

1.4 First Nations Context

Grouse Mountain Regional Park falls within the traditional territories of the Coast Salish People. The Musqueam Indian Band, the Squamish Nation, and the Tsleil-Waututh Nation were engaged in this planning process.

Mountains and alpine areas are places of spiritual importance to the Coast Salish People. Traditional uses of the North Shore mountains include harvesting resources, such as stones and bark, gathering berries, hunting, building rock shelters, and establishing trail networks (Kleanza Consulting Ltd. and Inlailawatash Limited Partnership).



FIGURE 2 – GROUSE MOUNTAIN PLANNING PROCESS

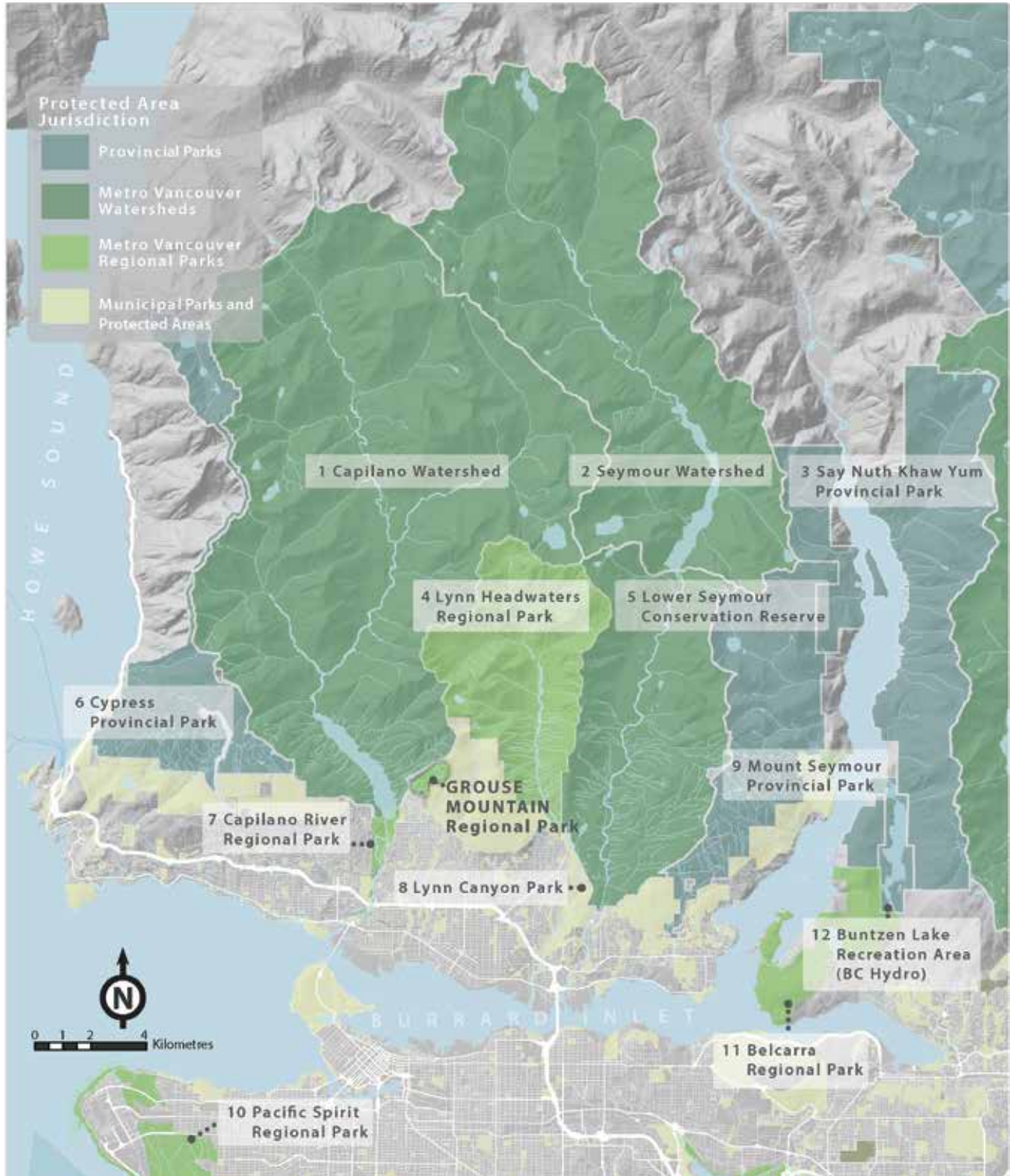


FIGURE 3: PROTECTED AREAS CONTEXT

1. CAPILANO WATERSHED

Metro Vancouver's steepest reservoir, protecting old and second growth forests; closed to the public to protect the water supply.

2. SEYMOUR WATERSHED

Protects old growth forest and alpine habitats; closed to the public to protect the water supply.

3. SAY NUTH KHAW YUM PROVINCIAL PARK

A fjord and estuary surrounded by old growth forest, mountains, and alpine lakes with hiking trails, boating and camping.

4. LYNN HEADWATERS REGIONAL PARK

Includes a network of forest trails, rocky outcrops, creeks and waterfalls, as well as rugged backcountry trails.

5. LOWER SEYMOUR CONSERVATION RESERVE

Alpine peaks, creeks and forested slopes, managed as a water supply reserve; hiking and cycling trails.

6. CYPRESS PROVINCIAL PARK

A mountainous wilderness area with facilities for winter and summer recreation.

7. CAPILANO RIVER REGIONAL PARK

A network of hiking trails and scenic viewpoints through Capilano River canyon.

8. LYNN CANYON PARK

Includes a network of hiking trails, waterfalls and viewpoints, through forest habitats.

9. MOUNT SEYMOUR PROVINCIAL PARK

Old and second growth forests and numerous alpine lakes with skiing, hiking and mountain trails.

10. PACIFIC SPIRIT REGIONAL PARK

Forest, creek, beach, cliff and bog habitats connected by an extensive trail network.

1.5 Local Context

The District of North Vancouver is bordered by Burrard Inlet to the south and east, and mountains to the north. It contains a growing residential community with a diverse economy.

The District is well-known for outdoor recreation, including skiing, hiking, mountain biking, and kayaking. Destinations near the park include the Capilano Suspension Bridge, Grouse Mountain Resort, Fromme Mountain, and Capilano River and Lynn Headwaters Regional Parks.

1.6 Commercial Enterprise Context

Grouse Mountain Resort is a skiing and tourism attraction at the top of Grouse Mountain. Grouse Mountain Resort leases Greater Vancouver Water District land at the base of Grouse Mountain for tram, parking, and resort facilities.

Grouse Mountain Resort maintains the parking lots and washrooms that serve both resort and park visitors, and provides support for rescue and emergency response within the park. Many park users at Grouse Mountain Regional Park hike up through the park and come down on the Grouse Mountain Resort gondola.

11. BELCARRA REGIONAL PARK

Forested ridgelines and lowlands, ocean and lake shores with trails connecting swimming and picnic areas.

12. BUNTZEN LAKE RECREATION AREA

A network of hiking, mountain biking, and horseback riding trails, rocky outcrops and viewpoints, through forest and lakeshore habitats.

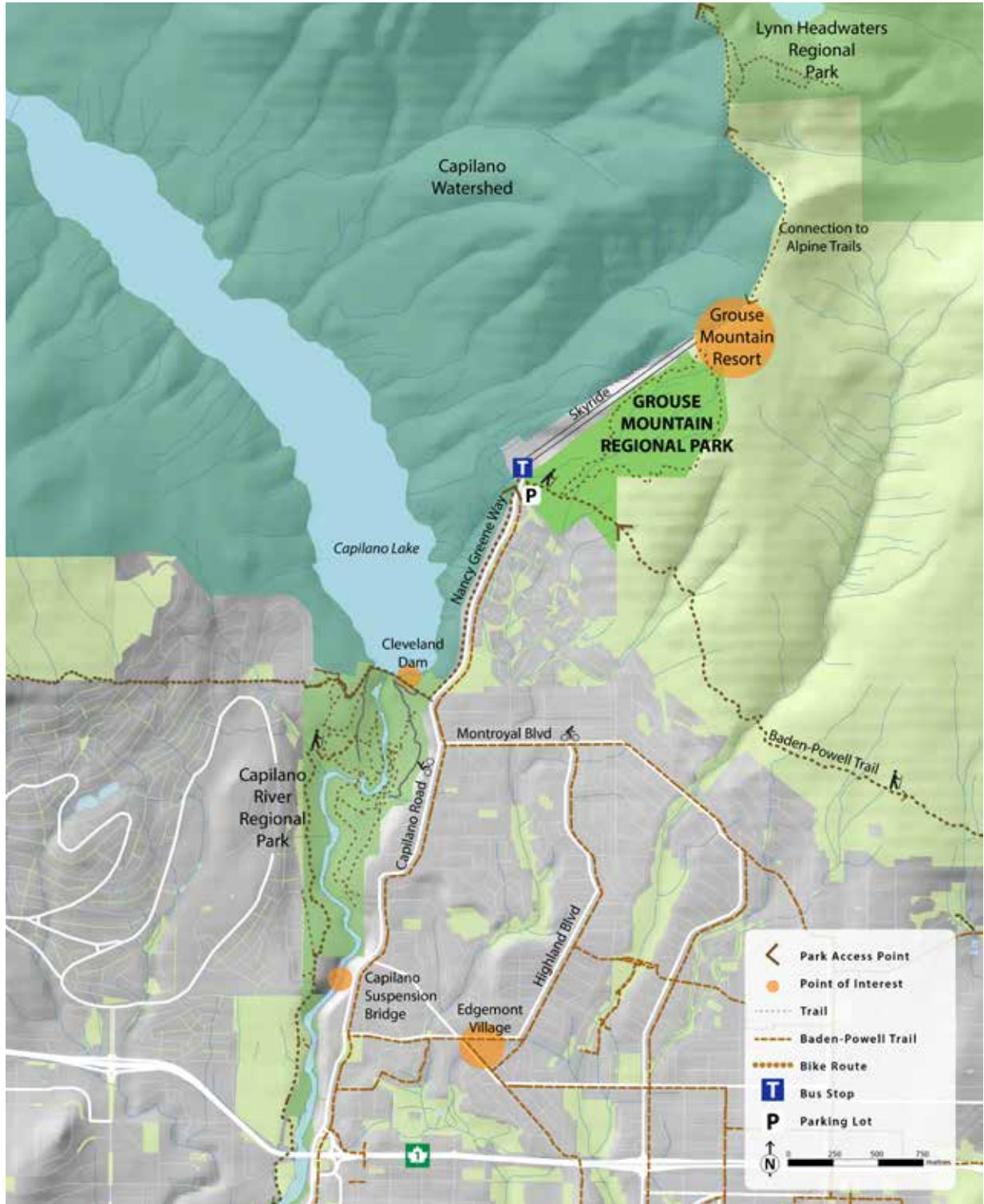


FIGURE 4: CONNECTIONS AND ACCESS TO GROUSE MOUNTAIN REGIONAL PARK

1.7 Landscape Context

Grouse Mountain Regional Park is located at the urban edge to an expansive forested and alpine area (figure 3). The park is bordered by:

- the Capilano Watershed, a large reservoir and forested area closed to the public to protect drinking water, to the northwest;
- the Grouse Mountain Resort to the northeast;
- undeveloped lands to the southeast;
- a residential neighbourhood to the southwest.

The park is largely intact coastal temperate rainforest which provides habitat and travel routes for resident wildlife moving along the mountainside or between the urban and mountain environments. The park contains a large portion of the MacKay Creek headwaters.

1.8 Park Access and Connectivity

Grouse Mountain Regional Park can be accessed by car, car-sharing, bus, bike, or foot (figure 4). There is a separated bike lane along Nancy Greene Way and the park is served by three bus routes. Parking on-site is managed by Grouse Mountain Resort. Over three quarters of planning survey respondents (summer 2018) get to the park by car.

Grouse Mountain Regional Park is mainly accessed by the trailhead and parking lot at the north end of Nancy Greene Way. The park can also be reached by:

- experienced hikers through Lynn Headwaters Regional Park via the Hanes Valley Route and Alpine Trail;
- Grouse Mountain Resort's gondola;
- and through a mix of formal and informal trails to the southeast, including the Baden Powell, Powerline, Simic, Larsen, and the Old BCMC Trails.



2.0 Existing Conditions

2.1 Overview

The parklands that are now Grouse Mountain Regional Park were originally purchased by the Greater Vancouver Water District in the 1930s as part of the Capilano Watershed. The lands in Grouse Mountain Regional Park, for the most part, do not drain into the watershed. Grouse Mountain Regional Park was established because of its ecological and recreational value. The land is still owned by the Greater Vancouver Water District and is licensed to the Metro Vancouver Regional District for park purposes. As such, approval from the Greater Vancouver Water District is needed for changes and improvements to land management, trails, and amenities.

Forest ecosystems within the park consist of second growth forest with riparian corridors and a large patch of old growth. This park provides an important connection between low and higher elevation habitats for species that move between elevations seasonally, as well as important east-west connections across the landscape. Other important habitat features include talus slopes, rocky outcrops, freshwater streams, and wildlife trees. Excluding the developed parking and trailhead areas, the park is comprised almost entirely of ecosystems with significant ecological value.

Grouse Mountain Regional Park contains three main, well-used trails: the Grouse Grind Trail, the BCMC Route, and a portion of the Baden Powell Trail.

2.2 Park Purpose

Grouse Mountain Regional Park protects important forest ecosystems and riparian corridors, and provides opportunities to experience forest changes through elevation.

The purposes of Grouse Mountain Regional Park are to:

- Conserve regional biodiversity and ecological health by protecting the natural resources of the area.
- Protect wildlife corridors facilitating migration between high and low elevation forest habitats.
- Provide mountain hiking opportunities and access to scenic vistas, and to act as a gateway to the alpine.
- Enhance public understanding of forest and subalpine ecosystems.

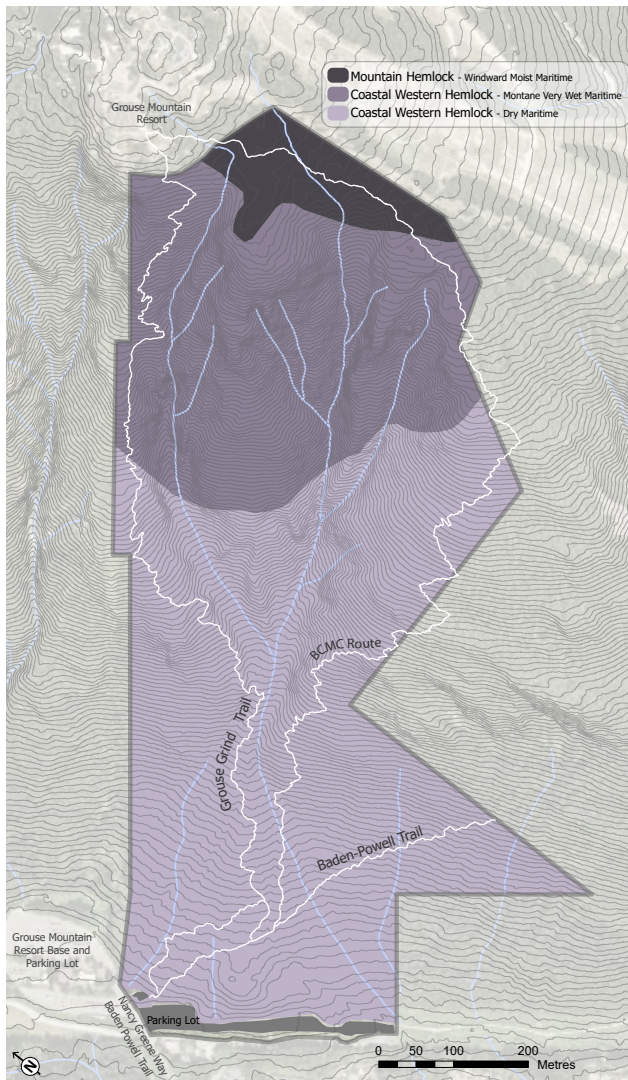


FIGURE 5: BIOGEOCLIMATIC SUBZONES

2.3 Ecosystems

Grouse Mountain Regional Park is part of the Coastal Mountains and is influenced by the area's geology, climate, topography, and history. The forested slopes are generally steep with scattered bedrock outcrops and bluffs. The climate is marine west coast temperate, with cool wet winters and warm, dry summers.

Forest Ecology

The park's forests are mostly in the coastal western hemlock biogeoclimatic zone, transitioning to the mountain hemlock zone at higher elevations (figure 5). Western hemlock, Douglas fir, and western red cedar trees dominate the coastal western hemlock forest, while mountain hemlock, with balsam fir and yellow-cedar, dominate the mountain hemlock forest.

Natural processes, including windstorms, landslides, and avalanches, have and continue to change the forest by clearing areas for young forest regeneration.

A large portion of the forest was clear cut in the early 1900s. These naturally regenerating areas are now mature forests (figure 6). These trees are fairly even-aged resulting in dense canopies which impede light from reaching the forest floor and limit understory vegetation.

At higher elevations, old growth stands were never logged. Where growing conditions are poor, these stands tend to have smaller, multi-aged trees with canopy gaps. Scattered bedrock outcrops and bluffs in the upper elevations add diversity to the forest structure.

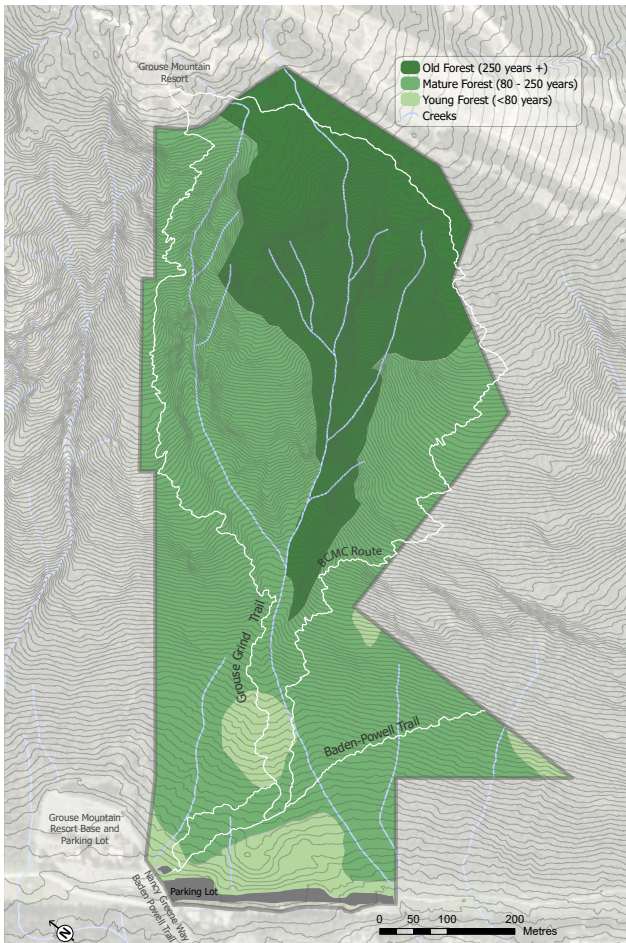


FIGURE 6: FOREST AGE

Streams and Riparian Corridors

Grouse Mountain Regional Park is part of two watersheds. It encompasses much of the Mackay Creek headwaters and also dips into the Capilano watershed. All but one of the small creeks drain into Mackay Creek, which becomes salmon spawning and rearing habitat downstream as it flows south towards Burrard Inlet.

Riparian areas include 30m setbacks on both sides of waterways. These corridors are important links between land and water supporting distinct plant communities. Riparian vegetation provides shelter, shade, and foraging opportunities, and functions as important movement corridors for wildlife. Habitat value is reduced in areas of high canopy cover.

Soils

The forest soils formed over hundreds of years by rocks and sediments that were transported and weathered by glaciers, wind, and water. The soils consist mainly of moderately compacted coarse-textured glacial till and colluvium till. Most soils in the park are highly weathered by precipitation and are generally acidic and low in nutrients, especially phosphorous and nitrogen. Soil moisture and nutrient regimes vary across the park based on terrain and soil conditions.

Soil textures are generally sandy loams and loamy sands with coarse fragment content ranging from 30-60%. Loamy sands are a minimum of 70% sand with small amounts of clay and silt. Sandy loams are almost half to three quarters sand with typically more silt and clay than loamy sands.



2.4 Biodiversity

In coastal temperate rainforests, young and old forests support a higher diversity of wildlife, than mature forests due to canopy closure and even-aged forest structure. Almost forty percent of the park contains old (30%) or young (8%) forest (figure 6).

Wildlife

The park has a southern aspect and is surrounded by forest to the northwest and southeast, making it attractive to wildlife for habitat and for movement across the landscape. The park size and adjacent natural areas (figure 3) allow the park to provide corridors and habitat for larger species, such as black bear and deer. The park provides denning sites for coyotes, skunks, and raccoons, and is home to smaller mammals such as snowshoe hare, mice, and shrews.

A wide diversity of bird species use the park as year-round, wintering, and breeding habitat. Nearly 100 species have been documented using the area in the last 10 years (eBird data). Forest hawks, owls, jays, and woodpeckers breed and winter in the park while neotropical migrants and flycatchers join resident species for breeding in the spring.

Species and Ecosystems at Risk

The park's habitat is suitable for a variety of species at risk. This includes coastal tailed frog, northern red-legged frog, pacific water shrew, Johnson's hairstreak butterfly, Pacific sideband snail, and western screech-owl. Olive-sided flycatcher and band-tailed pigeon have also been recorded in the area (eBird data).

Much of the park is listed as critical habitat for marbled murrelet under the *Federal Species at Risk Act* (2002). This species has been sighted in the area, but no nest sites have been found for many years. The park includes several ecological communities at risk:

CDC LISTING	BEC ZONE & VARIANT	ECOLOGICAL COMMUNITY
RED-LISTED (ENDANGERED OR THREATENED)	CWHdm / 02	• Douglas-fir - lodgepole pine/ oceanspray/ reindeer lichens
	CWHdm / 05	• western red cedar - sword fern dry maritime
BLUE-LISTED (SPECIAL CONCERN)	CWHdm / 01	• western hemlock flat-moss
	CWHdm / 09	• black cottonwood - red alder / salmonberry
	CWHvm2 / 03	• western red cedar salal very wet maritime

Delicate Plants

The park's limited understorey has created ideal conditions for shade tolerant orchid species, including western coralroot and rattlesnake-plantain. Both species grow in dark forests where little else is growing.

Steep Slopes and Rocky Outcrops

Talus slopes and rocky outcrops occur within the forest, providing unique habitat for animals such as reptiles, small mammals, and birds. These areas are found primarily in steep terrain in the north of the park and surrounding the main creek channels. They provide a unique habitat and protection for wildlife from predators as well as from human disturbance. Bird species such as falcons and swifts may use talus slopes and rocky outcrops as resting, foraging, or breeding habitat.



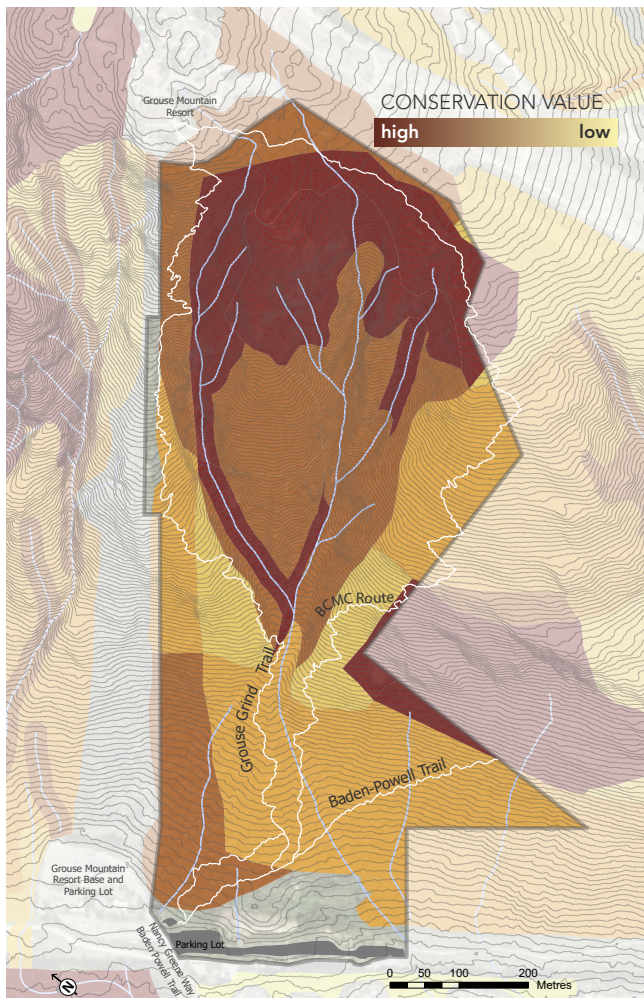


FIGURE 7: HABITAT SENSITIVITY ANALYSIS

2.5 Habitat Sensitivity Analysis

Most of Grouse Mountain Regional Park, excluding parking and staging areas, is classified as sensitive ecosystem. Sensitive ecosystems provide habitat for many species, including plants and animals at risk. Ecological sensitivities include susceptibility to human disturbance, hydrological changes, soil erosion, and spread of invasive plants.

Sensitivity analysis (Figure 7) outlines at-risk, fragile, or ecologically important ecosystems, incorporating species information, context, and condition. As regionally rare ecological communities, the upper forest and old growth stands have the highest

conservation value. Riparian corridors are high in biodiversity and habitat for species at risk, thus also high in conservation value.

2.6 Forest Condition Assessment

In the summer of 2018, a forest health and condition assessment was completed for the park. The work focused on elements that threaten the ecological integrity of the forest. The park was found to support relatively healthy mature forest plant communities.

The following observations were made about the state of the park's forest:

- **Riparian corridors:** The assessment revealed that official and unofficial trails in riparian areas may increase the risk of soil erosion, impact to sensitive habitat, and allow access for dogs and people into these areas.
- **Old growth trees:** The old growth stands at the upper elevations of the park supports high value trees that should be protected from impacts of existing and unauthorized trails.
- **Structural diversity:** The lower elevation forests in the park have a low structural diversity, low species diversity, few canopy gaps, and a low density of understorey vegetation.
- **Wildfire:** The risk from wildfires on steep slopes is increased with the presence of continuous conifer trees.
- **Invasive plant species:** Invasive plants were found mainly on the edge of parking and staging areas. Himalayan blackberry and English holly are the most common invasive species within the park.
- **Insects and disease:** Levels of insects and diseases that affect trees are at normal ranges for this type and age of ecosystem.

3.0 Park Sub-Areas + Trails

Four park sub-areas and major trail corridors have been identified, based on use patterns, visual character, and biophysical resources.

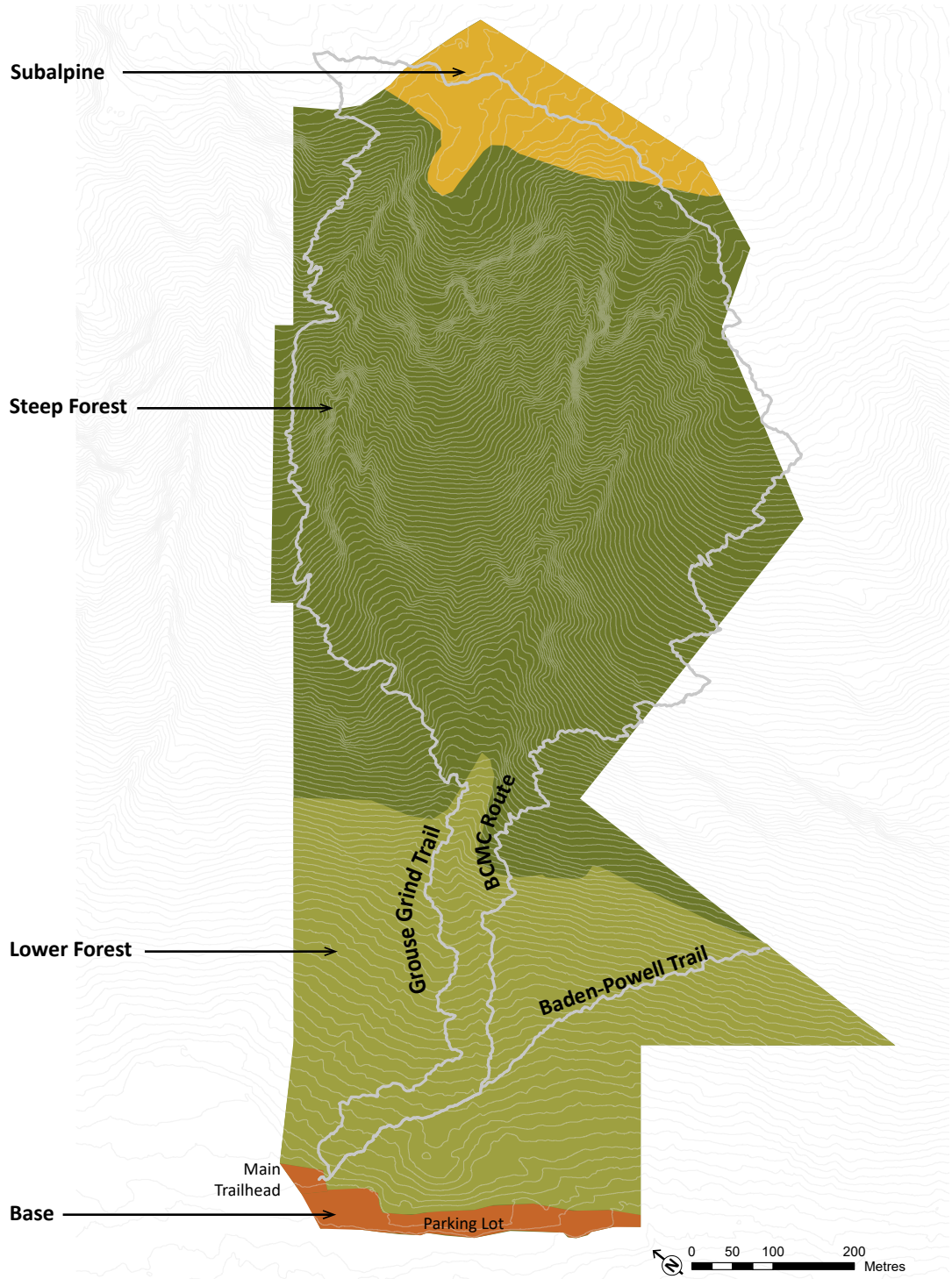


FIGURE 8: GROUSE MOUNTAIN REGIONAL PARK SUB-AREAS + TRAILS

Base

The Base is the main park entry, including parking and trailhead areas. This is the central visitor entrance and orientation point, including visitor staging and support facilities (e.g. kiosk, water fountain), as well as opportunities for interpretation.

Lower Forest

The Lower Forest is comprised of low to moderate sensitivity forest ecosystems with riparian corridors. This subarea has heavy trail use, as well as informal trails. This subarea is suitable for habitat enhancement, interpretive features, trail improvements, and new trail development within the constraints of topography, drainage, and ecosystem sensitivity.

Steep Forest

The Steep Forest subarea is comprised of high sensitivity forest ecosystems, including old growth and riparian corridors. This subarea includes the upper sections of the Grouse Grind Trail and the BCMC Route. Secondary routes also exist in the steep section, such as the Flint and Feather Route, a small portion of the Simic Route, and connections to the Larsen and Old BCMC Routes. Trail development should be limited outside of existing trail corridors due to challenging terrain and high value forest ecosystems.

Subalpine

The Subalpine is the upper entrance to Grouse Mountain Regional Park. It provides a secondary orientation point for the park. This area is comprised of moderate to high ecosystem sensitivity, and contains many unique plants as well as the park's only wetland. Opportunities at this subarea include habitat protection and enhancement, interpretive signage, and improved trail conditions and connections.

Grouse Grind Trail

The Grouse Grind Trail is a steep 2.5 kilometre trail with an 800 metre elevation gain. It is a challenging trail that is completed by many for fitness and health, and features a timer for users to track hikes and speed. The Grouse Grind Trail receives very heavy tourist and local use.

In the winter, the upper portion of the Grouse Grind Trail is subject to snowfall, icy conditions, avalanche risk, and rapidly changing conditions. The trail is typically closed for safety from November until it is snow free in the spring; and again for approximately three weeks in the early summer for annual maintenance and to repair trail sections damaged by winter weather.

BCMC Route

The BCMC Route is a steep 2.9 kilometre route that ascends Grouse Mountain. This route has the same elevation gain as the Grouse Grind Trail, and provides a less busy and more rugged experience. Its lower elevation portions are steepest while grades become more gentle in upper sections.

The BCMC Route is typically open year-round. In the winter, the upper portion of the BCMC Route is subject to snowfall and icy conditions. In this season hikers require proper traction and need to be prepared for safe winter hiking.

Baden Powell Trail

The Baden Powell Trail is a 42km multi-jurisdictional mountain trail that stretches across the North Shore, from Howe Sound, in West Vancouver to Deep Cove, in North Vancouver, knitting local, regional, and provincial parks and trails together. Grouse Mountain Regional Park includes 1.1 kilometres of the Baden Powell Trail. This is the park's least steep trail, with only a 150 metre elevation gain within the park's borders.

PARK FEATURES & NATURAL RESOURCES

PARK SUB-AREA		EXISTING FACILITIES & CONDITION	ECOLOGICAL FEATURES	CHALLENGES	OPPORTUNITIES
BASE	PARKING LOT	<ul style="list-style-type: none"> • Pay parking • Informal access trails 	<ul style="list-style-type: none"> • Slopes • Streams/ditches 	<ul style="list-style-type: none"> • Lack of regional park branding • Heavy parking lot use • Erosion and slope stability • Invasive species 	<ul style="list-style-type: none"> • Consider opportunities to encourage more use of sustainable transportation • Redesign trailhead/parking lot connector for better flow • Fencing / signage to protect waterways • Manage invasive plants before they can spread throughout the park • Habitat restoration
	TRAILHEAD	<ul style="list-style-type: none"> • Kiosk & hiker safety signage • Semi-shaded gathering area • Garden • Event staging area • Fence • Stretching pole • Power outlets • Grouse Grind timer 	<ul style="list-style-type: none"> • Creek crossing • Small amount of sensitive ecosystem 	<ul style="list-style-type: none"> • Park and trail closures and fencing • Emergency vehicle staging • High local and tourist use and congestion in summer season • Invasive species • Poor trailhead visibility 	<ul style="list-style-type: none"> • Improved trailhead facilities and bike parking • Interpretative features, signage and programs • Improved planning for event and emergency staging • Improved year-round access to BCMC and Baden Powell • Improved hiker safety and code of conduct signage • Invasive species management
STEEP FOREST		<ul style="list-style-type: none"> • Includes upper portions of the Grouse Grind Trail, the BCMC Route, and the Flint and Feather Route 	<ul style="list-style-type: none"> • Old growth forest • Talus slopes, rocky outcrops, and wildlife trees • High reaches of creeks and riparian corridors 	<ul style="list-style-type: none"> • Debris flow management and trail user safety • Heavy summer usage and trail erosion • Flint and Feather is a technical route that can be dangerous for inexperienced hikers 	<ul style="list-style-type: none"> • Habitat enhancement/restoration • Opportunity to decommission unsanctioned trails in old growth stands • Forest Management • Educate users on natural habitat values • Limited opportunities for new trails; this area is suited to conservation and maintenance of existing trails. • Trail rest points

LOWER FOREST	<ul style="list-style-type: none"> Includes lower portions of the Grouse Grind Trail, the BCMC Route, and the Baden Powell Trail 	<ul style="list-style-type: none"> High value forest habitat Low reaches of creeks and riparian corridors Wildlife trees 	<ul style="list-style-type: none"> Trail braiding and erosion Informal trails, especially at park entrance Invasive species 	<ul style="list-style-type: none"> Habitat enhancement/restoration Forest management Opportunity for connections between existing trails Invasive species management
SUBALPINE	<ul style="list-style-type: none"> BCMC Route Connected to Grouse Mountain Resort 	<ul style="list-style-type: none"> Old growth subalpine forest Rocky outcrops and wildlife trees Wetland and streams 	<ul style="list-style-type: none"> Trail braiding and erosion Informal trails, especially at park entrance Impacted by heavy use 	<ul style="list-style-type: none"> Opportunity for interpretation Down hike route and exit area for ascending hikes Orientation point to the park Opportunity to decommission unsanctioned trails in old growth stands Habitat enhancement/restoration
TRAIL CORRIDORS				
PARK SUB-AREA	EXISTING FACILITIES & CONDITION	ECOLOGICAL FEATURES	CHALLENGES	OPPORTUNITIES
GROUSE GRIND TRAIL	<ul style="list-style-type: none"> Well-maintained trail Wayfinding signage - Grouse Grind Timer system 		<ul style="list-style-type: none"> Heavy usage Narrow, steep trail Closures for safety and maintenance 	<ul style="list-style-type: none"> Improve signage Ongoing maintenance of steps and stairs Rest points Improved closure fence and safety signage
BCMC ROUTE	<ul style="list-style-type: none"> Rustic trail, requires repair Descent and ascent allowed 		<ul style="list-style-type: none"> Multiple informal connections to Grouse Grind Trail Section of trail outside of park boundaries Dogs off-leash Safety 	<ul style="list-style-type: none"> Confirm and define BCMC Route Reroute BCMC Route within park boundary Improve trail conditions while maintaining a rustic standard and limiting erosion and environmental impacts Opportunities to add a few rest points along trail Rationalize connections to trails outside the park Partnership opportunities Improved wayfinding signage
BADEN POWELL TRAIL	<ul style="list-style-type: none"> Trail that connects from Deep Cove to Horseshoe Bay Annual knee knacker race (ultramarathon) 		<ul style="list-style-type: none"> Wayfinding signage Coordinate marking and trail standards with other trail jurisdictions Keep trail access available during Grouse Grind Trail Closure 	<ul style="list-style-type: none"> Improved wayfinding signage Interpretive loop

4.0 Park Vision, Goals and Objectives



4.1 Park Vision

Grouse Mountain Regional Park supports ecological and human health by protecting and enhancing wildlife corridors and forest ecosystems, and by providing opportunities to learn about, explore, and be active in a coast mountain landscape.

4.2 Goals and Objectives

GOALS	OBJECTIVES
<p>PROTECT AND ENHANCE THE ECOLOGICAL VALUES OF FORESTLANDS AND RIPARIAN CORRIDORS</p>	<ol style="list-style-type: none"> 1. Compile a baseline of information on the park's ecological values to guide planning processes and management decisions. 2. Enhance biological diversity and structural complexity, and connectivity to strengthen ecosystem function and increase resilience to human use and climate change. 3. Complete a forest management plan to improve ecological health and provide resilience to climate change. 4. Work with local First Nations to understand and explore opportunities to allow for traditional use of parklands. 5. Manage invasive species throughout park. 6. Protect sensitive ecosystems and species at risk.
<p>PROVIDE HIKING OPPORTUNITIES, FACILITATING HEALTH AND WELLNESS, AND CONNECTION TO NATURE</p>	<ol style="list-style-type: none"> 1. Where possible given the terrain, provide a range of trail lengths, with loops and turn around points, to suit different fitness and experience levels. 2. Improve and maintain trails to ensure public safety and enjoyment. Consider innovative trail improvement materials and methods. 3. Provide technical trails that are maintained and improved to minimize hazard while maintaining rustic character. 4. Work with the District of North Vancouver and Grouse Mountain Resort to improve connections from Grouse Mountain Regional Park to Capilano River and Lynn Headwaters Regional Parks, and the municipal trail network. 5. Enhance main trailhead area to better orient visitors to the park, and enhance the visitor experience. 6. Provide trail safety and ecological values education through online and social media messaging, signage, and outreach. 7. Work with partners to provide park orientation and user preparedness education. 8. Develop and implement a wayfinding sign plan for the park.
<p>CONNECT PARK VISITORS TO THE LANDSCAPE OF GROUSE MOUNTAIN REGIONAL PARK THROUGH INTERPRETIVE PUBLIC PROGRAMMING, FEATURES, AND SIGNAGE</p>	<ol style="list-style-type: none"> 1. Work with local First Nations to protect and present their culture and history in the park as they see fit. Explore opportunities to collaborate on in-park projects. 2. Develop an interpretive sign plan for the park. 3. Provide public programming on the park's natural values. 4. Work with local government, agencies, non-profit and community organizations, and businesses on stewardship activities, research, and programming, to increase awareness and understanding of the park's ecosystems.

5.0 Management Strategies

The management planning and engagement process identified a number of issues in four thematic areas: communications, programming, trail closures, and interpretation. Action-oriented strategies were developed to address issues in each area.



5.1 Communications

This strategy outlines a communications approach to park visitor safety, hiker code of conduct, habitat protection, and Regional Parks' branding.

ACTIONS:

- Develop a communications strategy that identifies key issues, key audiences, and practical operational approaches.
- Develop hiker code of conduct communications materials, including reminders on packing out waste, trail sharing, and listening to music with headphones.
- Explore opportunities to increase Regional Parks' branding and presence.
- Develop communications materials that highlight habitat features within the park.

As part of the communications strategy, there are a number of actions focused on promoting an individual's responsibility for safety and preparedness.

- Continue developing hiker safety and preparedness communications materials.
- Work with partner organizations on trail safety education and outreach.
- Work with the tourism sector, local schools, and community organizations to incorporate visitor preparedness and park closure information into materials related to the park.

5.2 Habitat Protection and Enhancement

This strategy focuses on actions that enhance forest health, resiliency, and habitat values.

ACTIONS:

- Collaborate with local First Nations, the District of North Vancouver, provincial and federal governments, academic institutions, other agencies, and community partners on forest management planning, as well as studies, stewardship, and natural areas restoration.
- Limit trail development to trails identified in concept plan to avoid habitat impacts and fragmentation.
- Create a restoration plan to decommission and restore unsanctioned trails. Partner with the Greater Vancouver Water District and District of North Vancouver where appropriate.
- Mitigate environmental impacts of park management activities including rock scaling, trail maintenance, and hazard tree removal.
- Maintain significant geological features, protect rare and specialized plants and animals, and allow for geological processes where possible.
- Monitor and manage human-wildlife conflicts.
- Map and manage invasive species.
- Share progress and outcomes of park ecosystem studies and stewardship projects through communications and interpretive programs.
- Work with volunteers on stewardship projects.
- Explore opportunities to work with park neighbours to improve ecosystem connectivity.



5.3 Grouse Grind Trail Closure System

This strategy takes an education, engineering, and enforcement approach to safety closures on the trail.

ACTIONS:

- Develop and implement a Grouse Grind Trail closure communication strategy.
- Work collaboratively with emergency services, the Greater Vancouver Water District, Grouse Mountain Resort, and other agencies and partners on communications related to Grouse Grind Trail openings and closure.
- Continue evening trail safety sweeps.
- Enhance trailhead for improved user experience and trail closure procedures, including removal of existing chain-link fence, and new safety and trail condition signage.
- Maintain and operate the BCMC Route as an all-season route, safety permitting.
- Install a gate closure system for the Grouse Grind Trail.
- Continue opening the Grouse Grind Trail for periods in the fall and winter when weather and safety conditions allow.
- Continue to monitor and adaptively manage trail access and use.



FIGURE 9: PROPOSED GROUSE GRIND TRAIL CLOSURE GATE SYSTEM

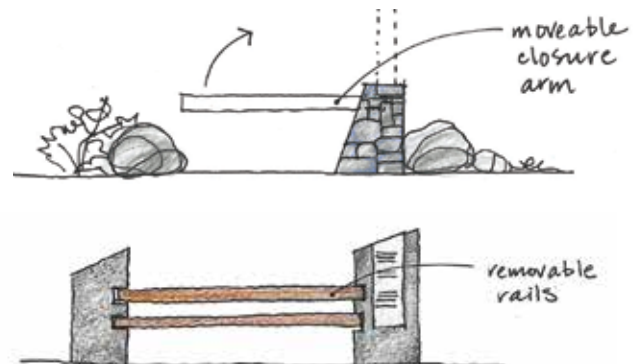


FIGURE 10: CONCEPTUAL GROUSE GRIND CLOSURE GATES
SOURCE: IAN STEWART AND BENCH SITE DESIGN

5.4 Public Programming and Nature Interpretation

This strategy outlines actions to connect people to nature, to the park's natural and cultural history and to promote wellness through group programs, public programs, events, displays, and signage.

ACTIONS:

- Design the trail network to support nature programs. Establish a loop trail and trail rest area locations for group nature programs.
- Complete a cultural heritage study of the park in collaboration with local First Nations.
- Develop a public and interpretive programming plan for the park.
- Limit interpretive signage and elements to areas that won't impede trail use.
- Explore opportunities to partner on interpretive signage and programs with local First Nations and community groups.

Public programming/nature interpretation thematic opportunities include:

- **First Nations Culture and Heritage:** opportunity to work with local First Nations to protect and present their culture and history in the park as they see fit.
- **Elevation:** opportunity to highlight how forest habitat changes at different elevations and through different seasons, including birds and animals that inhabit and migrate through different elevations.



- **Forest Ecology:** opportunity to teach tree and plant identification, and to explain different stages in forest development and active management techniques.
- **Geology:** opportunity to highlight the geological timeline and history of Metro Vancouver, including mountain formation and composition, and ongoing geological and erosion processes.
- **Hydrology:** opportunity to explain water movement and natural processes, from erosion and the dynamic character of streams to water purification and drinking water protection.
- **Protected Areas:** opportunity to tell the story of mountaineering and conservation, including the designation of provincial, regional, and municipal protected areas within Metro Vancouver.
- **Safety:** opportunity for trail safety education, including user preparedness and map reading, as well as safety in cougar and bear habitat.

6.0 Concept and Program



The park program and concept plan provide a long-range vision for park enhancements, including trail renovations, new trails, trailhead upgrades, secondary trailheads, and interpretive features.

6.1 Concept Plan

This concept plan builds on the existing trail network by establishing key connector trails to create loops and options for different hike lengths. The concept also includes realignment of the BCMC Route.

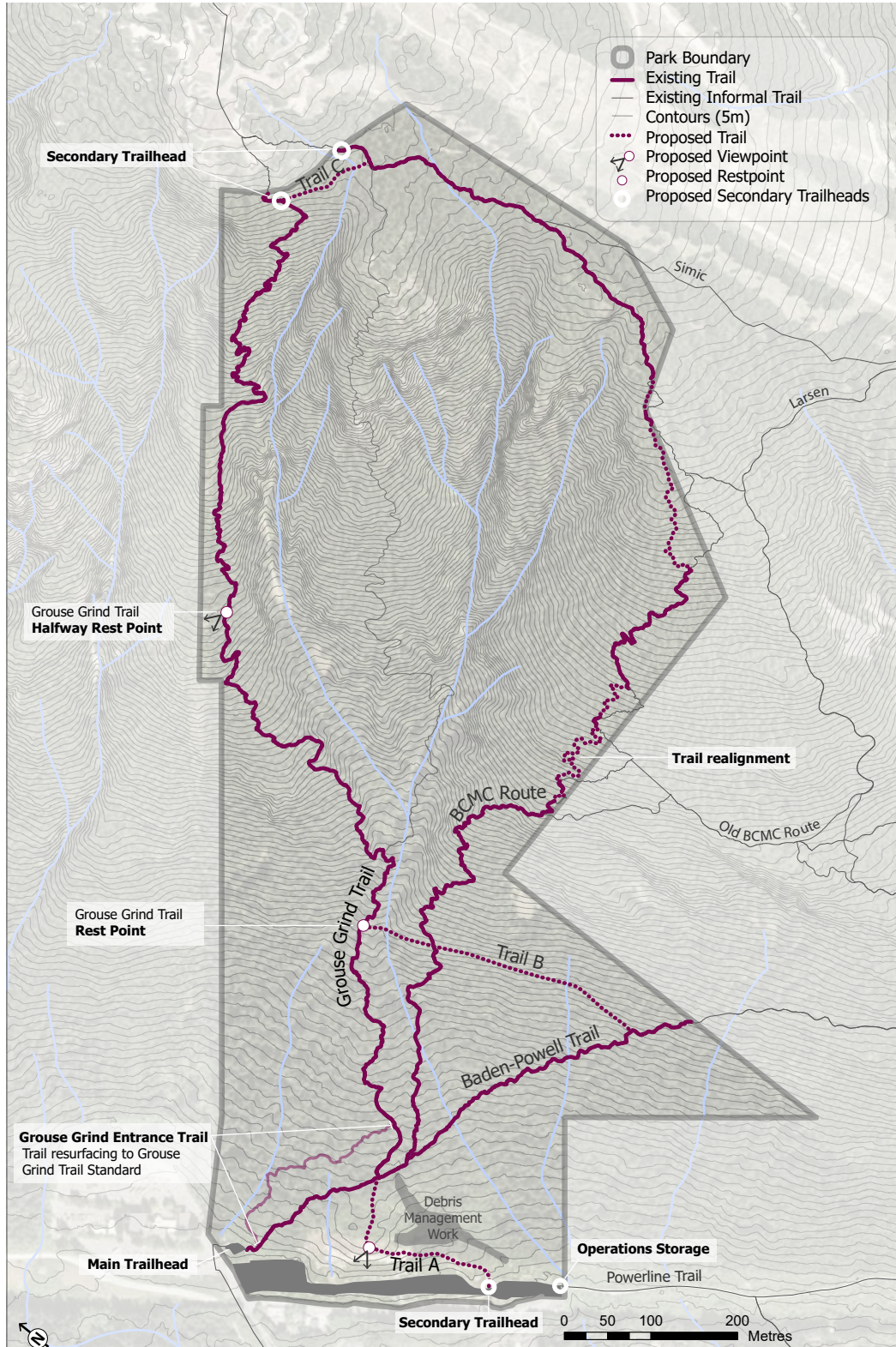


FIGURE 10: CONCEPT PLAN

6.2 Trailhead Concept Plan

The trailhead plan outlines circulation, layout, and visitor experience improvements for the main park entrance area.

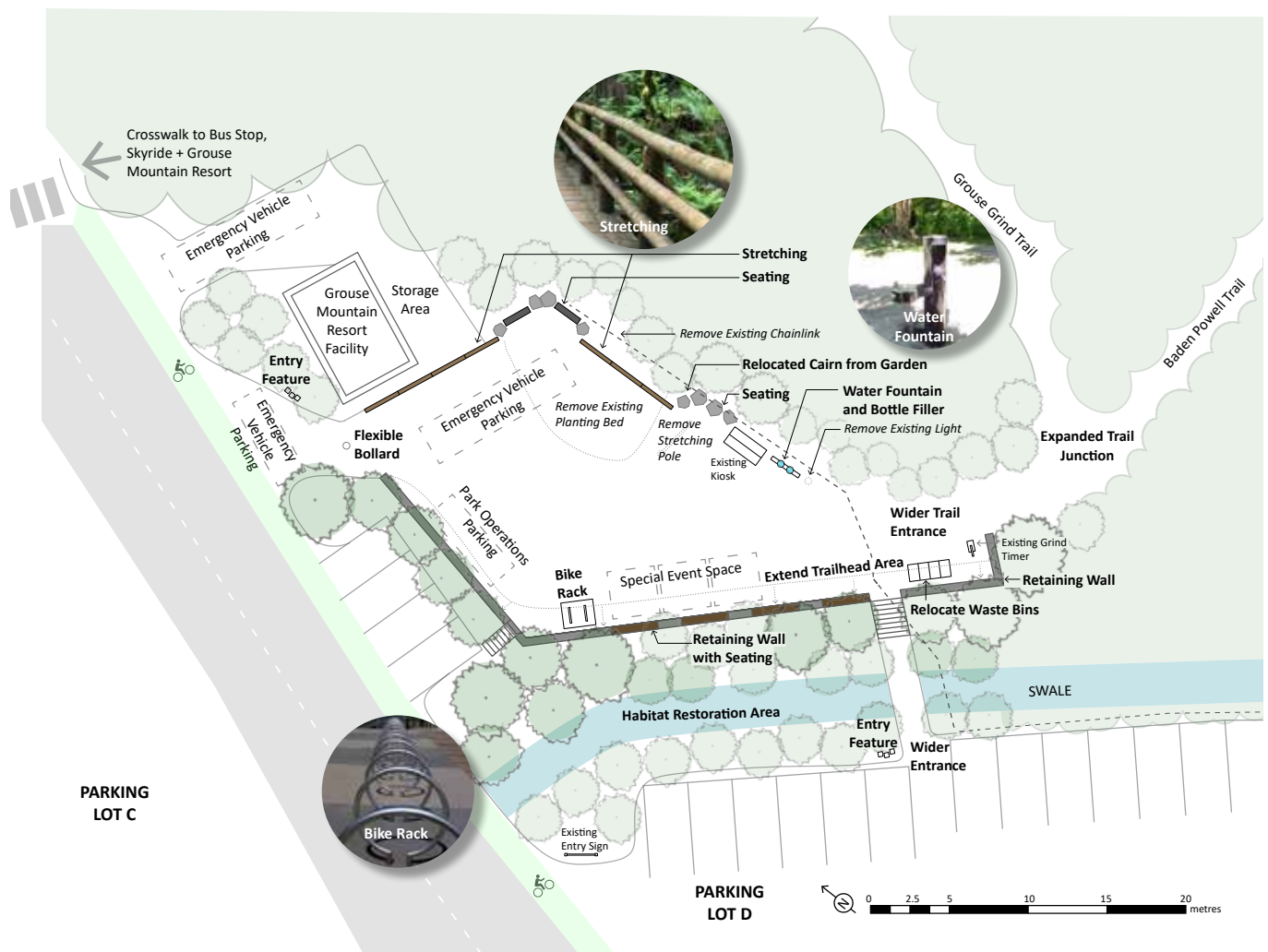


FIGURE 11: TRAILHEAD PLAN

6.3 Site Objectives and Elements

The table below outlines site objectives and planned elements by park sub-area.

PARK SUB-AREA	SITE OBJECTIVES	ELEMENTS
TRAILHEAD + BASE	<ul style="list-style-type: none"> • Provide park gateway and orientation • Improve staging area and enhanced regional park branding • Enhance functionality • Provide minor orientation and regional park branding at secondary trailheads 	<ul style="list-style-type: none"> • Water fountain and bottle filler • Interpretive features • Natural seating (large rocks or logs) • Additional stretching features • Operations storage area • Expanded open space for events • Park kiosk, safety and trail condition signage
STEEP + LOWER FOREST	<ul style="list-style-type: none"> • Provide a trail rest area and turn around point for the Grouse Grind Trail near the quarter mark • Enhance the rest area at the halfway point on the Grouse Grind Trail • Develop 1 to 2 minor and rustic rest points along the BCMC Route 	<ul style="list-style-type: none"> • Seating • Interpretive and safety signage • Explore opportunities for a viewpoint at halfway rest area on the Grouse Grind Trail • Explore opportunities for a mid-elevation washroom facility
SUBALPINE	<ul style="list-style-type: none"> • Provide park gateway and orientation • Protect sensitive habitat 	<ul style="list-style-type: none"> • Interpretive elements • Wayfinding signage for those entering the park and traveling down • Interpretive and safety signage • Consider adding infrastructure where necessary to reduce erosion and protect habitat

6.4 Trail Guidelines

Safety, durability, public input, environmental protection, and best practices were taken into consideration when developing trail guidelines for Grouse Mountain Regional Park.

TRAIL	EXPERIENCE	GUIDELINE	WIDTH	PROPOSED IMPROVEMENTS
Grouse Grind Trail	<ul style="list-style-type: none"> • high use, health oriented, ascent trail • steps, stairs, and retaining walls with a natural aesthetic 	<ul style="list-style-type: none"> • low-impact construction • trail edges defined to reduce off-trail use and erosion • natural & alternative materials as required • improvements and maintenance to address high use, safety, and erosion • resilient and durable trail surfaces 	varies 1.5 to 2 m passing areas as needed	<ul style="list-style-type: none"> • Grouse Grind Trail closure gates • ongoing maintenance • improved wayfinding signage
Rustic trail & route (BCMC, Baden Powell, proposed new trails)	<ul style="list-style-type: none"> • natural, rustic, technical routes • limited infrastructure 	<ul style="list-style-type: none"> • low-impact construction • where required, trail edges defined to reduce off-trail use and erosion • natural & alternative materials as required • improvements for safety and environmental protection • cobbled slopes for traction on eroded areas 	varies 0.5 to 1.5 m	<ul style="list-style-type: none"> • address loose gravel & rocks; where needed, realign trails to reduce hazards & erosion • use culverts only where needed • limit signs attached to trees • improved wayfinding signage



EXAMPLE OF GROUSE GRIND TRAIL



EXAMPLES OF RUSTIC TRAIL AND ROUTE GUIDELINES



Proposed Dog Management Strategy

DOG MANAGEMENT BY TRAIL	
Grouse Grind Trail	No dogs allowed
BCMC Route	No dogs allowed
Baden-Powell Trail	Dogs on-leash

Note: Dogs are not permitted on Grouse Mountain Resort's Gondola, ascent or descent

6.5 Phasing

The following phasing prioritizes park improvements based on analysis, feasibility, need, and engagement input. Phase 1 highlights priority actions identified as next steps in addressing issues, realizing the park vision, goals and concept and improving park ecological health and visitor experience.

	PHASE 1	PHASE 2	PHASE 3	PHASE 4
HABITAT CONSERVATION AND ENHANCEMENT	<ul style="list-style-type: none"> Invasive species mapping Forest management plan Park wildlife assessment 	<ul style="list-style-type: none"> Manage invasive species Habitat restoration plan Forest management plan implementation 	<ul style="list-style-type: none"> Decommission unsanctioned trails Ongoing invasive species management Ongoing forest management 	<ul style="list-style-type: none"> Decommission unsanctioned trails Ongoing invasive species management Ongoing forest management
MAIN TRAILHEAD NODE	<ul style="list-style-type: none"> Detailed design for trailhead, and Grouse Grind Closure System Communications and signage enhancements 		<ul style="list-style-type: none"> Trailhead implementation 	
GROUSE GRIND TRAIL	<ul style="list-style-type: none"> Implementation of Grouse Grind Trail Closure System 	<ul style="list-style-type: none"> Grouse Grind Rest Point (8/40) Ongoing maintenance 	<ul style="list-style-type: none"> Grouse Grind halfway area improvements Ongoing maintenance 	<ul style="list-style-type: none"> Ongoing maintenance
BCMC ROUTE	<ul style="list-style-type: none"> Trail assessment Trail realignment within park boundaries, taking into consideration connections to other trails Wayfinding signage enhancements 	<ul style="list-style-type: none"> Trail renovation and maintenance 	<ul style="list-style-type: none"> Ongoing maintenance 	<ul style="list-style-type: none"> Ongoing maintenance
BADEN-POWELL TRAIL	<ul style="list-style-type: none"> Trail Assessment 	<ul style="list-style-type: none"> Trail enhancements 	<ul style="list-style-type: none"> Ongoing maintenance 	<ul style="list-style-type: none"> Ongoing maintenance
NEW TRAILS		<ul style="list-style-type: none"> Detailed design for Trails A and B, including secondary trailheads 	<ul style="list-style-type: none"> Construction of Trails A and B Study of summit area & design of Trail C 	<ul style="list-style-type: none"> Construction of Trail C
FLINT AND FEATHER ROUTE	<ul style="list-style-type: none"> Trail Assessment 	<ul style="list-style-type: none"> Hazard reduction measures Trail improvements 	<ul style="list-style-type: none"> Monitoring and adaptive management 	<ul style="list-style-type: none"> Monitoring and adaptive management
PROGRAMMING/ COMMUNITY DEVELOPMENT		<ul style="list-style-type: none"> Pilot public programs Complete a cultural heritage study in collaboration with local First Nations 	<ul style="list-style-type: none"> Develop an interpretive signage plan Develop an interpretive programming plan 	

7.0 Operational Statement

Grouse Mountain Regional Park has an existing framework of steep, challenging, heavily-used trails. Park operations will focus on trail user safety, upgrading the trail system, and supporting park ecology.

Operational priorities include:

- continuing to focus on user safety and code of conduct education and enforcement.
- continuing to seek approval from the Greater Vancouver Water District for park modifications and improvements.
- coordinating and collaborating with the Greater Vancouver Water District, the District of North Vancouver, Grouse Mountain Resort, and other partners on park communications, operations, and management plan implementation.
- implementing the dog management strategy through education and enforcement.
- facilitating stewardship projects and public engagement in natural resource management.
- supporting opportunities for volunteer work parties and stewardship projects, where appropriate within site and safety constraints.
- developing event, race, and special use guidelines for the trailhead and park.
- continuing to provide park operations from the Capilano Regional Park works yard, with the addition of an operations storage building at Grouse Mountain Regional Park.



References

Diamond Head Consulting Ltd. (2018). *Metro Vancouver Grouse Mountain Park TEM Mapping Update and Forest Condition Assessment*, Vancouver, B.C.

Stewart, Ian and Bench Site Design. (2018). *Grouse Mountain Trail Closure Systems Study*, Vancouver, B.C.

