CASTLE MOUNTAIN RESORT
MASTER DEVELOPMENT PLAN

MAY, 2017

ACKNOWLEDGEMENTS

The development of this Master Development Plan was guided by input from the following individuals:

CASTLE MOUNTAIN RESORT
MASTER DEVELOPMENT PLAN
EXECUTIVE SUMMARY

MAY, 2017

BHA
DISTINCTIVE MOUNTAIN RESORT DESIGN

EXECUTIVE SUMMARY

INTRODUCTION

This Master Development Plan (MDP) details an exciting opportunity for Castle Mountain Resort to expand and diversify its winter and summer recreational activities, improve the overall experience for visitors at the resort, support wilderness adventure in the Castle Wildland and Provincial Parks, and develop into an all-season international and regional destination in southwest Alberta. It has been completed by Brent Harley and Associates Inc. (BHA) with extensive input from Castle Mountain Resorts Inc., the shareholders, community members and managers of Castle Mountain Resort and the Castle Mountain Community Association. The intent of this document is to provide a conceptual road map to the preferred development of Castle Mountain Resort (CMR). The content is designed to improve the quality of the experience offered at the Castle in an environmentally and economically sustainable fashion. The MDP forms the foundation from which the CMR vision, goals and objectives can be achieved.

THE PLANNING PROCESS

In March 2016, BHA was retained to create the Master Development Plan to guide the future development of Castle Mountain Resort. Anticipating a growing market for a unique all-season mountain experience in southwest Alberta, a comprehensive vision for CMR was crafted as the foundation of the MDP. Subsequently a detailed terrain analysis of the study area confirmed the technical viability for expansion and upgrade of the area's alpine skiing and snowboarding, and the development of summer recreational activities. Supporting this, an in-depth analysis of the base area lands was completed. This lead to the creation of development concepts for the expansion and upgrade of the mountain facilities and amenities, balanced in a well integrated fashion with an expanded base area village. The concepts went through an iterative process culminating in the Castle Mountain Resort Master Development Plan.

A VISION FOR THE FUTURE

The project envisioning sessions established that Castle Mountain Resort has a strong reputation for delivering a world-class, powder oriented skiing experience. The combination of steep and challenging terrain, dry "champagne powder" snow, and a friendly, family-oriented village has made CMR a coveted destination for dedicated skiers from across Western Canada.

Building on these positive qualities, Castle Mountain Resort is envisioned as:

> *"A mountain owned and operated by skiers who are driven by adrenaline, not profit, that believe that the right combination of dry powder snow and challenging terrain provide experiences of a lifetime for those who live to ski."*

III
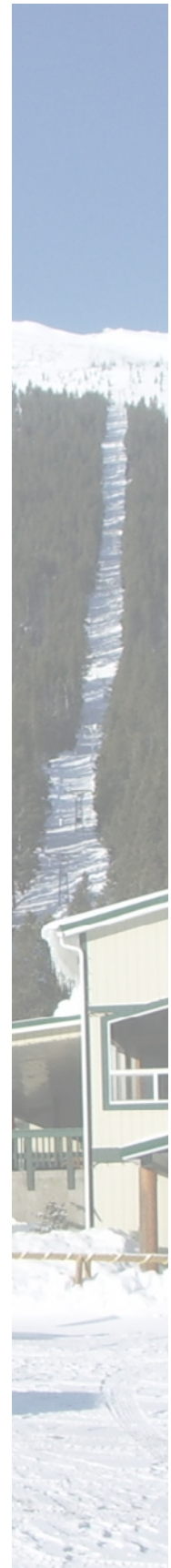
To achieve this CMR acknowledges the importance of aligning their development plans with the Management Vision for the Castle Wildland and Provincial Parks which sees the areas surrounding Castle Mountain as:

"World-class protected places, employing high standards in conservation, respecting Indigenous rights, and providing sites and facilities for exceptional recreation experiences."

Complementing this, the following goals and objectives acted to guide the creation of the Castle Mountain Resort MDP:

• Respect the natural attributes of the mountain and the setting recognizing that these are Castle Mountain Resort's primary attraction and currency;
• Provide state of the art all-season facilities on the mountain and in the village and base areas;
• Focus on the development and operation of a wide variety of recreation and retreat pursuits;
• Accommodate the needs and expectations of the day use visitors, the destination guests, the weekend patrons and the growing population of full time residents;
• Provide a well-balanced lift serviced alpine skiing and snowboarding experience as the primary winter attraction;

• Offer a diverse range of winter attractions to complement the alpine skiing including:
  - Backcountry skiing and touring
  - Events hosting (ski & snowboard events, festivals, etc,..)
  - Nordic skiing;
  - Snowshoeing;
  - Catskiing; and
  - Guided backcountry recreation activities, touring and hut to hut opportunities linked to lands beyond;

• Develop summer attractions including:
  - Lift serviced mountain biking, bike park, skills parks, and associated facilities;
  - Events hosting (festivals, concerts, etc,..)
  - Cross-country mountain bike trails and associated facilities;
  - Hiking and sightseeing;
  - Aerial adventure park;
  - Via ferrata;
  - Horseback riding, nature trails, fishing; and
  - Guided backcountry recreation activities, touring and hut to hut opportunities linked to lands beyond;

- Operate as a staging area and focal point for recreational users of the adjacent Castle Provincial and Wildland Parks, and develop the services and facilities to support their wilderness adventures;
- Maintain a diverse mix of specialized resort retail and equipment rental, restaurants, pubs, workout and training facilities, and "unique to Castle Mountain Resort" outlets;
- Develop an appropriate mix of facilities that will cater to longer term visitors including a grocery store, community centre, etc.;
- Ensure that the amount of real estate and overnight accommodation that is developed does not exceed the Balanced Resort Capacity of Castle Mountain Resort's attractions;
- Develop a range of appropriate resort oriented real estate product (hotel, condominium, townhouses, single family and RV) that are designed and zoned to be used for nightly rental;
- Maximize "warm beds" in the Village Core, ensuring that the majority of development caters to the needs and expectations of short term guests; and
- Maintain and maximize the "ski to/ski from" attribute that already defines Castle as being a truly unique ski resort.

The expansion and changes contemplated in this Master Development Plan are designed to achieve Castle Mountain Resort's Vision, Goals and Objectives.

EXISTING RESORT

Location

Castle Mountain Resort is located in the Westcastle Valley in southwest Alberta, approximately 145 kilometres southwest of Lethbridge, Alberta (Figure E-1). The Calgary International Airport, located approximately 250 kilometres north of the resort, provides easy access for visitors from across Canada and the world.

Figure E-1 Location Plan

Existing Facilities

Mountain Facilities

The current mountain facilities at Castle Mountain Resort shown on Figures E-2 and E-3, consist of 6 ski lifts servicing 84 trails (plus glades and terrain parks) contained within their License of Occupation (LOC), an area 1,295 hectares (3,200 acres). This tenure area also contains CMR's unique catskiing operation, Powder Stagecoach, a backcountry skiing experience within ski resort.

These facilities have a Comfortable Carrying Capacity (CCC) of 1,710 skiers and snowboarders per day. (For the purposes of this MDP, any future reference to skiers will imply skiers and snowboarders). Aligned with the powder skiing reputation of CMR and its vision for the future, BHA applied the lowest possible trail densities to the analysis.

The CCC is a measure of the optimum number of skiers that can utilize the resort over the course of the day while being guaranteed a pleasant recreation experience without causing a decline in the quality of the environment.

An analysis of the existing ski trails found that there is an oversupply of advanced and expert terrain, and a lack of beginner, novice and low intermediate. Castle Mountain Resort has committed to addressing this imbalance in the development of new ski terrain.

The Balanced Resort Capacity (BRC) is the total number of people that the resort's facilities can accommodate per day. This becomes the cornerstone to defining the appropriate amount of the base area facilities (built space, infrastructure, parking, bed units, etc). The capacity of the available alpine skiing, winter activities and passive visitors brings Castle Mountain Resort's BRC to a total of 1,900 visitors per day.

Figure E-2 Existing Resort 3D View

Castle Mountain Resort
Master Development Plan
2017

Existing Resort

Figure E-3

Base Area Facilities

The primary critical mass of existing base area facilities is found in the Village at CMR, as shown in Figure E-4. The analysis of these facilities, as they relate to the BRC, found that the amount of built space for restaurants, bars and retail are well provided for. However, compared to industry standards it appears that snow school services, as well as day care, washrooms and public locker space are underserviced. As these are crucial to a positive visitor experience, this plan evaluates and illustrates the opportunities to expand or upgrade base area space more effectively. Further, Castle Mountain Resort recognizes that snow school services will become increasingly more important, both as a profit centre and an opportunity to cater to an expanded all season international and regional destination marketplace.

Figure E-4 Existing Base Area Conditions
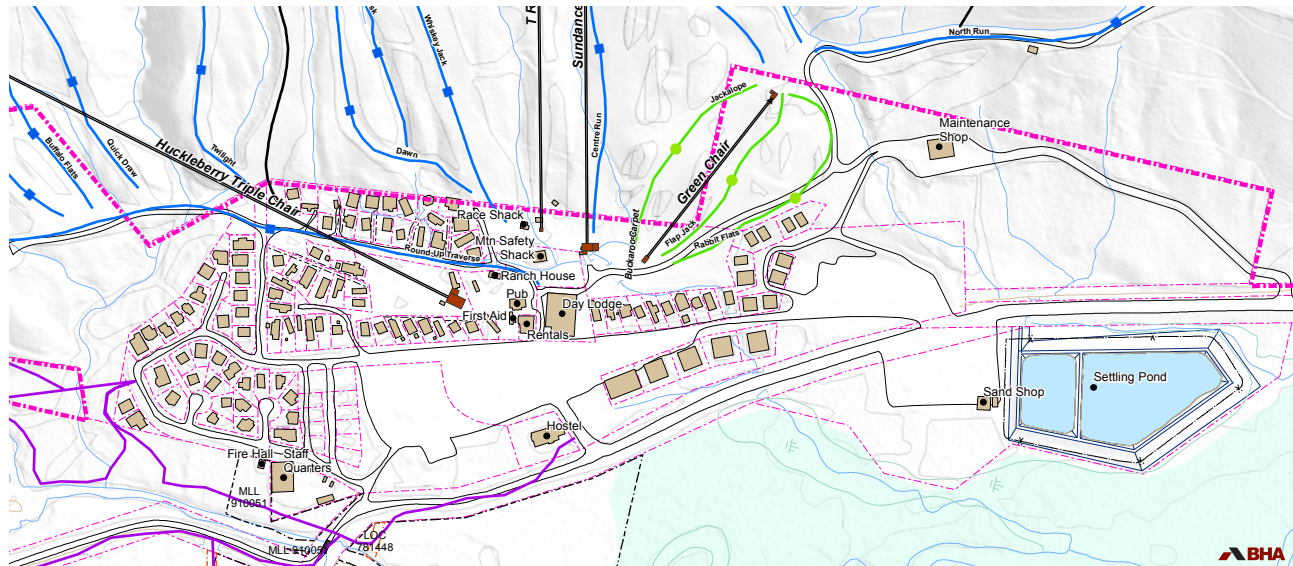
Overnight Accommodation

The existing residential and commercial accommodation facilities at Castle Mountain Resort have evolved over time to coincide with the development of the skiing facilities. The current Area Structure Plan (ASP) allows for the development of 225 accommodation units. However, as Castle Mountain Resorts' reputation as an all season international and regional destination grows, and the CCC and the BRC increase, so too must the ability to provide for overnight visitors. As such, the appropriate number of accommodation units should be increased and tied into the next ASP.

Currently the existing and committed overnight accommodation total 131 units, including 89 single family units, 40 multi-family units, a hotel, and a hostel.

Parking

The day use parking lot at Castle Mountain Resort currently has capacity for about 550 cars, while parking provided by overnight accommodation has space for another 200 vehicles distributed through the resort. At full capacity the parking areas have space for approximately 1,940 visitors per day. Recent experience has shown that this is insufficient to meet current demand. As Castle Mountain Resort grows, parking capacity will have to grow as well.

SITE ANALYSIS

The Mountain and the Base

The study area was analyzed in terms of slope, elevation, aspect, and fall-line in order to gain an understanding of the alpine skiing, cross-country skiing and mountain bike development potential, and its capability to physically and environmentally support additional all-season resort activities. Several areas were identified that hold significant promise for the upgrade and expansion of winter activities and the development of summer activities (See Figure E-5). Notably, Haig Ridge presents a significant opportunity to transition the existing catskiing experience into a lift serviced area while adding beginner, novice and low intermediate terrain currently lacking at the resort. Further, the northern end of the Ridge is well-suited for the development of a mountain bike park. Additionally, the Haig Creek Area was found to have the ideal slope for both Nordic skiing and Cross-country Mountain biking, adding recreational diversity and all-season opportunities. Finally, the surrounding Park lands offer summer and winter backcountry adventure opportunities which the resort can cater to.
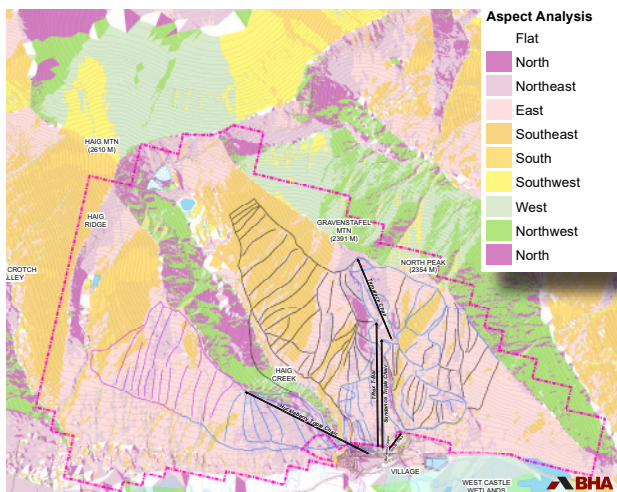
Aspect Analysis
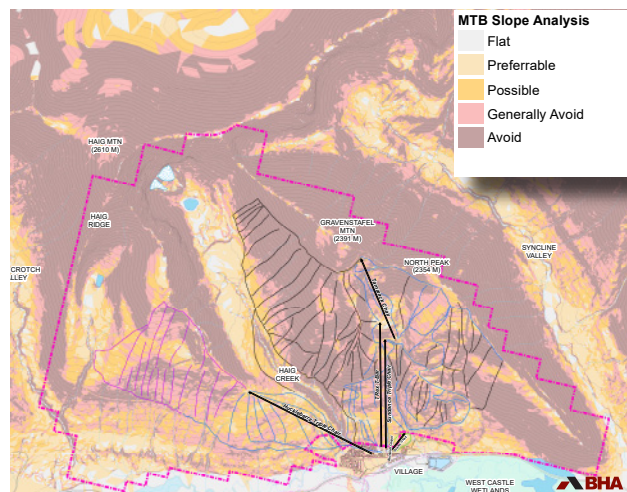
Mountain Bike Slope Analysis
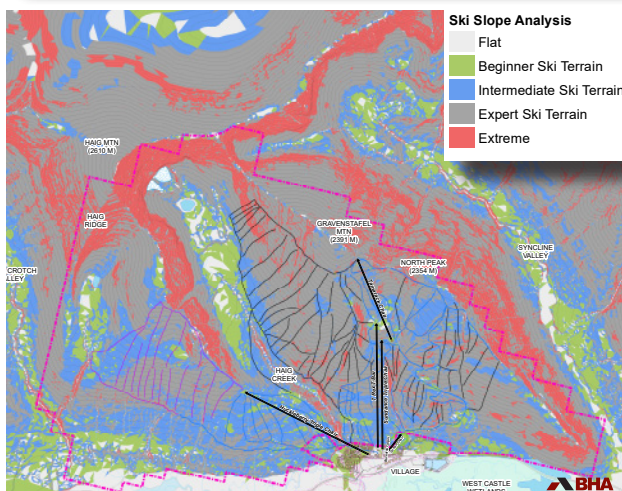
Ski Slope Analysis

Elevation Analysis

Castle Mountain Resort
Master Development Plan
2017

Legend

Existing Lifts
Existing LOC
West Castle Wetlands

Expansion Potential

Backcountry Castle South
Backcountry Catskiing Syncline Valley
Base Area Village Infill
Existing Infill
Haig Ridge
Haig Valley
North Bowl
Potential Satellite Base

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Development
Opportunities Plan

Figure E-5

HAIG MTN
(2610 M)

SORE CROTCH
VALLEY

**HAIG
VALLEY**

GRAVENSTAFEL
MTN
(2391 M)

NORTH PEAK
(2354 M)

SYNCLINE
VALLEY

**BACKCOUNTRY
CATSKIING
SYNCLINE
VALLEY**

**HAIG
RIDGE**

**EXISTING
INFILL**

Tamarack Chair

HAIG
CREEK

T Rex T-Bar

Sundance Triple Chair

**NORTH
BOWL**

Huckleberry Triple Chair

**BACKCOUNTRY
CASTLE
SOUTH**

Buckaroo Carpet

Green Chair

**BASE AREA
VILLAGE INFILL**

WEST CASTLE
WETLANDS

POTENTIAL SATELLITE BASE

MASTER DEVELOPMENT PLAN

The Castle Mountain Resort Master Development Plan describes the proposed transformation from a regional ski area into a standout all season international and regional destination resort. It is divided into two principal parts – the mountain facilities and the base area facilities.

Mountain Facilities

The Mountain Facilities are the elements developed at the resort to complement the natural environment and setting on which they are built. They are the tools utilized by visitors and guests to enjoy their escape to the mountains. The MDP defines the proposed facilities that Castle Mountain Resort can support in the future. In the winter these include the ski lifts and trails, the cross-country, snowshoeing, and catskiing. In the summer, the proposed development opportunities include mountain biking, hiking, a via ferrata, an aerial adventure park with ziplines, guided hut to hut backcountry tours (winter skiing and summer hiking and mountain biking), and support for horseback riding.

Mountain Facility Development Goals

WINTER SEASON

The primary development goals for the mountain as they relate to winter facilities are to:

- Optimize the development of advanced and expert terrain reinforcing Castle Mountain Resort's reputation of offering iconic steep ski terrain;
- Maximize the development of beginner, novice, low intermediate and intermediate terrain in an effort to improve the balance of the offering at Castle Mountain Resort;
- Provide beginner terrain to the greatest extent possible in close proximity to the Village;
- Develop new beginner and novice terrain along with a new satellite base area and parking;
- Continue to offer terrain that reinforces the diverse needs of families and provides something for everyone, from traditional ski runs to gladed, adventure terrain for all ability levels;
- Continue to offer terrain that is designed to encourage an advancement of skier/ snowboarding skills;
- Provide intermediate/entry level glades that are 'feathered' into more advanced gladed terrain;
- Realize efficiencies within existing terrain through modifications;
- Continue to upgrade the ski lift system to cater to a low density powder skiing experience;
- Develop a comprehensive snowmaking system, utilizing state of the art technologies to ensure a reliable snowpack especially on the lower elevations;
- Preserve, develop and enhance the ski to/ski from capabilities of the base village developments;
- Develop exciting new terrain that will inspire the market and attract visitors; and
- Develop on-mountain facilities that will cater to the diverse needs and expectations of skiers and snowboarders in each area of the mountain.

The primary development goals for the mountain as they relate to summer facilities are:

- Internal to the LOC, plan for, design and develop a:
    - Downhill mountain bike park that is lift serviced, complemented with skills park and supporting facilities;
    - Cross-country mountain bike trail system that is lift serviced, complemented with supporting facilities;
    - Backcountry oriented cross-country mountain biking trail network, staging from Castle Mountain Resort and accessing hut to hut trail systems within the Wildland and Castle Provincial Parks, including providing access to Waterton and Glacier National Parks to the south, Crowsnest Pass to the north and the Great Divide Trail in BC;
    - Via ferrata (guided, cable mountain climbing trail system);
    - Aerial adventure park and zip lines, designed to be unique to Castle Mountain Resort;
- Consistent with Environment and Parks' Castle Management Plan develop additional adventure tourism opportunities in and around Castle Mountain Resort;
- Preserve, enhance and expand on the trails catering to hiking, trail running, horseback riding, backcountry backpacking and alpine hut to hut trail systems, all staged from Castle Mountain Resort;
- Explore the opportunities to develop additional summer attractions, facilities and celebrations, based from the Castle Mountain Resort Village.

Expansion Areas

After synthesizing the results of the various analyses, several conceptual alternatives for mountain resort facilities and amenities were explored within the existing LOC and a potential LOC (Figure E-5). Well-integrated skiing potential was identified within a number of development areas, as illustrated on the Mountain Development Expansion Plan (Figure E-6). These areas are the Haig Ridge; the Haig Valley; the North Bowl; the Existing Area and Infill; the Backcountry (sub areas Castle South and Syncline Valley), and; the Base Area Infill (the Village and potential Satellite). While the capacity of the resort would increase, the size of the potential LOC will decrease from 1,295 to 1,268 hectares (3,133 acres), resulting in a net increase to the size of the Castle Wildlands Provincial Park. The largest change to the resort occurs at the south end with the addition of much needed beginner ski terrain and the backcountry ski pod, designed to complement backcountry access and recreation in the Park.

Castle Mountain in the Summer
Photo: BHA, 2016

The proposed expansion and upgrade areas are made up of a series of land use pods. The majority of these are ski pods, defined by skiablity within the LOC. They are complemented by the ability of the Haig Valley pod to contain other attractions, and the base area pods (village and satellite base) to stage all of the facilities.

External to the LOC, are specialized ski pods that have significant attributes that will balance and complete CMR in a fashion that will enable it to achieve the envisioned potential. This is illustrating the resort in it buildout condition. Development will be established in a series of sequential phases, responding to market trends and demand.

Ski terrain expansion was identified with a particular emphasis on the development of the Haig Ridge and Haig Valley expansions. These expansions would transform a backcountry ski experience into easily accessible lift-serviced playground, while opening up considerable low intermediate and intermediate terrain at lower elevations. Rounding out this potential is the critically important development of the Backcountry and Beginner lifts and trails, located outside of the LOC.

PHASE ONE WILL INCLUDE:
• Haig One Chair & Associated trail development;
• Initial expansion of the Village base;
• Initial mountain bike/Nordic area trail design and development.

PHASE TWO WILL INCLUDE:
• Haig Two Chair & Associated trail development.

PHASE THREE WILL INCLUDE:
• Haig Three Chair & Associated trail development.

FUTURE PHASES WILL INCLUDE:
• Existing Area Infill;
• Minor Divide and North Bowl Chairs;
• Aerial Adventure Park with Zipline Tour;
• Backcountry and Beginner Chairs with Satellite Base Area.

Figure E-6 Mountain Development Expansion Plan
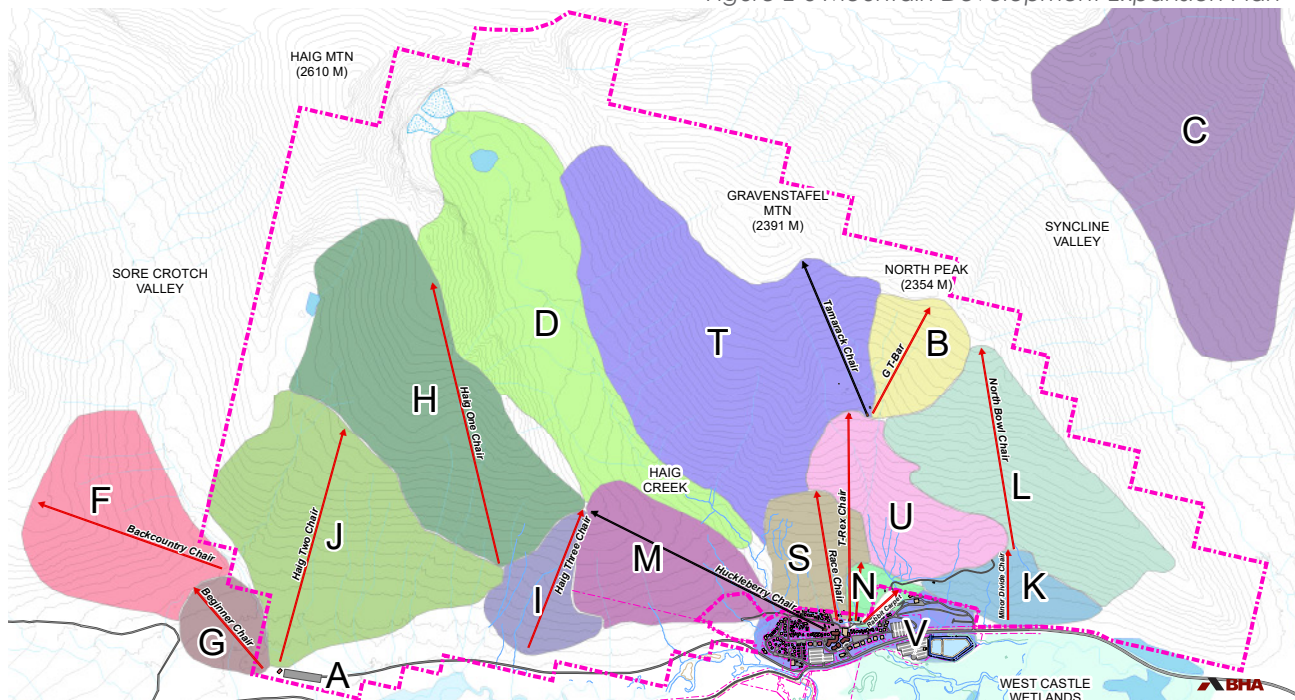
Complementing this are the proposed expansion and infill of intermediate and advanced terrain associated with the North Bowl area beneath Gravenstafel Ridge. This will enhance skier circulation and diversify skier options. Immediately adjacent to the Village, the Green Chair is proposed for realignment in order to maximize the beginner skiing offering.

Finally, there is physical opportunity to relocate the current Powder Stagecoach catskiing operation outside of the LOC to the slopes of Syncline Valley. In doing so, this will enable CMR to maintain a unique resort based backcountry operation.

Once completed, these additions will provide a balance of the steep, challenging terrain Castle Mountain Resort is known for, with terrain for beginner and intermediate skiers currently underrepresented at the resort.

Lift and Trails

At buildout of the Master Plan, Castle Mountain Resort will consist of 14 ski lifts servicing 169 formal trails, plus gladed and terrain park areas. Of these, 8 will service existing terrain, while the remaining 6 will offer access to new areas. This represents an addition of 398 hectares (984 acres) of newly developed ski terrain. This will bring Castle Mountain Resort's total developed ski terrain to approximately 761 hectares (1,881 acres). With the planned increases to the beginner and intermediate terrain, the offering will be much closer to the distribution of the skill classes found in the skier marketplace.

View of the Base area, Haig Mountain and Syncline Valley
Photo: CMR, 2017
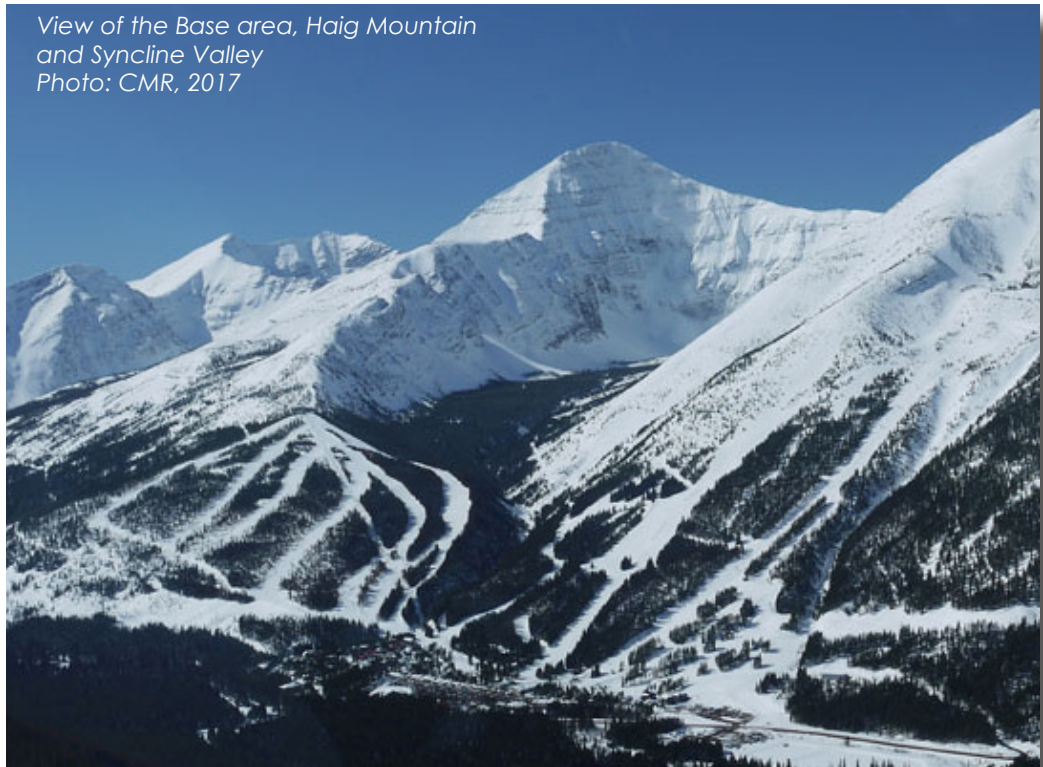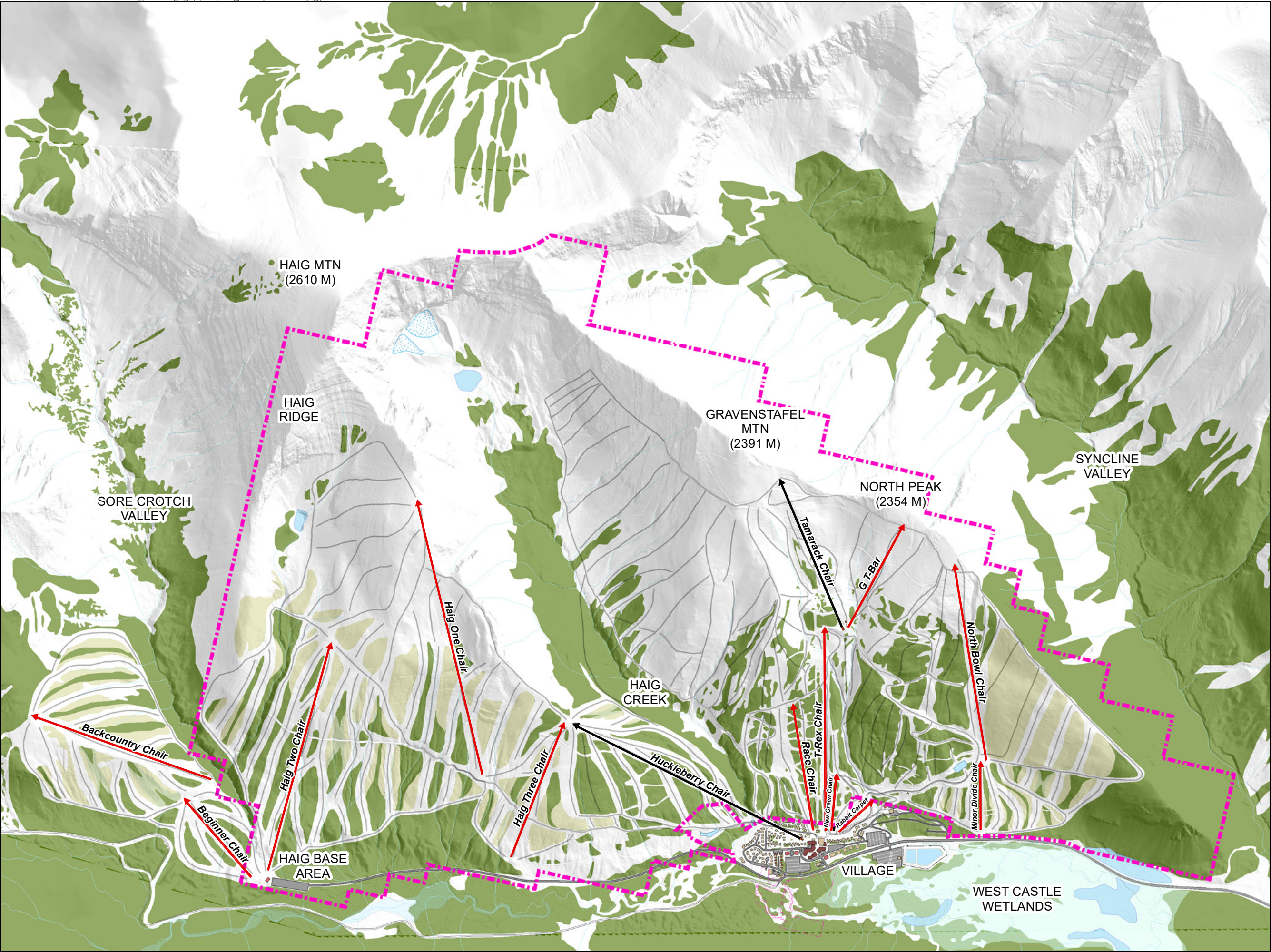
Figure E-7

Castle Mountain

Castle Mountain Resort
Master Development Plan
2017

Legend:
→ Existing Lifts
→ Proposed Lifts
Ski Trails
Existing LOC
West Castle Wetlands
Potential Glading
Thin Glading
Dense Glading
Existing Vegetation

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Master
Development Plan

Figure E-7

Map labels:
HAIG MTN (2610 M)
HAIG RIDGE
SORE CROTCH VALLEY
GRAVENSTAFEL MTN (2391 M)
SYNCLINE VALLEY
NORTH PEAK (2354 M)
HAIG CREEK
Tamarack Chair
G T-Bar
Haig One Chair
Haig Two Chair
Backcountry Chair
Beginner Chair
Haig Three Chair
Huckleberry Chair
HAIG BASE AREA
Race Chair
T-Rex Chair
New Green Chair
Rabbit Carpet
North Bowl Chair
Minor Divide Chair
VILLAGE
WEST CASTLE WETLANDS

Summer Attractions

Castle Mountain Resort has excellent potential to realize their summer activity goals. The MDP describes an all-season Summer Plan (Figure E-8). This includes the addition of lift serviced downhill and cross-country mountain bike areas. The Huckleberry Chair will serve as the lift for the downhill mountain bike park, and offer access to a cross-country mountain bike trail network in the Haig Valley. Further, the Chair will offer lift access to the via ferrata trail network and hiking trails.

Additional summer facilities include the aerial adventure park with a ziplines at the base of Haig Mountain and trail development accessing backcountry trails within the Parks, facilitating backcountry mountain bike touring.

Further, as base village facilities develop, CMR will actively engage in summer use programming to accommodate retreats, festivals and weddings.

Based on preliminary design and capacity estimates, it is anticipated that at buildout Castle can expect approximately 1,000 guests per day during the summer.

Figure E-8 Potential Summer Plan
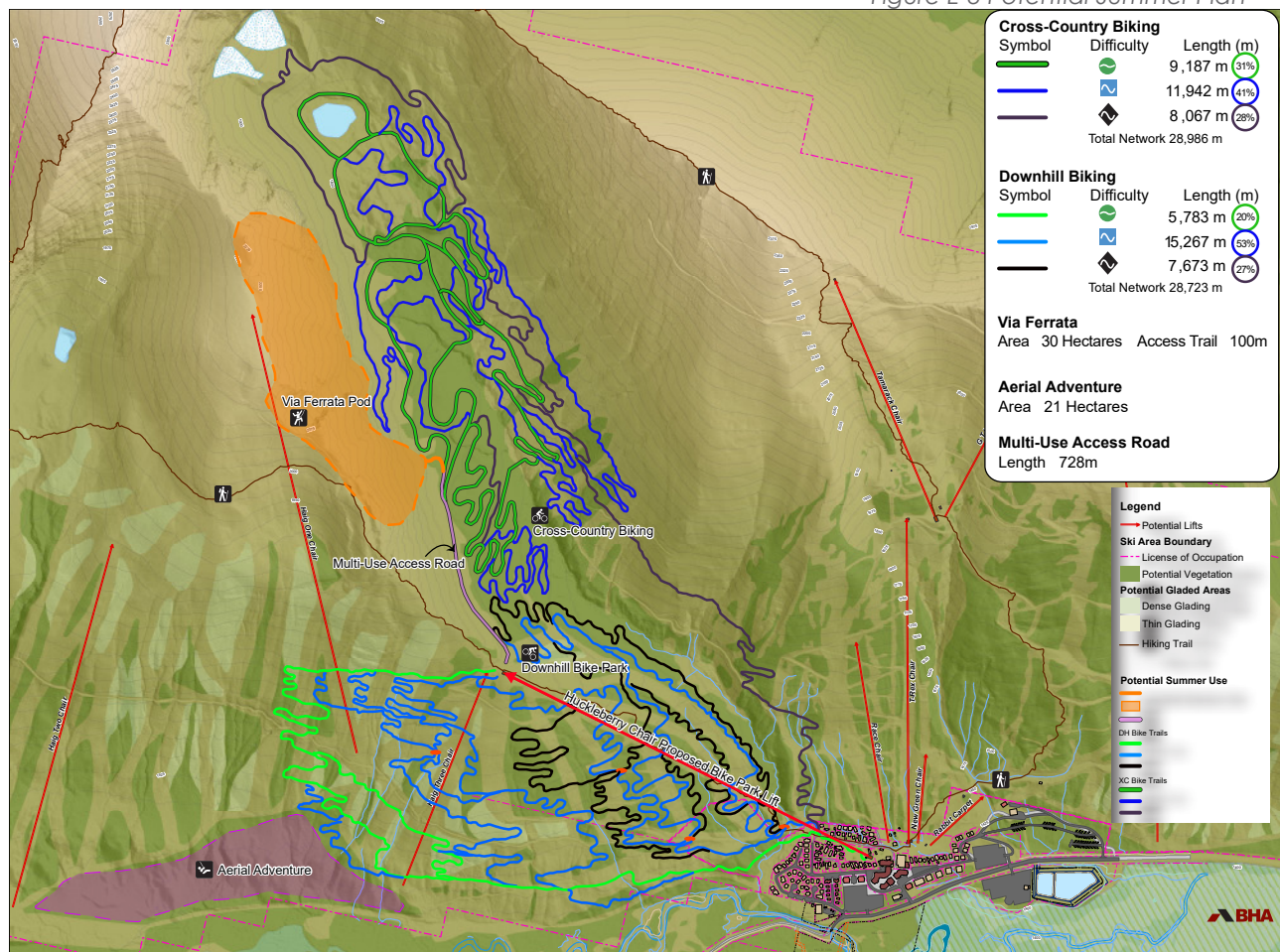
Balanced Resort Capacity

At buildout, the alpine skiing facilities will have a CCC of approximately 3,952 skiers per day. The expansion of Nordic skiing, snowshoeing, backcountry skiing, and passive visitors adds another 380 visitors per day, for a BRC of 4,332 visitors per day.

Annual Visitation

Utilizing the "at buildout" BRC of 4,332 visitors a day for winter visitation and applying a season length of 120 days and 30% utilization rate, CMR can expect 156,000 winter visits. Utilizing a buildout summer maximum daily capacity of about 1,000 and applying a season length of 100 days and 30% utilization rate, CMR can expect 30,000 summer visits. This equates to an annual visitation total of approximately 186,000.

Base Area Facilities

The proposed improvements and expansion of the base area development at CMR have been designed to complement the mountain's attributes and planned facilities. These developments will be gradually taken on in balance with the establishment of additional skiing and associated mountain resort attractions.

Base Area Facility Development Goals

The primary development goals for the base area facilities are to:

• Develop the base areas at Castle Mountain Resort in a comprehensive all-season, and well integrated fashion that caters to day use, international and regional destination visitors, second home owners and the permanent population;
• Expand the existing base into an all-season Village oriented focal point that reflects the core values and character already well established at CMR;
• Cater to day use, international and regional destination visitors, second home owners and the permanent resident population;
• Design the base area village to stage the facilities internal to the CMR License of Occupation tenure area as well as to provide recreation linkages to the surrounding Wildland and Provincial Parks and beyond;
• Incorporate direct linkages to and from the base area facilities and ski lifts such that the existing and proposed resort residential areas are ski to/ski from development;
• Reinforce the well established CMR pedestrian friendly base area character;
• Establish all of the base area facilities and residential development in balance with the capacities of the resort's attractions, recognizing that there are absolute limits to growth;

- Phase the base area development in an incremental fashion aligned with the proposed development of the mountain facilities;
- Incorporate a variety of resort residential accommodation initially limited to the allowable develop-ment cap of the Area Structure Plan and ultimately to an expanded and amended ASP;
- Incorporate affordable resident and employee housing into the plan;
- Provide enough parking to satisfy the requirements of the day use and destination visitors;
- Develop a satellite base area to cater to the access and parking requirements of the Castle South be-ginner terrain and backcountry opportunities;
- Ensure that all development is completed in a proactive, environmentally sensitive fashion that complements the surrounding Castle Wildland and Provincial Parks.

Built Space

Built space requirements are driven by the BRC of the resort's facilities. At buildout, CMR must have the ability to provide for the needs of approximately 4,332 visitors on any given day. The types of built space need to complement the needs and expectations of visitors and will range from amenities such as restaurants, bars, retail shops, to services such as ski school, rental, daycare, and day lockers, to administrative space needed to manage the resort. As Castle Mountain Resort grows in reputation and in size, these facilities need to be broadened to provide for the expectations of visitors.

At buildout, the amount and composition of facility related space will be adjusted and increased to reflect the needs of skiers and visitors.

The majority of the proposed base facilities will be concentrated in the existing village. The focus of the upgrades will be to complement and provide for the needs of destination guests and growing resident population, while continuing to cater to day use patrons.

The proposed satellite Haig Base Area at the base of Haig Ridge will be day use oriented. With its parking and a small day lodge, it will offer facilities to support basic necessities for a day in the mountains. The lift and trail configuration will enable skiers to stage from this satellite base, accessing the rest of the mountain, as well as linking to backcountry touring opportunities via the proposed Backcountry and Beginner chair lifts.

Overnight Accommodation

Overnight accommodation is defined by the appropriate number of accommodation units that can be physically developed at CMR. The current ASP allows for 225 accommodation units at buildout equating to 788 beds at CMR. The ASP associates this accommodation capacity to 2,400 on peak day visitors. Using the same ratio to align with the buildout BRC of 4,332 per day, the appropriate number of at buildout beds should be set at 1,421 and the accommodation units at 406. This increase should be incorporated into an updated ASP and tied into buildout detailed planning for the Village.

Development Areas

The development areas defined within the MDP are the Castle Mountain Village and the satellite Haig Base Area. They have been conceptually laid out to service and complement the adjacent mountain facilities.

The Village base has been and will remain the focal point for development at Castle Mountain Resort. The vision for the Village was established by the Village Master Plan (Figure E-9) completed in 2008. When completed, the Village core will provide a visitor centred experience, supported by restaurants, pubs, and a range of overnight accommodation. The layout has been designed to relate to the mountain, separating visitors from the parking, with the goal of maintaining CMR's established intimate and family-friendly atmosphere.

To support the Haig Ridge expansion, the satellite Haig Base Area is proposed for the bottom of Haig Ridge, south of the current Village. This new base area will enable the development of much needed beginner, novice and low intermediate ski terrain while providing quick and easy access to the new Haig Ridge development. It will contain a small day lodge providing basic staging and snow school facilities and expanded day use parking.

Figure E-9 Village Area Concept - 2008

DEVELOPMENT SUMMARY

The key points of the Castle Mountain Resort Master Plan are illustrated in the Master Development Plan descriptions and figures. The details are summarized in the following table.

Castle Mountain Resort Master Development Plan Summary May 2017			
	Existing Conditions	Proposed Development	Total Development at Buildout
Ski Lifts and Trails			
Carpet Lifts (#)	1	1 new/replacement	1
T-Bar (#)	1	1 new/replacement	1
Double Chair (#)	2	2 new/replacement	4
Triple Chair (#)	2	0 new/replacement	2
Quad Chair (#)	0	6 new/replacement	6
Total Lifts (#)	6	12 new/replacement 2 existing/preserved	14
Ski Trails (#)	84	85	169
Gladed Trails (ha)	70	205	275
Skiable Terrain (ha)	363	398	761
Comfortable Carrying Capacity (CCC) (skiers per day)	1710	2242	3952
Additional Winter Activities – Capacity			
Cross-country Skiing (users)	25	25	50
Snowshoeing (users)	25	25	50
Catskiing (users)	24	0	24
Backcountry Skiing (users)	0	50	50
Total (users)	74	100	174
Summer Activities – Capacity			
Downhill Mountain Biking (users)	0	200	200
Cross-country Mountain Biking (users)	0	250	250
Backcountry Touring (users)	0	50	50
Via Ferrata (users)	0	50	50
Hiking (users)	0	100	100
Aerial Adventure Park (users)	0	150	150
Events, Camps (users)	0	100	100
Total (users)	0	900	900
Balanced Capacity and Development Units			
Additional/Passive Guests	90	116	206
Balanced Resort Capacity (# of visitors)	1900	2432	4332
Accommodation Units (#)	131	275	406
Annual Visitation			
Winter (# of visitors)	90,000	66,000	156,000
Summer (# of visitors)	3,000	28,000	31,000
Total (# of visitors)	93,000	94,000	187,000

IMPLEMENTATION STRATEGY

The pace of implementation of the CMR Master Development Plan will be driven by the resort marketplace and economic conditions. However, a series of short term implementation strategies have been identified, designed to set the plan in motion. These are:
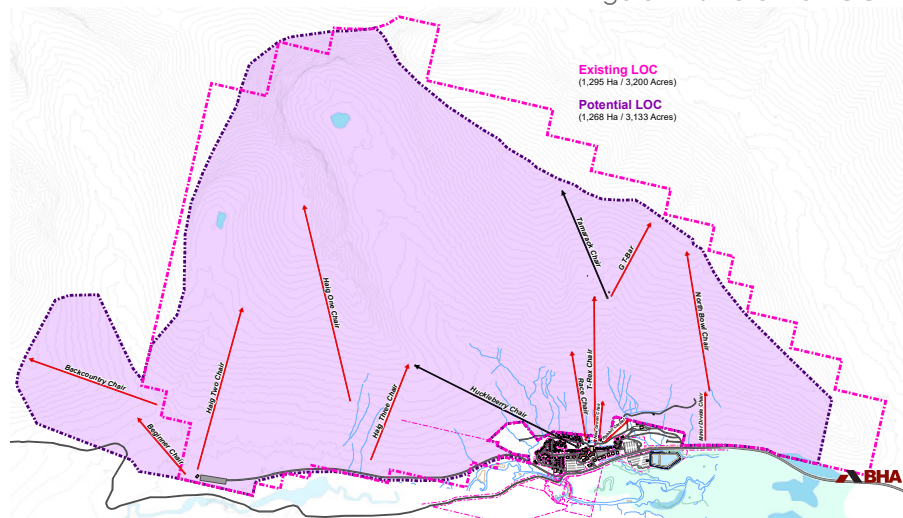
• Obtain development approval for the MDP through the Province of Alberta;
• Work with the MD to create a new ASP reflecting the MDP;
• Continue to make incremental improvements to the resort respecting the ultimate needs of the MDP;
• Working with the province, initiate access to and the development of the proposed snowmaking system and reservoirs, confirming water source and capacity requirements;
• Initiate detailed design for Haig One (lifts and trails);
• LOC amendment for all season use;
• Prioritize summer recreation plan facilities for development;
• Initiate detailed design for first summer use facility.

On a longer time frame the implementation strategies would be expanded to include:

• Construct Haig One (lift and trails);
• Construct first phase of summer facilities;
• Construct the first and second phase of the proposed snowmaking system;
• Initiate dialogue with the Province to determine the best mechanism to enable the development of the Beginner Chair (lifts and trails), the Backcountry Chair (lifts and trails), the access road to the proposed Satellite Base Area. One option may be the realignment of the LOC Boundary to enable a net increase of Park land (Figure E-10);
• Initiate dialogue with the Province to determine the best mechanism to enable the development of a new catskiing operation relocated in the Syncline Valley;
• Finalize design, construct and relocate the Green Chair (lifts and trails);
• Prioritize next steps of development as per the MDP.

Each of these strategies is directly aligned with the vision of CMR becoming a highly successful backcountry oriented, all-season, international and regional destination mountain resort.

Figure E-10 Potential LOC
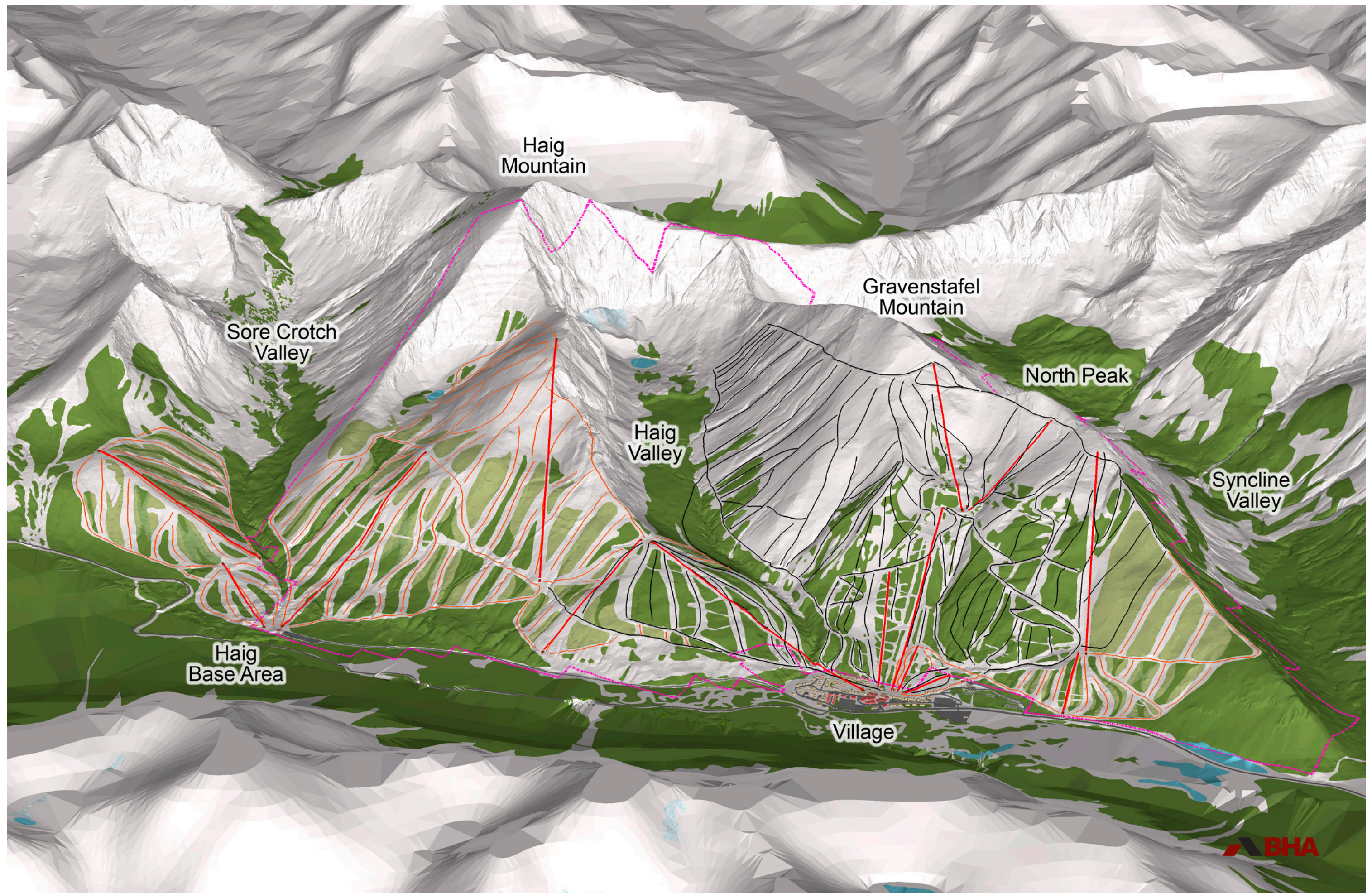
Haig Mountain

Sore Crotch Valley

Gravenstafel Mountain

North Peak

Haig Valley

Syncline Valley

Haig Base Area

Village

BHA

Figure E-11 Proposed Resort 3D View

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1.0 Introduction

1.1 PROJECT OVERVIEW

Castle Mountain Resort is a regional destination ski resort located in southern Alberta. This Master Development Plan delineates an exciting opportunity for the resort to double the size of its skiing and winter product as well as introduce significant summer attractions and facilities. Supporting the all-season mountain development, the existing base area will be expanded into a focused village core to provide a well balanced mix of facilities, amenities and accommodation designed to service the mountain attraction and facilities. A satellite day use base area will also be added in the future, designed to augment the overall resort experience.

This Castle Mountain Master Development Plan (MDP) describes the planning process, demonstrates the technical analyses and details the ski area, the summer use and the base area village plans. The overall intent of the MDP is to reinforce Castle Mountain's well established reputation as a very special powder ski resort while providing the blue print for development improvements and expansion. The MDP will guide the creation and establishment of a four season resort that caters to the growing backcountry oriented marketplace while respecting and complementing the ecological integrity of the surrounding Castle Provincial and Wildland Parks.

1.2 THE PROPONENT

Castle Mountain Resort (CMR) is owned by Castle Mountain Resort Inc., a group of avid local skiers and residents that aspire to maintain CMR as a viable all season international and regional destination in southern Alberta. Since 1996, the owners have invested in the revitalization of CMR, adding new terrain, lifts, and amenities.

1.3 PLANNING PROCESS

BHA (Brent Harley and Associates Inc.) has worked with Castle Mountain Resorts on a variety of planning and design projects since 1999. In 2016, BHA was engaged to design the Master Development Plan for the resort.

The Master Planning process was initiated by inventorying the existing conditions at the resort. Concepts were created based on a clear resort development vision for the future, the characteristics and potential of the local terrain features, the area's natural attributes, and the history and culture of CMR.
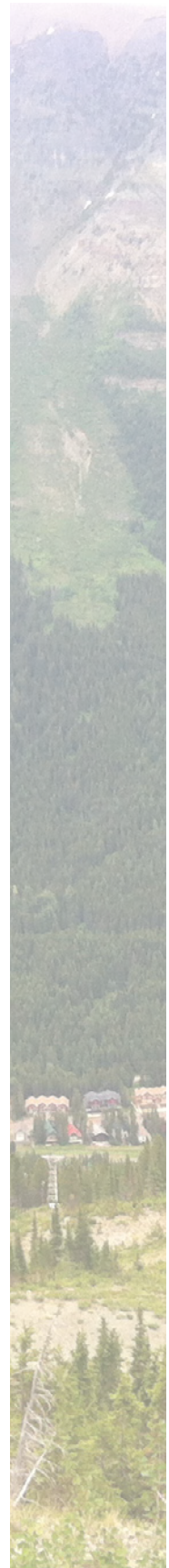
1.3.1 Visioning Session

Building upon the opportunities inherent in the local terrain and anticipating a growing market demand for mountain resort product, a comprehensive vision for the resort was created and detailed conceptual planning was undertaken. Opportunities and weaknesses of the existing mountain and base area offering were then identified. The results of this process provided the foundation for the MDP and will guide the implementation of these all-season plans, both on the mountain and in the village, well into the future.

Visionning session at Castle Mountain
Photo: BHA, 2016

1.3.2 Steering Committee, Board of Directors, AGM Meetings and Presentations

BHA carefully reviewed and completed an initial analysis of the undeveloped potential of the mountain, both within and outside of the resort's tenure area with an eye to improve and upgrade the skiing and snowboarding product and fully incorporate summer use recreation facilities and attractions. The objective was to take into account the existing development and expand onto terrain that would improve the balance of the offering, reflecting changes in the expectations of the mountain resort marketplace.

The Comfortable Carrying Capacity (CCC) of the lift serviced skiing and snowboarding was determined. The cumulative capacity of the attractions (alpine skiing and snowboarding, catskiing, backcountry touring, cross-country skiing, and snowshoeing) enabled the determination of the Balanced Resort Capacity (BRC) of CMR. In addition, BHA explored the possibility of diversifying

the winter product, differentiating the area from other 'typical' ski resorts, offering a wide variety of other outdoor activities and acting as an all-season staging area to the surrounding Parks.

Complementing the winter oriented development, proceeding toward the goal of becoming an all-season resort, the plan is for Castle to pursue a full range of summer season recreation activities including mountain biking (downhill and cross-country), via feratta, hiking, aerial adventure park, and other summer pursuits. This expands year-round opportunity and reputation of the area. It also should assist in the sustained financial viability and success of the resort.

This information, observations and conclusions were presented and discussed at meetings with the Castle Mountain Steering Committee, the Board of Directors, Stakeholders and the resort shareholders AGM. The results of these meetings influenced the project vision, goals and objectives, as summarized below.

1.4   CASTLE MOUNTAIN VISION, GOALS AND OBJECTIVES

The Vision for Castle Mountain is:

"A mountain owned and operated by skiers who are driven by adrenaline, not profit, that believe that the right combination of dry powder snow and challenging terrain provide experiences of a lifetime for those who live to ski."

To that end, their Mission is:

"To break down the barriers between downhill fanatics and some of Canada's most natural and challenging terrain. Castle Mountain Resort will be the Holy Grail for people whose real passion in life is downhill."

The expansion and changes contemplated in this plan are proposed to implement this Vision, Goals and Objectives. This Plan is designed to further the reputation of Castle Mountain as a backcountry oriented powder skiing mecca, while developing a balanced all-season mountain experience, and attracting visitors from across Alberta and beyond.

Supporting this, Castle Mountain's Goals and Objectives include the following:

• Respect the natural attributes of the mountain and the setting recognizing that these are CMR's primary attraction and currency;
• Provide state of the art all-season facilities on the mountain and in the village and base areas:
• Focus on the development and operation of a wide variety of recreation and retreat pursuits;

• Accommodate the needs and expectations of the day use visitors, the destination guests, the weekend patrons and the growing population of full time residents;

• Provide a well-balanced lift serviced alpine skiing and snowboarding experience as the primary winter attraction;

• Offer a diverse range of winter attractions to complement the alpine skiing including:
  - Backcountry skiing and touring
  - Cross-country skiing;
  - Snowshoeing;
  - Catskiing; and
  - Guided recreation activities;

• Develop summer attractions including:
  - Lift serviced mountain biking, bike park, skills parks, and associated facilities;
  - Cross-country mountain bike trails and associated facilities;
  - Hiking and sightseeing;
  - Aerial adventure park;
  - Horseback riding, nature trails, fishing; and
  - Guided recreation activities;

• Operate as a staging area and focal point for recreational users of the adjacent Castle Provincial and Wildlands Parks, and develop the services and facilities to support their wilderness adventures;

• Maintain a diverse mix of specialized resort retail and equipment rental, restaurants, pubs, workout and training facilities, and "unique to Castle" outlets;

• Develop an appropriate mix of facilities that will cater to longer term visitors including a grocery store, community centre, etc.;

• Ensure that the amount of real estate and overnight accommodation that is developed does not exceed the Balanced Resort Capacity of CMR's attractions;

• Develop a range of appropriate resort oriented real estate product (hotel, condominium, townhouses, single family and RV) that are designed and zoned to be used for nightly rental;

• Maximize "warm beds" in the Village Core, ensuring that the majority of development caters to the needs and expectations of short term guests; and

• Maintain and maximize the "ski to/ski from" attribute that already defines Castle as being a truly unique ski resort.

The expansion and changes contemplated in this Master Development Plan are designed to achieve Castle Mountain's Vision, Goals and Objectives.

1.5 MASTER DEVELOPMENT PLAN GOALS AND OBJECTIVES

The primary goal of this planning process is to create a new Master Development Plan for Castle that will guide in the ongoing development of the resort. It must reflect the:

- Unique development opportunities of CMR, reinforcing the established resort ambience and experience offered;
- Defined Vision, Goals and Objectives;
- Changes in the mountain resort marketplace;
- Requirements and expectations of the owners of CMR;
- Requirements of Alberta Parks and Tourism.

It is the intent of this project to:

Create a new Master Development Plan for Castle Mountain Resort, establishing well defined courses of action that upgrade the offering in an all-season capacity such that it enhances the existing resort development as well as acting as a complement to the recreation and tourism potential of the surrounding Provincial and Wildland Parks.

Building on this the following goals and objectives. The Master Development Plan will:

- Distinguish CMR as a **special and unique place** that complements the environment;
- Define the development opportunities within the existing License of Occupation (LOC) area and potential boundary adjustments (land exchange);
- Incorporate new and **expanded all-season recreation facilities**, amenities, and attractions;
- Be planned and designed to **optimize development and operational efficiencies**;
- Upgrade and formalize base area village development plans;
- Delineate how best to **optimize the tourism potential** in the context of the Castle Wildland and Provincial Parks;
- Utilize Castle Mountain as a key all-season **staging and focal point** to the Castle Wildland and Provincial Parks;
- Be planned and designed as an **environmentally sensitive and economically self-sustaining enterprise**;
- Establish well defined courses of action that successively guide future development;
- Act as a guide to the ongoing approvals.
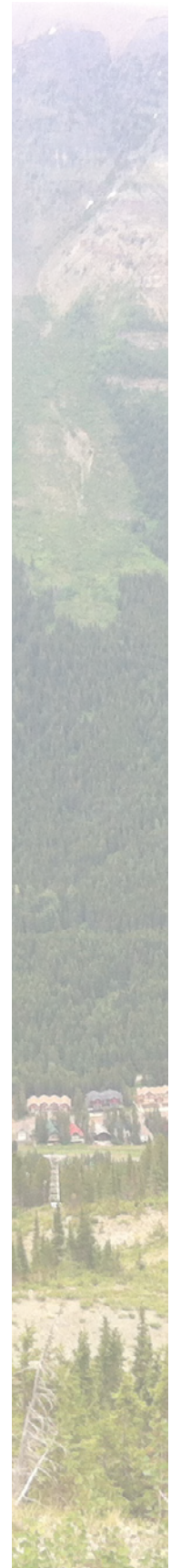
2.0 Existing Resort Context

2.1 LOCATION

Castle Mountain Resort (CMR) is located in the Westcastle Valley in southeast Alberta, Canada (Fig. 2-1). It is within the Municipal District (M.D.) of Pincher Creek, approximately 40 kilometres southwest of the Town of Pincher Creek, AB, 140 kilometres southwest of Lethbridge, AB, and 250 kilometres south of Calgary, AB. The resort resides along the continental divide within the Rocky Mountains, and is surrounded by Gravenstafel Mountain, Haig Mountain, and Barnaby Ridge.

Figure 2-1 Location Plan

Figure 2-2 Access Plan
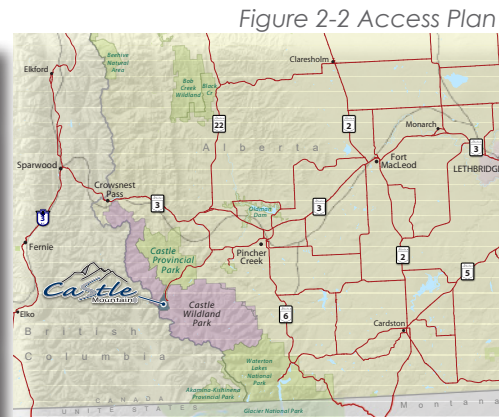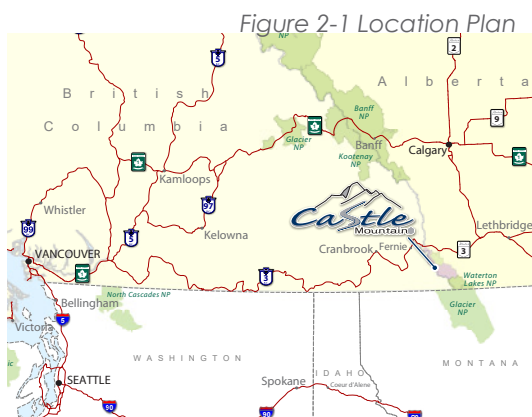
2.2 ACCESS

Castle Mountain Resort can be easily accessed by road via secondary highway AB-774/AB-507 from the Town of Pincher Creek (Fig. 2-2). The approximate driving times from regional centres are presented in Table 2-1.

The closest international airport is in Calgary. The airport services non-stop flights daily from across North America, Europe, and Asia. A shuttle service and rental vehicles are available for transport to and from CMR.

Table 2-1: Drive Times to Castle Mountain Resort

Location	Drive Time (Hours)
Pincher Creek, Alberta	0.5
Lethbridge, Alberta	1.5
Calgary, Alberta	3.0
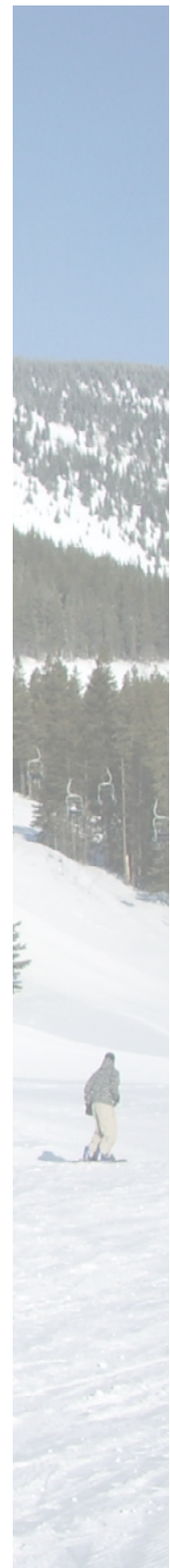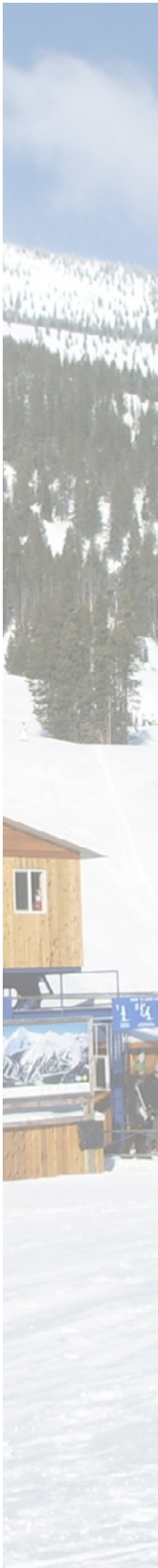
2.3   REGIONAL CONTEXT

Castle Mountain Resort is located in southwest Alberta, a region of 35,000 residents spread across 16 communities (Fig. 2-3). The region sits on the continental divide, where the Rocky Mountains meet the Canadian Prairies. The area is home to stunning natural and geological landscapes, and an economy that is growing and increasingly diversified.

Figure 2-3 Regional Context
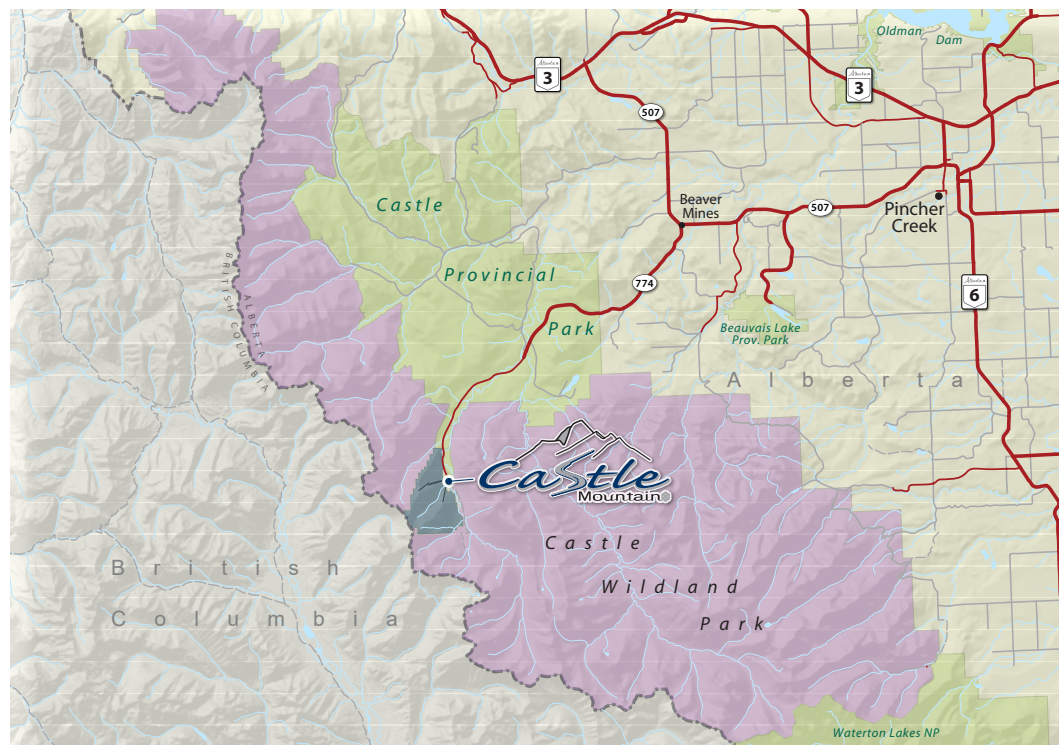
The continental divide is known for its tremendous biodiversity and scenic beauty. Mountain, foothills, and prairie landscapes can be found within a few hours of each other, offering habitat to notable species such as elk and cougar. The significance of this area has been recognized through the creation of numerous provincial and national parks intended to protect natural features while supporting nature-based recreation opportunities.

The natural landscapes of southwest Alberta are also the foundation for a regional economy with a historically strong agriculture sector, burgeoning renewable energy sector, and a growing tourism sector. Agriculture production ranges from cattle to canola farming and covers 2.7 million hectares of the region, while the geography and climate of southwest Alberta makes it ideal for the production of wind, solar, and bio-energy. Tourism in southwest Alberta has been growing for a number of years, thanks in part to the world renowned Head Smashed in Buffalo Jump and Waterton-Glacier International Peace Park UNESCO world heritage sites. As tourism has grown, so to have the services and amenities needed to support increased numbers of visitors.

2.3.1 Adjacent Land and Resource Use

Castle Mountain Resort is surrounded by Castle Provincial Park, Castle Wildland Park, and West Castle Wetlands Ecological Reserve. Castle Provincial Park and Castle Wildland Park were created in 2016 and were formed from what was known as the Castle Special Management Area. The creation of the Castle Provincial Park integrated the Castle Falls, Castle River Bridge, Syncline, Beaver Mines Lake, and Lynx Creek Provincial Recreation Areas.

Castle Mountain Resort is bordered by Castle Provincial Park to the northeast, and linked by route AB-774. The park is approximately 25,500 ha and was created to provide a wide array of recreational opportunities for visitors that are compatible with the ecological objectives of the park.

Castle Wildland Park borders CMR on the north, west, and south. The Wildland Park covers approximately 80,000 ha and connects Waterton Lakes National Park in the south with Castle Provincial Park and CMR. The area is intended to protect ecological healthy and functioning landscapes, and remain relatively undisturbed. Wilderness recreation opportunities, such as backcountry hiking or touring, are permitted where they align with the objectives of the Park.

For future consideration, it was noted by the Deputy Minister of Tourism that the area located north of CMR, known as Sore Crotch Valley should be renamed.

Figure 2-4 Existing Context: Winter Activities
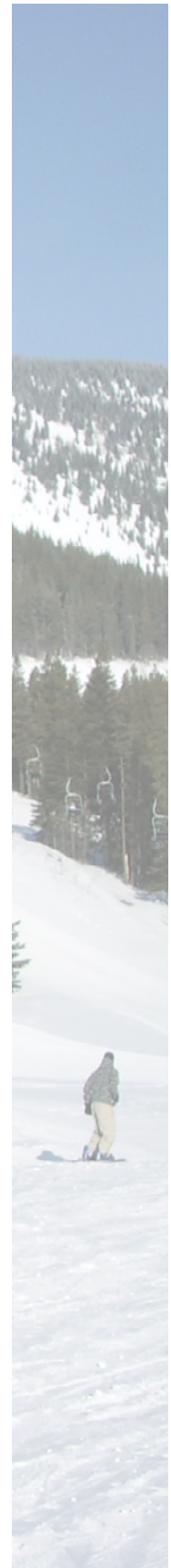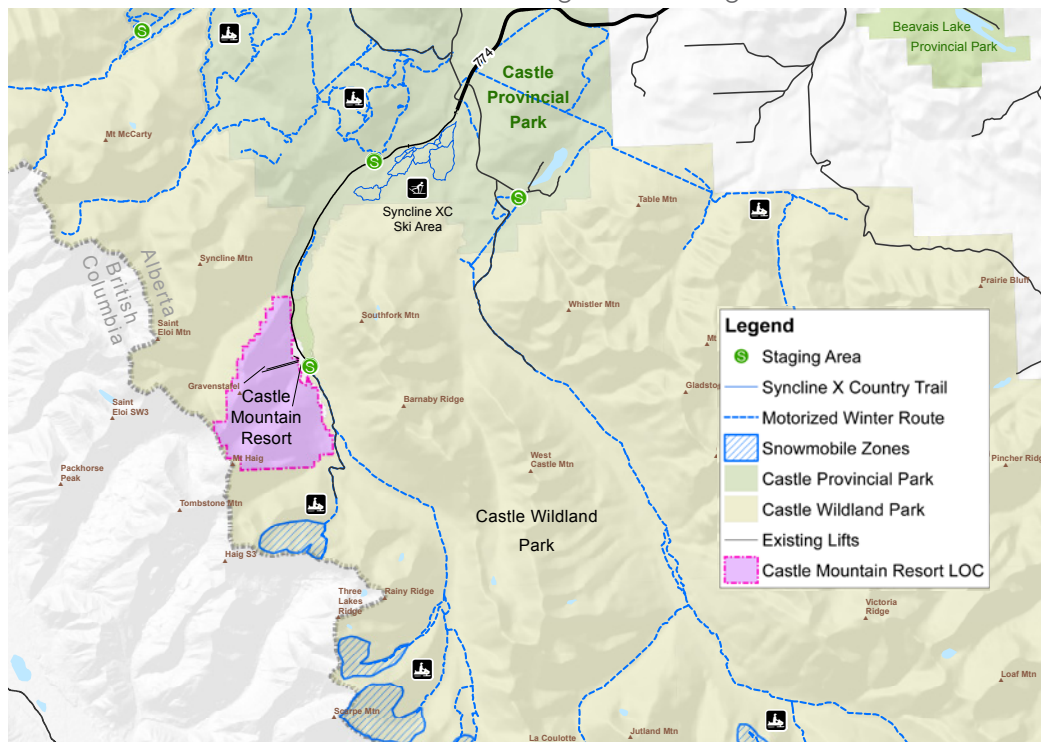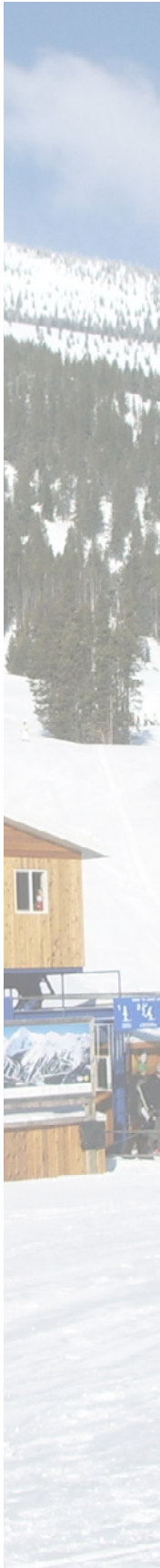
The West Castle Wetlands Ecological Reserve lies directly to the east of CMR. It was created to protect wetlands that are important habitat for beaver, trout, and amphibians. A small park (94.16 ha), it offers a few day-use hiking trails that connect with CMR.

A large network of trails and wilderness facilities exist in Castle Provincial Park and Wildland Park. These trails have been historically used for hiking, mountain biking, snowmobiling, and off-highway vehicles (Figs 2-4 and 2-5). As the Park Management Plan for this area is developed, CMR will look to work with recreational user groups to ensure that connections between the resort and the adjacent Parks lands are maintained and improved.

Castle Mountain Resort views its role within the region as a staging area from which visitors can easily access recreation opportunities on adjacent public lands. The resort owners and management will actively work to protect and enhance the public and commercial recreation values of adjacent Park and Provincial lands. Further, they will endeavor to ensure that tourism and public recreation opportunities co-exist and mutually benefit the region and the Province. They echo the sentiment expressed in the Draft Castle Management Plan (2017), that management of nature-based recreation and its surrounding environment must be undertaken from a regional perspective in collaboration with users and stakeholders.

Figure 2-5 Existing Context: Summer Activities
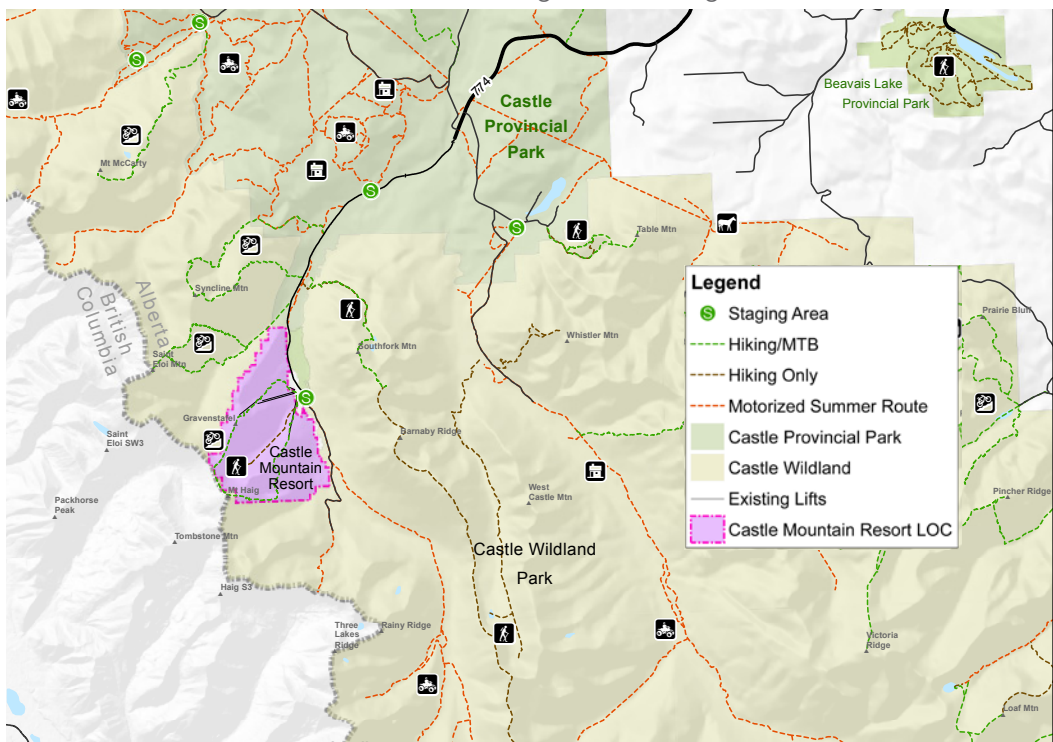
Photo: BHA, 2016

2.3.2 Castle Mountain Study Area

For the purposes of this Master Development Plan, the lands that surround the Castle Mountain License of Occupation (LOC) have been considered as the Study Area (Fig. 2-6).

Castle Mountain in the Winter
Photo: BHA, 2008
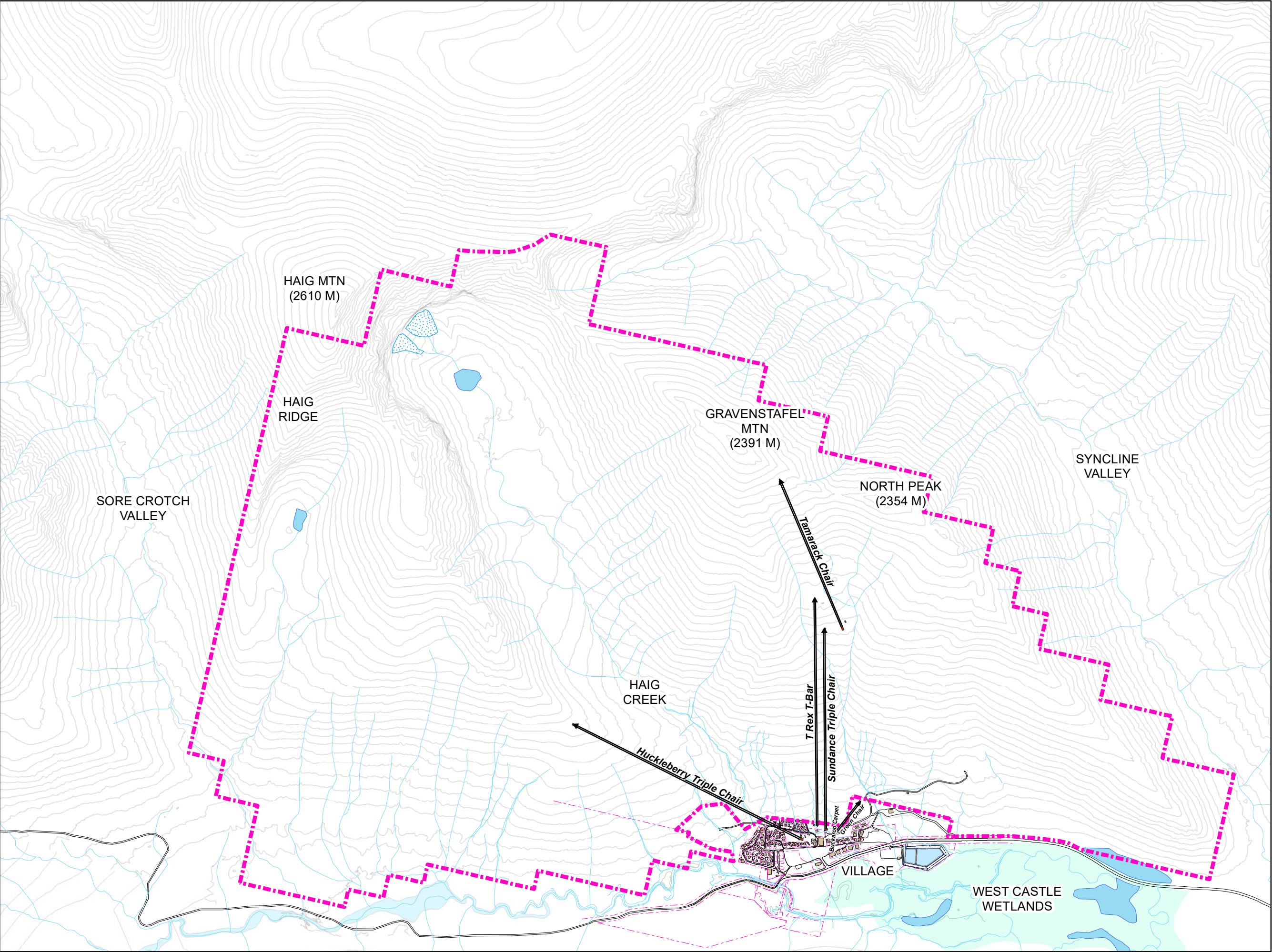
Castle Mountain Resort Master Development Plan 2017

Legend
- ·—· License of Occupation
- West Castle Wetlands

HAIG MTN
(2610 M)

HAIG RIDGE

SORE CROTCH VALLEY

GRAVENSTAFEL MTN
(2391 M)

NORTH PEAK
(2354 M)

SYNCLINE VALLEY

HAIG CREEK

Tamarack Chair

T Rex T-Bar

Sundance Triple Chair

Huckleberry Triple Chair

Blue Magic Carpet

Green Chair

VILLAGE

WEST CASTLE WETLANDS

Planning by:

BHA

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Tel: 604 932 7002
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1:20,000

0   150   300   600
Meters

Castle Mountain Study Area

Figure 2-6
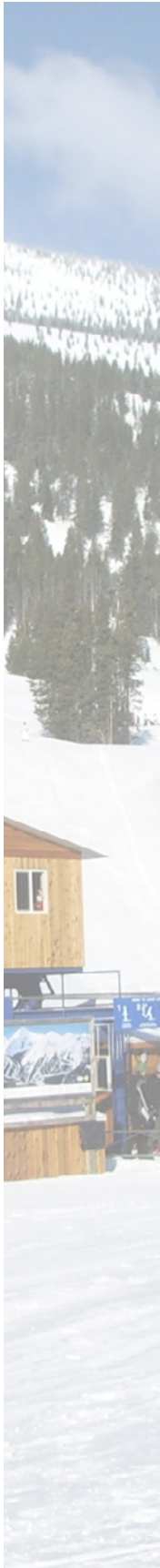
2.3.3 Provincial Legislative Framework

The Area Structure Plan (ASP) sets out a long-term strategy for the physical, economic and social development of CMR. An ASP is adopted by the local Municipal District as a bylaw to ensure that new development is consistent with municipal objectives, takes place in an orderly and economically efficient manner, and that the desired community characteristics and environmental qualities are protected. In 2001, CMR completed its first ASP, which was subsequently adopted as a bylaw of the M.D. of Pincher Creek (Fig. 2-7). The ASP defined the range and type of development anticipated at the resort and outlined the goals, objectives and strategies for creating an attractive alpine community at CMR.

It is anticipated that the 2017 Master Development Plan will influence the next revision of the ASP. Castle Mountain Resort will work closely with the M.D. of Pincher Creek, Alberta Parks, and stakeholders to ensure that the ASP and its subsequent amendments, responds to the concerns of property owners, improves existing bylaws (parking, density, etc.), and defines the vision for the CMR community as a whole.

Figure 2-7 Land Use District Map

M.D OF PINCHER CREEK No. 9
LAND USE DISTRICT MAP
Bylaw No. 1140-08, March 11, 2008

CASTLE MOUNTAIN RESORT

	West Castle Wetlands-Non Surveyed Location Approximate	
	Castle Carbondale Resource	'CCR'
	Castle Mountain Resort Medium Density Residential	'CMMDR'
	Castle Mountain Resort Public Utility	'CMPU'
	Castle Mountain Resort Residential 1	'CMR-1'
	Castle Mountain Resort Residential 2	'CMR-2'
	Castle Mountain Resort Seasonal Residential	'CMSR'
	Castle Mountain Resort Ski Resort	'CMSR-1'
	Castle Mountain Resort Ski Resort Core	'CMSRC'
	Castle Mountain Environmental Reserve	'CMER'

2.3.4 Regional Strategic Land-use Plans

Alberta's Land-use Framework (LUF) was adopted in 2008 to assist in managing the Crown's land and natural resources. The LUF integrates policy objectives, and approaches land-use from a holistic perspective. In 2009 the Alberta Land Stewardship Act (ALSA) was passed with the intent to provide a legal basis for the implementation of plans developed under the LUF framework.

As part of this effort, the South Saskatchewan Regional Plan (SSRP) was developed for the area including the South Saskatchewan River Basin, Milk River Basin, and the portions of the Cypress Hills that lay within Alberta. The Plan was created through consultation with municipalities, stakeholders, and the public to ensure continued economic growth, strong communities, and a healthy environment.

In the SSRP, the Castle Region, including Castle Mountain Resort, Castle Provincial Park and Castle Wildland Park, and surrounding municipalities, is recognized as an attractive tourism destination for Alberta with the potential for growth. The Plan states that the development of tourism in the region could enhance visitation and visitor experience, support economic diversification away from resource-based industries, drive demand for goods and services, and stimulate job creation. To that end, the SSRP recommends the creation of a Castle Region Tourism Strategy to develop and manage tourism in the region.

View of the Syncline Valley in Summer

2.4 HISTORIC CONTEXT

Castle Mountain Resort opened in the winter of 1966, with the installation of two T-Bars and a base lodge. Over the next few years the area grew with addition of two more lifts, an enlarged parking area, and on-hill accommodation. By 1975, CMR was able to play host to the Alberta Winter Games.

Clockwise:
The T-bar with Westcastle Valley in the background. Skiing at top of the T-Bar. Skiers enjoying the sun at the original Lodge.
Photo: Bryan-F.-Wilson , CMR

Unfortunately, a fire destroyed the ski lodge in 1976 and forced the sale of CMR to the M.D. and Town of Pincher Creek. A number of attempts were made to expand and redevelop CMR during the 1980s, but environmental concerns and political disagreement stalled these efforts.

In 1995, the Westcastle Supporters Association (WSA), a group of local skiers and residents, purchased CMR and formed Castle Mountain Resorts Inc. In purchasing the resort, those behind CMR aspired to overcome past challenges and maintain CMR as viable regional ski destination.

Since that time, CMR has invested significant effort and resources to improve the facilities and the experience at CMR. From 1996 to 2001, CMR installed the Sundance and Tamarack chair lifts, upgraded the drinking water system, installed a wastewater treatment system, and built resident and visitor accommodation. As noted, in 2001 CMR undertook the development of an Area Structure Plan (ASP) which laid out the vision for CMR as a ski resort that provided a quality alpine experience with a family-oriented atmosphere.
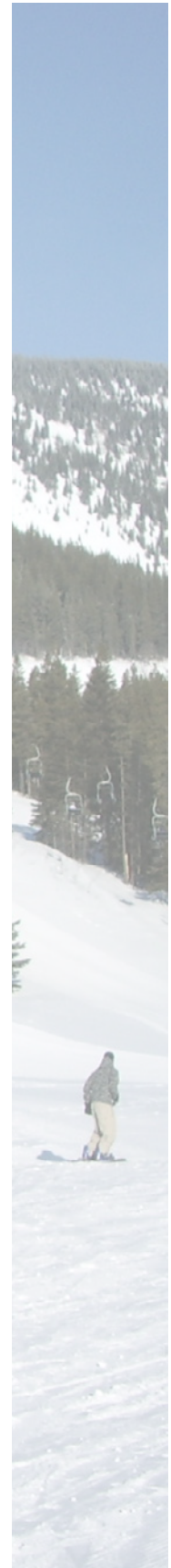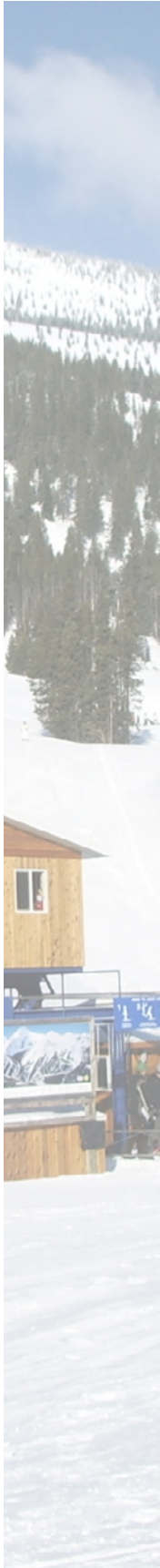
2.4.1 Mountain Development – 2002 to Present

Following the creation of the ASP, CMR has continued to develop as an important recreation destination in southern Alberta. Following the vision and objectives detailed in the ASP, CMR has undertaken improvements to the mountain and the base area.

On the mountain, the Green and the Huckleberry chair lifts have been installed. These additions have opened up new terrain for intermediate and novice skiers. For advanced and expert skiers, catskiing was launched in 2010 in the bowls and glades above Huckleberry chair lift on Haig Mountain. The presence of resort based catskiing allows expert skiers and riders to enjoy a more challenging experience while their families take advantage of the runs and amenities offered by the resort.

In the base area, a small hotel and hostel have been added to provide accommodation to overnight visitors, staff accommodation was constructed to ensure employees have secure, local residence, and additional residences have been built in response to the growing popularity of the resort. The services and amenities have also been upgraded; the local pub has received a renovation and a maintenance building was added to better service the mountain and the village.

When the resort was re-launched in 1996, its sole purpose was to maintain a viable regional winter recreation area to service southern Alberta. Looking to the future, the MDP has built on this initial vision and lays out a detailed plan for CMR to become an all season international and regional destination that is a primary complement to the region.

Castle Mountain Base Area in Summer
Photo: BHA, 2016

2.5   RESORT OWNERSHIP AND LAND BASE

2.5.1 Ownership

Within the resort boundaries, CMR owns 44.65 acres.   Numerous residential and commercial leasehold lots have been created by plan of subdivision for leasehold purposes.   These leases have facilitated complementary village development on resort lands at the base of the ski hill

2.5.2 Ski Area and Adjacent Land Leases

Through a License of Occupation (LOC) with the Provincial Government, CMR leases approximately 1,295 hectares (3,200 acres) of land on Gravenstafel Ridge and Haig Ridge.   The lease encompasses lands that have been historically intended for ski terrain expansion.   Castle Mountain Resorts considered and began discussions with the Province to adjust the LOC boundary through a land exchange to allow for improved lift-serviced skiing on both Gravenstafel and Haig, as well as provide non-lift-serviced skiing on Haig in the form of catskiing and guided backcountry skiing.   With the creation of the Castle Wildland Park, any changes to the LOC will now require a change in Provincial Park boundaries.

A Back Country Skier at Castle Mountain
Photo: CMR, 2016
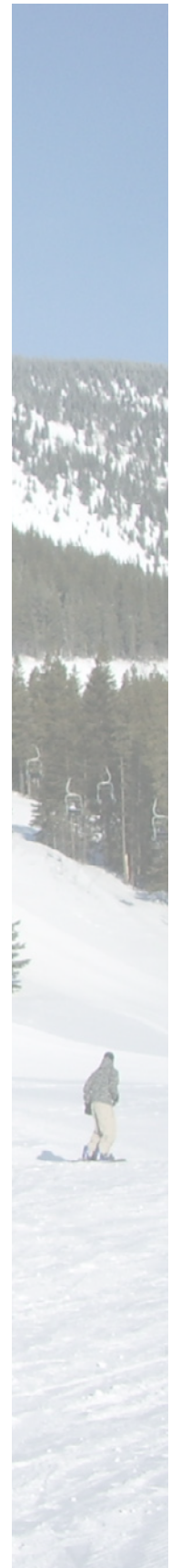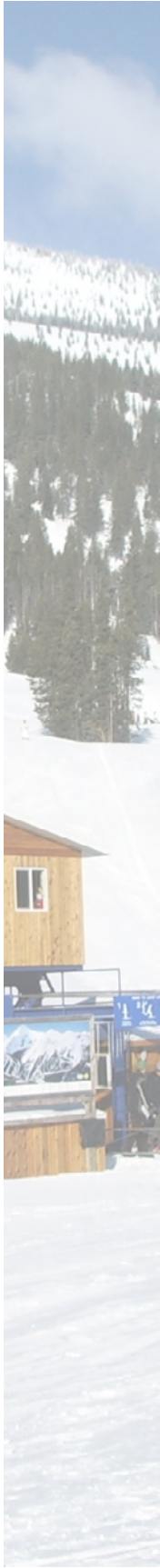
2.6 ENVIRONMENTAL CONTEXT

2.6.1 Environmental Setting

Castle Mountain Resort is located within the Rocky Mountain Natural Region, and contains terrain in the Alpine, Subalpine, and Montane Natural Subregions (Fig. 2-8). At the lower elevations, the area is populated by complex forests habitats, with stands of Lodgepole pine, Douglas fir, or aspen occurring on northerly slopes, and grasslands dominating southerly and westerly aspects. As elevation increases, the landscape transitions to alpine meadows inhabited by open stands of Engelman spruce or subalpine fir. At the highest elevations, harsher climates dominate and vegetation gives way to snow, and exposed rock.

Elevations in the area range from 1,410 metres in the base area to 2,391 metres at the summit of Mount Gravenstafel.

Figure 2-8 Natural and Eco Regions

CLIMATE AND WEATHER

The area has a mean annual temperature of 2.9 degrees Celsius, with winter temperatures (November to March) averaging -6.2 degrees Celsius. Castle Mountain Resort receives an annual average snow depth of approximately 416cm at the base, and 867cm at mid mountain with an approximate reliable snowline of 1700m. The base area receives an average of 10 days of winter rainfall per year while the summit receives zero.

Castle Mountain Resort receives strong Chinook winds throughout the year. Wind speed varies from the village base to the peak, and depending on the degree of forest cover. Higher elevations receive winds that are west-southwest in direction, while lower elevations receive winds that are south-southwest. Over the past five year, the upper mountain was closed an average of 10-15 days per years due to high winds.

TYPICAL SNOW QUALITY THROUGH THE SEASON (OPERATIONAL OBSERVATION)

Castle tends to receive early season light powder snow in December on regular intervals (every 2-3 days). January and early February tend to be drought months with lots of wind. Skiing is often firm, but light snowfalls and wind will create wind buff or wind sift (smooth carving snow). By mid-February spring storm cycles begin delivering higher quantities of cold or warm powder snow (depend on arctic influence, on a regular basis (2-3 days). Powder days are interspersed with spring corn days on southerly aspects.

WILDLIFE

The region surrounding CMR has been recognized internationally for its high level of biodiversity. The Castle Region is home to over 200 rare or at-risk species, and the Barnaby Ridge is an important wildlife corridor. Further, the Westcastle Valley offers habitat to several large mammals (bears, cougars, deer, elk, moose), as well as numerous other small mammals, and Bull and Cutthroat Trout (Fig. 2-9).

The high levels of biodiversity and the presence of so many rare or at-risk species led to the creation of the Castle Provincial Park and Castle Wildlands Provincial Park in 2016.

Figure 2-9 Fish and Wildlife
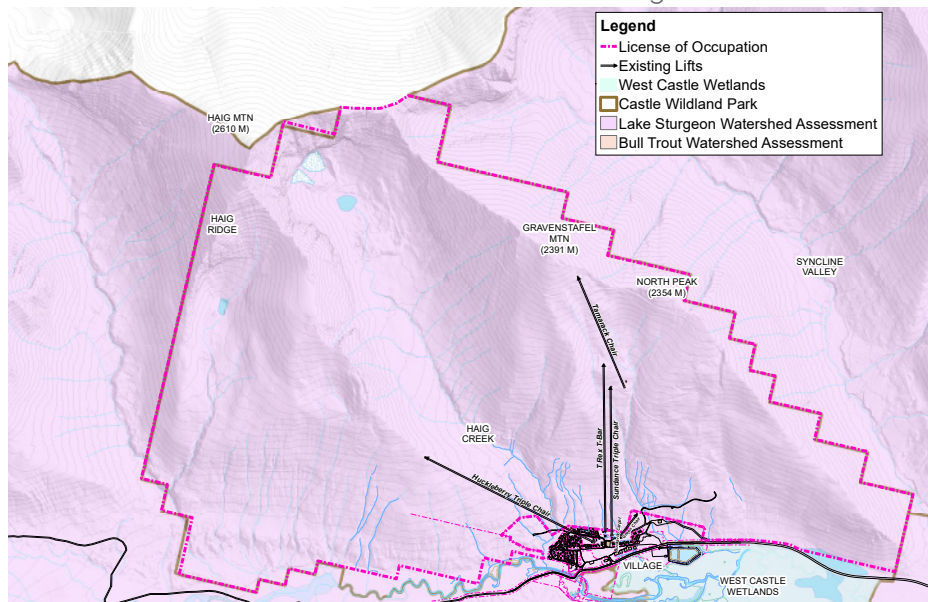
2.7   EXISTING MOUNTAIN FACILITIES

2.7.1 Introduction

The primary winter attraction at CMR is lift serviced alpine skiing and snowboarding. Catskiing, cross-country skiing and snowmobiling act as secondary regional attractions, complementing and rounding out the dynamic offering at the resort. (It is important to note that throughout this document, any reference to skiing and skiers applies equally to skiers and snowboarders alike). There is no formal summer offering at the resort. The following describes and illustrates the existing mountain facilities.

2.7.2 Skiing and Snowboarding

The existing lift serviced mountain facilities consist of 6 ski lifts that access 84 ski trails over an area of approximately 1,295 hectares (3,200 acres). Skiing and snowboarding are offered on predominantly the eastern facing slopes of Gravestafel and Haig Mountains and depend on natural snowfall. The existing mountain development is illustrated by the 3D views on Figures 2-10a, 2-10b and 2-10c as well as on Figure 2-11. It is effectively contained within 6 pods of ski terrain (Fig. 2-12):

• Sundance
• Tamarack
• South Chutes
• Green
• Huckleberry
• Catskiing.

The ski season runs from mid-November to mid-April of each year, accounting for approximately 120 operating days. Since the first lifts were installed in the mid 1960's, skier visits have steadily climbed to a high of 92,974 in 2012-13.

Figure 2-10a Existing Mountain 3D View
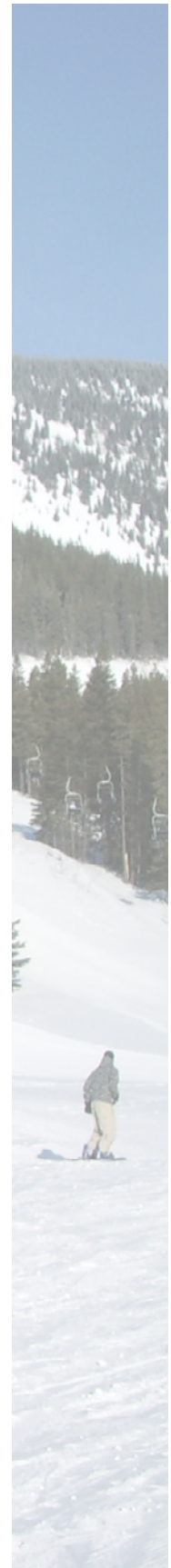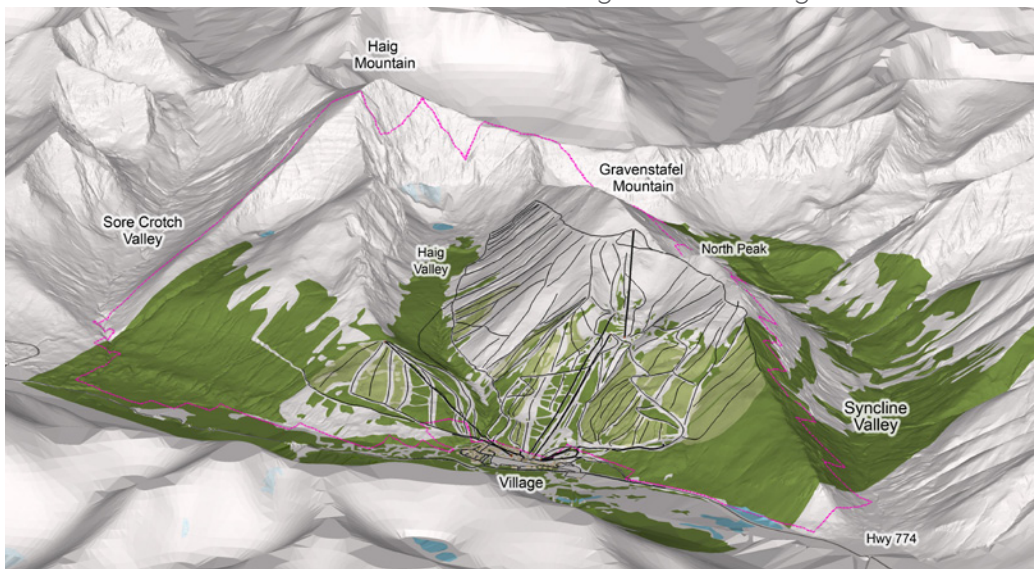
Figure 2-10b Existing Mountain 3D View

Figure 2-10b Existing Mountain 3D View

Figure 2-10c Existing Mountain 3D View

Figure 2-10c Existing Mountain 3D View

Legend
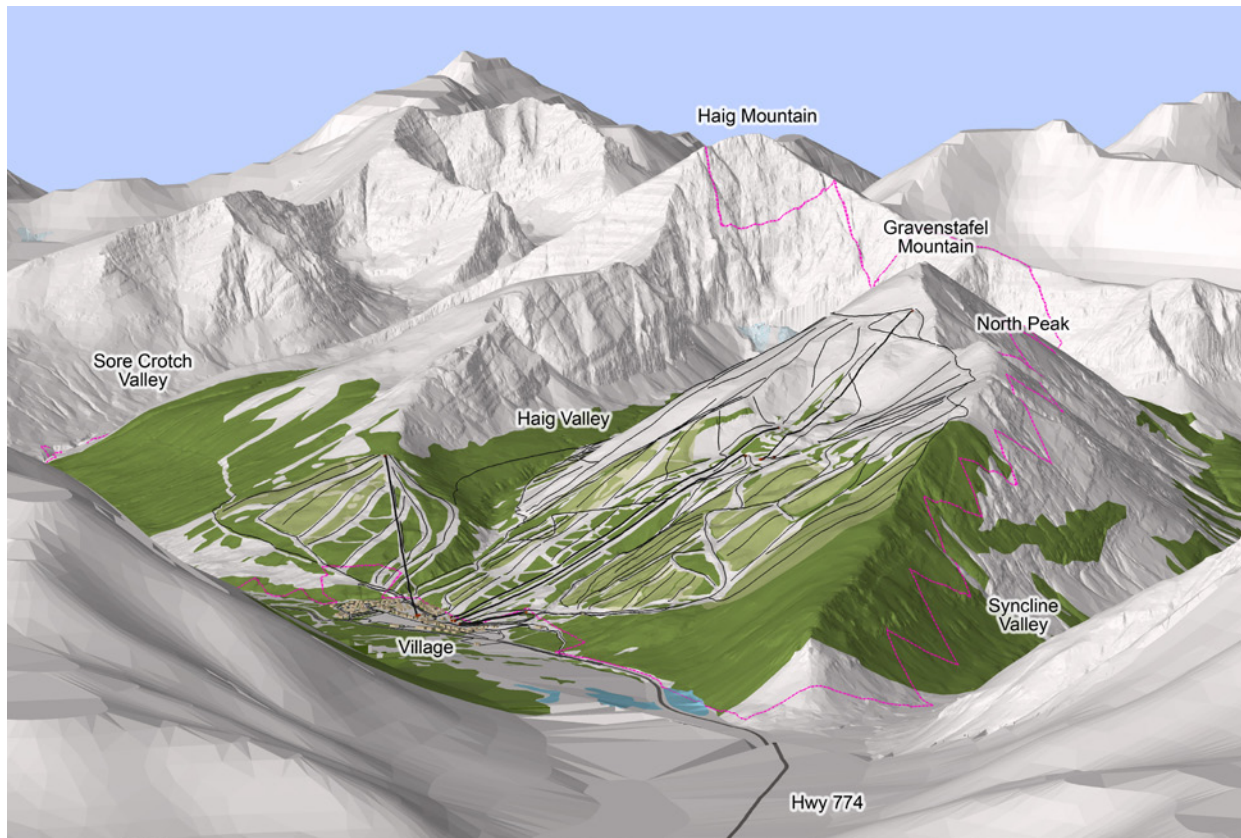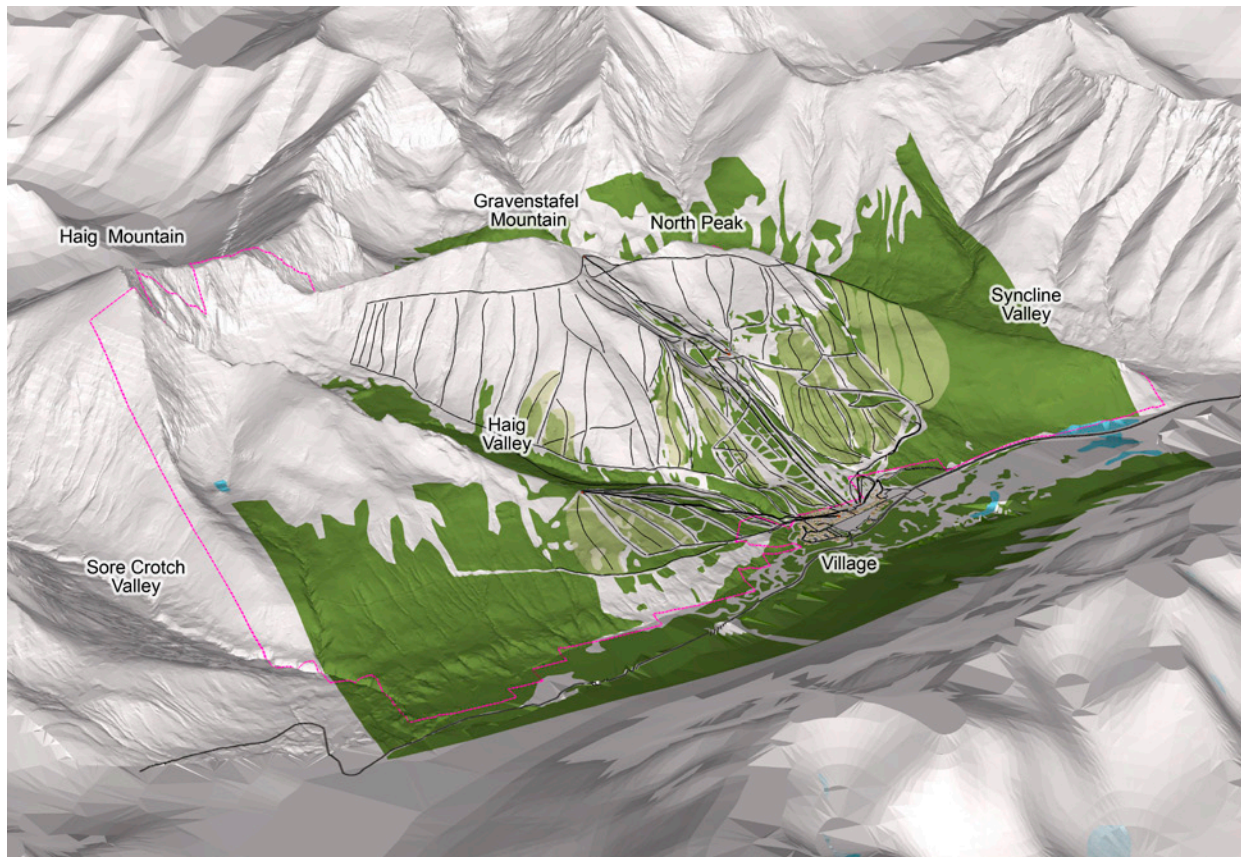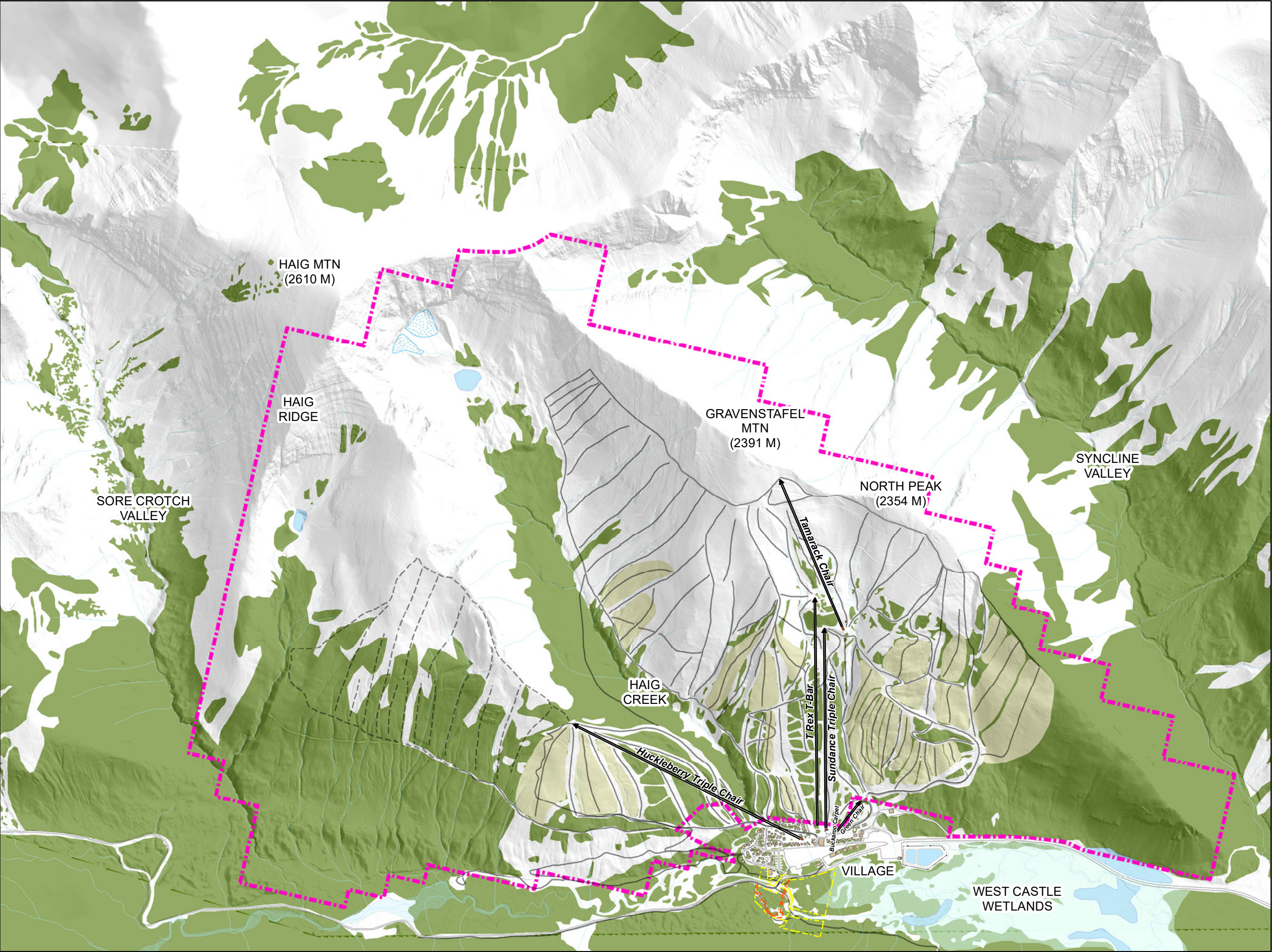
- → Existing Lifts
- Existing Trails
- --- Existing Catskiing
- ▬▬ License of Occupation
- West Castle Wetlands
- Existing Vegetation
- Existing Gladed Areas
- LOC 781448
- MLL 910051

1:20,000

0   150 300   600
Meters

HAIG MTN
(2610 M)

HAIG RIDGE

SORE CROTCH VALLEY

GRAVENSTAFEL MTN
(2391 M)

NORTH PEAK
(2354 M)

SYNCLINE VALLEY

HAIG CREEK

Tamarack Chair

T-Rex T-Bar

Sundance Triple Chair

Huckleberry Triple Chair

Buckaroo Carpet

Green Chair

VILLAGE

WEST CASTLE WETLANDS

Existing Resort

Figure 2-11

Legend

License of Occupation

Ski Run Category
- Beginner
- Intermediate
- Advanced
- Expert
- Catskiing

Pod Name
- Catskiing
- Green
- Huckleberry
- South Chutes
- Sundance
- Tamarack

1:20,000

0   150   300   600 Meters

Tamarack Chair

T-Rex T-Bar

Sundance Triple Chair

Huckleberry Triple Chair

**Existing Mountain
Ski Pods**

Figure 2-12
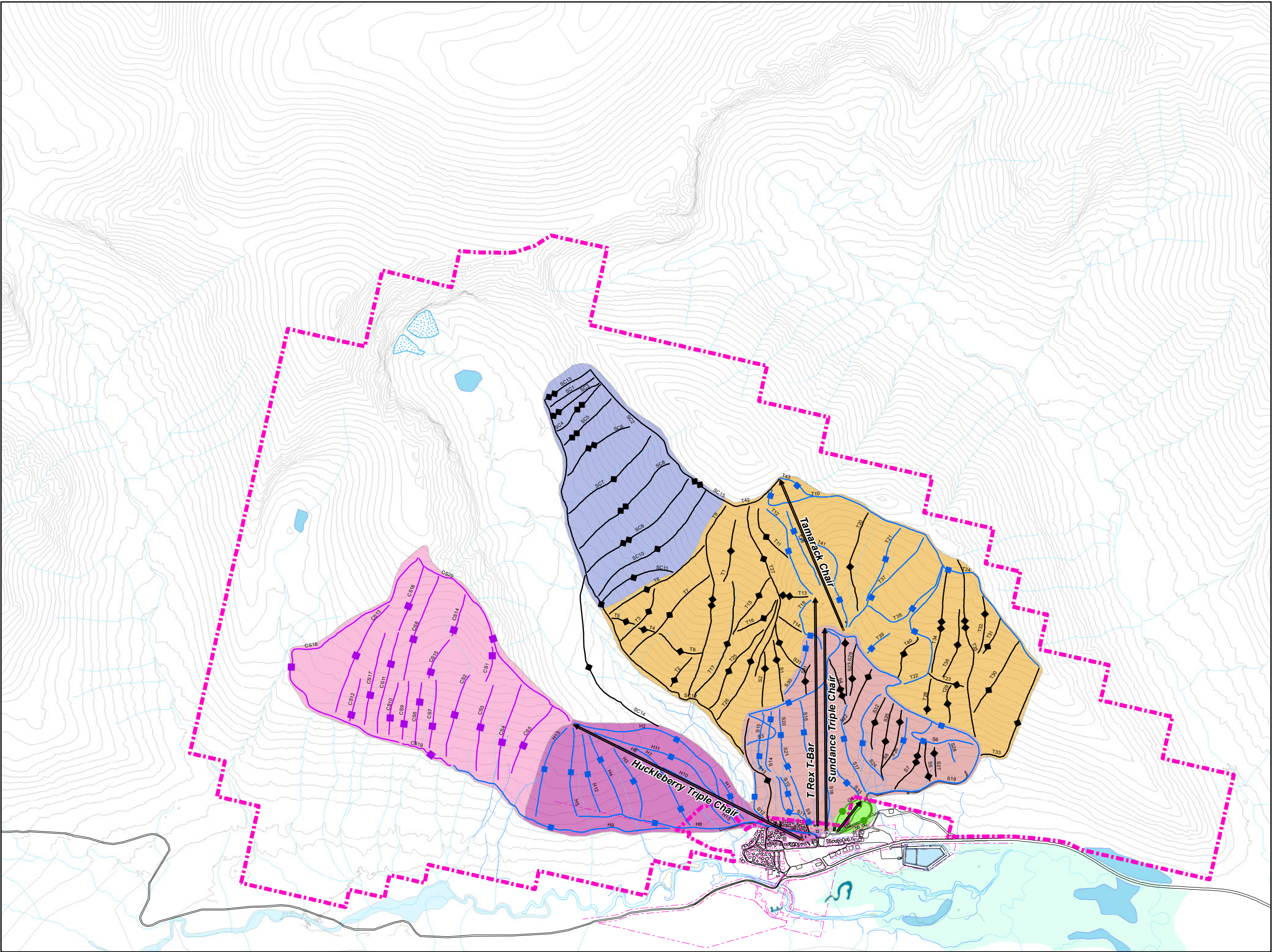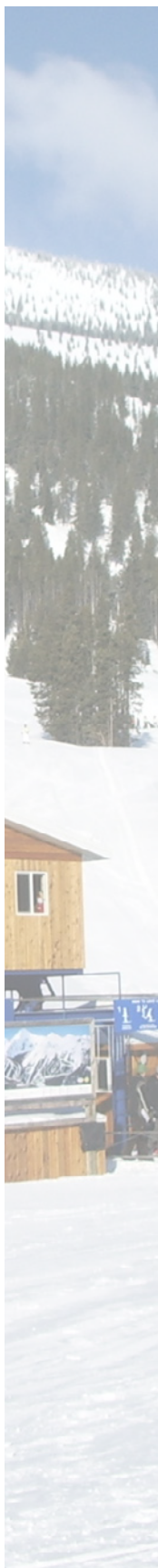
EXISTING SKI TRAILS

Castle Mountain Resort has 78 ski trails and gladed areas spread over approximately 1,454 hectares (3,592 acres) of skiing and riding terrain. In addition to the defined ski runs, catskiing is available above the Huckleberry chair lift.

The existing ski trails have been categorized by skier/snowboarder ability level. The international standard for classifying ski trails is by easiest (green circle), more difficult (blue square) and most difficult (black diamond). BHA further classified the existing ski trails based on the criteria in Table 2-2:

Table 2-2: Ski Trail Classification by Gradient

Skill Class	Range of Acceptable Gradients (%)
Beginner	8 - 15%
Novice	15 - 25%
Low Intermediate	25 - 35%
Intermediate	35 - 45%
Advanced	45 - 60%
Expert	60 - 80%
Extreme	80%+

To undertake an accurate analysis, the existing trail network was overlaid onto the 5 metre contour LiDAR topographic mapping and organized into groups of trails or 'pods' that are associated with each lift. Trails that cross into one or more pod areas are generally associated with the lift at which they return. Some Ski Pods may be associated with one or more lifts depending on the flow and layout of the mountain. Figure 2-13 and Table 2-3 illustrates and outlines the existing inventory of ski trails at CMR:

Legend

Existing Gladed Areas

Ski Area Boundary

– · – License of Occupation

Ski Run Category

— Beginner
— Intermediate
— Advanced
— Expert
— Existing Catskiing

1:20,000

0   150   300   600
Meters

Existing Mountain
Lifts, Trails and
Glades

Figure 2-13

Tamarack Chair

Sundance Triple Chair

T Rex T-Bar

Huckleberry Triple Chair

Buckaroo Chair

Green Chair
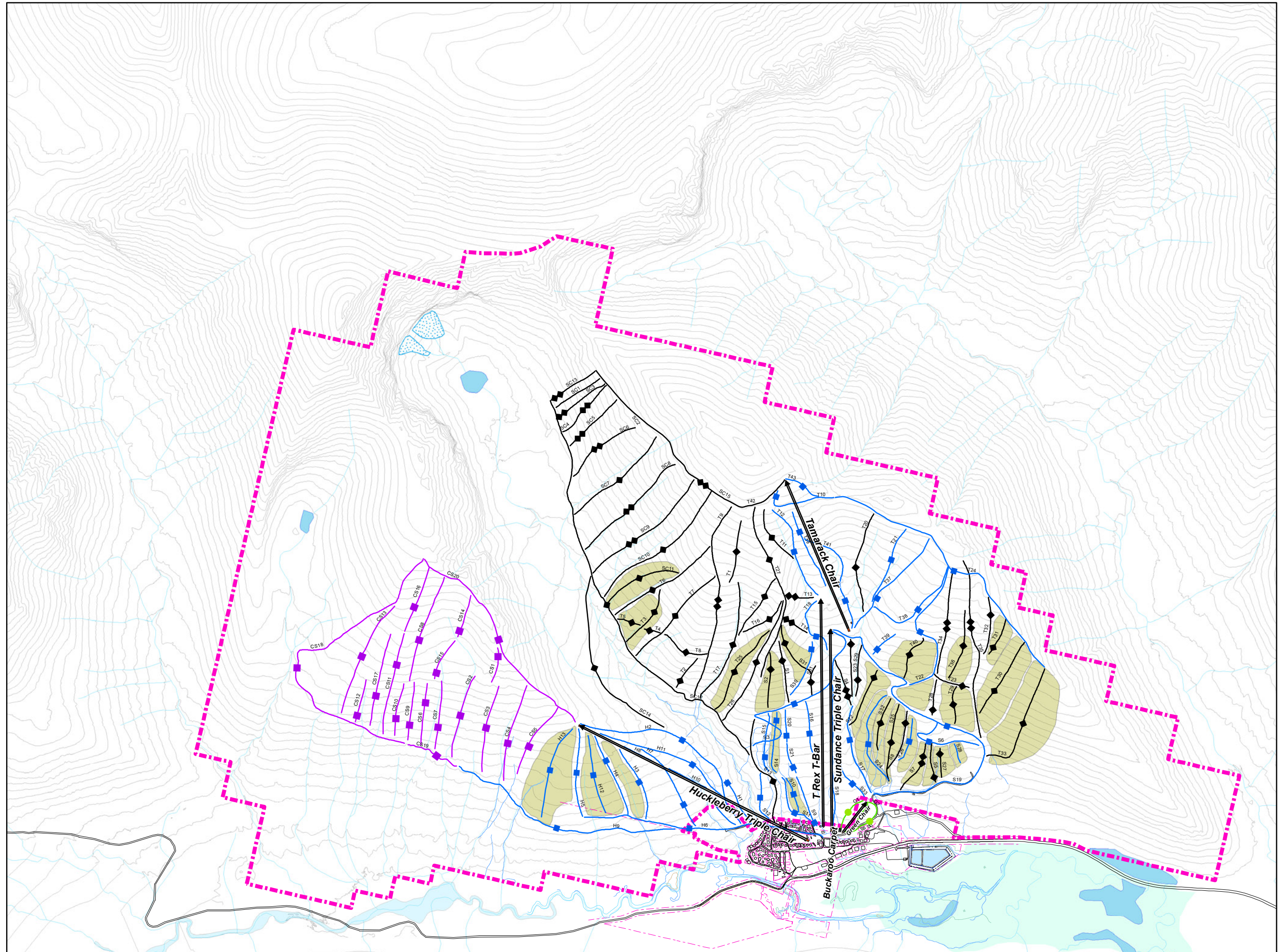
Table 2-3: Existing Ski Trail Network

Run Number	Run Name	Slope Length (m)	Vertical Drop (m)	Average Slope (%)	Average Width (m)	Trail Area (ha)	Skill Class
Tamarack Pod (South Chutes)							
SC1	Deadwood Minus Two	381.24	228.20	77.52	45	1.72	Expert
SC2	South Skyline	420.75	38.49	19.11	20	0.84	Expert
SC3	Minus One	414.33	236.56	71.94	40	1.66	Expert
SC4	Zero	455.00	249.80	67.70	50	2.28	Expert
SC5	Murphy's Law	473.46	265.83	70.02	80	3.79	Expert
SC6	Haavy's Dream	597.53	318.36	66.50	150	8.96	Expert
SC7	High Rustler	731.96	350.24	55.60	150	10.98	Advanced
SC8	Desperado	811.52	400.01	57.84	150	12.17	Expert
SC9	Lone Star	890.77	438.03	57.43	130	11.58	Expert
SC10	Blazing Saddles	969.37	474.00	56.69	120	11.63	Advanced
SC11	Saddle Up (Gladed)	504.07	215.58	47.89	95	4.79	Advanced
SC12	Cinch Traverse	2460.88	301.95	14.07	10	2.46	Advanced
SC13	Minus Three	370.81	218.69	76.33	60	2.22	Expert
SC14	Cinch Forks	1052.18	110.00	11.30	10	1.05	Advanced
Green Pod							
G1	Jackalope	294.56	44.15	15.25	30	0.88	Novice
G2	Rabbit Flats	242.85	30.55	12.69	30	0.73	Beginner
G3	Flap Jack	246.87	35.24	14.86	30	0.74	Beginner
Huckleberry Pod							
H1	Quick Draw	283.60	85.99	32.05	30	0.85	Low Intermediate
H2	Buffalo Flats	1213.93	291.01	24.84	45	5.46	Low Intermediate
H3	Pony Express	455.18	151.89	35.86	55	2.50	Intermediate
H4	Outrider	513.72	186.48	39.40	40	2.05	Intermediate
H5	Sidewinder	525.05	174.85	35.60	65	3.41	Intermediate
H6	Round-Up Traverse	1366.41	153.82	11.36	15	2.05	Intermediate
H7	Lone Ranger	562.03	170.43	32.27	50	2.81	Intermediate
H8	Stagecoach Upper	178.35	47.49	28.68	20	0.36	Intermediate
H9	Giddy Up Traverse	1097.96	92.98	9.72	15	1.65	Intermediate
H10	Stagecoach Lower	247.27	69.25	31.51	15	0.37	Intermediate
H11	Tumbleweed	817.72	214.35	27.31	30	2.45	Low Intermediate
H12	Ambush Glades (Gladed)	476.10	167.96	38.25	145	6.90	Intermediate
H13	Ghost Rider Glades (Gladed)	565.93	175.00	33.19	190	10.75	Intermediate
H14	Tumbleweed Terrain Park	214.34	54.85	26.68	50	1.07	Low Intermediate

Run Number	Run Name	Slope Length (m)	Vertical Drop (m)	Average Slope (%)	Average Width (m)	Trail Area (ha)	Skill Class
	Tamarack Pod						
T1	High Plains	428.21	188.76	49.58	200	8.56	Advanced
T2	Cinch Sluffs	235.52	123.70	62.24	160	3.77	Advanced
T3	Gambler Glades (Gladed)	399.27	170.91	48.01	105	4.19	Advanced
T4	Easy Out Mid	93.14	21.29	23.74	10	0.09	Advanced
T5	Easy Out Lower	133.37	15.58	12.05	10	0.13	Advanced
T6	Gambler	756.88	367.46	56.32	60	4.54	Advanced
T7	Full House	732.69	365.26	58.38	175	12.82	Advanced
T8	Easy Out Upper	280.89	17.37	8.69	10	0.28	Advanced
T9	Drifter	1277.83	600.24	54.20	125	15.97	Expert
T10	Easy Ramp	435.55	68.20	17.42	10	0.44	Intermediate
T11	Tamarack Bowl	384.06	179.99	54.39	65	2.50	Advanced
T12	Tamarack	626.60	266.84	48.85	60	3.76	Intermediate
T13	Showboat	174.32	77.09	52.97	40	0.70	Expert
T14	The Cliffs	190.46	112.61	81.61	70	1.33	Expert
T15	Showdown	439.81	222.13	58.97	130	5.72	Advanced
T16	Show Girl	326.37	158.11	56.10	75	2.45	Advanced
T17	OK Corral	757.77	367.44	56.58	150	11.37	Advanced
T18	South Bowl	389.10	128.24	38.33	50	1.95	Intermediate
T19	Lewico's Lane	504.73	214.88	47.98	50	2.52	Intermediate
T20	Sheriff	637.45	268.63	47.63	150	9.56	Advanced
T21	Outlaw	499.63	214.51	48.14	150	7.49	Intermediate
T22	Harker's High Way	925.19	332.33	39.16	30	2.78	Intermediate
T23	Bowl Access	214.52	31.63	15.31	10	0.21	Advanced
T24	Skyline Traverse	1647.01	280.60	18.08	10	1.65	Intermediate
T25	Being There (Gladed)	640.63	332.29	61.13	70	4.48	Advanced
T26	Side Show	870.92	420.90	56.04	50	4.35	Advanced
T27	Huckleberry Ridge	1106.46	428.07	42.66	40	4.43	Advanced
T28	Lower Siwash	228.11	106.43	54.12	55	1.25	Advanced
T29	Northern Delight (Gladed)	243.69	117.30	55.74	160	3.90	Advanced
T30	North Star (Gladed)	549.77	284.64	61.22	150	8.25	Advanced
T31	Northern Exposure (Gladed)	253.80	140.64	67.41	80	2.03	Advanced
T32	Double Exposure	373.57	180.85	56.34	40	1.49	Advanced
T33	Last 100 Turns (Gladed)	753.06	337.01	52.17	180	13.56	Advanced
T34	Siwash	640.48	283.81	50.66	80	5.12	Expert
T35	North Bowl	1102.77	505.09	52.50	60	6.62	Expert
T36	Powder Horns (Gladed)	451.42	211.58	53.88	65	2.93	Advanced
T37	Bandito	710.51	261.94	40.53	100	7.11	Intermediate
T38	High Noon	622.35	180.85	30.96	40	2.49	Intermediate
T39	Goat Run	185.22	77.76	46.70	75	1.39	Intermediate
T40	Funk Bowl (Gladed)	306.47	138.95	52.85	155	4.75	Advanced
T41	Deputy	687.13	217.78	35.25	70	4.81	Intermediate
T42	South Skyline	1456.21	187.29	14.46	10	1.46	Intermediate
T43	Off Ramp	227.78	74.88	35.36	20	0.46	Intermediate
T44	Lower Siwash Glades (Gladed)						Advanced

BHA
DISTINCTIVE MOUNTAIN RESORT DESIGN

Run Number	Run Name	Slope Length (m)	Vertical Drop (m)	Average Slope (%)	Average Width (m)	Trail Area (ha)	Skill Class
			Sundance Pod				
S1	The Burn	409.17	219.15	63.86	40	1.64	Advanced
S2	Trapper (Gladed)	364.09	198.95	65.66	120	4.37	Advanced
S3	Easy Street	1230.07	293.54	24.80	15	1.85	Intermediate
S4	South Barrel	314.06	154.84	60.66	35	1.10	Expert
S5	Weasel	243.90	122.60	59.81	50	1.22	Advanced
S6	Easy Way	493.03	82.27	16.96	20	0.99	Low Intermediate
S7	Wolverine	337.62	145.91	49.64	55	1.86	Expert
S8	The "Q"	387.58	186.27	55.56	50	1.94	Expert
S9	Whiskey Jack	307.59	85.92	29.29	50	1.54	Low Intermediate
S10	Dusk (Gladed)	214.17	65.97	32.99	60	1.29	Low Intermediate
S11	Dawn	333.25	81.77	25.54	25	0.83	Low Intermediate
S12	Twilight	288.28	77.47	28.45	25	0.72	Low Intermediate
S13	Sun Down	670.78	202.08	32.11	35	2.35	Advanced
S14	Outrigger (Gladed)	383.01	156.20	46.35	50	1.92	Intermediate
S15	Sun Up	368.12	144.26	44.10	35	1.29	Intermediate
S16	9 to 5	322.54	144.62	51.10	30	0.97	Intermediate
S17	Shotgun	607.75	168.62	35.15	35	2.13	Intermediate
S18	Centre Run	567.90	242.37	47.40	45	2.56	Intermediate
S19	North Run	1950.05	401.27	21.20	20	3.90	Intermediate
S20	Mouse Trap	197.03	80.46	45.18	70	1.38	Intermediate
S21	Jelly Roll	191.18	79.56	46.43	120	2.29	Intermediate
S22	Richochet (Gladed)	400.52	201.58	58.88	85	3.40	Advanced
S23	Gun Sights	363.18	170.12	54.24	50	1.82	Advanced
S24	Goat Run (Gladed)	633.65	249.00	44.14	75	4.75	Advanced
S25	Duke (Gladed)	548.93	240.66	50.05	65	3.57	Advanced
S26	Backwoods (Gladed)	310.66	135.46	49.30	75	2.33	Intermediate
S27	Lynx (Gladed)	187.28	95.18	60.08	95	1.78	Advanced
S28	A (Gladed)	158.90	64.95	46.71	85	1.35	Intermediate
S29	North Barrel	329.53	157.50	56.07	70	2.31	Advanced
S30	Cat Track	352.09	123.29	37.74	20	0.70	Intermediate
S31	Enchanted Forest (Gladed)	564.55	242.62	51.11	50	2.82	Intermediate
S32	Goat Glades	347.32	167.30	56.55	80	2.78	Advanced
S33	Free Style	224.72	90.81	44.54	40	0.90	Intermediate

EXISTING DOWNHILL CAPACITY

Ski trail capacity is a function of the acceptable density of users per hectare, rated by skier-skill class. Typically, the range of acceptable densities for ski trails by skill class is as follows:

Table 2-4: Acceptable Densities of Ski Trails for Various Skill Classes

Skill Class	Typical Ski Industry Skier Density/Ha	Powder Skiing Applied Density/Ha
Beginner	35 - 75	21
Novice	30 - 60	18
Low Intermediate	20 - 40	12
Intermediate	15 - 30	9
Advanced	10 - 20	6
Expert	5 - 10	3

Successful ski resorts catering to destination guests strive to provide a high quality skiing experience. This is best achieved when trail densities are maintained at the lower end of the spectrum.
The acceptable density of skiers on gladed trails is generally 15% to 30% of the comparable skier skill class, depending on the spacing of the trees and the acceptable densities of the trails around them.

It should be noted that the preferred and acceptable skier/rider densities have decreased considerably in recent years (for all skill classes). The advent of shaped skis, combined with snowboarding's relatively easy learning curve, has enabled a larger number of skiers and snowboarders to negotiate steeper and more adventuresome slopes sooner and with greater control than ever before. What was considered "experts-only' terrain ten years ago is now accessible to a much broader segment of the skiing population. This has often resulted in faster speeds and greater ski trail congestion. In addition, new terrain has opened up in areas that were traditionally too steep to ski or ride.

The issue of what is acceptable, what is expected, and what is desirable, has to be given careful consideration. All destination skiers expect a low-density skiing experience. Resorts that wish to cater to a powder skiing experience need to keep the density even lower. Urban skiers may still be willing to accept higher densities in exchange for the convenience created by ease of access, but this too is changing rapidly.

Castle Mountain Resort is a regional resort that also serves a large and expanding day use skier marketplace. The acceptable trail density varies at the resort throughout the year. On a weekend, guests are likely to accept a more crowded experience. However, during the week, skiers expect much lower trail densities.
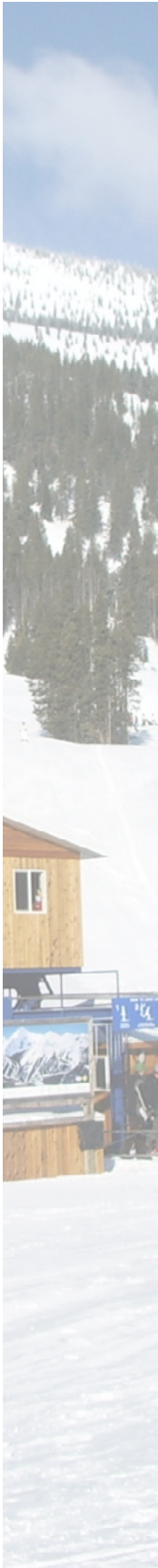
Aligned with powder skiing reputation of CMR and its vision for the future, BHA has applied the lowest possible trail densities. (See Table 2-4: Acceptable Densities of Ski Trails for Various Skill Classes)

By applying these densities to the trail and gladed areas existing at CMR, the capacity of those trails was calculated. Table 2-5 outlines the trail attributes, highlighting skier skill classes and capacity within each Ski Pod and for the entire existing ski trail development at CMR. The total existing trail capacity has been is calculated to be 2,065 skiers/snowboarders at one time.

Table 2-5: Existing Downhill CCC of Castle

Pod	Vertical (m)	Skiable Area (ha)	Downhill Capacity by Skill Class						Total Capacity
			Beginner	Novice	Low Intermediate	Intermediate	Advanced	Expert	
Huckleberry Pod	330.5	40.5	0	0	114	309	0	41	464
Sundance Pod	454.0	59.4	0	0	62	167	70	13	312
Tamarack Pod	396.0	260.3	0	0	0	345	654	225	1,223
Green Pod	42.0	2.3	30	16	0	0	0	0	46
Buckaroo Pod	4.0	1.0	20	0	0	0	0	0	20
Totals		263.6	50	16	0	345	654	225	2,065

Note 1: The terrain assoicated with the T-Rex T-Bar is incoporated into the Tamarack and Sundance Pods

Note 2: Tamarack Pod includes South Chutes

Skiers planning their adventure at the base of Castle Mountain Resort
Photo: BHA, 2008
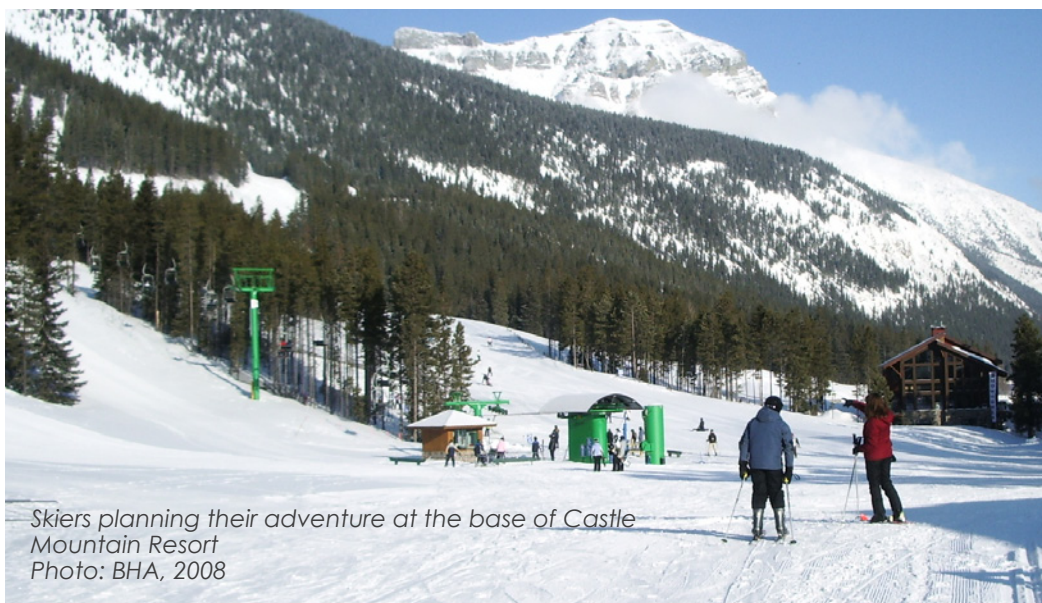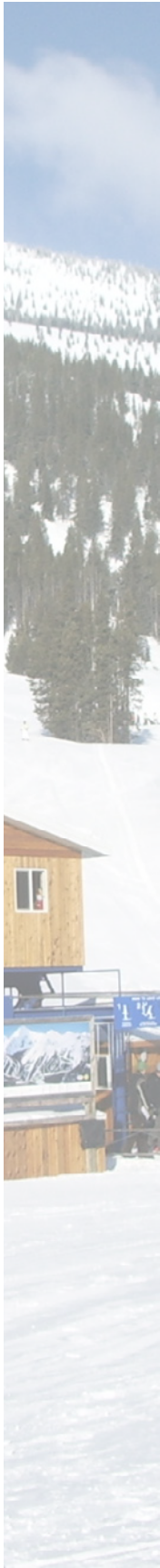
Cumulatively, the developed terrain at CMR was totaled by skier skill class. The resultant distribution was compared to the skill class distribution as found in the skier marketplace. This is illustrated in Table 2-6 and Chart 2-1.

Table 2-6 Existing Skier Distribution

Market Distribution	Skier Marketplace	Castle Mountain Existing
Beginner	5%	2.4%
Novice	10%	0.8%
Low Intermediate	20%	8.5%
Intermediate	35%	39.8%
Advanced	20%	35.0%
Expert	10%	13.5%

Chart 2-1 Existing Skiers Distribution

Castle Mountain Existing Distribution
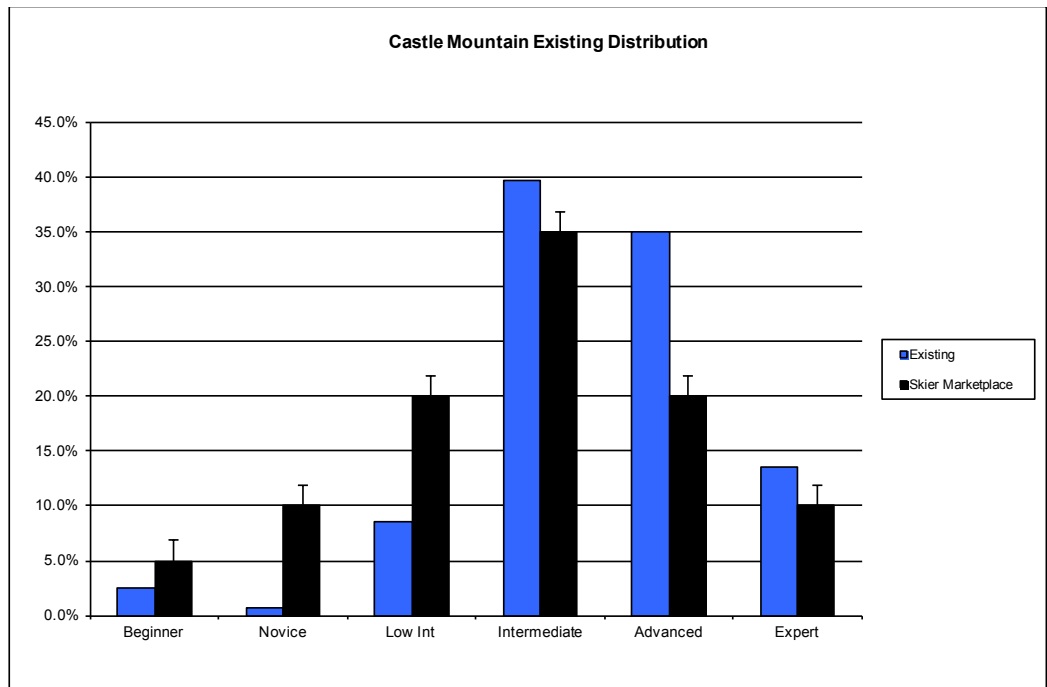
In terms of who the existing ski area development is catering to this average out to 4% of the terrain services Beginner skiers, 48% Intermediate and 48% Advanced skiers. It is important to note that skier marketplace distribution is typically 15% Beginner, 60% Intermediate and 25% Advanced. This illustrates that an emphasis needs to placed on the development of more Beginner, Novice and Low Intermediate terrain in any of the expansion and upgrade plans.

The results of this analysis clearly show that when CMR is compared to the skier marketplace, it has an insufficient offering of beginner and intermediate terrain. Terrain expansions (Section 4.0) will attempt to address this imbalance.

EXISTING SKI LIFTS

Castle Mountain Resort currently has 6 uphill conveyances including 3 and 2 person, fixed chair lifts, a T-Bar, and a carpet lift. Figure 2-13 and Table 2-7 provide an illustration and specifications for the existing ski lifts at Castle. In total the ski lifts provide a capacity of about 4,958 skiers per hour.

Table 2-7: Summary of Existing Ski Lifts

Lift Name	Lift Type	Bottom Elevation (m)	Top Elevation (m)	Vertical Drop (m)	Horiz. Length (m)	Slope Length (m)	Average Slope	Hourly Capacity (Theor.)	Hourly Capacity (Actual)	Rope Speed (ft/s)	Weighted Vertical Demand	Loading Efficiency	Hours of Operation	Access Reduction	Uphill CCC	Downhill CCC
Huckleberry	3C	1414	1744	330	1404	1464	24%	1397	1300	2.25	4,632	90%	7		584	464
Sundance	3C	1412	1866	454	1108	1207	41%	1180	1050	2.25	5,467	90%	7	3%	531	312
Tamarack	2C	1861	2257	396	884	986	45%	710	710	2.25	7,255	90%	6		209	1,223
T-Rex	T	1414	1932	518	1261	1377	41%	645	424	2	5,467	80%	7	2%	221	0
Green Chair	2C	1410	1452	42	210	205	20%	865	734	1.5	1,339	90%	7		145	46
Buckaroo	C	1410	1414	4	79	77	5%	1100	740	1.5	1,000	80%	7		20	20
Total								5897	4958						1,710	2,065

2.7.3 Existing Comfortable Carrying Capacity

The Comfortable Carrying Capacity (CCC) is a measure of the optimum number of skiers/snowboarders who can utilize the resort over the course of a day while being guaranteed a pleasant recreational experience without causing a decline in the quality of the physical or sociological environment. It is a dynamic number that takes into account the use of the mountain throughout the day.

The CCC for each lift is calculated by considering the vertical serviced; the capacity of the lift; the hours of operation; the lift loading efficiency; access reduction and; the vertical demand (as determined by the type of skiers using the lift). The cumulative CCC for each lift yields the total CCC for the resort. Ideally, this uphill capacity of the lifts should match the downhill capacity of the trails. Generally, depending on weather and snow conditions, 40% of the total CCC will be actively skiing, 25% will be on the lifts, 10% will be waiting in lift queues and the remaining 25% of skiers are rated as passive and will be using the skier service facilities and amenities.

As illustrated in Table 2-7, and based on the existing lift configuration, the uphill capacity of the ski lifts is 1,710 skiers per day. As the downhill capacity of the trails (2,065) surpasses the uphill capacity of the lifts, the CCC of CMR's existing facilities is pegged at 1,710 skiers and snowboarders per day.

EXISTING LIFT AND TRAIL BALANCE

At a well balanced ski resort, the downhill capacity of the ski trails should match the uphill CCC of the ski lifts resulting in a balanced ski product. This should hold true over the entire resort as well as for each ski pod area. By comparing the uphill CCC and downhill capacity for each pod, points of imbalance have been identified. Subsequently, improvements can be made to rectify the imbalances and improve the overall quality of experience at the resort. The existing lift and trail balance for CMR is outlined in Chart 2-2.

Chart 2-2: Existing Lift Balance Assessment
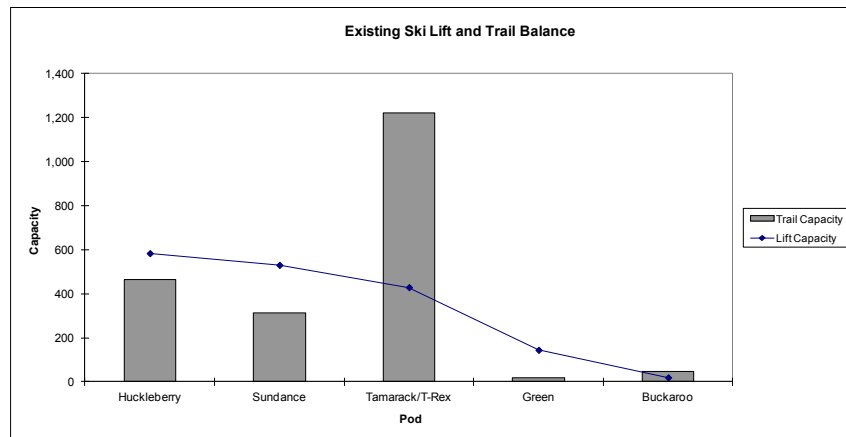
As illustrated, the lift capacities of the existing ski lifts do not align well with their corresponding trail capacities. Most notably, the Tamarack Chair plus the T-Rex T-Bar has an uphill capacity of only 403 skiers per day, while servicing a vast amount of ski terrain capable of accommodating about 1,223 skiers. This indicates that the lift(s) is woefully incapable of matching the developed capacity of the ski trails, it creates a very low density skiing for the skiers. While not this extreme, ratios favouring the ski trails will be considered as desirable in concepts for the future improvements and upgrades.

2.7.4 Additional Activities and the Balanced Resort Capacity

With a resort that focuses primarily on winter skiing and snowboarding like CMR, the calculation of the lift and trail capacities becomes the single most important planning indicator. However, additional attractions that add to the overall capacity of the resort must also be taken into account. In today's competitive tourism market, it is becoming increasingly necessary for resort developers to provide a variety of on-mountain activities that complement and enhance the proposed area's alpine skiing product. The capacity of additional facilities and attractions such as catskiing, snowshoeing, cross-country skiing, backcountry touring, etc. must be calculated and added in a cumulative fashion to determine the total carrying capacity of the resort.

The concept of carrying capacity must incorporate and achieve a sense of balanced use of the land without overwhelming the site's physical limitations. Likewise, the perceived experience offered must be integrated into the determination of capacity. That is, the expectations of the target market must be taken into account.

Just as there are limits to growth in terms of the actual size that an attraction can reach before it compromises the environmental integrity of the site, there are points where the numbers of users, or the mix of user types, compromises the quality of experience that a resort offers, to its own detriment. Again, a balance must be determined and adhered to. The objective is to calculate a "balanced resort capacity".

The definition of the Balanced Resort Capacity (BRC) is the optimum number of visitors that can utilize a resort's facilities per day in such a way that their recreational expectations are being met while the integrity of the site's physical and sociological environment is maintained on a year-round basis. This number functions as the baseline figure for determining annual capacity potential and rates of utilization, as well as all development and market projections for the resort on a seasonal basis. Most importantly, the BRC becomes the cornerstone to defining the appropriate amount of base area facilities (built space, infrastructure, parking, bed units, etc.) to be established at the resort.
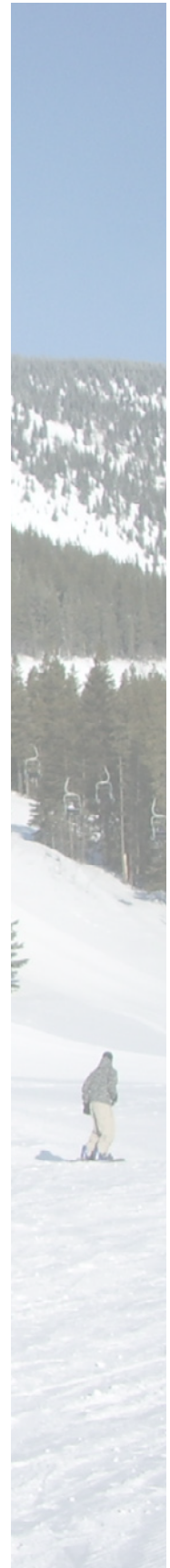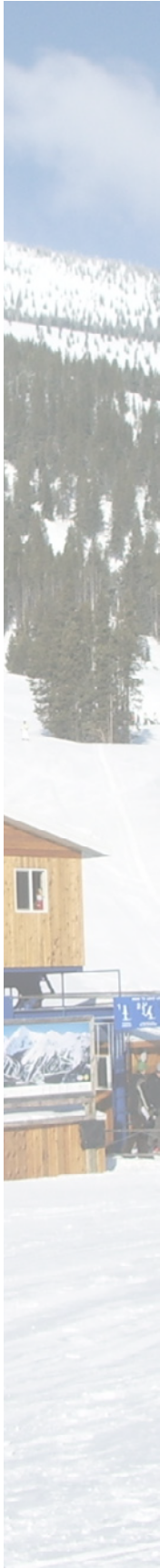
CROSS-COUNTRY SKIING

Castle Mountain Resort is 10 kilometres from the Syncline Castle Cross Country Ski Area, managed by the Syncline Castle Trails Association. The Association maintains 20km of trails, and hosts Nordic skiing and snowshoeing in the winter, and hiking and mountain biking in the summer. While the trail system is well-developed as a day use area, it is not directly connected to CMR. It is estimated that the Syncline cross-country skiing trail system adds approximately 25 additional guests at the resort. The opportunity to incorporate cross-country skiing more directly into the core of the resort will be explored.

SNOWMOBILING

Snowmobiling has historically been a popular pastime within the Castle Region. Numerous trails run through the wilderness areas north of AB-774, previously supported by a network of Provincial Recreation Sites. Currently, snowmobiling accounts for approximately 25 additional guests at the resort.

With the creation of the Castle Provincial Park and Castle Wildland Park, the future of Off-Highway Vehicle (OHV) use in the area is in question. The recently released draft of the Castle Management Plan states that OHV use in the Parks will be phased out in the near future (pg 103).

SNOWSHOEING

Castle Mountain Resort offers guided snowshoeing treks from the top of the Huckleberry chair lift. Snowshoeing provides those visitors who are not familiar or comfortable with skiing or snowboarding an accessible and fun opportunity to experience the scenery of the Rocky Mountains. Snowshoeing accounts for approximately 25 additional guests at the resort.
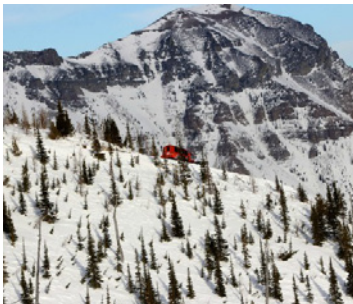
CATSKIING

The Powder Stagecoach Snowcat Skiing experience opened at CMR in 2010. Visitors are able to access the advanced and expert terrain off the south side of Haig Mountain. This accounts for an additional 24 guests.

TOTAL ACTIVITY BASED CAPACITY

In the winter, CMR has the capacity to accommodate 1,710 alpine skiers, 24 catskiers, 25 cross-country skiers, 25 snowmobilers, and 25 snowshoers. This totals a capacity of 1,809 guests using the attractions at the resort per day.

ADDITIONAL PASSIVE GUESTS

In addition to the active visitors, non-participating guests must be taken into account when sizing the amount of accommodation and space use requirements at the resort. This includes, drivers, parents, grandparents, etc. Typically this number equates another 8% to 15% guests to a regional resort like CMR. Applying a 5% increase adds 90 passive guest visitors.

EXISTING SUMMER ACTIVITIES

The success of CMR to this point has relied solely on the winter recreation activities. As part of the Master Planning process, and more specifically to reaffirm the Vision for CMR, the ownership and management have confirmed a need to expand their offering into all seasons.

The details of the summer resort experience will be discussed further in the following sections of this Master Plan.

EXISTING BALANCED RESORT CAPACITY

The BRC of the activities and attractions at the resort is the baseline for determining all necessary supporting facilities such as restaurants, retail outlets, resort services, parking, overnight accommodation, day use facilities and services. With the additional attractions capacity and the passive guests, the BRC at CMR is calculated to be 1,900 guests per day at the resort (Table 2-8).

Table 2-8 Balanced Resort Capacity

Winter Attractions	Capacity
Alpine Skiing CCC	1,710
Cross-country Skiing	25
Snowmobiling	25
Snowshoeing	25
Catskiing	24
Total	1,809
Passive Guests (5%)	90
Total BRC (Winter)	1900
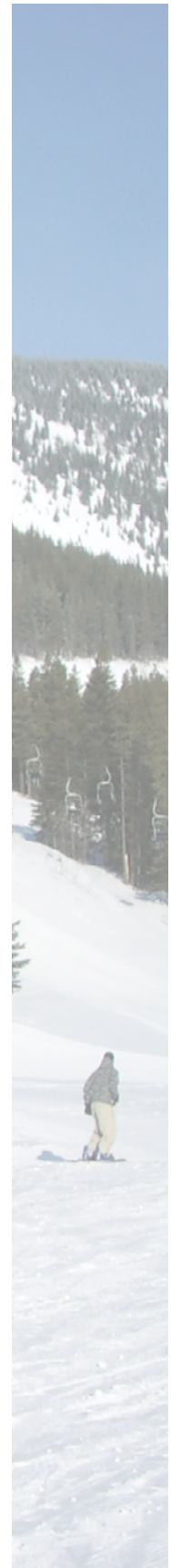
2.8   EXISTING BASE AREA

2.8.1 Existing Skier Related Built Space

Skier related built space provides the expected and required services for a ski resort to function properly during the skiing day. These services include all built space (restaurants, retail, equipment rental, day care, rest rooms, ski patrol, lockers, resort information, administration, etc.) catering to day use and destination skiers alike.

The core of the base area at CMR is made up of the Day Lodge, the Alpenland Ski Shop, the T-Bar Pub, and the Ski Patrol, servicing day use and destination guests throughout their ski day. The rest of the base area is comprised of parking lots, a mix of single family units/cabins, multi-family condominiums, the Castle Mt. Ski Lodge and Hostel, the employee building and the maintenance building (Fig. 2-14).

The key core area built space at Castle (restaurants, bars, rental, retail, washrooms, day care, skier services) total about 26,617sq. feet in size (Table 2-9).

Table 2-9 Space Use Inventory

Service/Function	Day Lodge Upper	Day Lodge Lower	T-Bar Pub	First Aid	Ski Patrol	Alpenland	Total (Sq Ft)
Restaurants and Related Facilities							
Seating Area (Indoor)	7660	2400	1152	0	0	0	11212
Kitchen/Scramble	2244	0	360	0	0	0	2604
Bar/Lounge	144	0	0	0	0	0	144
Subtotal	10048	2400	1512	0	0	0	13960
Retail							
Equip Rental/Repair	0	0	0	0	0	2660	2660
Retail Sales	0	0	0	0	0	1120	1120
Subtotal	0	0	0	0	0	3780	3780
Skier Services							
Washrooms	448	288	160	0	0	0	896
Ski Patrol/First Aid	0	0	0	384	300	0	684
Snow School	380	0	0	0	0	0	380
Public Lockers	0	0	0	0	0	0	0
Day Care/Nursery	315	0	0	0	0	0	315
Ticket Sales	0	832	0	0	0	0	832
Subtotal	1143	1120	160	384	300	0	3107
Operations / Storage							
Administration	100	1470	0	0	300	220	2090
Employee Lockers	0	736	0	0	1900	0	2636
Storage	208	250	112	0	100	0	670
Mechanical / Furnace	0	280	42	0	0	0	322
Maintenance	0	0	0	0	0	0	0
Subtotal	308	2736	154	0	2300	220	5718
Total Attraction Related Space	11499	6256	1826	384	2600	4000	26565

Castle
Mountain®

Castle Mountain Resort
Master Development Plan
2017
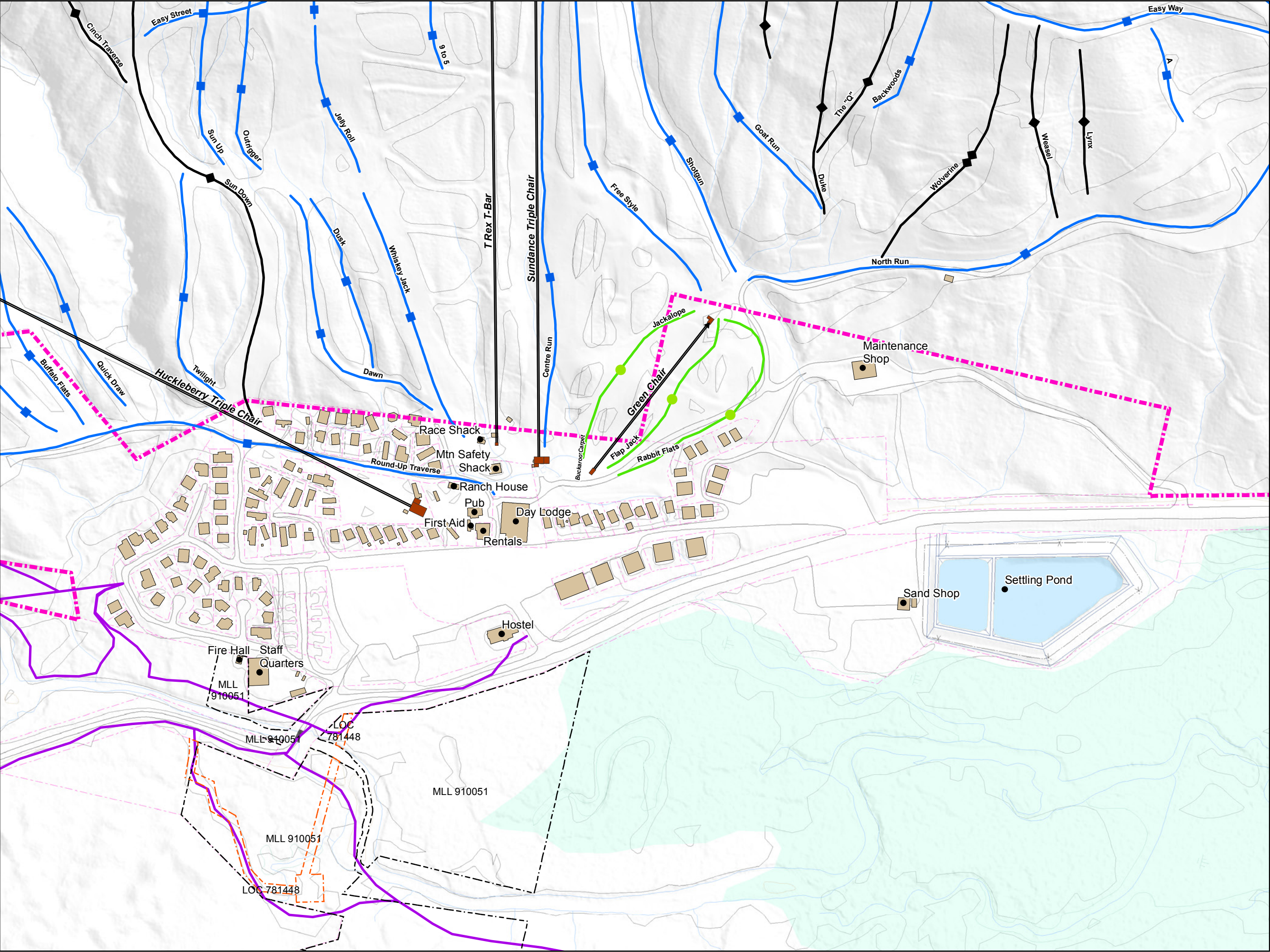
Legend
MLL 910051
LOC 781448
Existing Lifts
Existing Buildings
Lift Terminals
West Castle Wetlands

Ski Run Category
Beginner
Intermediate
Advanced
Expert

Cross Country Skiing

Ski Area Boundary
License of Occupation

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1:4,000
0   30   60   120
Meters

Existing
Base Area Conditions

Figure 2-14

Easy Street
Cinch Traverse
9 to 5
Easy Way
A
Sun Up
Outrigger
Jelly Roll
The "Q"
Backwoods
Goat Run
Weasel
Lynx
Sun Down
Dusk
Whiskey Jack
T Rex T-Bar
Sundance Triple Chair
Shotgun
Free Style
Duke
Wolverine
North Run
Twilight
Centre Run
Dawn
Jackalope
Maintenance Shop
Buffalo Flats
Quick Draw
Huckleberry Triple Chair
Green Chair
Flap Jack
Rabbit Flats
Buckaroo Carpet
Round-Up Traverse
Race Shack
Mtn Safety Shack
Ranch House
Pub
Day Lodge
First Aid
Rentals
Sand Shop
Settling Pond
Hostel
Fire Hall
Staff Quarters
MLL 910051
LOC 781448
MLL 910051
MLL 910051
LOC 781448

2.8.2 Space Use Requirements

In order to determine if there is an appropriate mix and amount of built space, the completed space use inventory is compared to 'industry standards' for ski resorts of a size and type similar to CMR. The objective is to identify any gross area deficiencies in the existing development that should, once corrected, make CMR a more balanced, enjoyable and successful operation.

The space use requirements are directly related to the BRC of the ski area. On average, utilizing a BRC of 1,990 visitors per day and based on industry standards, the existing 26,565 sq feet of developed space is strong in several areas (Table 2-10). Overall, food service space is well-accounted for between the Day Lodge and existing bar. Small additions to bar floor space would be advisable, but is not crucial at this point. Similarly, visitor expectations for retail will be largely met by existing space. Opportunities to expand retail exist, but these are not pressing.

The analysis of existing built space also highlights opportunities for improvements in the future. These include an increase in built space for washrooms, public lockers, ski school, and day care facilities.

Washrooms: There appears to be a significant lack of publicly available washrooms. Some of this shortfall may be justified by the fact that all of the resort accommodation is 'ski to/ski from', making it convenient for destination patrons to simply return to their unit. Nonetheless, this should be monitored to ensure that a negative experience does not begin to influence return visitation.

Ski School: The size and quality of the ski school at a ski resort are features that can have a very significant impact on the choice of the resort as a destination. The ski school should be a major profit center of the operations at CMR. The obvious lack of space dedicated to ski school facilities at the resort suggests that this is an opportunity that should be fully explored and addressed.

Day Care/Nursery: International and regional ski destinations must be family-friendly and account for the needs of families with young children. There is a significant lack of space dedicated to this space use. For Castle to meet the needs of their patrons in the future this shortcoming should be addressed.

Administrative: In contrast to the services discussed above, there appears to be an over abundance of administrative space at CMR. This space could be used to address the current space deficiencies seen in other areas. The advantage of this approach is that it would eliminate the need to expand the footprint of the base area, conserving valuable real estate, and reducing overall cost of improving these aspects of the visitor experience.
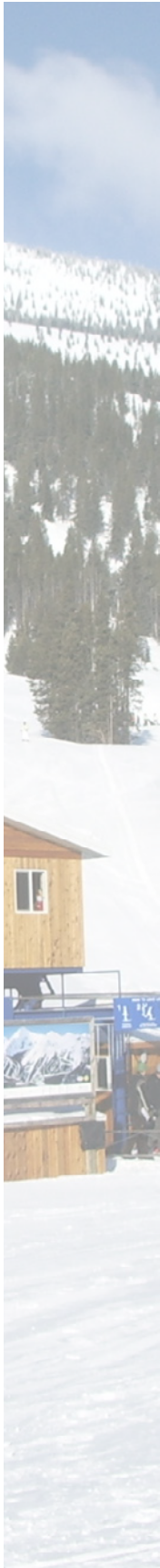
Table 2-10 Space Use Analysis: Existing Conditions

Capacities		CCC	1,710
		BRC	1,900

Service/Function	Existing Space	Space Required	Difference	% of Required
Restaurants and Related Facilities				
Seating (Indoor)	11,212	6,134	5,078	183%
Kitchen/Scramble	2,604	2,454	150	106%
Bar/Lounge	144	613	-469	23%
Subtotal	13,960	9,201	4,759	152%
Retail				
Equip Rental/Repair	2,660	1,583	1,077	168%
Retail Sales	1,120	1,431	-311	78%
Subtotal	3,780	3,014	766	125%
Skier Services				
Washrooms	896	1,840	-944	49%
Ski Patrol/First Aid	684	607	77	113%
Ski School	380	920	-540	41%
Public Lockers	0	920	-920	0%
Day Care/Nursery	315	2,188	-1,873	14%
Ticket Sales	832	184	648	452%
Subtotal	3,107	6,661	-3,554	47%
Operations / Storage				
Administration	2,090	1,031	1,059	203%
Employee Lockers	2,636	276	2,360	955%
Storage	670	120	550	560%
Mechanical / Furnace	322	1,421	-1,099	23%
Maintenance	0	285	-285	0%
Subtotal	5,718	3,133	2,585	183%
Total Attraction Related Space	26,565	22,009	4,556	121%

2.8.3 Existing All Season Resort Related Space and Community Space

Overnight guests have different expectations and needs as compared to the needs of a day use skier. The overnight visitor is typically looking for a variety of restaurants, bars, tourist retail and entertainment above and beyond the needs and services required for the ski day. The second home owners, residents and employees further add to the facility requirements. Their needs are more diverse and would include grocery, pharmacy, general store, liquor store, community services, etc.

Castle Mountain Resort has a variety of all-season resort related space in its base area. There are also various other spaces located within private developments. Community space needs to grow alongside the resort as more and more permanent or semi-permanent residents are located at CMR. The Castle Mountain Community Association (CMCA) supports the development of infrastructure in the base area that supports visitor demand and expectations, while providing for a family-friendly, community–oriented atmosphere. Finally, the CMCA supports the objective of CMR to develop the facilities to become a staging area for the respectful use of the Provincial and Wildland Parks.

2.8.4 Existing Overnight Accommodation

The existing residential and commercial accommodation facilities at CMR have evolved over time to coincide with the development of the skiing facilities. As the destination status of the resort improves, and the CCC and BRC increase, so must the resort's ability to accommodate overnight visitors.

The current ASP anticipates the development of 225 accommodation units to be developed at CMR. The existing overnight accommodation totals 131 units of development. Of these, 89 are single family units, 40 are multi-family units (within four-plexes), and a hotel and hostel. This leaves 94 accommodation units yet to be developed under the existing ASP.

2.8.5 Existing Parking

Currently, the day use parking lots have a capacity to park approximately 550 cars. At 2.8 guests per car,, this equates to about 1,540 day use guests. In addition, there are approximately 200 parking stalls attached to overnight accommodation units throughout the resort. At 2.0 guests per car, this adds enough

parking for 400 destination guests at the resort. In total this results in parking for about 1,940 guests on a full day. Experience shows that the parking lots in their existing configurations are insufficient on busy days. This may be a function of inefficiencies in the size, layout and operations. The new plan will need to address this.

2.8.6 Existing Base Area Development Experience

The existing base area at CMR has a unique and special club like ambience. Any upgrades need to reinforce this character while accommodating increases in mountain capacity. This is particularly critical in terms of respecting the limits to growth within the existing base area. Skiing access and egress to Mt. Haig must be planned to ensure that this opportunity is fully realized while maintaining the high quality resort experience.

The existing approved Area Structure Plan for CMR outlines additional bed units yet to be developed. These development opportunities have since been refined and are guided by the Village Master Plan, completed in 2008. They include single family and multi-unit residential development adjacent to the village core, mixed-use housing and commercial accommodation in the village core, as well as RV sites on the lower slopes of the North Bowl. The placement of these future residential and commercial developments planned for CMR are dependent upon lift and trail improvements, increased snow reliability with the addition of snowmaking on key lower elevation trails that will ensure reliable ski to/ski from access and the potential development of summer use facilities and amenities.

Limiting factors to upgrades and expansion are the lack of flat land for parking. This may be the most challenging element of CMR's future.

Skiers at the bottom of Castle Mountain
Photo: CMR, 2016
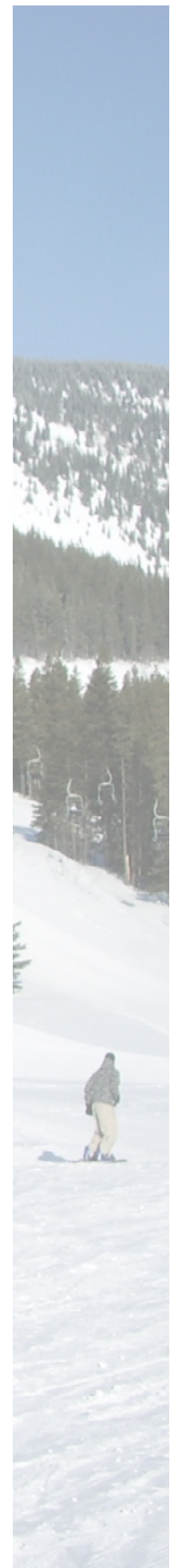
DEVELOPMENT ANALYSIS

3.0 Development Analysis

3.1 INTRODUCTION

An analysis of the CMR study area was undertaken to assess the development potential for the expansion of the existing resort. Given the defined project goals and objectives, a study area of approximately 3,450 hectares (8,925 acres) was identified. Utilizing a combination of high level AltaLIS data topographic mapping (with 20 metre contour information) and more detailed LiDAR mapping from the University of Lethbridge (with 5 and 1 metre contour information), a digital terrain model was created specific to Castle Mountain. Adding to this, U of L also provided planimetric information, ecological layers, rec sites, points and lines. Subsequent analyses were completed to initiate and guide the mountain and base area planning processes.

3.2 MOUNTAIN TERRAIN ASSESSMENT

The CMR study area was analyzed in terms of slope, elevation, aspect and fall-line in order to gain an understanding of the alpine, cross-country skiing, and mountain biking development potential. The map studies, combined with available weather data and site visits culminated in an understanding of the study area's capability to physically and environmentally support expanded, four-season recreation activities. Prior planning endeavors, notably a Base Area Master Plan in 2008, also informed this exercise.

The initial assessments examined the terrain, assessed the slope and elevation configurations, identified preliminary fall-line patterns and considered associated linkages. At this stage, multiple concepts were prepared to identify pod locations and potential lift locations. A coarse analysis of these potential pods was then carried out in order to get a general idea of the possible capacities. The results of the analysis identified the northern end of Gravenstafel Ridge, Haig Ridge, the Haig Valley, the lower elevations of Sore Crotch Valley and the Syncline Valley, as having significant expansion opportunities with connections to the existing mountain development and the surrounding Parks. This represents a potential increase of the CCC to approximately 4,000 skiers per day as compared to the existing CCC of about 1,700 skiers per day. Moreover, the initial analysis indicated that the development of this terrain would improve the skier distribution of CMR by providing much needed beginner, novice and low intermediate skiing, enabling the resort to more closely match the accepted market distribution of skier skill classes.

Given the potential to diversify available skiable terrain and connect the existing trail network to the potential expansion areas, the design team began to identify potential ski area trail alignments, lift configurations and glading opportunities.
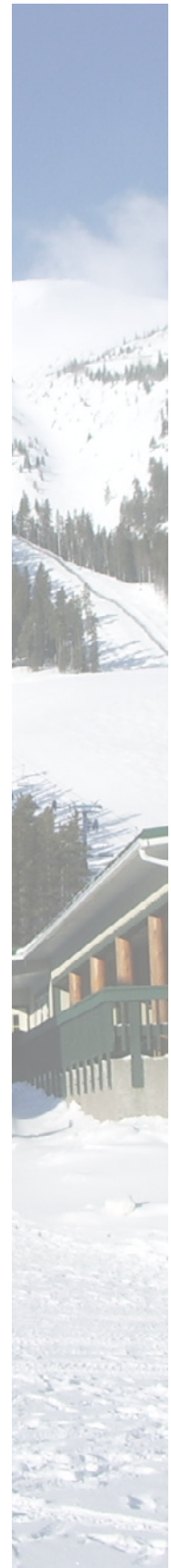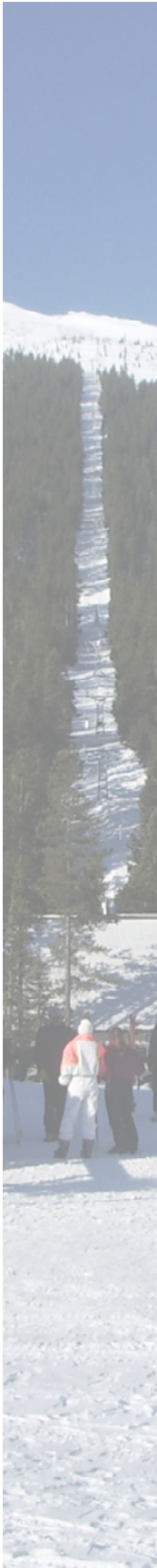
Summer opportunities were also identified to explore the potential to accommodate mountain biking (downhill and cross-country), hiking, via ferrata, aerial adventure and sightseeing.

The following sections highlight the results of the terrain analyses upon which these assessments were founded. The resultant detailed Mountain Expansion Plan is outlined in Section 4.0.

3.2.1   Skiing Mountain Slope Analysis

The Skiing Mountain Slope Analysis divides the topography of the study area into a range of skiable gradients as they relate to each of the primary skier/ snowboarder skill classes (Fig. 3-1 and Table 3-1). These are as follows:

Table 3-1. Ski Area Slope Analysis Criteria

Skill Class	Range of Acceptable Gradients (%)
Beginner	8 - 15%
Novice	15 - 25%
Low Intermediate	25 - 35%
Intermediate	35 - 45%
Advanced	45 - 60%
Expert	60 - 80%
Extreme	80%+

Layered over top of the slope analysis is the existing lift and trail configuration, the base village development and the LOC Boundary. The resultant analysis delineates the general character of the land, illustrating that the study area has a fairly well defined mix of terrain.

The best terrain is predominated by the Intermediate (blue) skier skill classification. As illustrated, much of this terrain has been developed with the current lift and trail configuration. There is obvious expansion potential on the east facing Haig Ridge face within the LOC, above and below the existing catskiing area and the lower elevations of the terrain serviced by the Huckleberry Chair. Further, there is a good mix of Intermediate and Advanced terrain on the north facing slopes of Sore Crotch Valley, outside of the LOC. In the same area, there is also significant Beginner (green) skiing potential in the lower elevations of the Haig Ridge face and Sore Crotch.

The Haig Valley is largely too flat to alpine ski. While there is an apparent abundance of Beginner ski terrain, it is too disconnected from the base village staging to be of any value to service this shortcoming. That said, the Valley appears to be very well suited to cross-country skiing, the challenge being the difficulty to get cross-country skiers in and out.
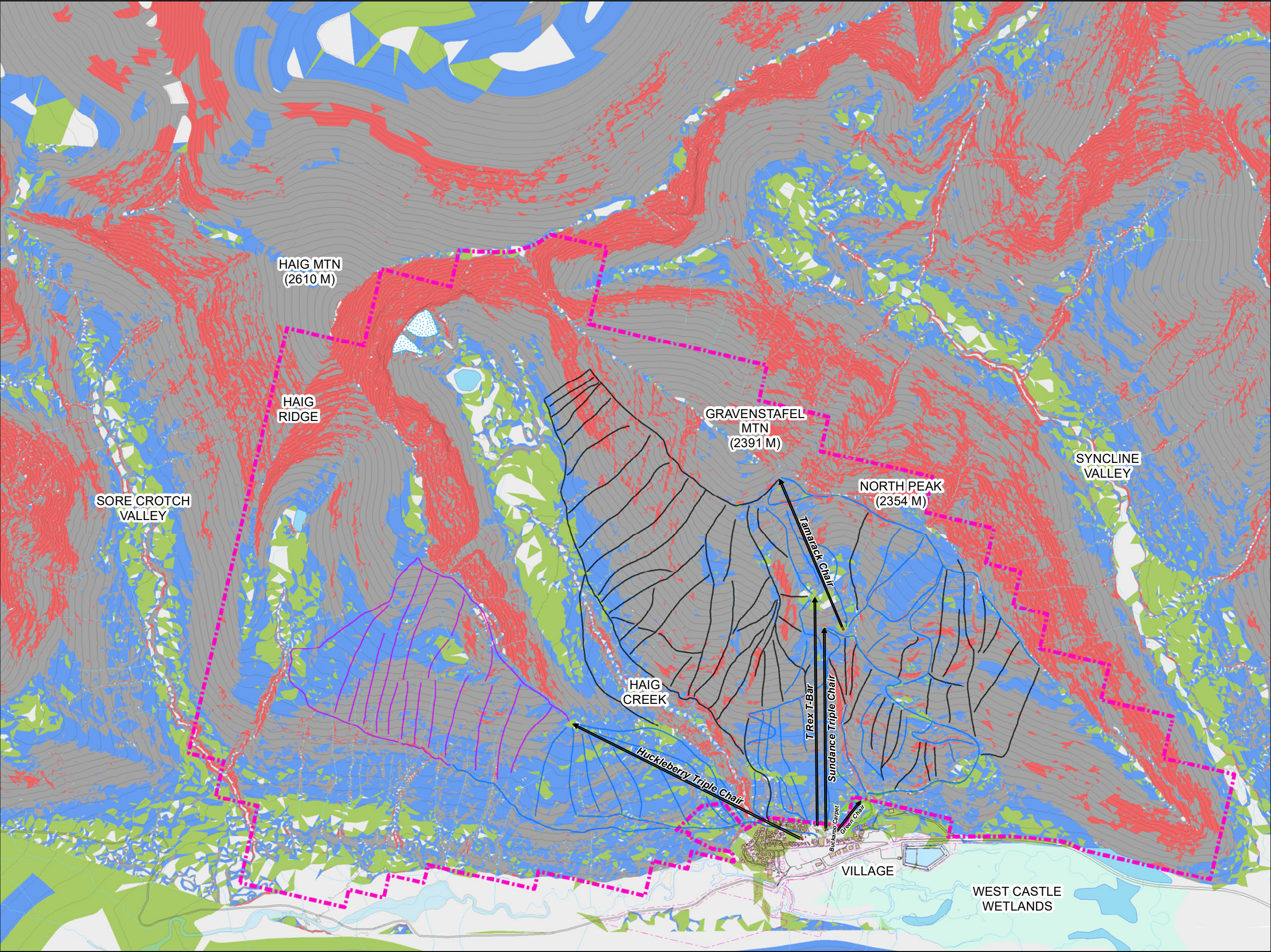
Castle Mountain Resort
Master Development Plan
2017

Legend
West Castle Wetlands
Ski Run Category
— Beginner
— Intermediate
— Advanced
— Expert
— Catskiing
Ski Area Boundary
▪▪▪ License of Occupation
Ski Slope Analysis
Flat
Beginner Ski Terrain
Intermediate Ski Terrain
Expert Ski Terrain
Extreme

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1:20,000

0   150   300   600
                              Meters

Slope Analysis

Figure 3-1

HAIG MTN
(2610 M)

HAIG
RIDGE

SORE CROTCH
VALLEY

GRAVENSTAFEL
MTN
(2391 M)

NORTH PEAK
(2354 M)

SYNCLINE
VALLEY

HAIG
CREEK

Tamarack Chair

T.Rex T-Bar

Sundance Triple Chair

Huckleberry Triple Chair

Buckaroo Carpet

Green Chair

VILLAGE

WEST CASTLE
WETLANDS

The Advanced skiing is very well represented by the iconic east facing South Chutes, and mixed throughout the existing trail development of the Gravenstafel Ridge. However, there appears to be fairly significant Intermediate infill potential in the North Bowl area. Further, there is expansion potential for Advanced skiing on the lower elevations of Gravenstafel Ridge. Below this, there is some Low Intermediate expansion potential. The Beginner terrain directly associated with the base village is fully developed. But, there may be opportunity enable this very limited low end skiing attribute to be optimized with a reorganization of skier circulation, combined with some grading.

The Syncline Valley is located outside of the LOC with a mix of Beginner, Intermediate and Advanced terrain. Unfortunately, the most desired Beginner and Intermediate terrain is in isolated pockets up the Valley, not well located to enable efficient links to the existing development. However, the Syncline Valley appears to be well suited for backcountry ski touring and/or a relocation of the catskiing operation.

3.2.2 Mountain Elevation Analysis

The Elevation Analysis (Figure 3-2) slices the topographic features of the study area into 125 metre increments. Effectively, this analysis illustrates the height and "flow" of the land.

The study area is dominated by the Westcastle Valley, with Gravenstafel Mountain and Mt. Haig rising to the west, and the Barnaby Ridge across the valley in the east. The highest point within the CMR area is the peak of the Tamarack chair lift at 2,273 metres (7,463 feet) elevation, just below the summit of Gravenstafel Mountain. The lowest developed ski terrain is 1,410 metres (4,626 feet), providing for a total skiable vertical of 863 metres (2,833 feet).

Castle Mountain Resort's peak and base elevations are comparable to other resorts in the region and throughout the Rocky Mountains (Table 3-2). Similarly, the skiable vertical drop is equal to the average seen in the region. Given its high base and peak elevations, CMR is well-situated to endure any adverse effects brought by climate change.

Table 3-2: Resort Area Elevation and Skiable Vertical

Resort Mountain	Summit Elevation (m)	Base Elevation (m)	Skiable Vertical (m)
Castle Mountain	2,273	1,410	863
Fernie Alpine Resort	2,134	1,052	1,082
Kimberley Alpine Resort	1,982	1,230	751
Sunshine Village	2,730	1,658	1,070
Nakiska	2,260	1,525	735
Mount Norquay	2,450	1,680	503
Lake Louise Ski Resort	2,637	1,646	991
Marmot Basin	2,612	1,698	914
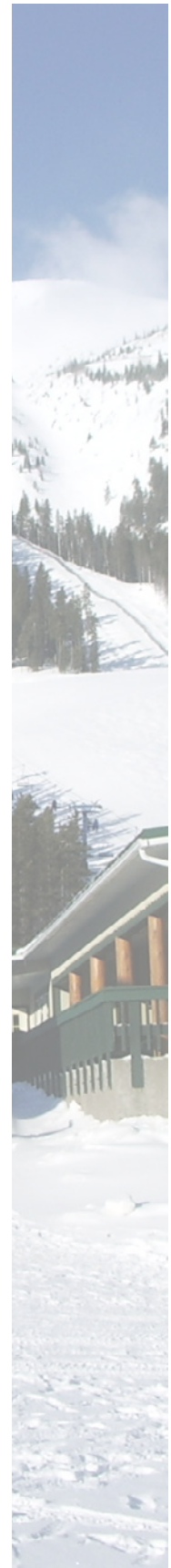
3.2.3 Mountain Aspect Analysis

The Aspect Analysis involves colour-coding the topographic features of the study area to illustrate the orientation and geographical exposure with respect to the eight points of the compass (Fig. 3-3). Receiving reduced direct sunlight, northern exposures are better suited for snow retention and therefore better suited for ski trail development. Southern exposures can prove to be problematic for skiing terrain due to reduced snow retention capabilities and a greater probability of snowpack reliability problems. However, southern orientations are more desirable for base area developments and on-mountain lodges.

Ski trails that have a high degree of solar exposure can have the resultant "solar burn out" minimized through careful design, including detailed grading (angling trails away from direct exposure), reduced trail width (maximizing shade from edge vegetation) and erosion control (directing melt waters away from the trails).

The majority of CMR's skiable terrain is east or northeast facing, with a few slopes oriented to the southeast. Of the existing ski terrain, the areas accessed by Tamarack, Sundance, and Huckleberry chairs are predominantly east or northeast facing. The terrain in the The Chutes area along Gravenstafel Ridge, and in the catskiing area on Haig Ridge are southwest facing and are at the greatest risk of solar burn out. The base area sits in the flat valley bottom, or has a slight eastern exposure. However, the north south orientation of the Westcastle Valley ensures natural sunlight throughout the day.

3.2.4 Mountain Fall-Line Analysis

The Fall-Line Analysis was completed to assist in the identification of contiguous skiable areas. Effectively, a fall-line analysis identifies potential routes that will allow for the natural flow of skiers and snowboarders from the mountain heights to the valley bottoms in a continuous, unbroken fashion. This consistency of fall-line provides the best recreational skiing experience while causing the least amount of environmental disruption during trail construction. Based on this analysis, the development of defined planning units (terrain pods) can be established and specific run layouts incorporated into the mountain plan. Opportunities for re-alignment and modification of existing runs can also be identified.

The fall-line analysis, in conjunction with the elevation and slope analyses of CMR, illustrate the significant potential and connectivity throughout much of the study area.
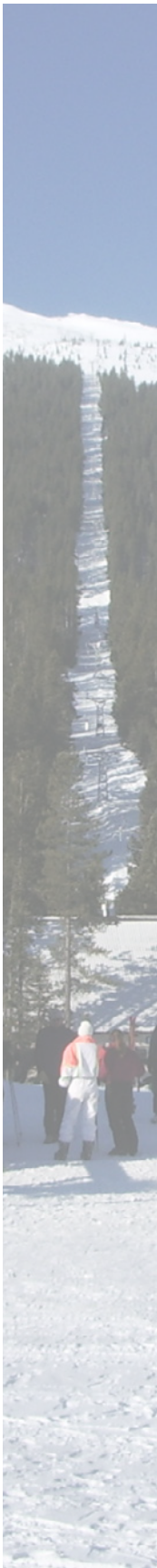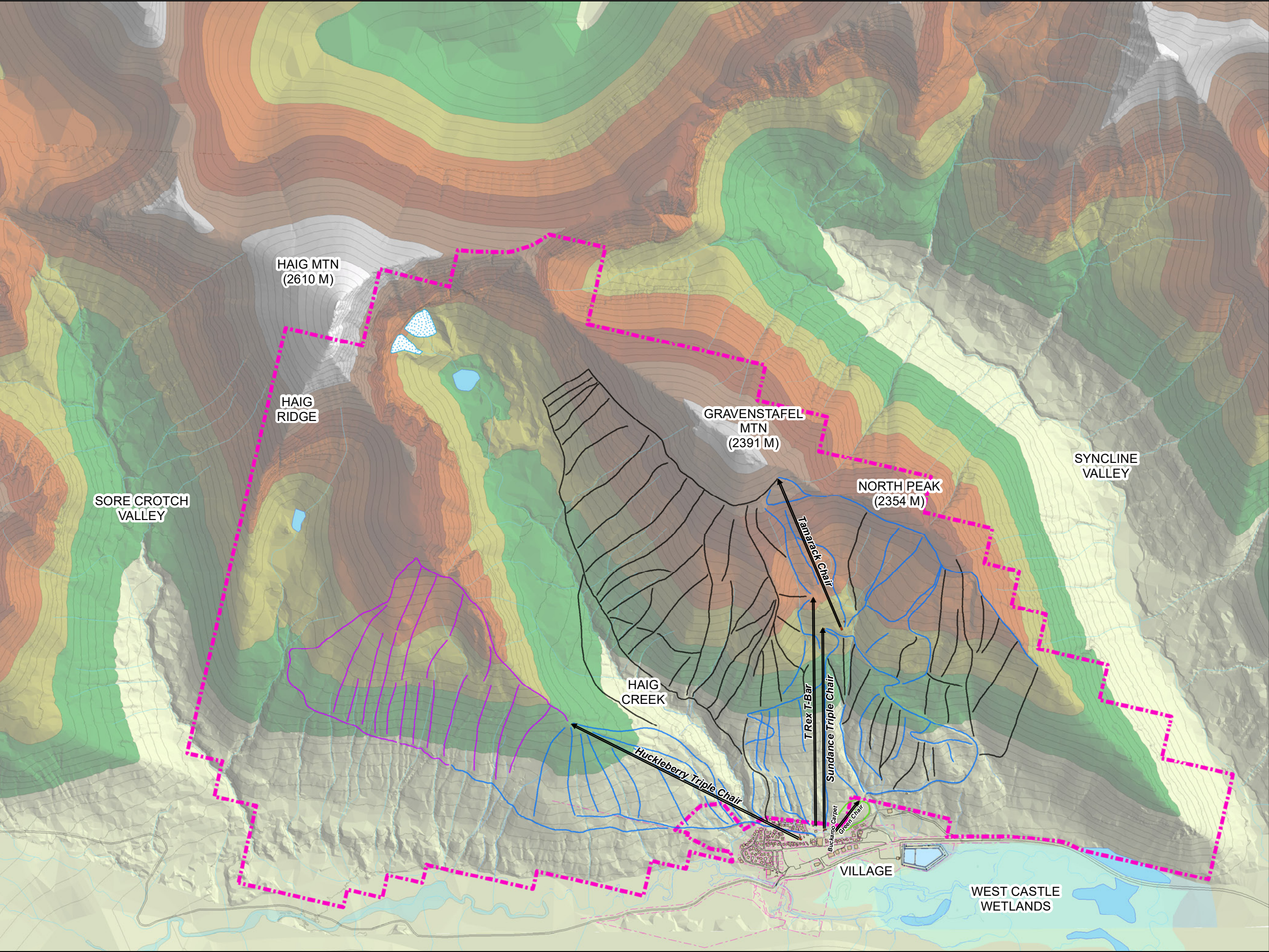
Castle Mountain Resort
Master Development Plan
2017

Legend

West Castle Wetlands

Ski Run Category
— Beginner
— Intermediate
— Advanced
— Expert
— Catskiing

Ski Area Boundary
— License of Occupation

Elevation Analysis
In metres

	2475 - 2605
	2325 - 2475
	2200 - 2325
	2075 - 2200
	1925 - 2075
	1800 - 1925
	1650 - 1800
	1400 - 1650
	1395 - 1400

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1:20,000

0 150 300 600
Meters

HAIG MTN (2610 M)
HAIG RIDGE
SORE CROTCH VALLEY
GRAVENSTAFEL MTN (2391 M)
NORTH PEAK (2354 M)
SYNCLINE VALLEY
HAIG CREEK
Tamarack Chair
T.Rex T-Bar
Sundance Triple Chair
Huckleberry Triple Chair
Buckaroo Carpet
Green Chair
VILLAGE
WEST CASTLE WETLANDS

Elevation Analysis

Figure 3-2

Castle Mountain Resort
Master Development Plan
2017

Legend

Ski Run Category
— Beginner
— Intermediate
— Advanced
— Expert
— Catskiing

Ski Area Boundary
▪▪▪ License of Occupation

Aspect Analysis
- Flat
- North
- Northeast
- East
- Southeast
- South
- Southwest
- West
- Northwest
- North

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HAIG MTN
(2610 M)

HAIG
RIDGE

SORE CROTCH
VALLEY

GRAVENSTAFEL
MTN
(2391 M)

NORTH PEAK
(2354 M)

SYNCLINE
VALLEY

Tamarack Chair

T Rex T-Bar

Sundance Triple Chair

HAIG
CREEK

Huckleberry Triple Chair

Buckaroo Carpet

Green Chair

VILLAGE

WEST CASTLE
WETLANDS

Aspect Analysis

Figure 3-3

3.2.5 Mountain Avalanche Hazard and Control

CMR has a robust avalanche mitigation strategy in place, that is carried out by highly qualified and experienced personnel. The base village area is located in a low avalanche risk area. As the potential expansion of the CMR lift and trail system is incrementally realized, a full analysis the site specific avalanche hazard and control will need to be completed to determine the extent that the existing strategy would have to be upgraded.

Patrollers on Castle Mountain
Photo: Dave Stimson/CMR, 2016
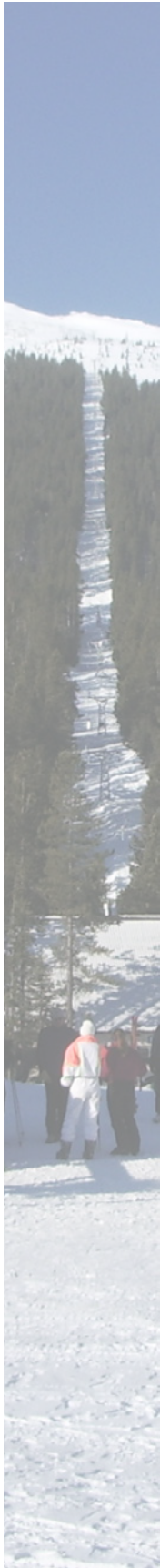
3.2.6 Mountain Bike Slope Analysis

A Mountain Bike Slope Analysis was undertaken to help identify those lands with the suitable gradient for use as mountain bike trails (Fig. 3-4 and Table 3-3). The analysis involves colour coding the topographic features within the CMR study area based on bike-able slope gradients. The following table defines the gradients in terms of their desirability for downhill mountain bike park development.

Table 3-3 Mountain Bike Slope Gradient

Type of Terrain	Mountain Biking Terrain	Range of Acceptable Gradients (%)
Flat	Try to avoid. Drainage will be an issue.	0 - 5%
Preferred	Best range for skill parks, trail hubs, trail intersections, climbing turns and all levels of trail development.	5 - 25%
Possible	Maximum preferred grade for switchbacks.	25 - 40%
Generally Avoid	Switchbacks require retaining structures.	40 - 55%
Avoid	Too steep for Mountain Bike use.	50% +

Based on the analysis, it is apparent that much of the terrain is too steep for lift serviced or shuttle mountain biking. Internal to the LOC, the two notable exceptions are the lower elevations of Haig Ridge (downhill mountain biking) and the Haig Valley area (cross-country mountain biking). The terrain below the Huckleberry chair contains Possible or Preferred terrain with gradients up to 40%. This steeper terrain in close proximity to a chairlift makes the area well-suited for lift-accessed mountain biking. The Haig Valley area, between Gravenstafel and Haig Ridge, contains a large area of low to moderate gradient terrain ideal for cross-country mountain biking and compatible recreational activities.

Outside of the LOC, both the Syncline and Sore Crotch Valleys have significant cross-country mountain biking potential. In combination with existing roads and trails in the Castle Wildland and Provincial Parks, there appears to be a great opportunity to build and facilitate backcountry mountain biking and touring. Specifically, the Great Divide Trail, a cross-country mountain bike touring route that connects Canada to Mexico is located in the adjacent valley in British Columbia, on the west side of Mt Haig. CMR could become a key staging and egress point to this increasingly popular trail.
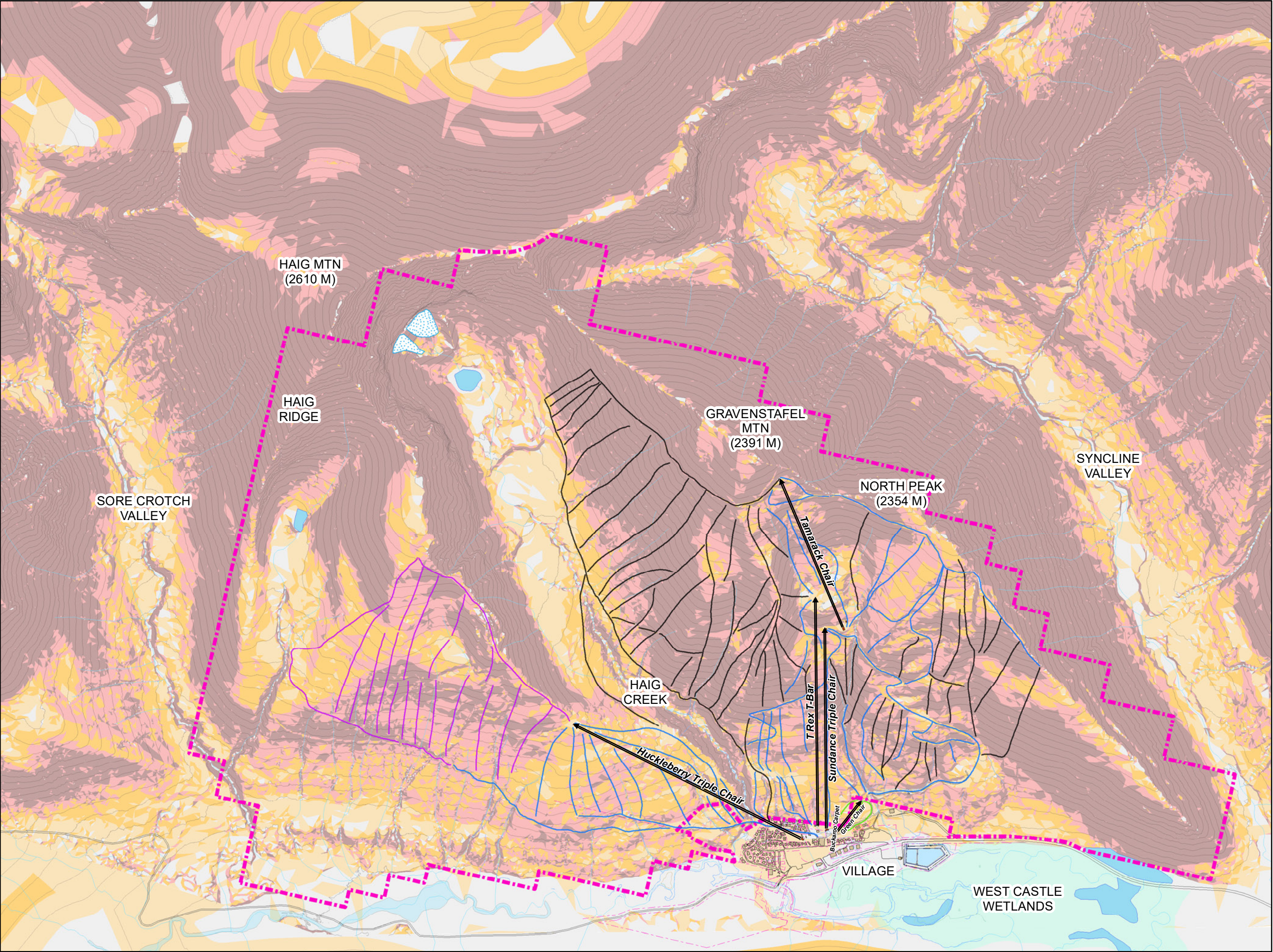
Castle Mountain Resort
Master Development Plan
2017

Legend

Ski Run Category
— Beginner
— Intermediate
— Expert
— Advanced
— Catskiing

Ski Area Boundary
–·– License of Occupation

MTB Slope Analysis
Flat
Preferrable
Possible
Generally Avoid
Avoid

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1:20,000

0   150   300   600
                          Meters

HAIG MTN
(2610 M)

HAIG
RIDGE

SORE CROTCH
VALLEY

GRAVENSTAFEL
MTN
(2391 M)

NORTH PEAK
(2354 M)

SYNCLINE
VALLEY

HAIG
CREEK

Tamarack Chair

T Rex T-Bar

Sundance Triple Chair

Huckleberry Triple Chair

Buckaroo Carpet

Green Chair

VILLAGE

WEST CASTLE
WETLANDS

Mountain Bike
Slope Analysis

Figure 3-4

3.3 BASE AREA TERRAIN ANALYSIS

The base area at CMR was analyzed using 1 metre contour mapping. This analysis was completed in terms of slope, elevation and aspect in order to determine the best potential layouts and concepts. The resultant detailed plan is fully described in Section 4.0.

3.3.1 Base Area Slope Analysis

The Slope Analysis of the base lands study area was completed as illustrated in Figure 3-5. As indicated, the slopes of the lands were categorized based on the physical capability to support specific types of development.

The grey areas represent areas less than 5% slope. Generally, this land is ideal for all types of built development (base lodge/village development; high, medium and low density residential; parking lots; settlement ponds; etc.). However, it is important to note that these same areas, because they are flat, limit the ski in/ ski out qualities. In addition, these lands can be wet and environmentally sensitive, adding to the development challenges.

Lands with slopes between 5% and 10% (yellow) that surround the 'flat' lands (less than 5%) have significant development potential. With some minimal grading, these lands can all be tied together into a contiguous development opportunity.

The green coloured slopes represent areas with terrain greater than 10% but less than 20% slope. These lands may be utilized for built development, subject to more difficult access issues. While they are generally too steep for base area staging capabilities and high-density development, they are still conducive to medium and low-density residential development as well as limited golf course considerations. As illustrated, there are a variety of consolidated areas within this classification.

Slopes between 20% and 30% gradients (indicated by light blue) are lands where medium density development becomes more challenging. The key to entertaining such development is both vehicular access and the establishment of sufficient off street parking in an economically viable fashion. Low-density single family and duplex type development may be applied to these lands with greater ease than the multi-family, medium-density models. The benefits of development on these slopes usually include ski to/ski from capabilities, unrestricted views and good solar access.

The dark blue colour represents areas with slopes between 30% and 40%. This generally represents the maximum limit to low-density development without incurring access and development expenses beyond economic viability. The challenges of developing on these slopes are often offset by the benefits of big views and excellent solar access.
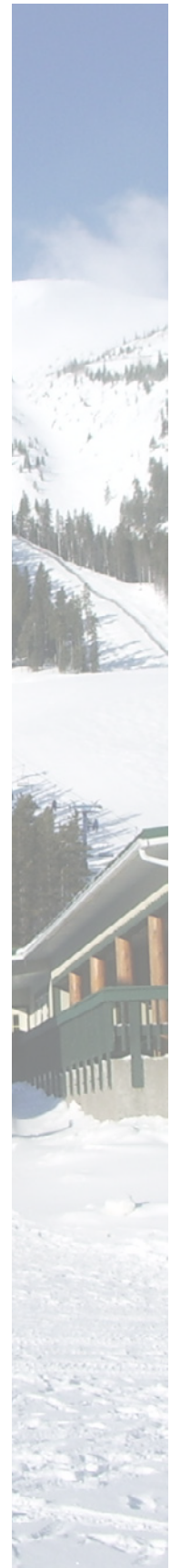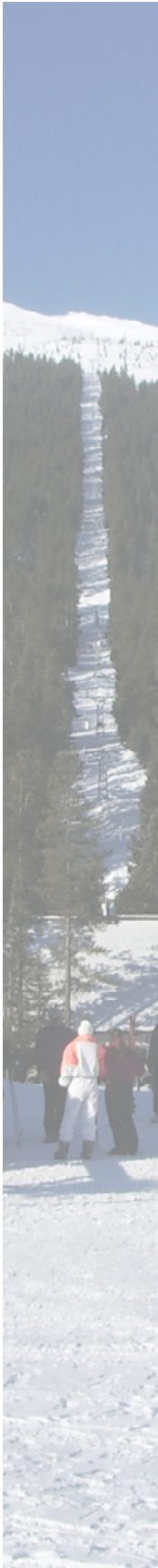
Finally, pink coloured areas represent slopes greater than 40%. These areas should largely be avoided due to the difficulties of access and the expense of building, unless special circumstances prevail. As illustrated in the Base Area Slope Analysis, there are no contiguous areas with this classification.

Table 3-4 Acceptable Base Area Slopes

Slope	Building and Development Potential Use
0 - 10%	Capable of accommodating all types of base area development with limited grading. Typically identifying parking potential as well as lands that may be wet and environmentally sensitive to development.
10 - 20%	Lands that will require some grading to accommodate development. Upper limits to base area/village and golf course development.
20 - 30%	Upper limits to multifamily development with grading.
30 - 40%	Upper limits to conventional single family development.
40%+	Generally too steep for development. However, dependent on reasonable access and geotechnical considerations, some development possible.

The capacity of the mountain facility development is directly hinged to the staging capacity of the base area lands. Based on these slope classifications, it is apparent that there is a lack of obvious and easy to develop flat land for parking and village development adjacent to the existing base village lands. This limits the potential growth of CMR. The only real opportunity to increase base area capacity lies at the lower elevations of Haig Ridge and/or the front of the Syncline Valley. These lands are flat enough to accommodate significant parking and day use base area development.

The Haig Ridge lands are located within the LOC and at the bottom of potential ski area development expansion. Most notably, these potential base lands would link directly to the much needed potential Beginner skiing. However, in order to access these lands, a new 2.5 kilometre road would have to be constructed and maintained.

The Syncline Valley lands are outside of the LOC and have no direct existing or potential skiing links. They are however, located immediately adjacent to the access highway.
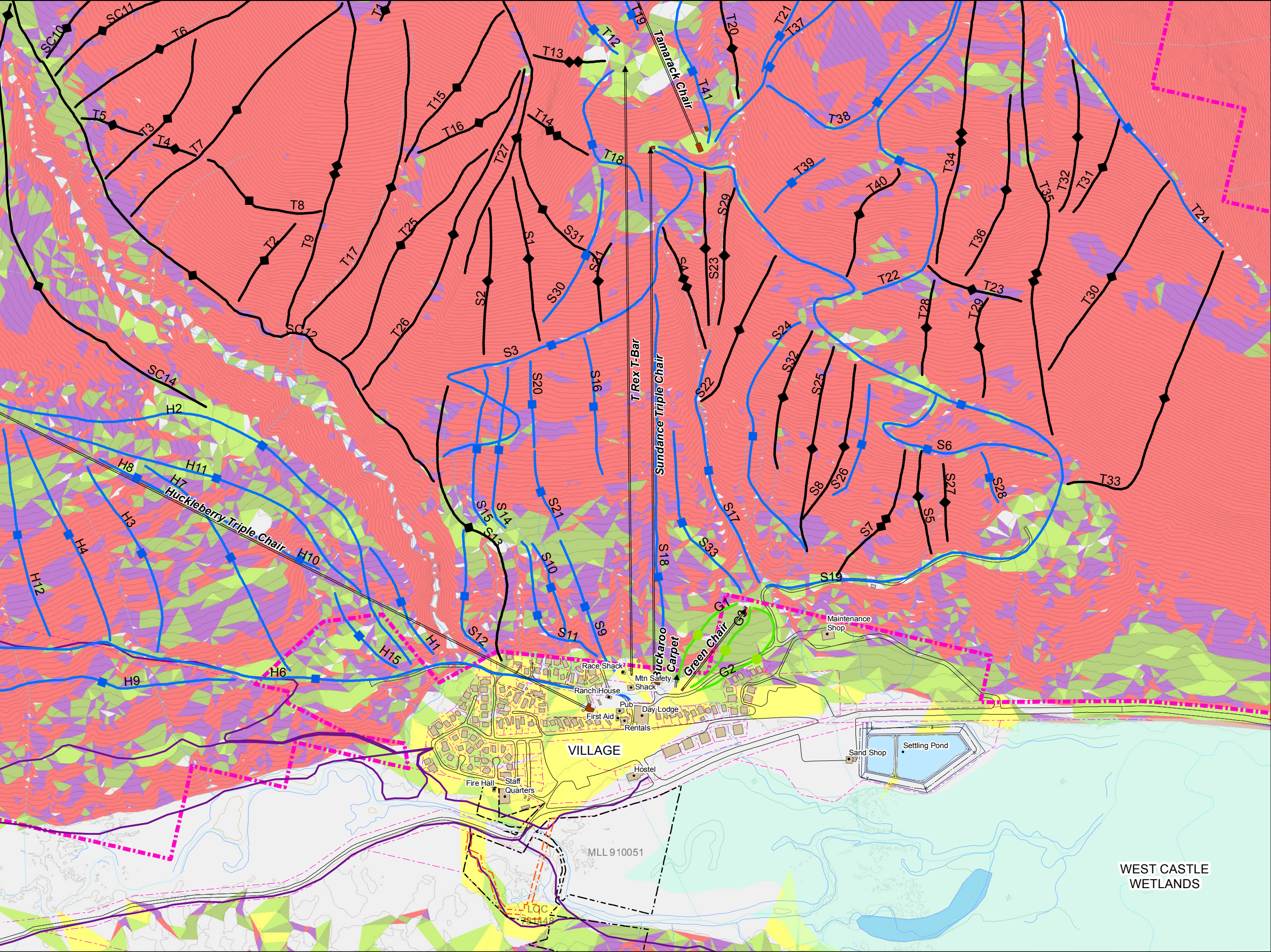
Castle Mountain Resort
Master Development Plan
2017

Legend

- MLL 910051
- LOC 781448
- Existing Lifts
- West Castle Wetlands

Ski Run Category
- Beginner
- Intermediate
- Advanced
- Expert
- Catskiing
- Cross Country Skiing

Ski Area Boundary
- License of Occupation

Base Slope Analysis
- Suitable for All Construction Types
- Acceptable for High Density
- Maximum for High Density
- Acceptable for Low Density
- Maximum for Low Density
- Not Suitable

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1:7,500

0   60   120   240
Meters

Base Area
Base Slope Analysis

Figure 3-5

VILLAGE

WEST CASTLE
WETLANDS

MLL 910051

MASTER DEVELOPMENT PLAN

4.0 MASTER DEVELOPMENT PLAN

4.1 INTRODUCTION

The Master Development Plan for Castle Mountain Resort (CMR) describes the proposed transformation of this already successful ski area into an iconic all season international and regional destination resort. The following describes the various components and elements that make up the Master Development Plan. It is divided into two primary pieces - the expansion of the mountain facilities and recreation amenities and the expansion of the base area developments. Each is detailed in its proposed "resort buildout" condition.

A key intent of this Master Development Plan is to focus on the development of a high quality mix of all-season mountain and recreation facilities and attractions. To be successful, these will be designed to reflect the expectations of existing and future day use and destination guests. The size and scale of the base area facilities will reflect the Balanced Resort Capacity of those mountain recreation facilities and attractions, providing the appropriate combination of support facilities and services to meet the needs of the guests during their visit. The proposed creation of the Castle Mountain Village core area and the expansion of overnight accommodation will follow the vision and direction established in the 2008 Village Master Plan.

Sequentially phased implementation the mountain facilities of the Master Development Plan have been delineated. Regarding the timing, it must be noted that expansion of the mountain, base area facilities and accommodation will only be initiated when market conditions, ongoing resort utilization and resort area trends all indicate that there is a business case for doing so.

As follows:

- Section 4.2 details the Mountain Development Plan and resort recreation;

- Section 4.3 describes the Other Resort Attractions;

- Section 4.4 outlines the Resort Capacity and the anticipated Visitation at buildout;

- Section 4.5 is dedicated to specifying the scale and scope of the associated Base Area Village Development Plan;

- Section 4.6 describes the basic requirements regarding Service and Infrastructure;

- Section 4.7 illustrates the proposed boundary adjustments by buildout of the Licence of Occupation;

- Section 4.8 describes the CMR Master Development Plan Implementation Strategy;

- Section 4.9 describes the CMR Master Development Plan at Buildout.
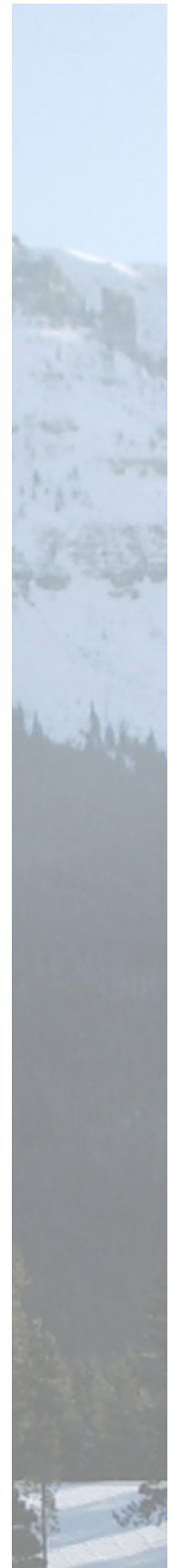
Castle Mountain summer view from the top of Tamarack chairlift
Photo: BHA, 2016

4.2   MOUNTAIN DEVELOPMENT PLAN

Based on the detailed Inventory and Analysis of the mountain terrain (See Sections 2 and 3) and its physical capability to support additional development, it is clear that CMR has significant skiing and snowboarding expansion potential. Further, the surrounding "backcountry" lands also offer a great deal of opportunity to support a wide range of all-season recreation activities, centered and staged from the CMR base areas.

Utilizing the completed analyses as a foundation, more comprehensive and detailed technical opportunities and constraints have been completed. These resulted in the creation of a series of development concepts from which the Preferred Concept was derived. This Preferred Concept became the basis for the Master Development Plan. This section details the extent of ski area development that is proposed for CMR's mountain facilities expansion. It illustrates the exact configuration of all proposed lifts, trails and gladed areas at buildout, as well as demonstrating the associated capacities, and market distribution of ski terrain.

4.2.1 MOUNTAIN DEVELOPMENT GOALS

It is the intent of the Mountain Development Plan to provide the blueprint to define, describe, protect and develop CMR's alpine environment such that it anticipates and capitalizes on evolving market trends, establishes a unique and distinctive character and ultimately is fundamentally about 'mountain play' on a year-round basis.

The defined vision for the resort has led to the use of a mix of design criteria applied in successful mountain resorts throughout North America. Reflecting changes in expectations of the marketplace and CMR's desire to be a successful unique and special, powder skiing and backcountry oriented mountain resort, the lowest possible alpine skiing densities are to be applied in the design. Equally, planning for a summer product that complements the attributes of the surrounding parks, attractions and facilities will cater to the growing market demand and all season international and regional destination guest expectations for a low key, environmentally aware offering.

Building on the identified goals and objectives of the resort as a whole (see Section 1: Introduction), the following development goals were envisioned for the mountain area, divided into season and type of activities:
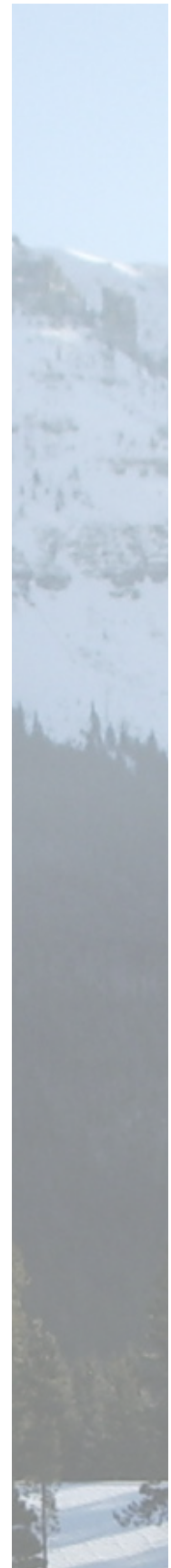
WINTER SEASON – SKIING AND SNOWBOARDING

• Optimize the development of advanced and expert terrain reinforcing Castle's reputation of offering iconic steep ski terrain;

• Maximize the development of beginner and novice terrain in an effort to improve the balance of the offering at Castle Mountain;

• Provide beginner terrain to the greatest extent possible in close proximity to the Village;

• Develop new beginner and novice terrain along with a new satellite base area and parking;

• Continue to offer terrain that reinforces the diverse needs of families and provides something for everyone, from traditional ski runs to gladed, adventure terrain for all ability levels;

• Continue to offer terrain that is designed to encourage an advancement of skier/ snowboarding skills;

• Provide intermediate/entry level glades that are 'feathered' into more advanced gladed terrain;

• Realize efficiencies within existing terrain through modifications;

• Continue to upgrade the ski lift system to cater to a low density powder skiing experience;

• Preserve, develop and enhance the ski to/ski from capabilities of the base village developments;

• Develop exciting new terrain that will inspire the market;

• Develop a comprehensive snowmaking system, utilizing state of the art technologies to ensure a re-liable snowpack especially on the lower elevations; and

• Develop on-mountain facilities that will cater to the diverse needs and expectations of skiers and snowboarders in each area of the mountain.

WINTER SEASON – OTHER ACTIVITIES

• Provide alternative winter activities for guests, recognizing the diverse needs of families, such as:

- Snowshoeing;
- Cross-country skiing;
- Backcountry skiing and touring;
- Guided recreation activities;
- Catskiing.

SUMMER SEASON

- Plan for, design and develop a:

  - Downhill mountain bike park that is lift serviced, complemented with skills park and supporting facilities;
  - Cross-country mountain bike trail system that is lift serviced, complemented with supporting facilities;
  - Backcountry oriented cross-country mountain biking trail network, staging from Castle and accessing trails in the Castle Wildland and Provincial Parks, including access to the Great Divide Trail;
  - Via ferrata;
  - Aerial adventure park and zip lines, designed to be unique to Castle Mountain Resort;
  - Consider and develop additional adventure tourism opportunities in and around Castle Mountain;
  - Preserve, enhance and expand on the trails catering to hiking, trail running, and backcountry back-packing alpine trails staged from Castle Mountain Resort;
  - Explore the opportunities to develop additional summer attractions, facilities and celebrations, based from the Castle Mountain Village.

Castle Mountain Base Area in the Summer
Photo: BHA, 2016

4.2.2 PRELIMINARY WINTER TERRAIN CAPACITY ANALYSIS

After synthesizing the results of the various analyses, several conceptual alternatives for mountain resort facilities and amenities were explored. Well-integrated skiing potential was identified within a number of development areas, as illustrated on the Mountain Development Opportunities Plan (Figure 4-1). These areas are:

• Haig Ridge;

• Haig Valley;

• The North Bowl;

• Existing Area and Infill;

• Backcountry:

    - Castle South;

    - Syncline Valley;

• Base Area:

    - Village Infill;

    - Satellite.

View of the Base area, Haig Mountain and Syncline Valley
Photo: CMR, 2017

Castle Mountain Resort
Master Development Plan
2017

HAIG MTN
(2610 M)

West Castle Wetlands

HAIG
VALLEY

HAIG
RIDGE

SORE
CROTCH
VALLEY

GRAVENSTAFEL
MTN
(2391 M)

SYNCLINE
VALLEY

BACKCOUNTRY
CATSKIING
SYNCLINE
VALLEY

NORTH PEAK
(2354 M)

EXISTING
INFILL

HAIG
CREEK

Tamarack Chair

T Rex T-Bar

Sundance Triple Chair

Huckleberry Triple Chair

NORTH
BOWL

BACKCOUNTRY
CASTLE
SOUTH

Buckwood Carpet

Lynx Chair

POTENTIAL SATELLITE BASE

BASE AREA
VILLAGE INFILL

WEST CASTLE
WETLANDS

Legend

→ Existing Lifts
— · — Existing LOC
West Castle Wetlands
Expansion Potential
Backcountry Castle South
Backcountry Catskiing Syncline Valley
Base Area Village Infill
Existing Infill
Haig Ridge
Haig Valley
North Bowl
Potential Satellite Base

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0   150   300   600
Meters

Development
Opportunities Plan

Figure 4-1

4.2.3 PROPOSED EXPANSION AND UPGRADES

The proposed expansion and upgrade areas are made up of a series of land use pods, or partial pods. The majority of these are ski pods, defined by skiablity within the LOC. They are complemented by the ability of a pod containing other attractions along with the capability of the base village and a satellite base to stage and service all of the facilities (Fig.4-2). External to the LOC, are specialized ski pods that have significant attributes that will balance and complete CMR in a fashion that will enable it to achieve the envisioned potential. This is illustrating the resort in it buildout condition. Development will be established in a series of sequential phases, responding to market trends and demand.
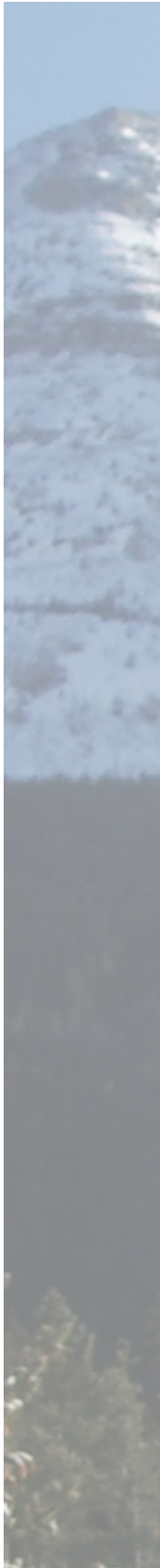
The ski pods were created based on the terrain characteristics and the envisioned potential uses and user type. The shape of the ski pods were delineated by skiability, radiating out from an upper elevation and returning naturally to a lower focal point. These were tied to a skier skill class and potential lift terminal locations. This terrain analysis illustrates that Castle Mountain has considerable potential for expansion, phased sequential growth to a highly marketable ski resort product.

The total area of potential skiable terrain within the CMR study area is approximately 800 hectares (2,000 acres). In order to take into account unskiable areas, slopes over 80% and under 8%, were removed. Typically, the actual skiable terrain ranges between 25% to 50% of the total area of the ski pods. According to these preliminary analyses, the Castle Mountain study area, excluding the existing lift and trail facilities, had the potential to develop approximately 350 hectares (850 acres) of additional ski terrain (using 35% trail development per unit of potentially skiable terrain). Additional gladed terrain would also be developed on another 15% of the expansion area.

The upper and lower points of a mountain development pod are used to determine the total vertical rise and average slope. This in turn is used to determine a basic skier/snowboarder skill class for each pod. Applying the corresponding low density powder oriented standards to each pod, the CMR area is capable of supporting approximately 3,500 to 4,000 skiers/day. Although the results were preliminary, they clearly indicate that there is sufficient expansion potential on the mountain, leading to the recommendation to complete a more detailed analysis of the opportunities inherent within the study area.

Once established, the skiing experience offered will be a fairly well balanced product that continues to adhere to CMR's established powder skiing reputation and culture. If the Castle study area's potential is fully developed and realized, it is not hard to imagine Castle Mountain becoming a standout international and regional ski destination.
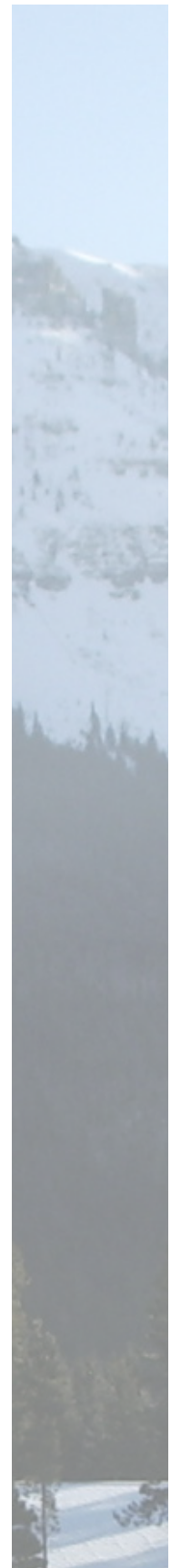
The following describes the land use areas and pods.

HAIG RIDGE

The development of Haig Ridge represents a significant expansion opportunity at CMR. The addition will transition the existing catskiing area into lift accessible terrain, making it easier for expert and advanced skiers to enjoy world-class experiences. Further, it will open up new intermediate terrain at CMR and align the offering at the resort with the majority of the skier marketplace.

The Haig Ridge expansion will be developed in three distinct components:

•   Haig One Chair;
•   Haig Two Chair;
•   Haig Three Chair.

The Haig One Chair will be fixed grip quad chair, providing lift access to the current catskiing area, and create new intermediate and advanced runs. The terrain has already been proven to offer world-class skiing and will add considerable intermediate terrain to CMR's offerings. The Haig One expansion would link to existing mountain offerings via the Huckleberry Chair. While connected to the resort, the Haig One expansion would retain the ambience of a backcountry or remote skiing destination, setting up a unique skiing experience for the visitor.

The Haig Two Chair will be fixed grip quad chair, located below the Haig One Chair, will add further advanced and intermediate runs bringing CMR's terrain offerings in-line with the skier marketplace. Further, with lift access from the valley floor to the top of Haig Ridge, the addition of the Haig Two Chair would create options for 'peak to creek' runs in excess of 650m of vertical.
Finally, the addition of the Haig Three Chair will be a double chair, will bolster the number of intermediate runs at CMR and make it easier to travel to and from the Haig Ridge skiing.

HAIG VALLEY

The Haig Valley has been identified as an integral component to the CMR offering. In the winter it will contain cross-country ski trails and snowshoeing trails. In both cases, patrons will ride the Huckleberry Chair to gain access. From the top of the lift, visitors will ski (classic or skate) or snowshoe along a newly built access road into the Valley. The egress from the Valley can be either by downloading the Chair or via a long descent trail.

NORTH BOWL

The North Bowl is located at the northern end of Granvenstafel Ridge. Its face is oriented east, with steeper upper slopes suitable for intermediate and advanced trails, while its lower slopes contains terrain suitable for low intermediate skiing. This expansion will extend skiable terrain along the Gravenstafel Ridge, and offer an easily accessible and diverse range of terrain options. The expansion will open new intermediate and advanced terrain as serviced by the establishment of three new lifts:

• G T-Bar;
• North Bowl Chair;
• Minor Divide Chair.

The G T-bar will allow experienced skiers easier access to the advanced terrain to the north of the Tamarack Chair on Haig Ridge. It will increase the overall uphill capacity at higher elevations, subsequently making steep powder terrain more accessible to skiers, reducing lift lines and generally improving the visitor experience. The lower terminal of G T-bar will be located adjacent to the lower terminal of the existing Tamarack Chair. This gives skiers a greater number of run options, and has the added benefit of disbursing skier effort, maintaining lower skier density and the powder experience sought after by experienced skiers. It will be accessed via the new T-Rex Chair and complement the Tamarack Chair. A T-Bar was chosen in an effort to keep the upper mountain open and accessible on high wind days when the Tamarack Chair is unable to run.

The North Bowl Chair will be double chair offering an extensive range of advanced intermediate and expert trail and gladed skiing. It will be accessed via the T-Rex Chair or the Minor Divide Chair.

The Minor Divide Chair will be fixed grip quad chair located relatively close proximity to the Village base. This pod will connect existing Green Chair beginner area with intermediate and advanced terrain, creating a comfortable learning area where skiers will be able to improve their skiing ability, graduating from easier to more challenging runs. This allows groups or families of different skiing abilities to stay connected during the skiing experience. Further, the close proximity to the base area allows new and veteran skiers alike to easily transition between on-hill and village amenities.

EXISTING AREA AND INFILL

The redevelopment and infill of CMR's existing terrain is an opportunity to deliver an upgraded skiing experience. By replacing or realigning existing lifts and adding new lifts, CMR will make more effective use of its existing terrain, improve the ease and speed of circulation of visitors, renew aging infrastructure, support skier development and provide a more enjoyable visitor experience overall.
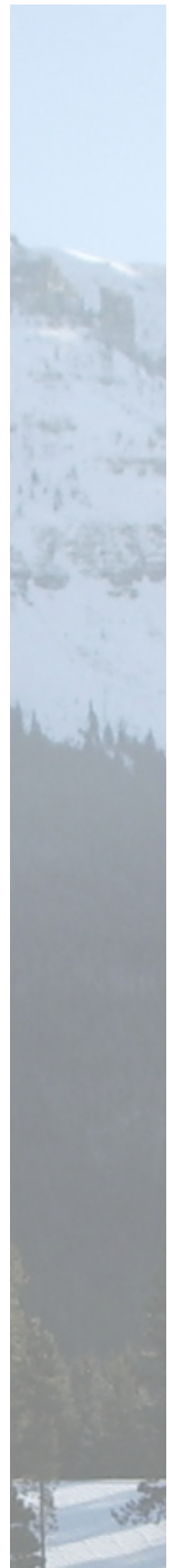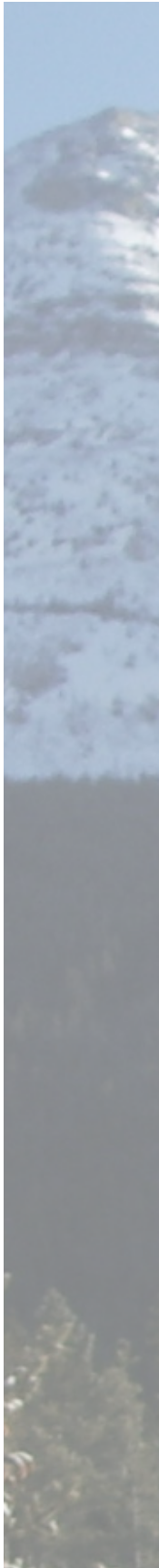
The timing of these redevelopments will be determined by market demand and economic trends. The lift improvements include:

- Tamarack Chair;
- T-Rex Chair;
- Race Chair;
- Green Chair;
- Rabbit Carpet.

The Tamarack Chair will remain as a double chair servicing the upper terrain of Gravenstafel and the South Chutes.

The T-Rex Chair is proposed as a fixed grip quad chair, replacing the existing Sundance Chair and T-Rex T-Bar. These conveyances currently act as the core of the on-mountain recreation activities, linking skiers to the Tamarack Chair at higher elevations and a large part of CMR's terrain. They are also the oldest lifts on the mountain, and follow a very similar alignment. The Sundance Chair was originally added to meet uphill demand capacity not served by the T-Rex T-Bar. Looking to the future, and in consideration of the expansions planned for CMR, the consolidation of these two lifts will increase operational efficiencies while maintaining the visitor experience. In place of these lifts, the T-Rex Chair will be installed and follow the same alignment as the old T-Rex T-Bar.

The Race Chair will be the relocated Sundance triple chair, realigned to support the athlete development programs at CMR. Specifically, the Race Chair will aid the Westcastle Ski Club, Castle Mountain Freestyle Ski Club, and Alberta Special Olympics. The Westcastle Ski Club has been training young skiers and hosting competitive ski races at CMR since 1984. Similarly, the Castle Mountain Freestyle Club offers coaching to youth in a range of freestyle disciplines, hosts Freestyle skiing events, and organizes a competitive freestyle ski team that travels to competitions across Alberta and B.C. Finally, CMR has a strong history of working with CADS (Canadian Association of Disabled Skiing) and will work towards supporting Para Olympians. To benefit these programs, a small race hut will also be constructed near the terminus of the chair to act as a storage and staging area for the ski clubs and athletes. From here, skiers will be able to access the existing Competitive Freestyle Ski Area or utilize the east facing slopes for race and skill development purposes. The development of the Race Chair will create a training area suitable for downhill and freestyle skiers, and foster the development of a new generation of athletes.

While the athlete development groups will undoubtedly benefit from this addition, the Race Chair will also benefit the broader skiing public. The Race Chair will be based in the village and rise to the tree line, just south of the new T-Rex Chair. As a result of this alignment, the Race Chair allows skiers to stay on the mountain if inclement weather sets in at higher elevations. This provides a degree of safety for prospective multi-day visitors that may be turned away if the guarantee of skiing everyday is in doubt.

Together, the Green double chair and the Buckaroo carpet will be realigned, expanding the terrain for beginner and novice skiers, which are currently underrepresented at CMR. The redevelopment will see the area undergo substantial regrading to make it more suitable for novice and beginner skiers. Additionally, fencing will be used to guide intermediate and advanced skiers around the beginner area, creating a dedicated space for learning. As part of this effort, intermediate and advanced ski runs that currently connect to the area from upslope will receive minor realignments. Finally, the new Green Chair will serve as the connection to the Minor Divide Chair, part of the North Bowl expansion. This will link beginner runs to new intermediate runs, creating a natural evolution in terrain that fosters the development of skier ability.

BACKCOUNTRY

As the name implies, the Backcountry will provide access to lands beyond to CMR skiers. It is effectively two areas:

- Castle South;
- Syncline Valley

Castle South will potentially be made up of two lifts and touring access:

- Backcountry Chair;
- Beginner Chair;
- Touring access.

The Castle South expansion will grant skiers lift access to the backcountry areas beyond the current ski area boundary. The development of this area will also open up new beginner, intermediate and advanced terrain in close proximity to the satellite base area (see Sec. 4.6). The result is an area where beginners can be taught how to carve their first turns, or challenge the steep faces within or outside the ski area boundary.

The Castle South area is situated to the south of the existing Village base, sitting opposite of Haig Ridge. It is comprised of two steeper faces, one oriented north and the other northeast, and a gentler face at lower elevations. The steeper faces are similar to the highly popular advanced slopes CMR is known for, while the gentler face would expand CMR's offering of beginner and novice terrain, which is currently lacking. The northern aspect of these areas will ensure a high quality snowpack throughout the year.

This expansion is a future phase of the proposed improvements to CMR. It will contain the Backcountry Chair and the Beginner Chair, both fixed grip quad chairs, and be serviced by the amenities and facilities of the potential satellite base area. The development of the Castle South expansion is contingent on an adjustment of CMR's current License of Occupation (see Sec 4.9), and market demand.
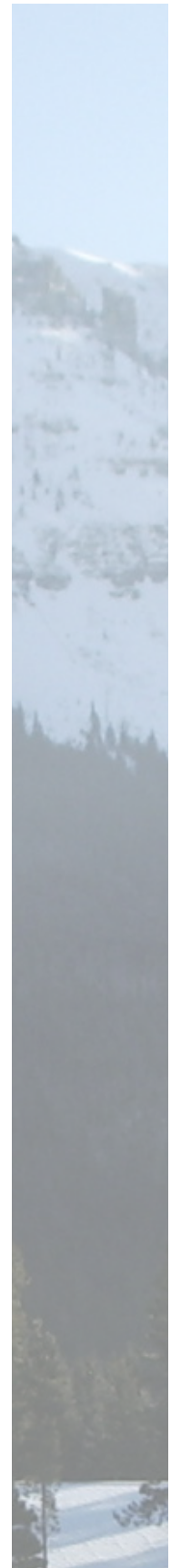
Finally, Castle South can contain the staging area for all-season backcountry touring of the Sore Crotch Valley and beyond.

The Syncline Valley will potentially include:

- Catskiing;
- Touring access.

The Syncline Valley is somewhat disconnected from CMR. However, depending on the intent of the Province and potential mechanisms for recreation use, there appears to be the physical opportunity to replicate the catskiing that is currently being offered on Haig Ridge. If this could be established in Syncline Valley it would be a dynamic complement to the buildout resort configuration of CMR.

Similar to Castle South, Syncline Valley can offer all-season backcountry touring opportunities to a wide spectrum of user types and skill sets.

BASE AREA

The Base Area land use areas are divided into the:

- Village Infill;
- Haig Base Area.

The CMR existing base village has potential to be expanded with infill development. This potential was identified in the 2008 Master Plan. It has been refined to complement the proposed ski area expansion and upgrades.

The Haig Base Area is located within the lower elevations of Haig Mountain. These lands are very well suited to become a day use oriented base, with significant parking capacity and a small day lodge. With the immediately adjacent beginner terrain there is the potential to take a large step towards having the necessary ability to introduce new skiers to the CMR market. To facilitate this, an access road will have to be built.

Castle Mountain Resort
Master Development Plan
2017
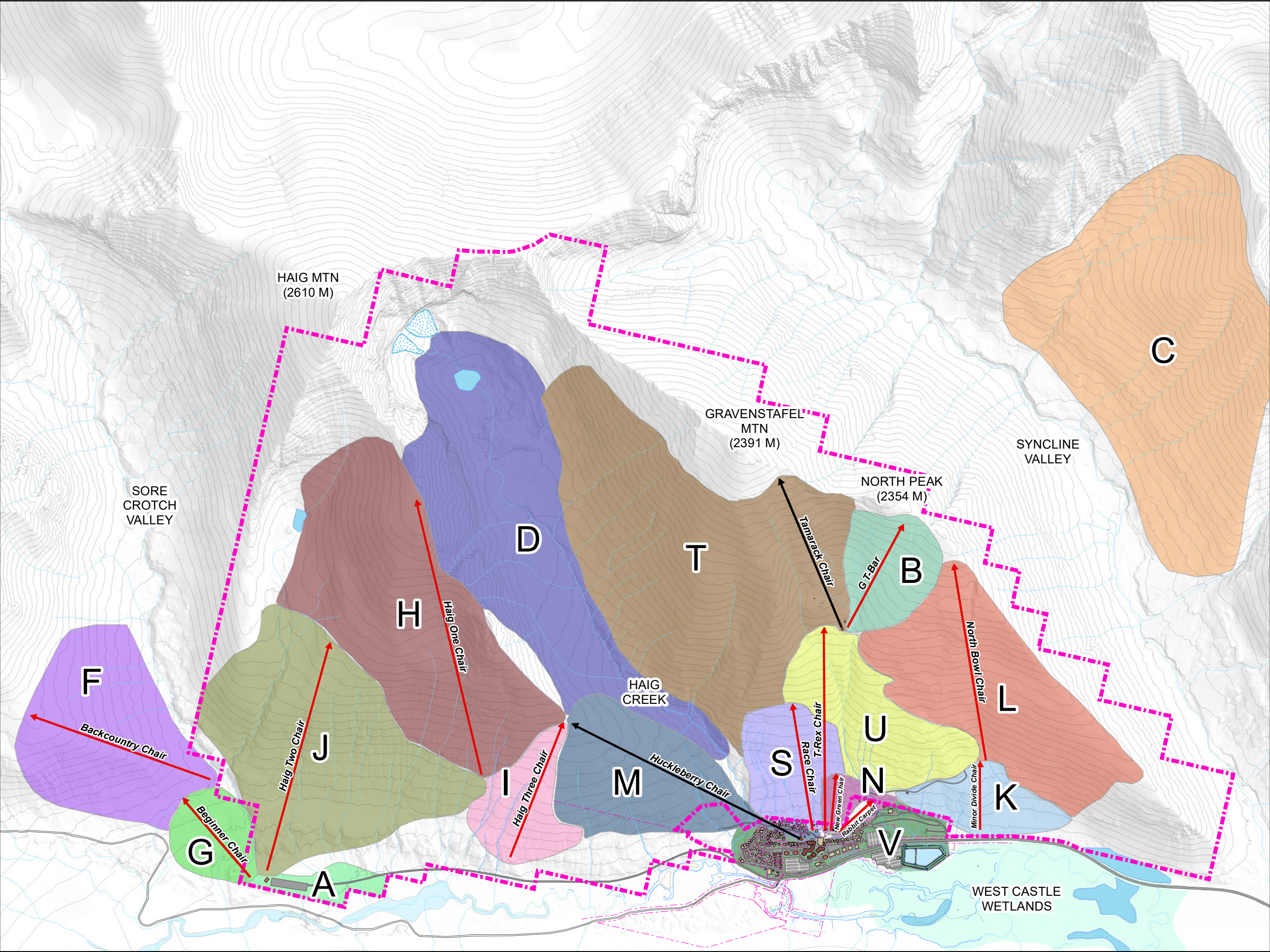
Existing LOC
West Castle Wetlands
Development Pods
A, Haig Base Area
B, G-TBar
C, Catskiing
D, XC Snowshoeing
F, Backcountry
G, Beginner
H, Haig One
I, Haig Three
J, Haig Two
K, Minor Divide
L, North Bowl
M, Huckleberry
N, Beginner 2
S, Race Chair
T, Tamarack
U, T-Rex Chair
V, Village

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1:20,000

0   150 300   600
                    Meters

Mountain
Development
Expansion Plan

Figure 4-2

HAIG MTN
(2610 M)

SORE
CROTCH
VALLEY

GRAVENSTAFEL
MTN
(2391 M)

SYNCLINE
VALLEY

NORTH PEAK
(2354 M)

HAIG
CREEK

WEST CASTLE
WETLANDS

Haig One Chair
Haig Two Chair
Beginner Chair
Backcountry Chair
Haig Three Chair
Huckleberry Chair
Tamarack Chair
G T-Bar
T-Rex Chair
Race Chair
New Green Chair
Rabbit Carpet
North Bowl Chair
Minor Divide Chair

4.2.4 PROPOSED SKI TRAIL DEVELOPMENT

The proposed expansion of lifts and trails at CMR will see the realignment of some of the existing terrain use plus the addition of the new ski area expansion lands. The following sections detail the specific nature and technical characteristics of this Mountain Plan in its proposed buildout form.

The Mountain Existing and Proposed Ski Lifts and Trails (Figure 4-3) graphically illustrates the proposed mountain expansion as it relates to the existing lift and trail development.

The Proposed Ski Trails by Skier Category (Figure 4-4) distinguishes the trails in terms of their skier skill classifications.

The details of the ski trails are listed in Table 4-1.

Each ski trail or trail segment is identified by an alphanumeric code, which identifies the trail on all associated mapping as well as within the geospatial and statistical databases. Proposed gladed areas have been left as larger pods showing potential gladed terrain. Detailed design will result in specific areas being developed as glade skiing.

Castle Mountain in the Winter
Photo: CMR, 2017

4.2.5 SENSITIVE SKI TERRAIN DEVELOPMENT

Castle Mountain Resorts strives to ensure the ecological integrity of the region, and will work to protect and preserve the West Castle Wet Lands. To that end, CMR will not plan for any development within the Wet Lands and ensure that any development adjacent to these lands have a negligible impact. Further, CMR will work with residents, the M.D. of Pincher Creek, and Alberta Parks to ensure the health of the adjacent public lands for the enjoyment of all Albertans into the future.

Tamarack Chairlift
Photo: BHA, 2016

Existing LOC
West Castle Wetlands
Ski Lifts
Existing Lifts
Proposed Lifts
Ski Trails
Proposed Ski Trails
Existing Ski Trails

1:20,000

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                     Meters

Existing and
Proposed Ski
Lifts and Trails

Figure 4-3

Backcountry Chair
Haig Two Chair
Haig Three Chair
Haig One Chair
Huckleberry Chair
Tamarack Chair
G T-Bar
Race Chair
T-Rex Chair
North Bowl Chair
Minor Divide Chair
New Green Chair
Rabbit Carpet

Castle Mountain Resort
Master Development Plan
2017

Legend
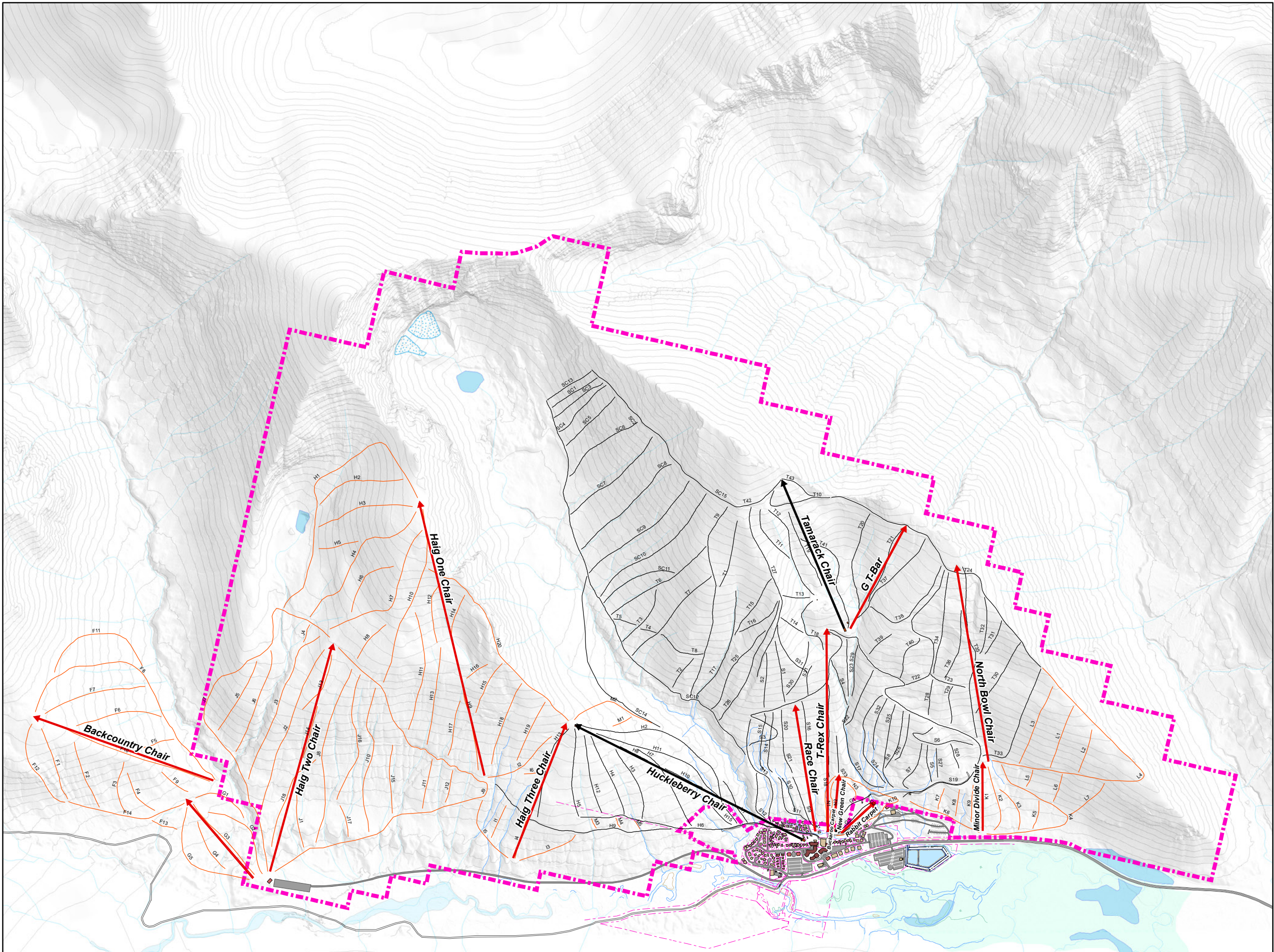
West Castle Wetlands
Existing LOC

Ski Lifts
→ Existing Lifts
→ Proposed Lifts

Ski Trail Category
●— Beginner
■— Intermediate
♦— Advanced
♦♦— Expert

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1:20,000

0   150   300   600
                          Meters

**Proposed Ski Trails
By Skier Category**

Figure 4-4

4.2.6 PROPOSED SKI TRAILS

As illustrated on Figures 4-3 and 4-4, the following table details the proposed alpine ski trail development:

TABLE 4-1: SUMMARY OF EXISTING AND PROPOSED SKI TRAILS

Run Number	Run Name	Slope Length (m)	Vertical Drop (m)	Average Slope (%)	Average Width (m)	Trail Area (ha)	Skill Class
Tamarack Pod							
T1	High Plains	428.21	188.76	49.58	200	8.56	Advanced
T2	Cinch Sluffs	235.52	123.70	62.24	160	3.77	Advanced
T3	Gambler Glades (Gladed)	399.27	170.91	48.01	105	4.19	Advanced
T4	Easy Out Mid	93.14	21.29	23.74	10	0.09	Advanced
T5	Easy Out Lower	133.37	15.58	12.05	10	0.13	Advanced
T6	Gambler	756.88	367.46	56.32	60	4.54	Advanced
T7	Full House	732.69	365.26	58.38	175	12.82	Advanced
T8	Easy Out Upper	280.89	17.37	8.69	10	0.28	Advanced
T9	Drifter	1277.83	600.24	54.20	125	15.97	Expert
T10	Easy Ramp	435.55	68.20	17.42	10	0.44	Intermediate
T11	Tamarack Bowl	384.06	179.99	54.39	65	2.50	Advanced
T12	Tamarack	626.60	266.84	48.85	60	3.76	Intermediate
T13	Showboat	174.32	77.09	52.97	40	0.70	Expert
T14	The Cliffs	190.46	112.61	81.61	70	1.33	Expert
T15	Showdown	439.81	222.13	58.97	130	5.72	Advanced
T16	Show Girl	326.37	158.11	56.10	75	2.45	Advanced
T17	OK Corral	757.77	367.44	56.58	150	11.37	Advanced
T18	South Bowl	389.10	128.24	38.33	50	1.95	Intermediate
T19	Lewico's Lane	504.73	214.88	47.98	50	2.52	Intermediate
S1	The Burn	409.17	219.15	63.86	40	1.64	Advanced
S31	Enchanted Forest (Gladed)	564.55	242.62	51.11	50	2.82	Intermediate
S2	Trapper (Gladed)	364.09	198.95	65.66	120	4.37	Advanced
T24	Skyline Traverse	1647.01	280.60	18.08	10	1.65	Intermediate
T25	Being There (Gladed)	640.63	332.29	61.13	70	4.48	Advanced
T26	Side Show	870.92	420.90	56.04	50	4.35	Advanced
T27	Huckleberry Ridge	1106.46	428.07	42.66	40	4.43	Advanced
T31	Northern Exposure (Gladed)	253.80	140.64	67.41	80	2.03	Advanced
T41	Deputy	687.13	217.78	35.25	70	4.81	Intermediate
T42	South Skyline	1456.21	187.29	14.46	10	1.46	Intermediate
T43	Off Ramp	227.78	74.88	35.36	20	0.46	Intermediate

Run Number	Run Name	Slope Length (m)	Vertical Drop (m)	Average Slope (%)	Average Width (m)	Trail Area (ha)	Skill Class
Tamarack Pod (South Chutes)							
SC1	Deadwood Minus Two	381.24	228.20	77.52	45	1.72	Expert
SC2	South Skyline	420.75	38.49	19.11	20	0.84	Expert
SC3	Minus One	414.33	236.56	71.94	40	1.66	Expert
SC4	Zero	455.00	249.80	67.70	50	2.28	Expert
SC5	Murphy's Law	473.46	265.83	70.02	80	3.79	Expert
SC6	Haavy's Dream	597.53	318.36	66.50	150	8.96	Expert
SC7	High Rustler	731.96	350.24	55.60	150	10.98	Advanced
SC8	Desperado	811.52	400.01	57.84	150	12.17	Expert
SC9	Lone Star	890.77	438.03	57.43	130	11.58	Expert
SC10	Blazing Saddles	969.37	474.00	56.69	120	11.63	Advanced
SC11	Saddle Up (Gladed)	504.07	215.58	47.89	95	4.79	Advanced
SC12	Cinch Traverse	2460.88	301.95	14.07	10	2.46	Advanced
SC13	Minus Three	370.81	218.69	76.33	60	2.22	Expert
SC14	Cinch Forks	1052.18	110.00	11.30	10	1.05	Advanced
G T-Bar Pod							
T37	Bandito	710.51	261.94	40.53	100	7.11	Intermediate
T21	Outlaw	499.63	214.51	48.14	150	7.49	Intermediate
T20	Sheriff	637.45	268.63	47.63	150	9.56	Advanced
T39	Goat Run	185.22	77.76	46.70	75	1.39	Intermediate
T38	High Noon	622.35	180.85	30.96	40	2.49	Intermediate
T-Rex Pod							
S18	Centre Run	567.90	242.37	47.40	45	2.56	Intermediate
S17	Shotgun	607.75	168.62	35.15	35	2.13	Intermediate
S23	Gun Sights	363.18	170.12	54.24	50	1.82	Advanced
S29	North Barrel	329.53	157.50	56.07	70	2.31	Advanced
S22	Richochet (Gladed)	400.52	201.58	58.88	85	3.40	Advanced
S28	A (Gladed)	158.90	64.95	46.71	85	1.35	Intermediate
S26	Backwoods (Gladed)	310.66	135.46	49.30	75	2.33	Intermediate
S3	Easy Street	1230.07	293.54	24.80	15	1.85	Intermediate
S4	South Barrel	314.06	154.84	60.66	35	1.10	Expert
S24	Goat Run (Gladed)	633.65	249.00	44.14	75	4.75	Advanced
S32	Goat Glades	347.32	167.30	56.55	80	2.78	Advanced
S25	Duke (Gladed)	548.93	240.66	50.05	65	3.57	Advanced
S8	The "Q"	387.58	186.27	55.56	50	1.94	Expert
S7	Wolverine	337.62	145.91	49.64	55	1.86	Expert
S19	North Run	1950.05	401.27	21.20	20	3.90	Intermediate
S5	Weasel	243.90	122.60	59.81	50	1.22	Advanced
S27	Lynx (Gladed)	187.28	95.18	60.08	95	1.78	Advanced
S6	Easy Way	493.03	82.27	16.96	20	0.99	Low Intermediate

BHA

Run Number	Run Name	Slope Length (m)	Vertical Drop (m)	Average Slope (%)	Average Width (m)	Trail Area (ha)	Skill Class
Race Pod							
S14	Outrigger (Gladed)	383.01	156.20	46.35	50	1.92	Intermediate
S11	Dawn	333.25	81.77	25.54	25	0.83	Low Intermediate
S10	Dusk (Gladed)	214.17	65.97	32.99	60	1.29	Low Intermediate
S16	9 to 5	322.54	144.62	51.10	30	0.97	Intermediate
S30	Cat Track	352.09	123.29	37.74	20	0.70	Intermediate
S33	Free Style	224.72	90.81	44.54	40	0.90	Intermediate
S13	Sun Down	670.78	202.08	32.11	35	2.35	Advanced
S12	Twilight	288.28	77.47	28.45	25	0.72	Low Intermediate
S15	Sun Up	368.12	144.26	44.10	35	1.29	Intermediate
S9	Whiskey Jack	307.59	85.92	29.29	50	1.54	Low Intermediate
S21	Jelly Roll	191.18	79.56	46.43	120	2.29	Intermediate
S20	Mouse Trap	197.03	80.46	45.18	70	1.38	Intermediate
North Bowl Pod							
T28	Lower Siwash	228.11	106.43	54.12	55	1.25	Advanced
T44	Lower Siwash Glades (Gladed)					0.00	Advanced
T23	Bowl Access	214.52	31.63	15.31	10	0.21	Advanced
T29	Northern Delight (Gladed)	243.69	117.30	55.74	160	3.90	Advanced
T40	Funk Bowl (Gladed)	306.47	138.95	52.85	155	4.75	Advanced
T22	Harker's High Way	925.19	332.33	39.16	30	2.78	Intermediate
T34	Siwash	640.48	283.81	50.66	80	5.12	Expert
T36	Powder Horns (Gladed)	451.42	211.58	53.88	65	2.93	Advanced
T35	North Bowl	1102.77	505.09	52.50	60	6.62	Expert
T32	Double Exposure	373.57	180.85	56.34	40	1.49	Advanced
T30	North Star (Gladed)	549.77	284.64	61.22	150	8.25	Advanced
T33	Last 100 Turns (Gladed)	753.06	337.01	52.17	180	13.56	Advanced
L1		430.12	223.90	62.63	65	2.80	Advanced
L2		288.51	141.14	57.13	55	1.59	Advanced
L3		552.48	284.18	61.02	60	3.31	Advanced
L4		1746.77	348.23	21.64	35	6.11	Low Intermediate
L5		116.89	60.01	60.51	50	0.58	Advanced
L6		192.42	106.63	67.73	60	1.15	Advanced
L7		312.25	167.51	64.46	50	1.56	Advanced
Minor Divide Pod							
K1		363.39	121.26	36.68	30	1.09	Intermediate
K2		397.53	123.69	33.70	45	1.79	Intermediate
K3		281.44	81.05	31.12	55	1.55	Intermediate
K4		992.12	135.08	16.45	25	2.48	Low Intermediate
K5		167.71	46.24	29.16	45	0.75	Low Intermediate
K6		432.70	39.85	17.05	25	1.08	Beginner
K7		128.52	40.51	33.80	50	0.64	Low Intermediate
K8		163.07	67.34	45.85	35	0.57	Intermediate
K9		220.30	78.21	38.74	50	1.10	Intermediate
K10		777.70	91.31	16.13	50	3.89	Beginner

Run Number	Run Name	Slope Length (m)	Vertical Drop (m)	Average Slope (%)	Average Width (m)	Trail Area (ha)	Skill Class
Green Pod							
N1		359.62	90.04	26.56	25	0.90	Beginner
N2		249.86	72.23	30.58	35	0.87	Novice
N3		146.69	42.85	31.80	40	0.59	Beginner
Huckleberry Pod							
H1	Quick Draw	283.60	85.99	32.05	30	0.85	Low Intermediate
H2	Buffalo Flats	1213.93	291.01	24.84	45	5.46	Low Intermediate
H3	Pony Express	455.18	151.89	35.86	55	2.50	Intermediate
H4	Outrider	513.72	186.48	39.40	40	2.05	Intermediate
H5	Sidewinder	525.05	174.85	35.60	65	3.41	Intermediate
H6	Round-Up Traverse	1366.41	153.82	11.36	15	2.05	Intermediate
H7	Lone Ranger	562.03	170.43	32.27	50	2.81	Intermediate
H8	Stagecoach Upper	178.35	47.49	28.68	20	0.36	Intermediate
H9	Giddy Up Traverse	1097.96	92.98	9.72	15	1.65	Intermediate
H10	Stagecoach Lower	247.27	69.25	31.51	15	0.37	Intermediate
H11	Tumbleweed	817.72	214.35	27.31	30	2.45	Low Intermediate
H12	Ambush Glades (Gladed)	476.10	167.96	38.25	145	6.90	Intermediate
H13	Ghost Rider Glades (Gladed)	565.93	175.00	33.19	190	10.75	Intermediate
H14	Tumbleweed Terrain Park	214.34	54.85	26.68	50	1.07	Low Intermediate
M1		122.55	37.51	32.53	50	0.61	Low Intermediate
M2		511.62	111.47	26.18	35	1.79	Intermediate
M3		65.55	26.44	44.65	40	0.26	Intermediate
M4		61.55	21.94	38.37	30	0.18	Low Intermediate
M5		61.76	20.18	35.08	30	0.19	Intermediate
Haig One Pod							
H1		1641.18	387.94	26.62	100	16.41	Advanced
H2		596.81	298.45	58.57	150	8.95	Advanced
H3		641.17	317.26	57.84	150	9.62	Expert
H4		979.75	367.52	41.29	140	13.72	Advanced
H5		262.32	138.54	62.43	150	3.93	Advanced
H6		425.63	176.54	46.32	140	5.96	Advanced
H7		904.43	328.26	39.46	150	13.57	Intermediate
H8		266.31	89.06	35.68	70	1.86	Low Intermediate
H9		787.31	283.09	39.50	55	4.33	Intermediate
H10		1088.97	373.73	37.43	100	10.89	Intermediate
H11		741.96	308.99	46.31	65	4.82	Advanced
H12		399.45	165.98	46.20	90	3.60	Intermediate
H13		604.24	252.53	46.72	60	3.63	Intermediate
H14		266.31	128.34	55.33	130	3.46	Advanced
H15		361.73	171.89	54.83	65	2.35	Advanced
H16		156.23	65.10	46.85	65	1.02	Advanced
H17		347.38	145.61	46.86	70	2.43	Intermediate
H18		539.40	238.71	50.11	65	3.51	Advanced
H19		397.11	166.56	46.72	55	2.18	Intermediate
H20		1254.94	354.13	29.98	20	2.51	Intermediate

Run Number	Run Name	Slope Length (m)	Vertical Drop (m)	Average Slope (%)	Average Width (m)	Trail Area (ha)	Skill Class
Haig Two Pod							
J1		314.42	54.70	23.69	50	1.57	Intermediate
J2		1049.01	341.35	36.29	65	6.82	Advanced
J3		969.25	292.73	32.28	50	4.85	Intermediate
J4		105.90	17.89	19.92	50	0.53	Intermediate
J5		493.92	211.92	48.41	65	3.21	Advanced
J6		661.07	246.78	41.35	60	3.97	Advanced
J7		2201.26	413.53	25.64	30	6.60	Expert
J8		1084.75	358.50	39.31	50	5.42	Intermediate
J9		2632.08	411.28	21.33	30	7.90	Intermediate
J10		901.24	319.60	39.42	50	4.51	Intermediate
J11		295.75	94.53	34.33	65	1.92	Low Intermediate
J12		195.76	65.77	36.14	70	1.37	Low Intermediate
J13		373.91	107.07	30.16	65	2.43	Low Intermediate
J14		344.09	169.99	58.61	60	2.06	Advanced
J15		408.49	133.31	35.18	40	1.63	Intermediate
J16		811.37	284.59	45.06	50	4.06	Advanced
J17		182.75	16.79	13.17	50	0.91	Advanced
J18		587.21	125.59	24.72	75	4.40	Intermediate
Haig Three Pod							
I1		209.37	67.67	34.75	65	1.36	Intermediate
I2		465.15	123.03	31.93	70	3.26	Intermediate
I3		363.43	71.56	28.06	30	1.09	Intermediate
I4		239.48	92.29	42.17	130	3.11	Intermediate
I5		417.40	94.82	30.21	30	1.25	Intermediate
I6		87.19	12.31	14.63	35	0.31	Intermediate
Backcountry Pod							
F1		477.55	219.81	52.88	75	3.58	Advanced
F2		443.55	207.08	53.43	65	2.88	Advanced
F3		324.85	122.67	41.48	65	2.11	Intermediate
F4		287.94	92.52	34.51	60	1.73	Intermediate
F5		237.60	99.80	47.07	65	1.54	Intermediate
F6		528.96	204.54	42.73	60	3.17	Intermediate
F7		631.90	225.51	39.01	60	3.79	Intermediate
F8		1534.46	306.85	22.75	65	9.97	Intermediate
F9		196.31	62.34	35.18	60	1.18	Intermediate
F10		1058.72	299.67	30.04	70	7.41	Intermediate
F11		736.44	209.96	32.54	55	4.05	Advanced
F12		587.79	228.65	26.64	50	2.94	Advanced
F13		156.66	30.41	25.88	25	0.39	Low Intermediate
F14		683.03	75.22	14.08	25	1.71	Novice
Beginner Pod							
G1		335.07	41.37	13.92	75	2.51	Beginner
G2		529.28	60.19	19.99	65	3.44	Beginner
G3		530.55	72.35	18.26	80	4.24	Novice
G4		318.41	55.73	20.96	60	1.91	Novice
G5		686.97	77.36	19.67	60	4.12	Intermediate

4.2.7 PROPOSED GLADED TERRAIN

By buildout, gladed skiing on the mountain will be expanded from the current 70 hectares to over 275 hectares (see Figure 4-5). It is proposed that the gladed terrain will be developed using a feathering technique from the ski run edges. Feathering ski trail edges is beneficial from both an environmental as well as a recreational point of view. As illustrated in Figures 4-5a and 4-5b, the typical layout would see a gladed edge moving into the trees from the clear cut of the ski trail. The tree spacing initially would be wide (5 to 7 metres). Progressively, the glading has closer spacing down to a minimum of 2 metres. The lower branches of gladed trees should also be limbed to a height of 3 metres above the maximum snow depth depending on tree species, to facilitate clear paths for skiers and boarders.

Feathering forest edges by thinning encourages a brushy transition zone between the opening and the denser stand, which promotes food growth and improved wildlife habitat. In addition, the feathered edge protects against wind blow down and provides better visual quality across the forest stand.

Another possible added benefit of glading is the potential reduction in fuel loads for wildfires, as glading activities remove low branches as well as reduce total canopy cover. Feathering of hard edges along newly cut ski runs could also contribute the same beneficial fire break and possibily further reduces the total forest fire fuel load in the resort area. Gladed and feathered areas are removed of woody debris left over from the process, which could results in a net reduction of forest fire fuel, and possibly contribute to acts, along with fire managment efforts, as a safeguard against future forest fires spreading across the resort area and reaching resort infrastructure. In any case, glading does not replace a proper fire management strategy and should not be relied on for fire protection.

From a recreational point of view, feathering the edges of ski trails provides an excellent skills development opportunity by making a semi-gladed transition zone between the fully cut ski run and the denser gladed areas in between runs. Overall, feathering the edges of runs and glading in between runs will provide great adventure terrain for all ability levels and encourage all ability levels to progress to new levels of enjoyment. The Proposed Glading Plan (Figure 4-5) outlines the glading potential over the existing and proposed mountain.

FIGURE 4-5a and 4-5b: GLADING SCHEMATICS

TIGHT SPACING MIN. 6ft.
WIDE SPACING 16-23ft.

GRADUATED TREE SPACING

Castle Mountain Resort
Master Development Plan
2017
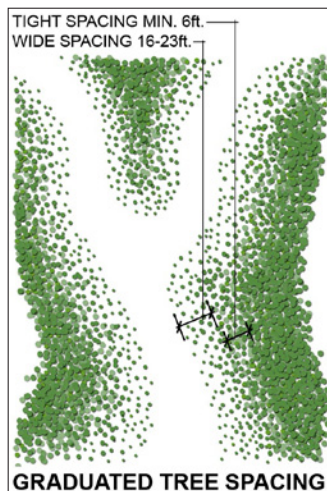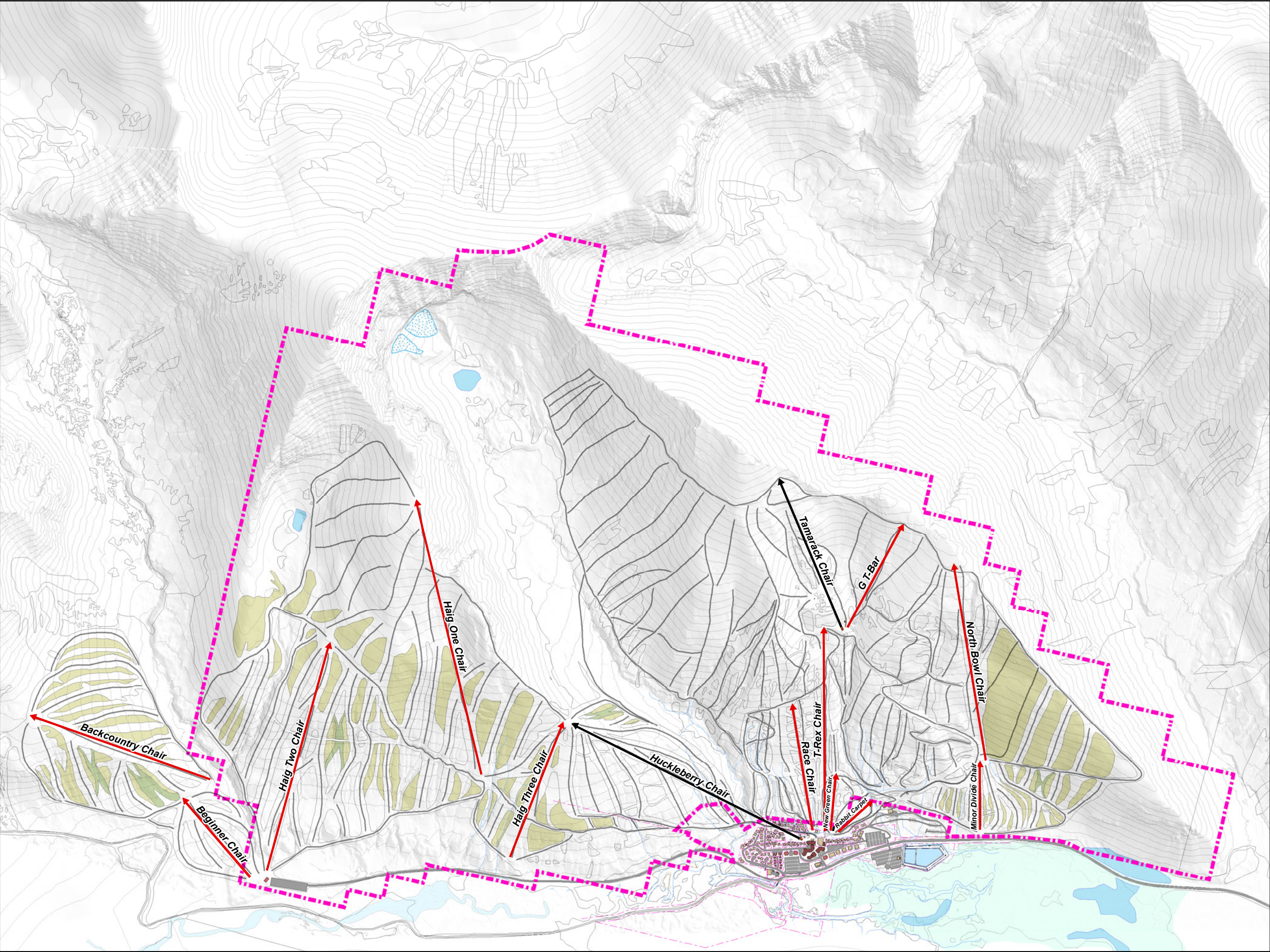
Existing LOC
West Castle Wetlands
Proposed Glading
Proposed Dense Glading
Proposed Thin Glading

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Proposed Glading

Figure 4-5

Backcountry Chair
Beginner Chair
Haig Two Chair
Haig One Chair
Haig Three Chair
Huckleberry Chair
Tamarack Chair
G T-Bar
North Bowl Chair
Race Chair
T-Rex Chair
New Green Chair
Rabbit Carpet
Minor Divide Chair

4.2.8 DOWNHILL CAPACITY

By applying the appropriate powder oriented low densities to the ski trails and gladed areas in terms of skiers per hectare, the total downhill capacity of the existing and proposed development at CMR was calculated. Table 4-2 outlines the downhill capacity of the trails by skier skill class within each pod for the entire ski area. In total, the buildout trail capacity is 4,600 skiers.

TABLE 4-2: EXISTING AND PROPOSED DOWNHILL CCC

Pod	Vertical (m)	Skiable Area (ha)	Downhill Capacity by Skill Class						Total Capacity
			Beginner	Novice	Low Intermediate	Intermediate	Advanced	Expert	
Huckleberry	330.5	62.9	0	0	123	330	5	41	499
Haig One	594.4	134.0	0	0	21	377	363	26	788
Haig Two	406.8	75.4	0	0	65	278	128	19	491
Haig Three	287.1	18.2	0	0	0	92	7	0	99
Backcountry	301.2	63.0	0	30	5	274	112	0	421
Beginner	78.7	15.8	20	108	0	36	0	0	164
Tamarack	396.0	188.2	0	0	0	158	544	190	892
Minor Divide	129.2	18.7	102	0	59	55	1	0	218
North Bowl	554.7	101.5	0	0	71	25	125	52	273
G T-Bar	280.5	28.0	0	0	0	166	57	0	224
T-Rex	453.9	36.2	0	0	12	100	44	13	168
Race Chair	268.2	15.6	0	0	125	138	33	0	297
Green Chair (New)	90.8	2.4	31	16	0	0	0	0	47
Rabbit Carpet	33.0	1.0	20	0	0	0	0	0	20
Totals		761.0	173	154	481	2030	1421	341	4600

Note 1: Tamarack Pod includes South Chutes

Skier on an untouched slope at Castle Mountain
Photo: CMR, 2016

4.2.9   ALPINE TERRAIN DISTRIBUTION

The design of the ski trails were carefully planned to ensure that proposed development of the ski terrain closely approximates the distribution of the skier marketplace.   The terrain distribution assessments are an important tool to ensure that currently accepted market segmentation is represented in the ski trail offerings. The following Table 4-3 and Chart 4-1 illustrates the overall distribution assessment as it relates to the proposed buildout condition at CMR. They also compare the proposed distribution to the existing distribution and the market distribution. This demonstrates that the proposed trail development at buildout provides a much more balanced product than what is currently offered. The Haig Ridge expansion is key to CMR being able to make these improvements as this area contains the majority of the intermediate terrain within the study area.

TABLE 4-3: PROPOSED SKIER DISTRIBUTION AT BUILDOUT

Market Distribution	Castle Mountain Existing	Castle Mountain Buildout	Skier Marketplace
Beginner	2.4%	3%	5%
Novice	0.8%	3%	10%
Low Intermediate	8.5%	10%	20%
Intermediate	39.8%	43%	35%
Advanced	35.0%	32%	20%
Expert	13.5%	9%	10%

CHART 4-1. PROPOSED SKIER DISTRIBUTION AT BUILDOUT
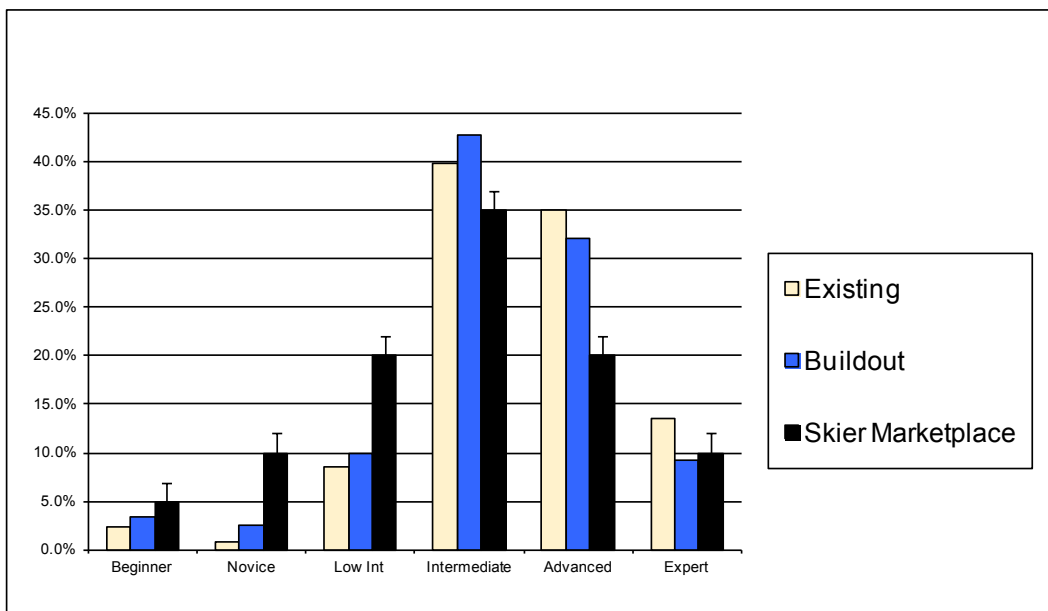
4.2.10 PROPOSED SKI LIFT INVENTORY

Directly related to the goal of balancing the skier skill class distribution with the market distribution, the downhill capacity of the ski terrain needs to be in balance with the uphill capacity of the ski lifts. To achieve this, the mountain plan must also anticipate skier movement and circulation patterns over the course of the ski day. This involves detailed disbursement modeling and staging analysis undertaken to ensure that skiers on slopes, on lifts, in lift lines and in support facilities are accounted for. From this, the appropriate capacity of uphill infrastructure is determined.

The proposed ski lift system has been planned to act as the uphill balance to the downhill capacity of the alpine trail network. Table 4-4 illustrates the specific characteristics, capacities and design parameters for each of the existing and proposed ski lifts. At buildout, CMR will have increased their ski lift inventory from 6 to 14 ski lifts. Figure 4-6 illustrates the existing and proposed ski lifts at buildout.

TABLE 4-4: PROPOSED SKI LIFTS AT BUILDOUT

Lift Name	Lift Type	Bottom Elevation (m)	Top Elevation (m)	Vertical Drop (m)	Horiz. Length (m)	Slope Length (m)	Average Slope	Hourly Capacity (Theor.)	Hourly Capacity (Actual)	Rope Speed (ft/s)	Weighted Vertical Demand	Loading Efficiency	Hours of Operation	Access Reduction	Uphill CCC	Downhill CCC
Huckleberry	3C	1414	1744	330	1405	1465	24%	1397	1300	2.25	4,652	90%	7.00	16%	491	499
Haig One	4C	1603	2197	594	1558	1696	38%	2400	1300	2.25	6,279	90%	6.00		664	788
Haig Two	4C	1439	1845	407	1302	1391	31%	2400	1100	2.25	5,651	90%	7.00		499	491
Haig Three	2C	1456	1743	287	793	849	36%	1200	400	2.25	5,180	90%	7.00		140	99
Backcountry Chair	4C	1530	1831	301	1049	1100	29%	2400	1100	2.25	5,434	90%	6.00		329	421
Beginner Chair	4C	1443	1522	79	564	580	14%	2400	1100	1.5	2,538	75%	7.00	5%	170	164
Tamarack Chair	2C	1861	2257	396	884	986	45%	710	710	2.25	7,589	90%	6.00		200	892
Minor Divide Chair	4C	1418	1547	129	370	397	35%	2400	800	2.25	2,732	90%	6.50		221	218
North Bowl Chair	2C	1547	2102	555	1243	1097	45%	1200	600	2.25	6,705	90%	6.00		268	273
G T-Bar	TB	1859	2140	281	642	708	44%	1200	700	2.25	5,641	90%	7.00		219	224
T-Rex Chair	4C	1410	1864	454	1122	1221	40%	2400	500	2.25	5,929	90%	7.00	22%	188	168
Race Chair	3C	1413	1681	268	702	762	38%	1180	800	2.25	4,646	90%	7.00		291	297
Green Chair (Realigned)	2C	1410	1501	91	307	323	30%	865	734	1.5	1,335	75%	7.00	5%	250	47
Rabbit Carpet	C	1408	1441	33	247	250	13%	1100	740	1.5	1,000	80%	7.00		20	20
Total															3,952	4,600

Proposed Lift Summary

Figure 4-6

Castle Mountain Resort
Master Development Plan
2017

Legend:
- Existing Ski Lifts
- Proposed Ski Lifts
- Ski Trails
- Existing LOC
- West Castle Wetlands

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Lift labels:
- Backcountry Chair
- Haig One Chair
- Haig Two Chair
- Haig Three Chair
- Beginner Chair
- Huckleberry Chair
- Tamarack Chair
- G T-Bar
- North Bowl Chair
- Race Chair
- T-Rex Chair
- New Green Chair
- Rabbit Carpet
- Minor Divide Chair

4.2.11 PROPOSED LIFT BALANCE ASSESSMENT

The following summary demonstrates the balance between the proposed capacity of the lift infrastructure and the capacity of the associated trails. As illustrated, the uphill capacity closely approximates the downhill capacity.

CHART 4-2: SKI LIFT AND TRAIL BALANCE – BUILDOUT
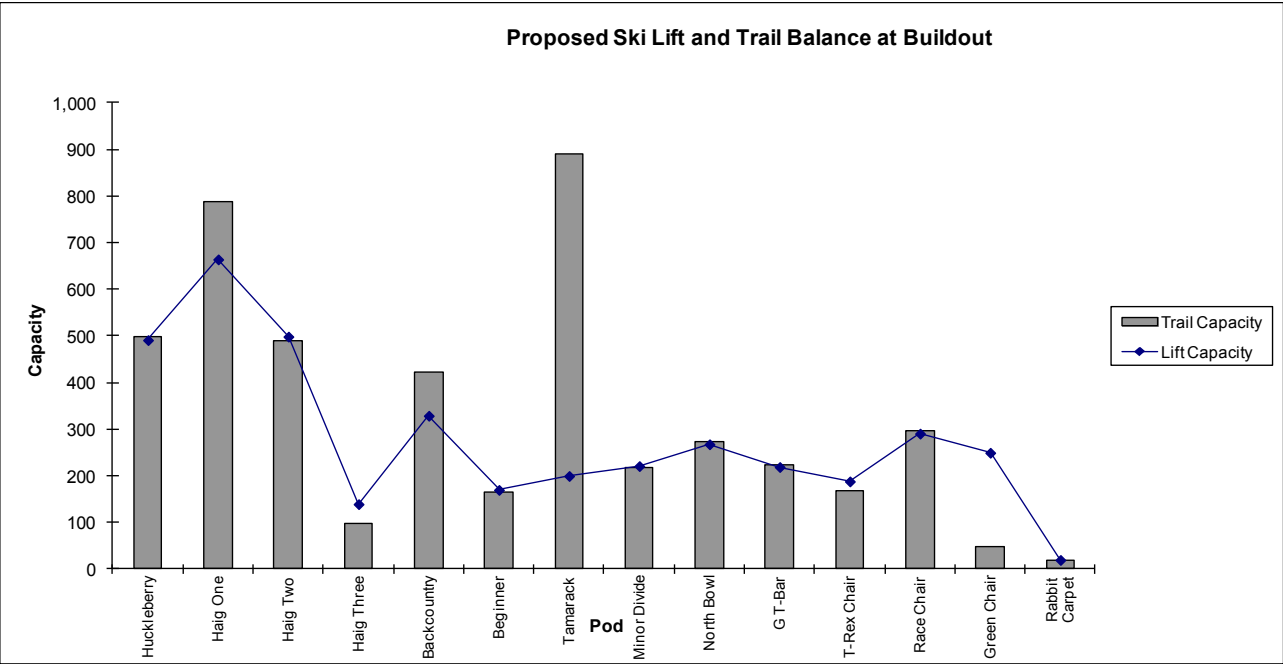
4.2.12 PROPOSED COMFORTABLE CARRYING CAPACITY OF THE SKIING

The Comfortable Carrying Capacity (CCC) is a measure of the optimum number of skiers/snowboarders who can utilize the resort over the course of a day while being guaranteed a pleasant recreational experience without causing a decline in the quality of the physical or sociological environment. It is a dynamic number that takes into account the use of the mountain throughout the day.

The CCC for each of the proposed lifts is calculated by considering the vertical serviced; the capacity of the lift; the hours of operation; the lift loading efficiency; access reduction and; the vertical demand (as determined by the type of skiers using the lift). As the existing lifts have been impacted, removed or realigned, their CCC has been recalculated and included. The cumulative CCC for each lift yields the total CCC for the resort. Ideally, this uphill capacity of the lifts should match the downhill capacity of the trails. Generally, depending on weather and snow conditions, 40% of the total CCC will be actively skiing, 25% will be on the lifts, 10% will be waiting in lift queues and the remaining 25% of skiers are rated as passive and will be using the skier service facilities and amenities.

Based on the existing proposed lift configuration, the uphill capacity of the proposed and existing lifts is 3,952 skiers per day. As the downhill capacity of the trails (4,600) surpasses the uphill capacity of the lifts, the CCC of CMR's existing facilities is pegged at 3,952 skiers and snowboarders per day.

4.2.13 MOUNTAIN OPERATIONS FACILITIES

There are a variety of ski area oriented facilities key to the successful operation of any mountain resort. The degree of impact and influence each has on the resort offering is tied directly to the envisioned type of product. Specific to CMR, the size, scale and scope of the area dictates primary operational considerations including snowmaking; day lodges; ski patrol/search and rescue; mountain access roads; grooming; and maintenance.

SNOWMAKING

There is currently no snowmaking at CMR. Snowmaking will be required during the early season on certain slopes with unreliable natural snowpack. Initially, snowmaking infrastructure will be incorporated on a limited scale and focus, and gradually expanded to ensure adequate snow coverage throughout the year.

A comprehensive snowmaking study of CMR was carried out in 2015 by TechnoAlpin. It detailed the water and infrastructure required to provide CMR with reliable early season snowpack. From these projections a four phase snowmaking plan was developed for CMR at buildout (See Figure 4-7 and Table 4-5)

Table 4-5 Proposed Snowmaking Development

Development Area	Area (Acres)	Area (Hectares)	Water Required (Imperial Gallons)
Phase One Trails	12.00	4.86	2,850,000
Phase Two Trails	28.00	11.33	6,650,000
Phase Three Trails	78.48	31.76	18,639,000
Phase Four Trails	20.63	8.35	4,899,625
Totals	139.11	56.30	33,038,625

Assumptions within the TechnoAlpin report were considered to provide an insufficient buffer against unexpected changes in temperature, or unseasonably warm early or late seasons. Accordingly, additional projections were calculated to take these potential threats into account.

At present, a detailed snowmaking facilities plan remains to be created. The recommendations contained within the TechnoAlpin report are being used to develop several plans, and determine the most effective approach to meet CMR's snowmaking needs.

Regardless of the finalized plan, the objective will be to ensure that the resort is open for early season skiing, ideally by the last week of November. The specific details for the proposed snowmaking will be confirmed at the time of development, and will reflect leading technologies.

Conceptually, the snowmaking system should be put in place for the areas near the village, and high-use trails at lower elevations. This will ensure that trails critical to circulation are operational earlier in the season.
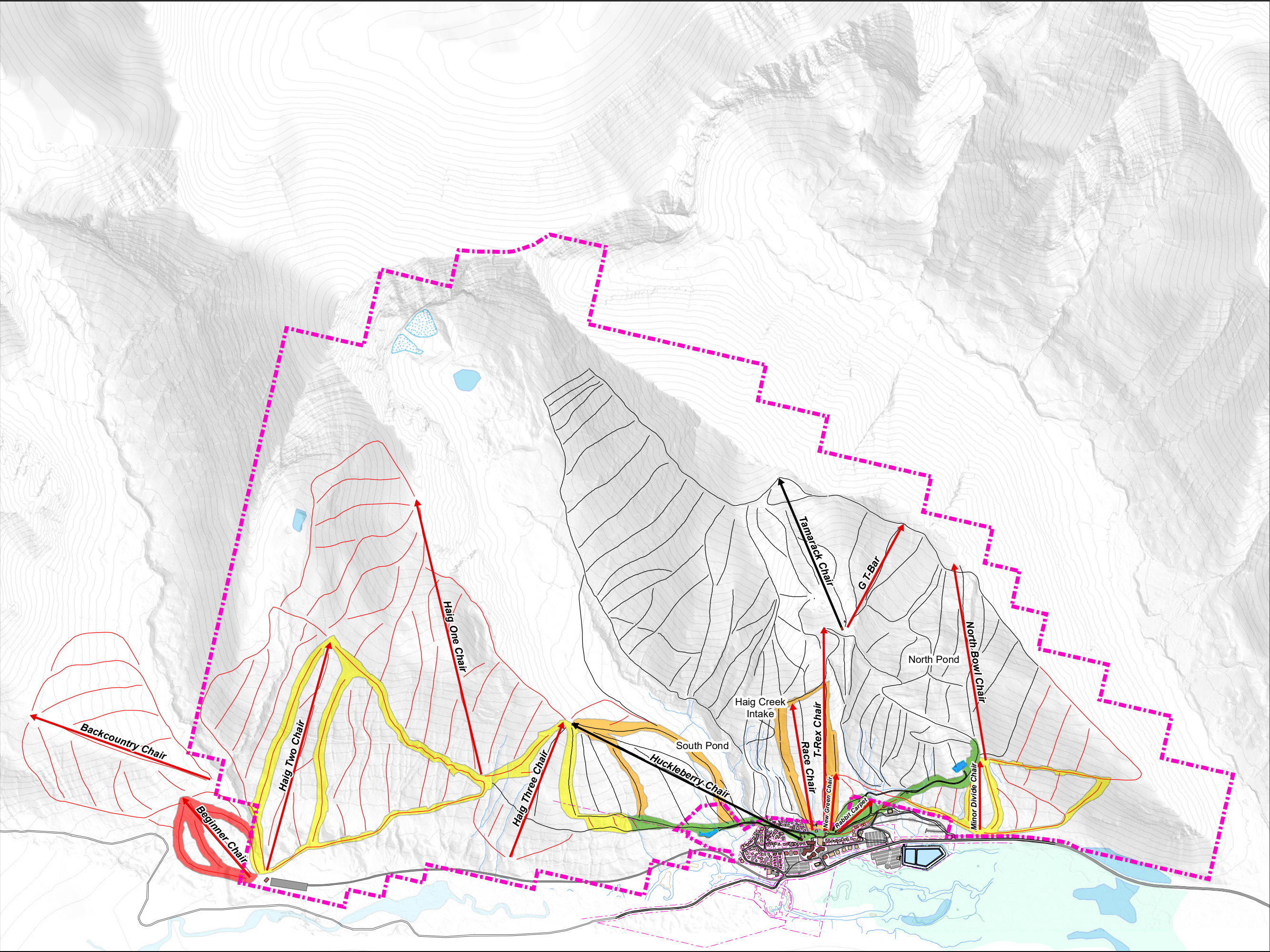
Legend:
- Snowmaking Ponds
- Phase 1
- Phase 2
- Phase 3
- Future
- Existing Ski Lifts
- Proposed Ski Lifts
- Existing Ski Trails
- Proposed Ski Trails
- Existing LOC
- West Castle Wetlands

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Meters

Proposed
Snowmaking
Development Plan

Figure 4-7

BASE LODGE

The existing day lodge does a very good job of servicing the needs of the skiers over the course of the day. There is potential for expansion of the existing day lodge in keeping with the vision that was established through the 2008 Village Master Plan.

SKI PATROL

The phased development of ski patrol facilities is a key component of a well planned and effectively managed mountain operation. Design considerations include the need to be able to provide on-snow, toboggan access to medical facilities as well as vehicular and ambulance access to injured or sick guests. Castle Mountain Resort's existing ski patrol facilities will be maintained and expanded as needed.

MOUNTAIN ACCESS ROADS

Building on the existing layout, additional mountain access roads will be developed. These roads will first utilize existing logging roads in order to avoid unnecessary construction.   Mountain access roads provide service access, safety, access to future development areas/trails, and are a critical component of a well functioning ski area. Mountain road development will also provide additional summer infrastructure for summer-season products such as mountain biking and hiking.

GROOMING

Ski trail grooming is required to provide a balanced product capable of meeting the needs of multiple skill classes. Castle Mountain Resort's well established grooming will be aligned with the development of the expansion terrain.

MAINTENANCE

The existing maintenance facility in the Village base will be incrementally expanded to match the needs of the resort's expansion. Further, with the Backcountry expansion, a maintenance facility would be developed as part of the facilities at the satellite base area.
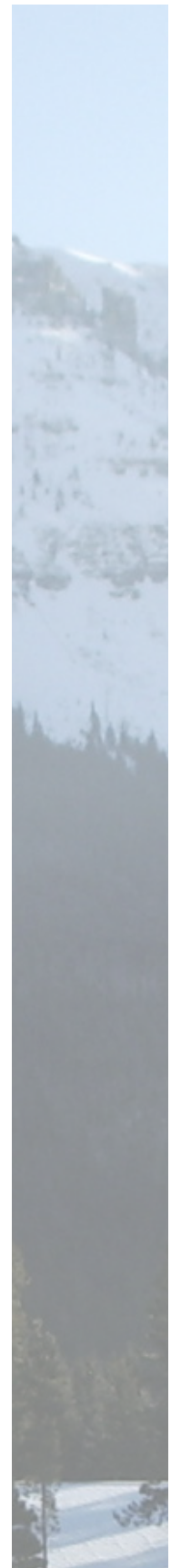
Sunset at Castle Mountain
Photo: Claudia Mannering, CMR, 2017
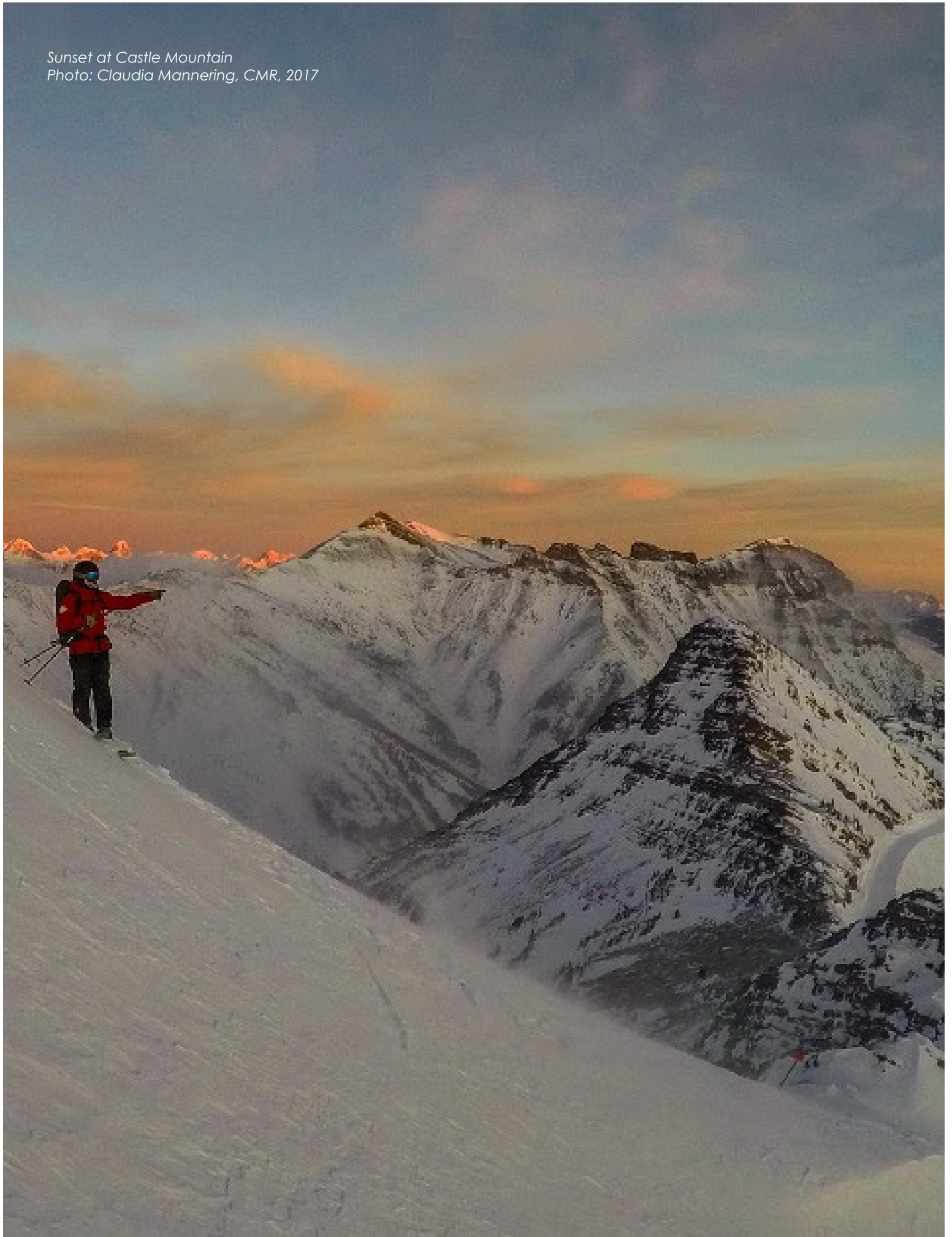
4.3 OTHER RESORT ATTRACTIONS

In the past, CMR's winter activities have been focused on lift accessed alpine skiing. However, increasing effort has been placed on providing complementary attractions such as backcountry skiing, Catskiing, and snowshoeing. With the expansion of its alpine skiing offerings, CMR plans to develop additional winter activities. Attractions such as Nordic skiing will provide a more diverse mountain experience and attract a wider group of visitors. These are described as Other Winter Activities and illustrated on Figures 4-8 and 4-9.

To date, the facility development has been winter focused; little has been done in terms of formalized summer activities or facilities. The intention now is to round out the offering in an effort to make CMR an all-season resort and community. To that end, the development of lift serviced mountain biking, via ferrata, and hiking trails are all being explored. These are described as Other Summer Activities and illustrated on Figure 4-10.

Hiking at Castle Mountain
Photo: CMR, 2017

4.3.1 OTHER WINTER ACTIVITIES

NORDIC SKIING

The market for Nordic skiing is anticipated to grow. To accommodate this, the Haig Valley area will be developed into a day use Nordic skiing trail network (in conjunction with a Cross-country Mountain bike network. See Sec. 4.3.2). Visitors will access the trail network by riding the Huckleberry Chair, and download back to the Village at the end of their day. The trail network will offer a wide range of trails to suit all ability levels. The Nordic ski area will contain 1,884m (22%) beginner trails, 4,574m (54%) intermediate trails, and 1,988m (24%) advanced trails at buildout. It is anticipated that the development of Nordic skiing will result in the addition of 50 visitors per day at CMR.

SNOWSHOEING

Castle Mountain Resort currently offers visitors guided snowshoeing trips in the area above the Huckleberry Chair. With the development of Nordic skiing and cross-country mountain biking, there is a great opportunity to develop unguided snowshoeing opportunities in the Haig Valley area. The area will be easily accessed from the Village base, with visitors using the Huckleberry Chair to travel to and from the snowshoeing trails. In the Haig Valley area, snowshoeing will utilize the trails developed for cross-country mountain biking. The snowshoe trail network will contain approximately 11,300m of trails at buildout, and offer visitors views of Mt. Haig and Gravestafel Ridge not available from the Village base. The development of snowshoeing in the Haig Valley area is expected to attract and additional 50 visitors to CMR each day.

CATSKIING

The launch of guided Catskiing along Haig Ridge in 2010 secured CMR's reputation as having some of the best steep powder skiing found anywhere in North America. With the expansion of lift accessed skiing to Haig Ridge, CMR is proposing to shift the Catskiing operation a 215ha area on the south facing ridge below Syncline Mountain. It is proposed that the relocation of Catskiing operations outside of CMR's LOC will be undertaken in collaboration with Alberta Parks and local stakeholders. At present, Catskiing accounts for 24 visitors per day to CMR, and this number is only expected to increase as CMR develops its Catskiing offerings and reputation as a premiere international and regional destination.

BACKCOUNTRY SKIING AND TOURING

Castle Mountain Resort understands that the skiing just beyond its boundaries is some of the greatest in the Rocky Mountains. Further, CMR sees itself as the staging area for visitors seeking an out-of-bounds experience. To support backcountry skiing and touring in the larger Castle region, CMR will develop a variety of facilities and services. Additionally, with the Backcountry area expansion CMR will offer visitors lift serviced backcountry access. The possibility of offering guided backcountry experiences in the mountains surrounding CMR will also be explored. The growth of backcountry skiing at CMR is expected to bring 50 visitors per day during the winter season.

Figure 4-8 Proposed Winter Use Context

Castle Mountain Resort
Master Development Plan
2017

Legend
Existing LOC
Proposed Development Areas
XC Skiing & Snowshoeing
Catskiing

HAIG MTN
(2610 M)

GRAVENSTAFEL
MTN
(2391 M)

NORTH PEAK
(2354 M)

SYNCLINE
VALLEY

**BACKCOUNTRY
CATSKIING
SYNCLINE
VALLEY**

**CROSS COUNTRY
SKIING AND SNOWSHOEING**

SORE
CROTCH
VALLEY

**BACKCOUNTRY
ACCESS**

**BACKCOUNTRY
ACCESS**

Backcountry Chair

Haig One Chair

Haig Two Chair

Haig Three Chair

Beginner Chair

Tamarack Chair

G T-Bar

North Bowl Chair

Race Chair

T-Rex Chair

New Green Chair

Rabbit Carpet

Minor Divide Chair

HAIG
CREEK

XC SKIING/SNOWSHOEING LIFT ACCESS

**BACKCOUNTRY
ACCESS**

**CROSS-COUNTRY AND
BACKCOUNTRY SKIING**

**EXISTING CROSS-COUNTRY
SKIING, FAT BIKE AND
SNOWSHOEING TRAILS**

WEST CASTLE
WETLANDS

TO SYNCLINE CROSS-COUNTRY SKI TRAILS

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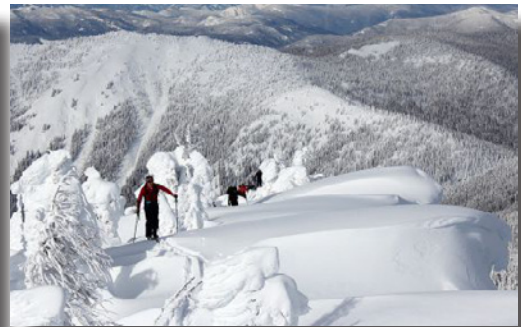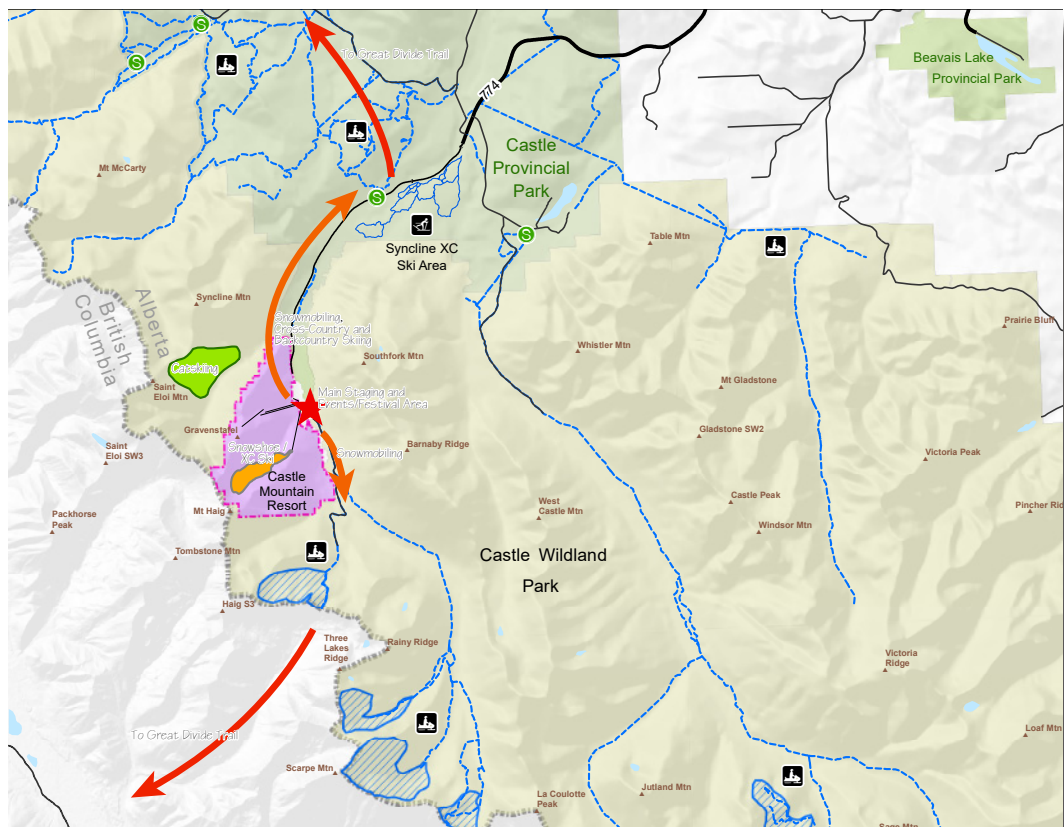   Meters

Proposed Winter
Use Plan

Figure 4-9

4.3.2 PROPOSED SUMMER RESORT ACTIVITIES

As planned, the summer season at CMR will grow in prominence and importance at the resort over time. It is anticipated that this will include lift serviced mountain biking, cross-country mountain biking, via ferrata, aerial adventure, zipline tours, horseback riding, hiking and sightseeing. Further, CMR is proposed to be a key staging point for backcountry summer access to the surrounding Parks and lands beyond. The summer resort activities are described below and illustrated on Figures 4-10 and 4-11.

MOUNTAIN BIKING

The slopes beneath the Huckleberry Chair are ideal for a downhill mountain bike park and skills park. Development of a lift accessed bike park at CMR would create an experience not yet seen in Alberta.

Mountain bike parks are commercial lift or shuttle accessed trail networks, typically built within ski resorts that offer technical (natural) and freeride (machine built) trails. Often these trails contain features including berms (banked corners), jumps, rock faces, roots, ladders and other obstacles. Using lifts or shuttles allows riders to focus on descending and riding thousands of vertical feet in a single day.

Rather than using ski runs, downhill, lift-assisted mountain biking requires a different trail system to be built. While mountain bike trails sometimes cross ski runs, they are typically built within treed areas. Developed specifically for summer use, mountain bike trails are generally far less steep than even the easiest winter ski run. When properly designed, constructed, drained and maintained, lift-accessed mountain bike trails use techniques to control the downhill speed of the bikes and move riders down the hill in a safe and well-maintained fashion. This is especially important at turns or other features in the trail as it reduces the need for braking and minimizes impacts to soil and vegetation. Additionally, if trails are well designed, riders are able to stay on the trail because of the way the trail flows, speeds up and slows down for the next feature.
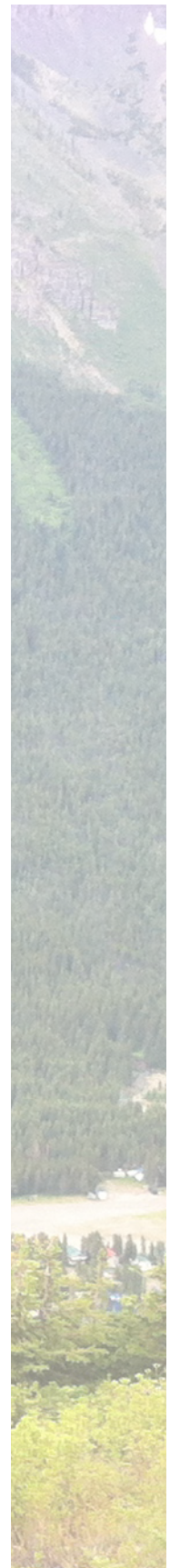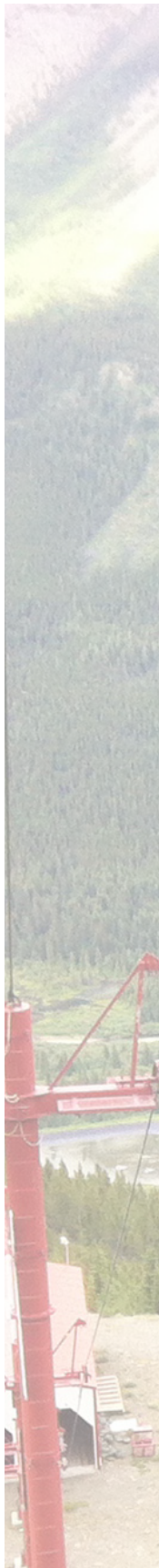
Mountain bike trails have adapted the ski run difficulty classification system. In addition to beginner (green), intermediate (blue), and advanced (black) difficulty classifications, mountain bike trails can also be grouped by the style of riding. Technical trails can be thought of as natural or handmade trails and usually feature extensive roots, rocks, and technical pitches. Conversely, Freeride trails are often machine made and offer fast, smooth 'flowy' rides punctuated with jumps and berms. Past experience from existing bike parks suggests that a balance of difficulty and styles is needed to ensure a viable bike park.

Downhill Mountain Biking Trail Classification and Examples

Mountain bike parks are gaining popularity in North America. In the late 1990s, the Whistler-Blackcomb ski resort began development of their bike park which ultimately created the model upon which North American bike parks have followed. The Whistler Bike Park reported over 120,000 visits in 2011 and unofficial statements suggest that number has continued to grow. Trestle Bike Park at Winter Park, Colorado is the largest bike park in the U.S. and hosts a reported 30,000 riders per year, while regional destinations in western Canada consistently receive 25,000 visits per year.

Given CMR's proximity to major population centres and the tremendous potential provided by its terrain, the opportunity to develop a downhill mountain bike park at CMR is substantial. As proposed, CMR's mountain bike park would offer 5,783m (20%) of beginner trails, 15,267m (53%) of intermediate trails, and 7,673m (27%) of advanced trails.

Complementing the development of a downhill mountain bike park, the Haig Valley area between Haig Ridge and Gravenstafel Ridge has ideal terrain for a cross-country mountain bike trail network. The trail network will be developed in conjunction with Nordic skiing and snowshoeing, and provide visitors opportunities to cruise easy paths, or challenging long 'epic' rides.

Cross-country mountain biking uses trails that are often less-technical than those found in a mountain bike park. Instead, trails feature intermixed sections of uphill and downhill so that riders are constantly transitioning from climbing to descending. Much like downhill mountain bike parks, cross-country mountain bike trails are classified by difficulty (beginner, intermediate, advanced), but are rarely modified by style (technical or freeride). The difficulty of a trail results from a combination of the skill required to navigate its obstacles and the fitness needed to complete the desired route.

Cross-Country Mountain Biking Trail Classification and Examples

At buildout the Cross-country Mountain biking area would have 9,187m (31%) of beginner trails, 11,942m of intermediate trails (41%), and 8,067m of advanced trails (28%).

The development of cross-country mountain biking at CMR represents a significant opportunity to expand its summer offerings. The terrain within the Haig Valley area is well-suited to cross-country mountain bike trails. Further, developing the trails in conjunction with a Nordic skiing area allows CMR to diversify its recreational activities while realizing operational efficiencies; the costs of maintaining a single trail network will be far less than if these opportunities were developed separately, and if only one were developed the trails would sit idle for half the year.

Both the downhill mountain bike park and the cross-country trail network will utilize the Huckleberry Chair lift. This connects the on-hill activities directly to the Village base, facilitating the circulation of riders and other visitors. Additionally, it allows riders to easily access amenities in the Village base, such as restaurants, and rental or repair shops. Finally, by funneling activity through the Huckleberry Chair, management has greater control of the use of the mountain biking areas as well as being able to generate a stream of income that can be utilized to
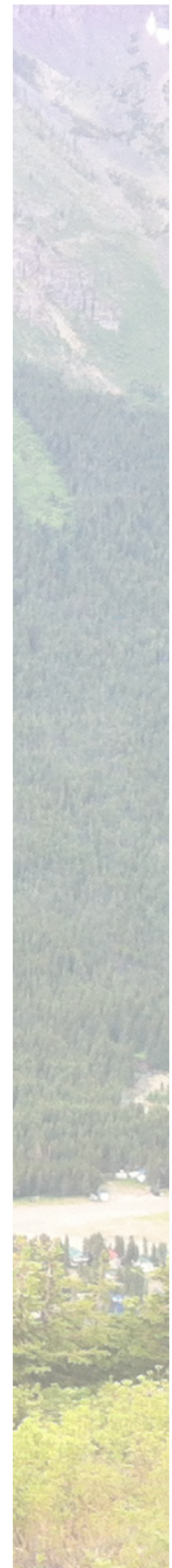
build and maintain the trails. This will help preserve the trails when conditions are not ideal, limit illegal access, and can be used in wildlife and environmental management plans to limit overall impact and avoid disturbance during environmentally sensitive times of the year.

The development of the mountain biking areas will take place in phases. Each phase will include a range of trail types and difficulties to accurately represent the mountain biker marketplace. The rate of development is dependent on existing use, forecasted demand, and the priorities of CMR. It is anticipated that at buildout the cross-country mountain biking will area will attract 100 riders per day while the downhill mountain bike park will attract upwards of 300 riders per day.

With the growth in popularity of mountain biking, there have often been concerns that mountain biking will cause irreversible damage to the environment. However, the belief that mountain biking damages ecosystems disproportionately to other trails uses has been found to be untrue. In comparisons with hiking, horseback riding, and motorcycling, mountain biking has been found to have a comparable impact to hiking, and to be far less damaging than horseback riding or motorcycling (Wilson & Seney, 1994; Thurston & Reader, 2001). Studies have found that the impact of mountain biking on wildlife is similar to that of hiking (Taylor & Knight, 2003). Further, the bike trails built will follow International Mountain Bike Asso-ciation (IMBA) trail standards augmented by the variety of emerging industry best practices. Key to the long term success and sustainability of a bike park trail network are the quality of the mountain bike trail product, erosion control and a consistent and frequent maintenance program.

HIKING AND SIGHTSEEING

The areas in and around CMR have been a popular hiking destination for many years. The creation of the Castle Provincial Park and Castle Wildlands Provincial Park are certain to only enhance the reputation of the region as a hiking destination. Similar to backcountry skiing, CMR sees itself as the staging area for hiking adventures in the larger Castle region. Accordingly, it will develop the services and facilities to support hikes and multi-day treks in the neighbouring Provincial Parks. Further, CMR will work with stakeholders to support the continued redevelopment and maintenance of the Great Divide Trail as the premier thru-hike of western Canada.

It is also understood that not every visitor is looking for multi-day wilderness adventure. Many visitors are looking for accessible day hiking opportunities that get them out into nature and offer great views of the area. To fulfill this need, CMR will offer hiking trails starting in its Village base as well as lift accessed hiking from the top of the Huckleberry Chair. It is anticipated that the growth of hiking in the region and at CMR will attract about 50 visitors per day.

VIA FERRATA

A via ferrata, or "iron road", is proposed for the slopes on the north face of Haig Ridge accessed from the Haig Valley area by way of the Huckleberry Chair.

A via ferrata is a well defined alpine climbing route traveling through exposed areas. The climbing route is equipped with fixed, manmade structures to increase ease and security for climbers. The activity is usually guided and the users require a via ferrata climbing kit to access the route: climbing harness, shock absorber and two short lengths of rope.

The main structural component of a via ferrata is a steel cable which runs along the route and is fixed to the rock face every 3 to 10 metres. Using a via ferrata kit, climbers can secure themselves to the cable, limiting the risk of injury. The cable can also be used to aid in climbing, and additional climbing aids, such as iron rungs (stemples), pegs, carved steps and even ladders and bridges are often provided.

Via ferrata can vary in length from short routes taking less than an hour, to long, demanding alpine routes covering significant distance and altitude (greater than 1,000 metres (3,300 ft) vertical), and taking eight or more hours to complete.
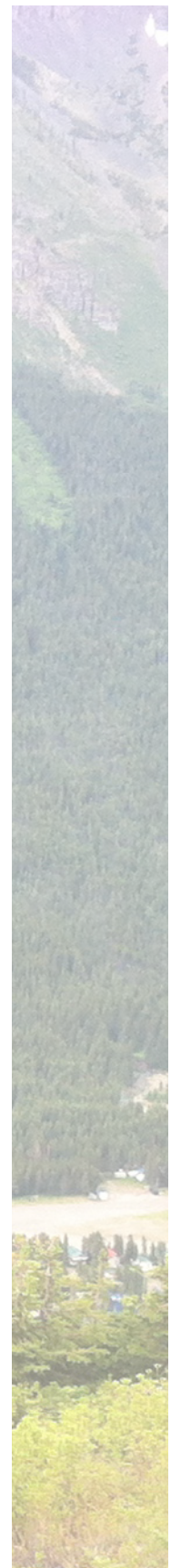
Guided trips along the via ferrata at CMR will provide visitors with a unique mountain experience, and some of the best views in southwest Alberta. The trips will run on a set schedule during the summer and early fall when the ground is still free of snow. Groups will be able to opt for easier beginner trails, or challenge themselves with more difficult routes. The via ferrata area would be located a short 100m hike from the top of the Huckleberry Chair. It is expected that the via ferrata will bring an additional 40 visitors per day to CMR.

The construction and use of the via ferrata will be designed to respect and respond to the local ecosystem. An environmental study of the proposed via ferrata routes should be undertaken to identify the presence of at-risk wildlife and plants, or special habitat such as nesting areas. The layout of the route and staging area should respect the land, wildlife and quality of the site in order to limit negative impacts on the ecosystem and ultimately offer sustainable alpine experience to visitors.

via ferrata climbing kit
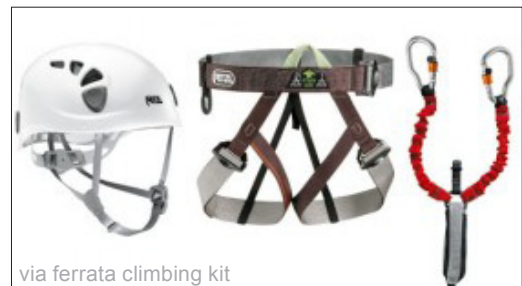
AERIAL ADVENTURE PARK AND ZIPLINE TOURS

An aerial adventure experience combines wilderness hikes with playground activities, in a playful, family-oriented atmosphere. Tree-top walks, rope ladders, and swings allow visitors to explore the forests and challenge themselves. Additionally, a zipline course with multiple lines linked through a forest walk will offer visitors a unique perspective on the surrounding landscapes, combined with the rush of whisking through tree tops.

An aerial adventure park complete with zipline tours will complement ski and mountain bike opportunities, giving guests an alternative activity that allows them to experience the forests of the Rocky Mountains in a truly unique way. An Aerial Adventure area (approximately 20ha) just below the proposed Haig Two Chair is being explored, and would be expected to attract about 150 visitors per day to CMR.

HORSEBACK RIDING

Exploration of the Castle region by horseback has been a long-standing recreational activity. Early discussions concerning the trail network in Castle Provincial Park and Wildlands Provincial Park indicate that equestrians will still have access to numerous trails within the region. In keeping with its role as the staging area for recreational activity in region, CMR will develop the facilities and infrastructure to support equestrian visitors. This may include parking for horse trailers and dedicated areas to stage prior to a horseback trip. The final decisions on how best to support equestrian users will be determine through discussion with stakeholders, and Alberta Parks.
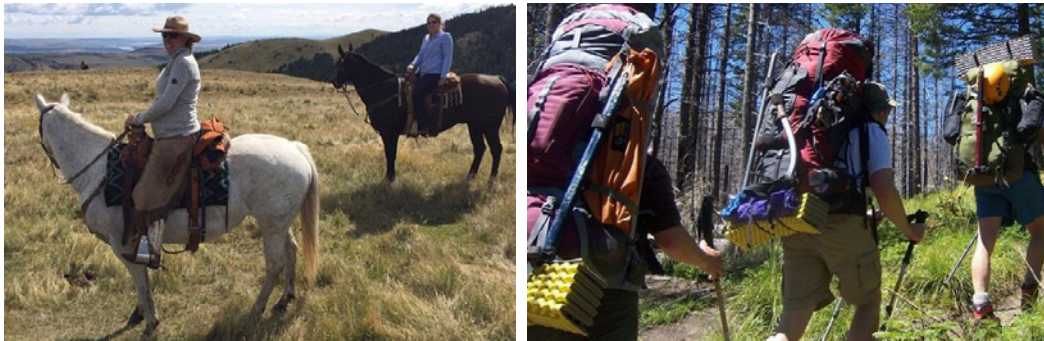
BACKCOUNTRY ACCESS AND TOURS

CMR is well positioned to being a summer oriented backcountry mecca. To support backcountry trekking and mountain bike touring in the larger Castle region, CMR will develop a variety of facilities and services. This will include guiding opportunities staged out of CMR.

The route of the increasingly popular Great Divide Mountain Biking Trail (from Banff to New Mexico) is located on the backside of Haig Mountain in British Columbia. With the development of an access trail, Castle Mountain has a significant opportunity to cater to this market as either starting or ending staging points to the Trail. This will also create looping trail opportunities (guided and self directed) connecting CMR to Pass Powderkeg, Crowsnest Pass, Sparwood, Fernie, Kananaskis and Banff to the north and Waterton National Park and the Unites States to the south.

OTHER SUMMER ACTIVITIES

The Castle region has traditionally been a favourite destination for use of Off-Highway Vehicles (OHV). Preliminary management discussions regarding the newly created Castle Provincial Park and Wildlands Provincial Park place the future of these activities within the region in doubt. Regardless of the final management decision, CMR will continue to work to support wilderness adventures in the surrounding region and the preservation of the area's ecological integrity.
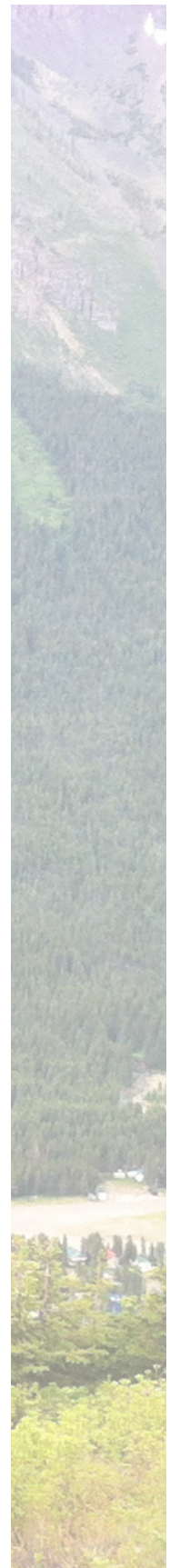
BASE AREA PROGRAMMING

Taking advantage of the growth of facilities and bed base at CMR, more summer activities will be programmed to cater to the imagination and expectations of tourists and residents alike. These will include sporting events (mountain bike races, adventure tourism competitions, etc.); festivals (music, art, spoken word); and camps (kids camps, training camps, and educational camps). Further, while not wanting to be out of character, the shopping, restaurants, and bars of the Village will grow in importance as attractions in their own right. Careful planning and design is underway in an effort to turn CMR into a unique and special all-season resort that will ultimately rival other mountain destinations throughout Alberta.

Huckleberry Festival at Castle Mountain
Photo: CMR, 2017

FIGURE 4-10: SUMMER USE CONTEXT
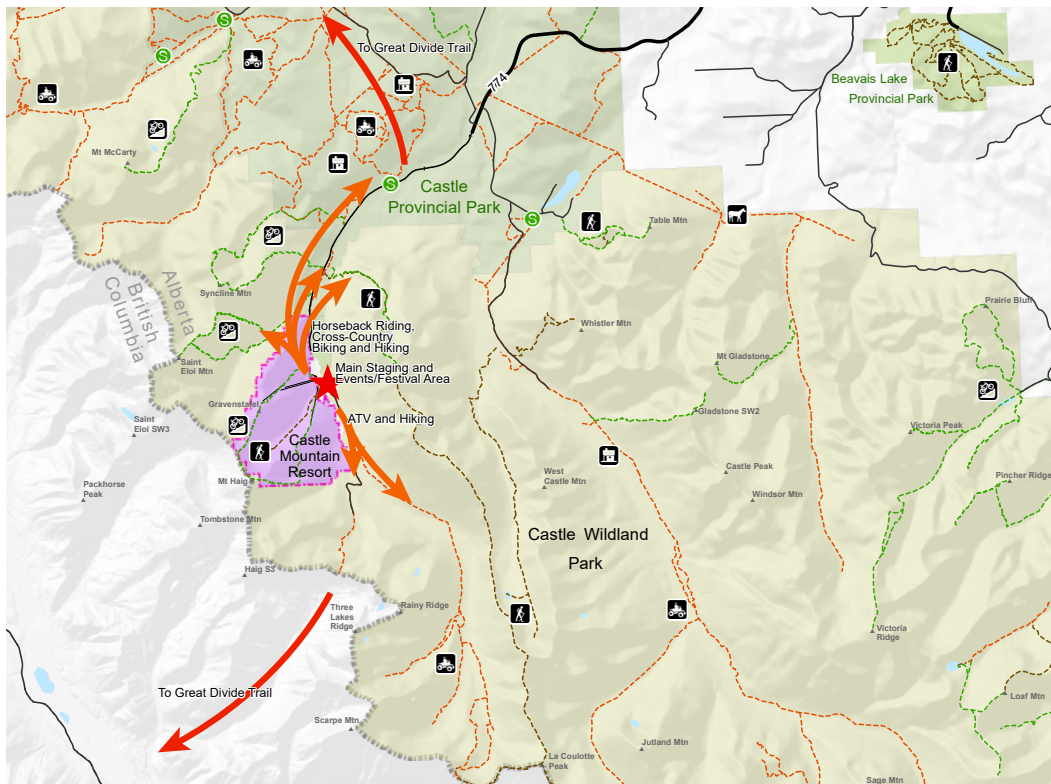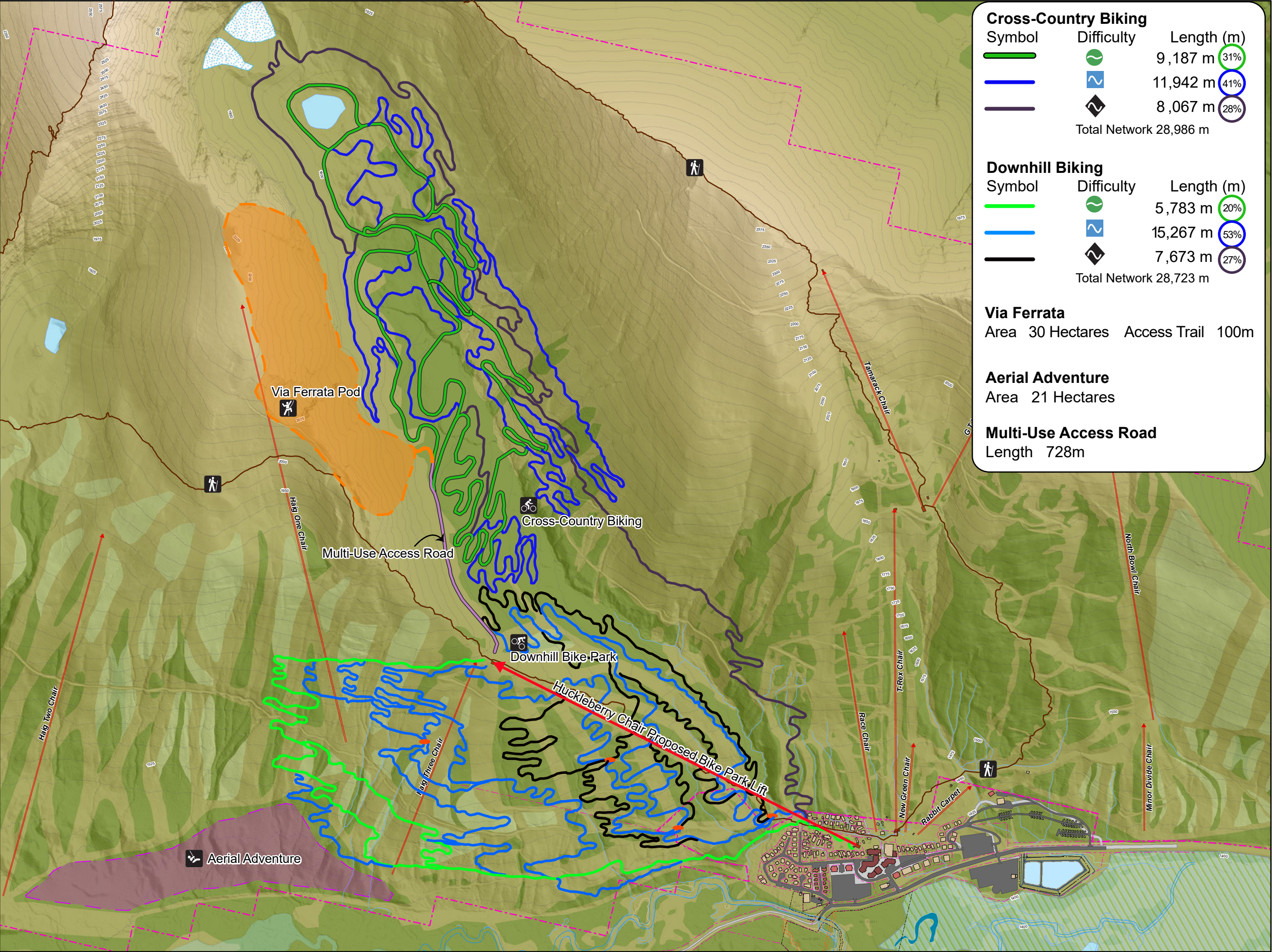
Cross-Country Biking

Symbol	Difficulty	Length (m)	
(green)	≈	9,187 m	31%
(blue)	~	11,942 m	41%
(purple)	◆	8,067 m	28%

Total Network 28,986 m

Downhill Biking

Symbol	Difficulty	Length (m)	
(green)	≈	5,783 m	20%
(blue)	~	15,267 m	53%
(black)	◆	7,673 m	27%

Total Network 28,723 m

Via Ferrata
Area   30 Hectares   Access Trail   100m

Aerial Adventure
Area   21 Hectares

Multi-Use Access Road
Length   728m

Castle Mountain®

Castle Mountain Resort
Master Development Plan
2017

→ Potential Lifts
Ski Area Boundary
– · – License of Occupation
■ Proposed Vegetation
Proposed Gladed Areas
□ Dense Glading
□ Thin Glading
— Hiking Trail

Proposed Summer Use

DH Bike Trails

XC Bike Trails

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Proposed
Summer Use Plan

Figure 4-11

Via Ferrata Pod

Multi-Use Access Road

Cross-Country Biking

Downhill Bike Park

Huckleberry Chair Proposed Bike Park Lift

Aerial Adventure

Haig One Chair

Haig Two Chair

Haig Three Chair

Tamarack Chair

T-Rex Chair

Race Chair

New Green Chair

Rabbit Carpet

North Bowl Chair

Minor Divide Chair

4.4 RESORT CAPACITY AND VISITATION AT BUILDOUT

4.4.1 BALANCED RESORT CAPACITY

The capacity of the various facilities and attractions developed at CMR defines the size and scale of the resort. In the winter, the primary attractions are skiing and snowboarding, cross-country skiing, snowshoeing, catskiing, and, backcountry touring. The effective Balanced Resort Capacity (BRC) of CMR in the winter is the total capacity of these attractions plus additional 5% for passive guests. As per Table 4-6, this equates to a winter BRC of approximately 4,332 visitors per day at buildout.

Table 4-6 Balanced Resort Capacity: Winter Buildout

Winter Attractions	Capacity
Alpine Skiing CCC	3,952
Cross-country Skiing	50
Backcountry Skiing	50
Snowshoeing	50
Catskiing	24
Total	4,126
Passive Guests (5%)	206
Total BRC (Winter)	4332

In the summer the primary attractions are downhill mountain biking, cross-country mountain biking, via ferrata, hiking, backcountry hiking and mountain biking, glamping, camps, festivals, and events. The effective BRC of CMR in the summer is the total capacity of these attractions plus additional 15% for passive guests. As per Table 4-7, this equates to a summer BRC of approximately 1,035 visitors per day at buildout.

Table 4-7 Balanced Resort Capacity: Summer Buildout

Summer Attractions	Capacity
Downhill Mountain Biking	200
Cross-country Mountain Biking	250
Backcountry Touring	50
Via Ferrata	50
Hiking	100
Aerial Adventure Park	150
Events, Camps	100
Total	900
Passive Guests (15%)	135
Total BRC (Summer)	1035
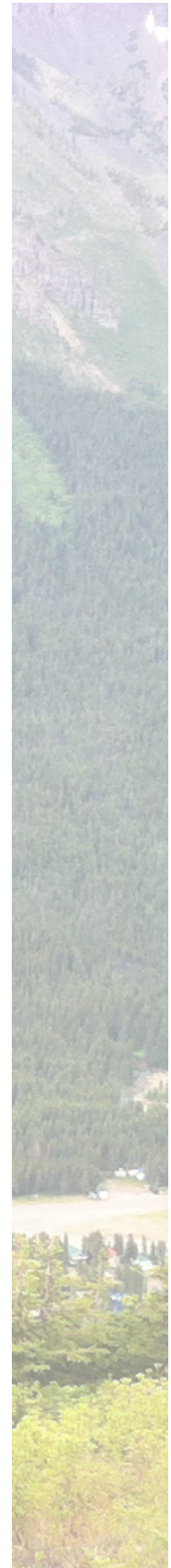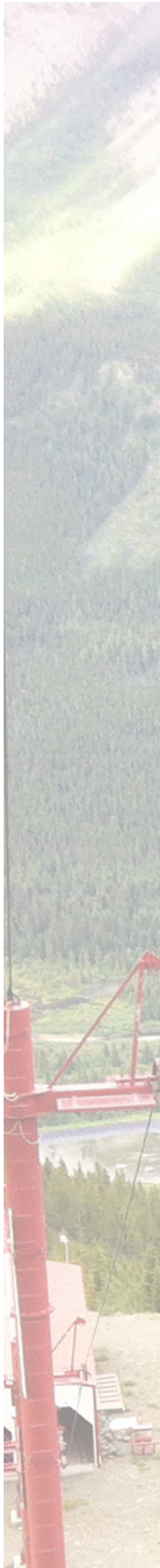
It is clear that the capacity of the proposed winter attractions will exceed the capacity of the proposed summer attractions. As these capacities are not cumulative, the winter BRC of 4,332 visitors per day is used to determine the appropriate amount of base area development that should be in place at CMR at buildout. This same number is applied in the infrastructure requirements.

4.4.2 VISITATION ESTIMATES

Utilization rates for successful mountain resorts range from 30% to 40% of their annual capacity. Resorts in a growth mode, encouraging ongoing development, use the upper range as the catalyst point to the next phase of development. Resorts that have achieved buildout, typically sustain a well balanced, steady state success at a utilization rate of approximately 30%. It is assumed that this will be the case for CMR at buildout.

Applying the "at buildout" BRC of 4,332 visitors a day for winter visitation and assuming a winter season length of 120 days and a 30% utilization rate, CMR can expect 156,000 winter visits. Similarly, applying a buildout summer maximum daily capacity of 1,035 visitors, assuming a summer season length of 100 days and a 30% utilization rate, CMR can expect 31,000 summer visits. In total, CMR can expect an estimated annual visitation total of approximately 187,000 visitors.

Busy Apres-Ski at Castle Mountain
Photo: CMR, 2017

4.5 BASE AREA DEVELOPMENT

The Master Development Plan for the proposed improvements and expansion of the base area developments at CMR have been designed to complement the mountain's attributes and proposed expansion opportunities. These developments will be gradually taken on, in balance with the establishment of additional skiing and associated mountain resort attractions. The following describes the details of the various base area developments, the rationale behind them and the relationships with the skiing and the all-season attractions at CMR.

At buildout, CMR will have two base areas, Castle Mountain Village and the Haig Base Area. These have been conceptually laid out to service and complement the adjacent mountain facilities.

4.5.1 BASE AREA DEVELOPMENT GOALS

Specific to CMR's Base Area, the following development goals were applied to guide the details of the development plan:

- Develop the base areas at Castle Mountain Resort in a comprehensive all-season, and well integrated fashion that caters to day use, international and regional destination visitors, second home owners and the permanent population;

- Expand the existing base into an all-season Village oriented focal point that reflects the core values and character already well established at CMR;

- Cater to day use, international and regional destination visitors, second home owners and the permanent resident population;

- Design the base area village to stage the facilities internal to the CMR License of Occupation tenure area as well as to provide recreation linkages to the surrounding Wildland and Provincial Parks and beyond;

- Incorporate direct linkages to and from the base area facilities and ski lifts such that the existing and proposed resort residential areas are ski to/ski from development;

- Reinforce the well established CMR pedestrian friendly base area character;

- Establish all of the base area facilities and residential development in balance with the capacities of the resort's attractions, recognizing that there are absolute limits to growth;

- Phase the base area development in an incremental fashion aligned with the proposed development of the mountain facilities;

- Incorporate a variety of resort residential accommodation initially limited to the allowable development cap of the Area Structure Plan and ultimately to an expanded and amended ASP;

- Incorporate affordable resident and employee housing into the plan;

- Provide enough parking to satisfy the requirements of the day use and destination visitors;

- Develop a satellite base area to cater to the access and parking requirements of the Castle South beginner terrain and backcountry opportunities;

- Ensure that all development is completed in a proactive, environmentally sensitive fashion that complements the surrounding Castle Wildland and Provincial Parks.

4.5.2 BASE AREA PLANNING CRITERIA

The appropriate size and scale of development of the base area facilities are directly linked to the capacity, location and scope of the resort attractions. The Balanced Resort Capacity (BRC) ultimately defines the size of CMR in terms of the number of visitors and residents that can be expected at buildout. It is important to remember that this is a static picture of the finished resort in the future. There will be a series of phases of development leading from the existing conditions to this end point.

The buildout BRC was calculated to total 4,332 visitors per day. This defines the number of people that need to be catered to in terms of their expectations for a satisfying resort experience. By extension, this defines the total amount and type of built space that needs to be put in place. It also defines the appropriate accommodation capacity, parking and infrastructure (sewer, water and power) requirements for the resort.

4.5.3 BUILT SPACE REQUIREMENTS

Built space requirements are driven by the BRC of the resort's facilities. At buildout, CMR must have the ability to provide for the needs of approximately 4,332 guests and residents on any given day. The types of built space necessary to provide for the needs and expectations of the guests range from restaurants, lounges, rental and repair shops, guest services, ski school, patrol/first aid and lockers to resort administration and employee facilities. As illustrated in Table 4-8, the specific space use requirements are listed. The total requirements at buildout are compared with the existing development to provide a sense of the scale of development necessary for CMR to be in balance in the future.

As illustrated, approximately 51,000 square feet of attraction-related built space should be in place at buildout. This is an increase of about 25,000 square feet to be incrementally added to CMR as the resort expands.

In addition, CMR will increasingly require facilities oriented to service destination guests, residents and visitors using CMR to stage lands beyond. This will include additional space to accommodate restaurants, cafes, bars, specialized retail and rental, destination services, recreation/entertainment/spa/fitness facilities, and convention/seminar facilities. As illustrated, this destination space at buildout totals approximately 20,500 square feet. This will bring the total amount of built space for CMR base area and village facilities to about 71,500 square feet.

These numbers are intended to guide the content, type, size and scale of facilities to be established at CMR. In the final analysis, the specifics of the base area facilities will be designed and located to meet the specialized needs unique to CMR's patrons. The pace of the development will be market driven and tied to improvements and expansion of the skiing and resort attractions.
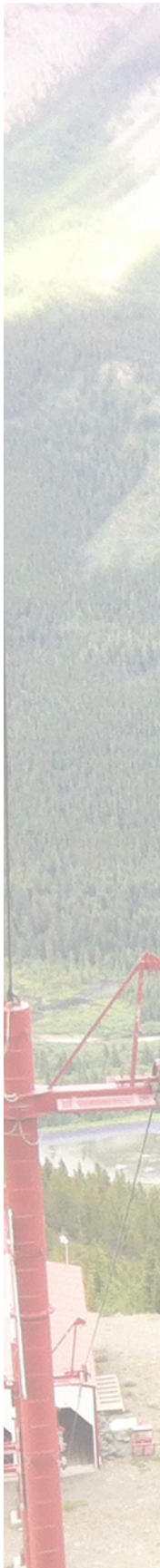
TABLE 4-8 SPACE REQUIRMENTS: BUILDOUT

Buildout Capacities		Alpine CCC	3,952	
		BRC	4,332	
Service/Function	Existing Space	Space Required	Difference	% of Required
Restaurants and Related Facilities				
Seating (Indoor)	11,212	13,989	-2,777	80%
Kitchen/Scramble	2,604	5,596	-2,992	47%
Bar/Lounge	144	1,399	-1,255	10%
Subtotal	13,960	20,983	-7,023	67%
Retail				
Equip Rental/Repair	2,660	3,658	-998	73%
Retail Sales	1,120	3,264	-2,144	34%
Subtotal	3,780	6,922	-3,142	55%
Skier Services				
Washrooms	896	4,197	-3,301	21%
Ski Patrol/First Aid	684	1,404	-720	49%
Ski School	380	2,127	-1,747	18%
Public Lockers	0	2,127	-2,127	0%
Day Care/Nursery	315	4,989	-4,674	6%
Ticket Sales	832	425	407	196%
Circ./Wall/Waste	0	763	-763	0%
Subtotal	3,107	16,032	-12,925	19%
Operations / Storage				
Administration	2,090	2,382	-292	88%
Employee Lockers	2,636	638	1,998	413%
Storage	670	277	393	242%
Mechanical / Furnace	322	3,306	-2,984	10%
Maintenance	0	660	-660	0%
Subtotal	5,718	7,263	-1,545	79%
Total Attraction Related Space	26,565	51,201	-24,636	52%
Destination Space				
Restaurant/Bar	0	5,735	-5,735	0%
Rec/Ent/Spa/Fitness	0	2,048	-2,048	0%
Destination Retail	0	6,144	-6,144	0%
Destination Services	0	4,915	-4,915	0%
Convention/Seminar	0	1,638	-1,638	0%
Total Destination Space	0	20,481	-20,481	0%
Total Built Space (sq ft)	26,565	71,682	-45,117	37%

4.5.4 OVERNIGHT ACCOMMODATION

Overnight accommodation is directly connected with the appropriate number of accommodation units that should be in place at CMR to achieve a well balanced resort experience and sustained success. The current ASP allows for 225 accommodation units at buildout equating to 788 beds at CMR. The ASP associates this accommodation capacity to 2,400 peak day visitors. Using the same ratio to align with the buildout BRC of 4,332 per day, the appropriate number of at buildout beds should be set at 1,421. Using the ASP applied 3.5 beds per accommodation unit, this equate to 406 accommodation units at builtout.

The difference between this and the existing 131 accommodation units, leaves 275 accommodation units to be developed by buildout. This increase will need to be incorporated into an updated ASP and tied into new a detailed Village Master Plan, guiding the development to resort buildout.

UNIT TYPES

The breakout of unit types is somewhat a function of the market demand for public and private beds. As a basic guide, successful mountain resorts will typically have about 40% of the accommodation catering to public use (available for any interested party to rent on a nightly basis), 45% for private use (used exclusively by the owners) and 15% for resident/employee housing (accommodation retained in perpetuity through affordability mechanisms in order to house the permanent population necessary to ensure that CMR functions with a high level of service and operational efficiency).

The specific and detailed allocation and phased development of overnight accommodation lie outside of the scope of this Master Development Plan. A detailed Village/Base Area Master Plan should be created that builds on the current Village Master Plan that was designed to adhere to the 2001 ASP.

ATTAINABLE HOUSING FOR EMPLOYEES AND RESIDENTS

A resort's employees and the local support and community residents are key to the character and quality of experience offered to its visitors. It is important to note the distinction between resort employees and support residents. The former are directly engaged by CMR to operate all aspects of the resort. They include everyone from the transient/seasonal workers to the top levels of management. Complementing this are all the other members of the working community at CMR. These include everyone from the hotel and restaurant personnel to trade industry operators (plumbers, electricians, contractors, etc.) to professional services (doctors, police, firemen, school teachers, etc.) Collectively, they are the locals of CMR. These locals are the lifeblood of the resort community and as such, function as ambassadors for the experience. It is in the best interest of CMR to ensure that their employees and the support residents live close by and have

access to the activities and services offered. This engagement becomes more of a challenge as the resort becomes more successful. Over time, seasonal and full-time employees and residents are typically less able to compete with the financial resources of investors and second homeowners. This makes it increasingly more difficult to live within or near the resort. Unchecked, the resort will become less and less affordable. Employees, critical to the provision of all resort services (not just the operation of the resort) begin to move further away. Ultimately, this compromises the vibrancy and economic vitality of the resort.

Castle Mountain Resort understands this and is committed to the resort establishment of employee and resident restricted housing integrated throughout CMR.

At buildout, the number of employee/resident bed units at CMR should equal about 15% of the total accommodation units at the resort. The specific unit types will be determined over time.

4.5.5 PARKING

With the envisioned changes to the mountain and base area lands, CMR will experience an increase in visitors per day and subsequently changes in parking demand. At buildout, it is estimated that the number of day use guests will account for about 70% of the total Balanced Resort Capacity. This equates to approximately 3,030 day use guests. Assuming that about 85% of the day use guests will arrive by car and 15% by bus, this equates to a need to park around 900 day use cars and 10 buses.

Based on the Village Master Plan parking concept, with careful design parking for approximately 900 cars and 10 buses can be accommodated in the 3 day use parking lots associated with the Village.

At buildout there will be the potential to construct about 300 day use parking stalls and 10 buses at the new Haig Base Area.

As such, at buildout, there should be the capacity to accommodate around 1250 day use parking stalls and at least 10 buses at the resort.

Destination visitors utilizing the 406 accommodation units equates to approximately 1,421 guests. Parking for these patrons will be linked to the individual accommodation units although a number of existing single family homes do not have access to parking on their lots and will continue to use the day lot.

TABLE 4-9: PROPOSED DAY USE PARKING AT BUILDOUT

Loaction	Car Capacity	Bus Capacity	Day Use Guest Capacity
Parking Lot 1	300	0	840
Parking Lot 2	200	0	560
Parking Lot 3	350	10	1430
Haig Parking Lot	300	10	1290
Total	1150	20	4120
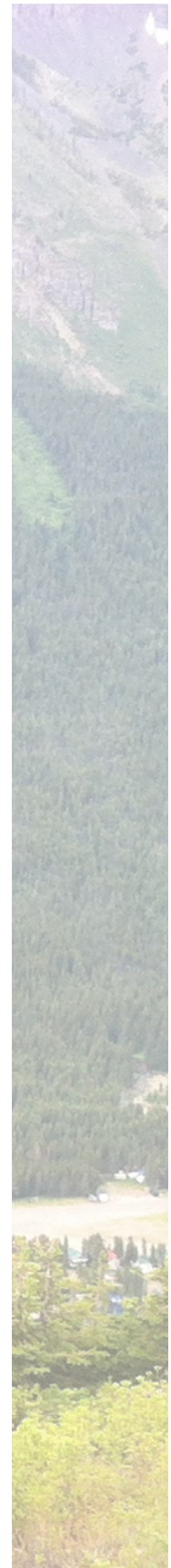
4.5.6 SUSTAINABILITY CHARACTERISTICS

The ongoing development at CMR will adapt and implement sustainability best practices. The intent is to ensure that development of all elements of the resort are environmentally sensitive, designed to maintain the ecological integrity of the setting and to mitigate all impacted areas. Aside from being the right thing to do, CMR recognizes that any guest patronizing the resort is escaping from their day-to-day realities. They are invariably most interested in visiting a place that has a respect for the special qualities of its setting. To that end, CMR will:

• Incorporate design guidelines that include green building objectives, criteria and minimum standards;
• Incorporate resort-wide sustainable procurement strategies;
• Incorporate a wildlife aware management strategy;
• Use riparian habitat protection best practices on all watercourses;
• Incorporate a trail development plan to avoid the removal of old growth trees and enabling appropriate on-the-ground trail alignment adjustments;
• Incorporate soil erosion best practices to minimize the loss of valuable topsoil and associated vegetation;
• Plan and design to minimize requisite grading;
• Utilize renewable energy systems when possible;
• Utilize and purchase local and regional goods and services wherever possible.

4.5.7 CASTLE MOUNTAIN VILLAGE

The Village base has been and will remain the focal point for development at Castle Mountain Resort. The vision for the Village was established by the Village Master Plan, completed in 2008. When completed, the Village core will provide a visitor centred experience, supported by restaurants, pubs, and a range of over-night accommodation. The layout has been designed to relate to the mountain, separating visitors from the parking, with the goal of maintaining CMR's established intimate and family-friendly atmosphere.

This Village Plan takes the base area development to the buildout point of the current ASP, containing 225 Accommodation Units. The Village Master Plan will have to be revisited and further expanded to reflect the full development program of 406 Accommodation Units.

The Castle Mountain Village will continue to be developed following the established Village Master Plan. The core area will be laid out so as to maximize the visitor's experience, with ground floor services ensuring the streets remain lively and animated. The Village will offer a range of overnight accommodation, including rental units and B&Bs, as well as townhouse and multiplex developments for residents.   In addition, there is an opportunity to include tennis courts as a summer facility. These could then be utilized as an ice skating rink in the winter. Employee housing and maintenance services will be located on the periphery of the core, but still connected through a network of pedestrian walkways. The full vision for the Village is illustrated in Figures 4-12 to 4-19.

Castle Mountain Ski Resort
Master Plan
2017

Existing Cistern

Future Employee Housing

Maintenance Shop

RV Sites

RV Sites

Parking Lot 2

SUNDANCE CHAIR

T-REX T-BAR

GREEN CHAIR

Water Pump House

Parking Lot 3

Day Lodge

HUCKLEBERRY TRIPLE CHAIR

Resort Core Area
Public Plaza

Bed & Breakfast Accommodation

Proposed Public Recreational Area
- Tennis Courts
- Ice Skating Surface

Primary Resort Entrance to Drop off

Hostel

Parking Lot 1

Fire Hall
Employee Housing

Secondary Entrance

Road to South Base

1:3,120

0   30   60   120 m

Castle Mountain
Village Plan

Figure 4-12

VILLAGE MASTER PLAN DESCRIPTION

The main entry to the Village utilizes the existing access, leading to a central drop off cul-de-sac adjacent to the Village core. With careful architectural design of the core buildings, a strong sense of arrival will be established. The orientation of the proposed core buildings guide the view towards the mountain and the skiing, minimizing the sightlines to the Day Lodge 'back-of-house' services.

Figure 4-13 Village Master Plan 3D View 1

The proposed drop off area enables easy access to Parking Lot 1. Parking Lots 2 and 3 provide additional parking areas for peak days. These parking areas are connected to the resort core via pedestrian linkages. Parking Lots 1, 2 and 3 provide a total of 1,010 parking stalls for day use and destination visitors to the resort.

The secondary access road separates the parking area from the core area and provides direct vehicular ac-cess to the existing residential and proposed development areas.

The proposed core buildings offer space for additional facilities, expansion opportunities and the relocation of existing amenities. The core buildings also provide 'warm-bed' rental accommodation units on various levels.
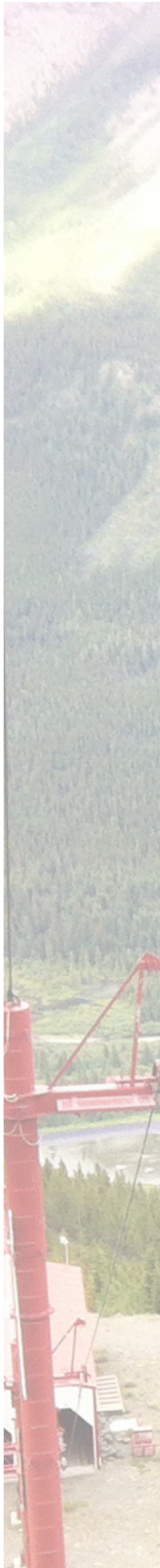
The layout of the village core has been designed to optimize user accessibility, building function and visitor experience. Buildings in the core area provide services on the first floor that open into the village stroll and plaza areas. This creates animation and enhances the pedestrian experience as visitors move throughout the Village. The rear of the buildings permits access for service trucks as well as accommodation check-in and circulation space.

The Master Plan proposes 82 'warm-bed' rental rooms that are approximately 800-850 sq. ft. per room, for a total of 41 core rental units. This provides flexibility to the size and form of the finished product depend-ing on market demand, detailed architecture and construction requirements.

The core area also includes Bed and Breakfast rental accommodation with the allocation of 12 rooms for a total of 6 units. (Resort Core: Building 8).

In addition to the proposed core area accommodation, townhouse and multi-plex development parcels are also proposed to provide a total of 32 dwelling units on Parcels 2 and 3.

In total there are 79 accommodation units proposed in this plan within the resort boundary. In addition to the 79 market units proposed there are 50 RV sites and development for Employee Housing accommodation on Parcel 1.

The north end of the site provides a location for 50 RV stalls and a site for some future employee housing. Access to these facilities is proposed from the main road at the north end of the resort boundary. The majority of the RV sites are located on a one-way road that exits adjacent to Parking Lot 2 and the lower RV road has a hammer-head turn around. The Maintenance Shop will continue to have a vehicular access from the north road and from the existing south access road.

The existing Alpenland building is to be incorporated into the proposed village design as per Resort Core – Building 6. Careful consideration will be required to ensure the finished product is both functional and aes-thetically pleasing.

The proposed Mountain Plan anticipates replacement of the existing T-Bar with a new Chair. This future lift will utilize the T-Bar alignment and place the bottom lift terminal at the location of the existing Ski Patrol building, designed to ensure proper skier circulation. This will require the removal of the Ski Patrol building and the relocation of all building facilities and services. Resort Core – Building 6 incorporates the relocated of all Ski Patrol facilities, as well as the First Aid, Ski School and Pub amenities.

Castle Mountain Resort
Master Development Plan
2017

Legend:
— Existing Ski Lifts
→ Proposed Ski Lifts
West Castle Wetlands
Proposed Vegetation

Race Chair

T-Rex Chair

New Green Chair

Rabbit Carpet

Huckleberry Chair

Maintenance Shop

Race Shack

Mtn Safety Shack

Ranch House

Pub

Day Lodge

First Aid

Rentals

Hostel

Sand Shop

Settling Pond

Fire Hall

Staff Quarters

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1:4,000

0   30   60   120
                              Meters

Proposed Village
Core

Figure 4-14

Figure 4-15 Village Master Plan 3D- View 2
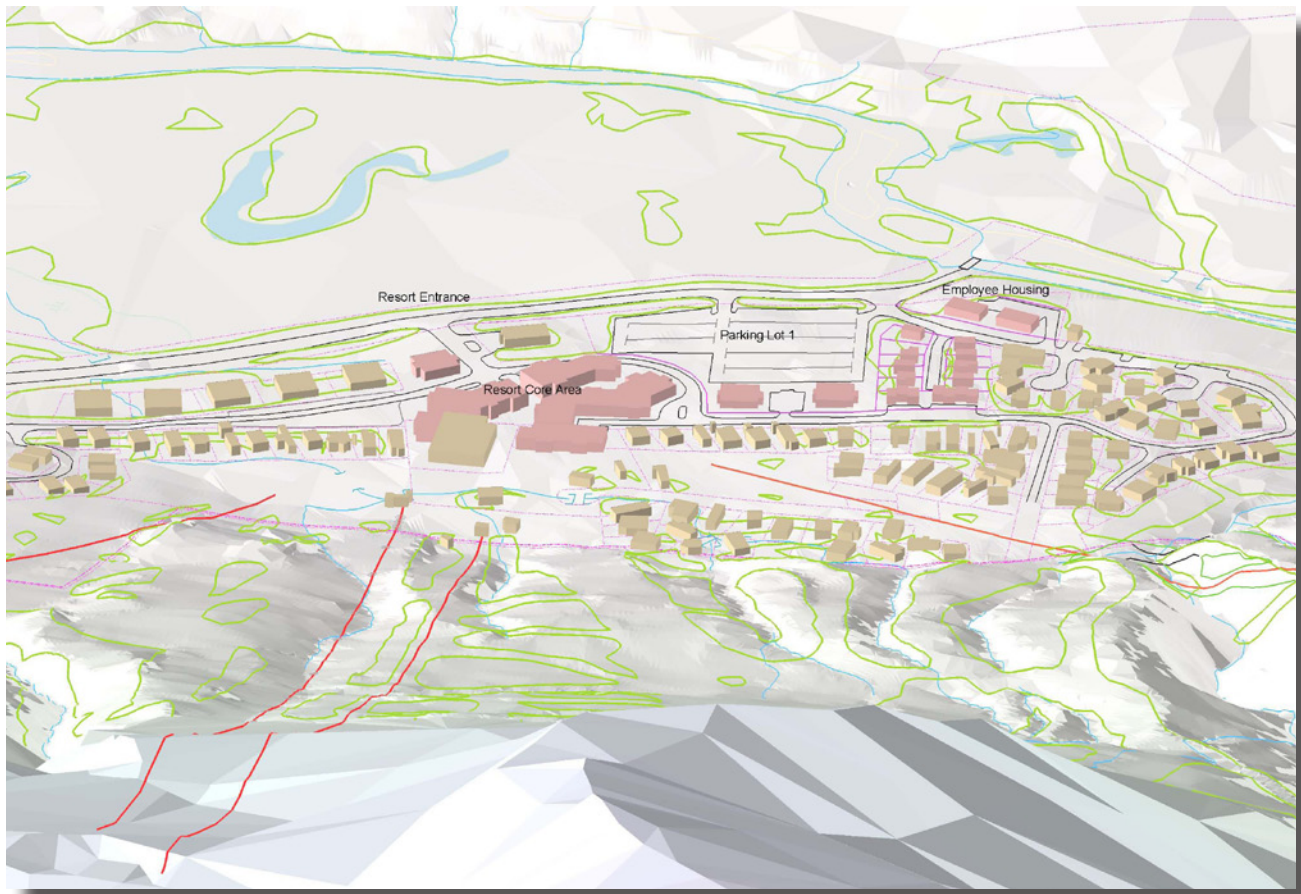
Figure 4-16 Village Master Plan 3D- View 3
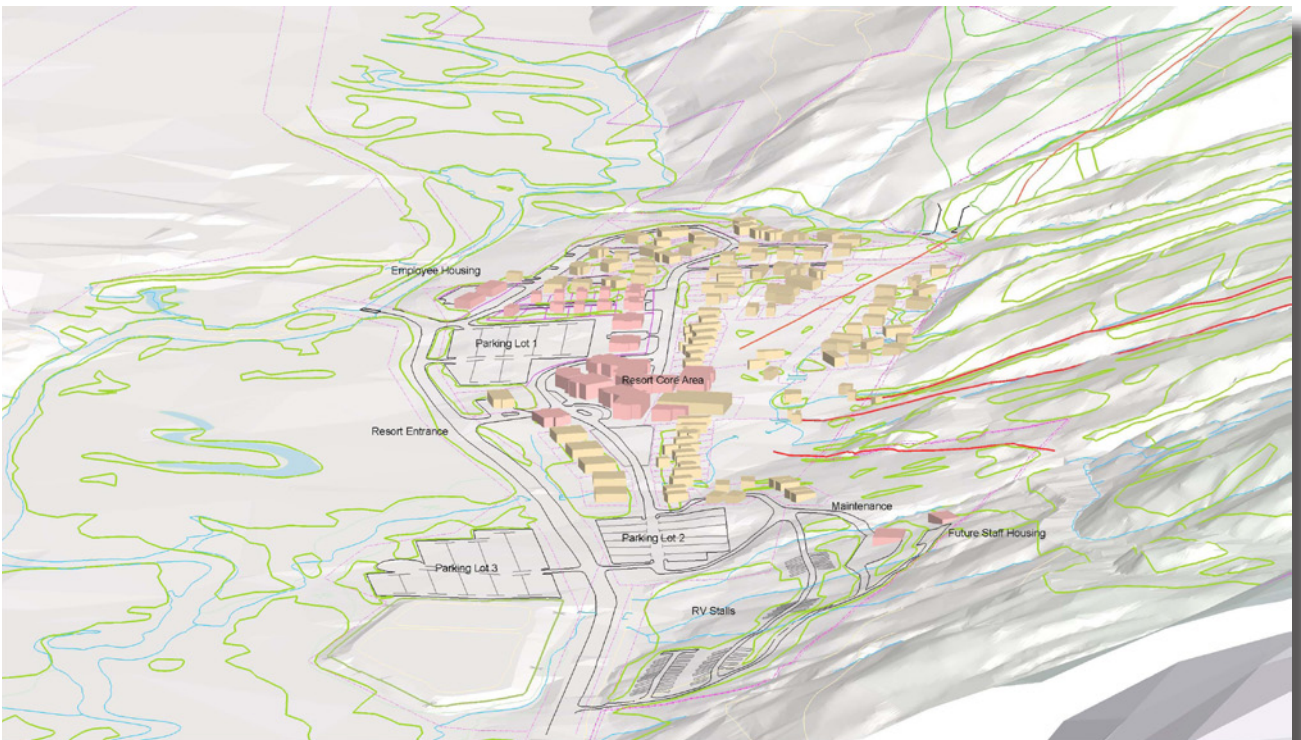
TICKETS

Castle

Castle Mountain Resort
Overnight Camping
With Power- $25.00
Without Power- $15.00
Weekends: Please check in at the T-Bar Pub
Weekdays: Please call 403-627-5101
or check in at Daylodge Services

VILLAGE SPACE USE AND ARCHITECTURAL PROGRAMMING

The resort core buildings incorporate existing, relocated and proposed services based on the additional development units at build-out. The existing Day Lodge will continue to house tickets and administration, guest services, snow / mountain bike school and primary cafeteria. The following describes the basic architectural programming of the various proposed Village core buildings and illustrated on Figures 4-17 to 4-19.

Resort Core: Building 1
- 21,680 sq. ft. total on 3 levels
- First Floor
o Arrival Information / Check in / Lobby
o Cafe / Restaurant
o Washrooms
o Retail and Rental Space
o Employee Lockers
- Second & Third Floor
o Accommodation (7 units)
o Average room size 800 sq. ft. / room

Resort Core: Building 2
- 12,910 sq. ft. total on 3 levels
- First Floor
o Arrival Information / Check in / Lobby
o Retail Space
- Second & Third Floor
o Accommodation (7 units)
o Average room size 800 sq. ft. / room

Resort Core: Building 3
- 8,070 sq. ft. total on 2 levels
- First & Second Floor
o Accommodation (5 units)
o Average room size 800 sq. ft. / room

Resort Core: Building 4
- 15,060 sq. ft. total on 2 levels
- First & Second Floor
o Accommodation (9 units)
o Average room size 800 sq. ft. / room
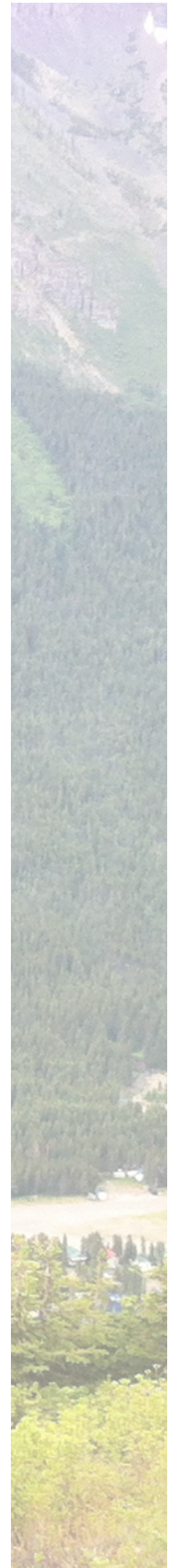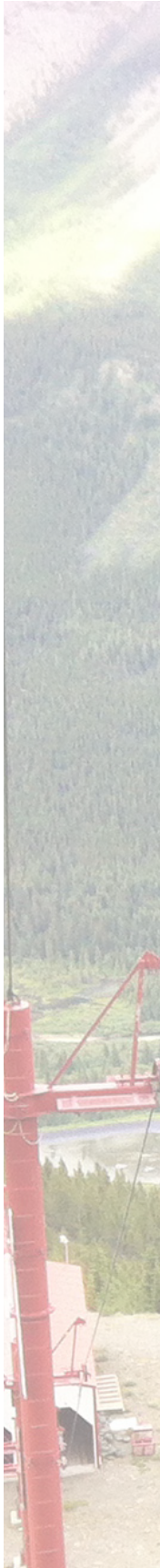
Resort Core: Building 5
- 21,160 sq. ft. total on 2 levels
- First Floor
o Rental Equipment / Repairs
o Retail Space
o Day Care
o Service Access / Parking
o Accommodation (2 units)
o Average room size 850 sq. ft. / room
- Second Floor
o Accommodation (6 units)
o Average room size 850 sq. ft. / room

Resort Core: Building 6
- 19,370 sq. ft. total on 2 levels
- First Floor
o Pub
o Ski School
o First Aid / Ski Patrol (relocated services)
o Service / Emergency Access
- Second Floor
o Accommodation (5 units)
o Average room size 800 sq. ft. / room

Resort Core: Building 7
- 3,400 sq. ft. total on 2 levels
- First Floor
o Service / Supply storage
o Service Access
- Second Floor
o Service / Supply storage for Day Lodge facility

Resort Core: Building 8
- 6,450 sq. ft. total on 1.5 levels
- Owners suite (1000 sq. ft.)
- 1,450 sq. ft. common space / kitchen area
- Accommodation - Bed and Breakfast (6 units)
o Average room size 333 sq. ft.

Parcel 1: Employee Housing

The total number of rooms provided for staff accommodation is base on the number of building levels, types of staff accommodation units created and the amount of square footage allocated per staff member. The number of staff members sharing common living, kitchen and bathroom facilities will determine the amount of square footage (sq. ft.) required to accommodate each staff member. Two development options are described below.

Option A: 2 staff members per dwelling of 500 sq. ft. with common living, kitchen and bathroom space (a breakdown of 250 sq. ft. / staff member).

- 5,810 sq. ft. foot print
- 17,400 sq. ft. on 3 levels
- 35 units @ 500 sq. ft. / unit (double occupancy)
- Surface parking for 24 cars
- Able to accommodate 70 staff members over 3 levels (17,400 sq. ft.).

Option B: Multiple staff members per dwelling, 3-4 bedroom dwelling with common living, kitchen and bathroom space (allocating 200 sq. ft. / staff member).

- 200 sq. ft. / staff member considers living, kitchen and bathroom space
- 5,810 sq. ft. footprint
- 11,620 sq. ft. on 2 levels
- 200 sq. ft. / staff member = 58 rooms (accommodating 58 staff members)
- Able to accommodate 87 staff members over 3 levels (17,400 sq. ft.).

Parcel 2: Multiplex Layout

The proposed layout of townhouse / multiplex unit dwellings creates an opportunity to develop these units in various combinations to total the proposed 16 units. Our recommendation would be to provide variety with duplex, triplex, fourplex buildings to create a more diverse streetscape. The opportunity to reduce the number of townhouse units on Parcel 2 would allow for larger dwellings if this was desirable based on mar-ket demand.

The other consideration and flexibility for total townhouse development on Parcel 2 will be directly tied to the number of rental units that are created in the resort core, again based on market demand.

- 16 Townhouse units
- 1,720 sq. ft. total on 2 levels
- Surface parking at each unit dwelling
- Garage / carport opportunities as per building aesthetics and design guidelines.
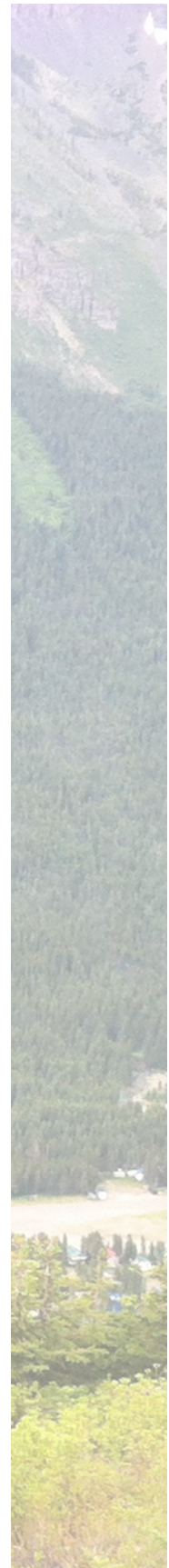
Parcel 3: Multiplex Layout

The proposed development and layout on Parcel 3 provides two multiplex buildings with 8 units per building for a total of 16 units. The location and design of the site provides the flexibility to have one building as 'warm-bed' rental accommodation. 16 units over two buildings also create phased building opportunities.

- 2 Buildings (rental or sale)
- 4,300 sq. ft. footprint / bldg
- 8,600 sq. ft. total on 2 levels / building
- 17,200 sq. ft. total over 2 buildings
- 16 units @ 1,075 sq. ft. / unit
- Surface parking for each unit

Future Employee Housing

As noted in 'Parcel 1: Employee Housing' above, the total number of rooms provided for staff accommoda-tion is base on the number of building levels, types of staff accommodation units created and the amount of square footage allocated per staff member. Options to decrease the amount of square footage per staff member will provide additional number of rooms.

- 2,580 sq. ft. foot print
- 7,750 sq. ft. on 3 levels
- 15 units @ 500 sq. ft. / unit (double occupancy)
- Surface parking.

Potential Accommodation Development

The total number of accommodation units has been established at 406 units at buildout. The difference between this and the existing 131 accommodation units, leaves 275 accommodation units to be developed. Approximately 17.26 acres of land within the resort base area and 1.07 acres of land for potential future purchase have been identified for potential accommodation development (Figure-19b). Detailed analysis of these areas will be required, however with the appropriate density applied these areas should contain the envisioned accommodation development.

Figure 4-17 Village Master Plan 3D- View 3

Resort Core - Building 1
- 21,680 sq. ft. total on 3 levels
- Arrival Information / Check in / Lobby
- Cafe / Restaurant
- Washrooms
- Retail Space
- Employee Lockers
- Accommodation units (14)
- Average unit size 800 sq. ft. / unit

Resort Core - Building 2
- 12,910 sq. ft. total on 3 levels
- Arrival Information / Check in / Lobby
- Retail Space
- Accommodation units (14)
- Average unit size 800 sq. ft. / unit

Resort Core - Building 3
- 8,070 sq. ft. total on 2 levels
- Accommodation units (10)
- Average unit size 800 sq. ft. / unit

Resort Core - Building 4
- 15,060 sq. ft. total on 2 levels
- Accommodation units (18)
- Average unit size 800 sq. ft. / unit

Resort Core - Building 5
- 24,360 sq. ft. total on 3 levels
- Rental Equipment / Repairs
- Retail Space
- Service Access / Parking
- Accommodation units (21)
- Average unit size 800 sq. ft. / unit

Resort Core - Building 6
- 19,370 sq. ft. total on 2 levels
- Pub
- Ski School
- Ski Patrol / First Aid
- Service / Emergency Access
- Accommodation units (11)
- Average unit size 800 sq. ft. / unit

Resort Core - Building 7
- 3,400 sq. ft. total on 2 levels
- Service / Supply storage
- Service Access

Resort Core - Building 8
- 6,450 sq. ft. total on 1.5 levels
- B&B units (10 @ 500 sq. ft. ea.)
- 1,450 sq. ft. common space

Multi-plex Layout
- 2 Buildings (rental or sale)
- 16 units @ 1,075 sq. ft. / unit
- 4,300 sq. ft. footprint / bldg
- 17,200 sq. ft. total on 2 levels
- Surface parking for each unit

Employee Housing
- 3,000 sq. ft. footprint
- 9,000 sq. ft. total on 3 levels
- 18 units @ 500 sq. ft. / unit
  (double occupancy)
- Surface parking

Existing Ski Lifts
Proposed Ski Lifts
West Castle Wetlands
Proposed Vegetation

Employee Housing

Parking Lot 1

Parking Lot 2

Parking Lot 3

Multi-plex

Huckleberry Chair
Race Chair
T-Rex Chair
New Green Chair
Rabbit Carpet
Buckaroo Carpet

PREFERRED CONCEPT SUMMARY

MULTI-PLEX / TOWNHOMES:	32 UNITS
CONDO / RENTALS:	41 UNITS
BED & BREAKFAST:	6 UNITS
TOTAL:	79 UNITS
EMPLOYEE HOUSING: (Double Occupancy)	35 + UNITS
FUTURE EMPLOYEE HOUSING (Double Occupancy)	15 + UNITS
RECREATIONAL VEHICLES (RV):	50 STALLS
PARKING (LOTS 1, 2 & 3):	1,010 STALLS

NOTES:
- Resort core space use details provided on Plan #3 and attached design summary
- Employee Housing unit totals may vary depending on the size and type of development as noted in the design summary
- Design Summary provided on separate page

1:4,000

0   30   60   120
Meters

Proposed Village
Core Space Use

Figure 4-18

RESORT CORE - BUILDING LEVELS

FIRST FLOOR

Ski School / Pub / First Aid / Ski Patrol

Rental Equipment & Repairs / Retail / Accommodation (4 rooms)

Accommodation (9 rooms)

Day Lodge

Service / Supply storage & Access

Cafe & Restaurant / Retail / Washrooms / Arrival & Info. / Employee Lockers

Retail / Arrival / Accommodation (4 rooms)

Accommodation (5 rooms)

Hostel

Multi-plex - Option - First Floor

- 2 Multi-plex Buildings
- 6,450 sq. ft. footprint per building
- 12,900 sq. ft. total footprint on first floor
- Parking on first floor (36 stalls)
- Common entrance

SECOND FLOOR

Accommodation (10 rooms)

Accommodation (12 rooms)

Accommodation (9 rooms)

Day Lodge

Service / Supply storage & Access

Accommodation (7 rooms)

Accommodation (5 rooms)

Accommodation (5 rooms)

Hostel

Multi-plex - Option - Second Floor

- 6,450 sq. ft. on second floor / building
- 12,900 sq. ft. total on second floor
- Accommodation 12 unit total (6 units / bldg)
- Average unit size 1000 sq. ft. / unit
- Potential for additional units by reducing the average unit size
(16 units @ 800 sq. ft. each)

THIRD FLOOR

Day Lodge

Accommodation (7 rooms)

Accommodation (5 rooms)

Hostel

Multi-plex - Option - Third Floor

- 3,225 sq. ft. on third floor / building
- 6,450 sq. ft. total on second floor
- Accommodation 6 unit total (3 units / bldg)
- Average unit size 1,000 sq. ft. / unit
- Potential for additional units by maximizing the building sq. ft. on the third floor / by reducing the average unit size (16 units @ 800 sq. ft. each)
- Parcel 3 has the potential to accommodate 18-36 units (range in unit size +/- 700-1,000 sq. ft.) based on the parking capacity

Parking Lot 1

Multi-plex

Race Chair

T-Rex Chair

New Green Chair

Huckleberry Chair

Buckaroo Carpet

Rabbit Carpet

Existing Ski Lifts

Proposed Ski Lifts

West Castle Wetlands

Proposed Vegetation

Castle Mountain Ski Resort
Master Plan
2017

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1:4,000

0   30   60   120
Meters

Proposed Village Core Architecture Programming

Figure 4-19

Castle Mountain Resort
Master Development Plan
2017

Legend

- Existing LOC
- West Castle Wetlands
- Existing Ski Lifts
- Proposed Ski Lifts
- Ski Trails
- Proposed Glading
  - Dense Glading
  - Thin Glading
  - Proposed Vegetation
- Potential Future Accomodation Development
- Potential Land Purchase Option

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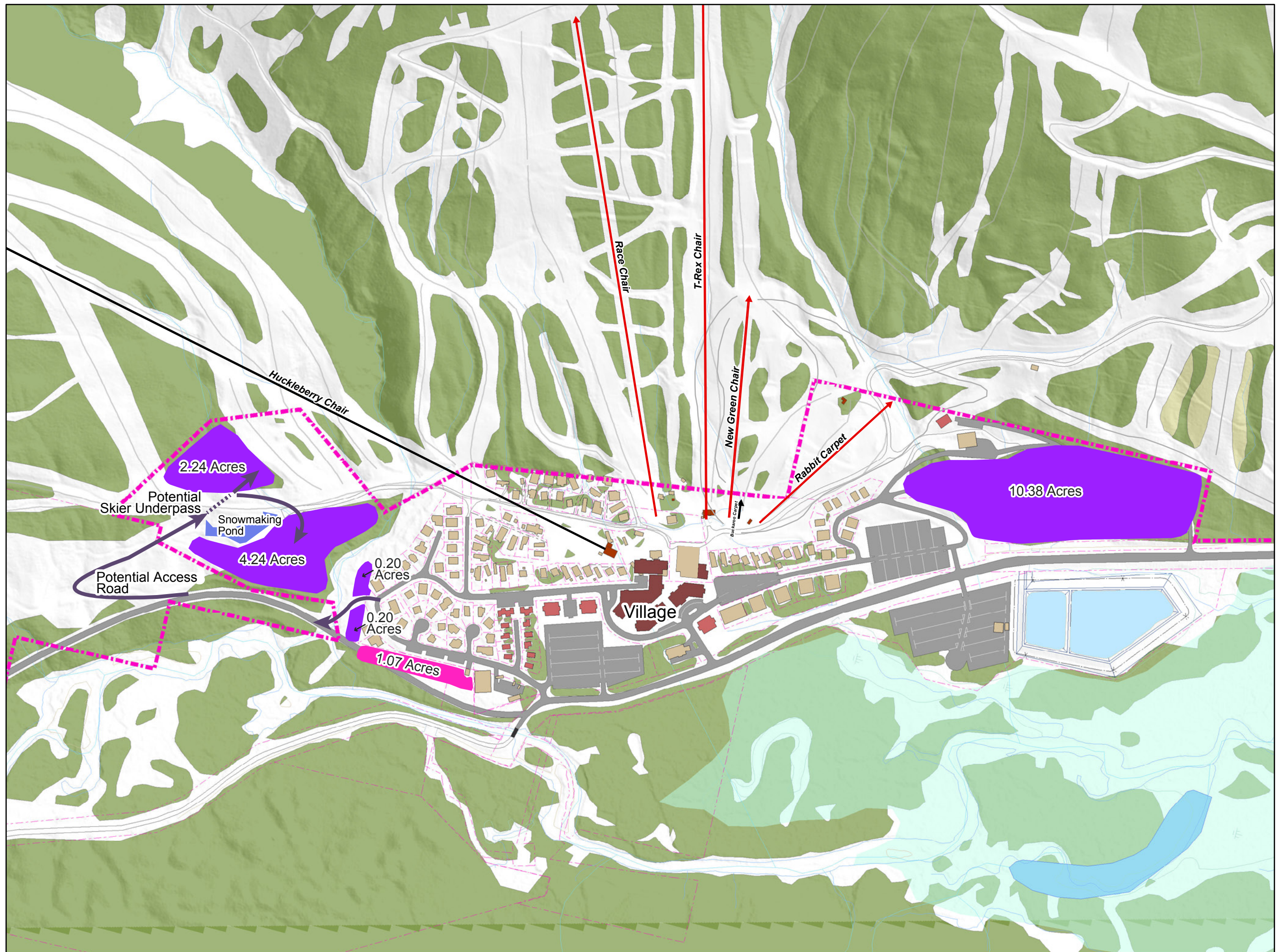email: info@skicastle.ca
website: www.skicastle.ca

1:5,000

0   37.5   75   150
                          Meters

Potential Future
Accommodation
Development

Figure 4-19b

Map labels:

- Race Chair
- T-Rex Chair
- New Green Chair
- Rabbit Carpet
- Huckleberry Chair
- 2.24 Acres
- Potential Skier Underpass
- Snowmaking Pond
- 4.24 Acres
- 0.20 Acres
- Potential Access Road
- 0.20 Acres
- 1.07 Acres
- 10.38 Acres
- Village

Base Area at Castle Mountain
Photo: BHA, 2016

4.5.8 HAIG BASE AREA

The satellite, day use oriented, Haig Base Area is proposed for development at the bottom of Haig Ridge, south of the Village. This will include the development of a formalized access road, parking lot and day lodge (Figure 4-20). The day lodge will provide basic amenities, cafeteria, tickets and snow school facilities. The Haig Base will stage and support much needed beginner and novice ski terrain, as serviced by the proposed Beginner Chair. It will also provide quick and easy access to the new Haig Ridge skiing development via the Haig Two Chair, enabling a ski experience that leads back and forth to the Village and the Gravenstafel skiing. Finally this base will act to stage lift serviced, slack country and backcountry skiing via the proposed Backcountry Chair.

Welcome to Castle Mountain
Photo: BHA, 2016

HAIG RIDGE

GRAVENSTAFEL
MTN
(2391 M)

SORE
CROTCH
VALLEY

Backcountry Chair

Tamarack Chair

G T-Bar

Haig One Chair

Haig Two Chair

Haig Three Chair

Huckleberry Chair

Race Chair

T-Rex Chair

New Green Chair

Rabbit Carpet

Beginner Chair

Haig Base
Area

Haig Lodge

Proposed Parking
(260 cars)

Proposed Access
Road

Village

Castle Mountain Resort
Master Development Plan
2017

Existing LOC
West Castle Wetlands
Existing Ski Lifts
Proposed Ski Lifts
Ski Trails
Proposed Glading
Dense Glading
Thin Glading
Proposed Vegetation

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                           Meters

Proposed Haig
Base Area

Figure 4-20

4.6 SERVICING AND INFRASTRUCTURE

4.6.1 Introduction

At buildout of this Master Development Plan, CMR will have approximately doubled in size. To accommodate this growth, CMR's infrastructure has to be sized to accordingly. This will be will be subject to an ASP amendment and refined infrastructure planning. The current infrastructure components (existing and planned) are illustrated in Figure 4-21.

Key elements are the:

• Proposed development of a significant snowmaking system (see Section 4.2.13);
• Proposed increase of overnight accommodation to 406 units (see Section 4.5.4);
• Anticipated increases in visitation to approximately annual 187,000 visitors (see Section 4.4.2);
• Expansion of the Village core area (see Section 4.5.6);
• Development of the Haig Base Area (see Section 4.5.7).

It is important to note that this development will be gradual, responding to market demand, over the course of many years. As development of the resort continues, the water, sewer and power utilities will be improved and upgraded as necessary. In all cases, state of the art technologies will be applied to keep environmental impacts to an absolute minimum.

4.6.2 Water

Water at CMR is currently supplied from groundwater, with the potential to expand to surface water diversion and storage as development demands. The current capacity of CMR's water utility is sufficient to accommodate the needs of the committed and planned resort residential development. Metered water use indicates a required supply rate of 44 Igpm. The current water supply and utility infrastructure can support a withdrawal rate of approximately 50 Igpm.

The groundwater accessed by CMR comes from a very deep aquifer, and is located away from sources of contamination or flooding. Laboratory analysis of groundwater samples from the CMR concluded the quality was high and suitable for potable supply. All domestic water supply goes through the CMR water plant for treatment before its distribution.

In cases of emergency, such as fire, the current water infrastructure can provide a maximum of 400 Igpm for a short duration. A report from the Insurer's Advisory Organization recommended a minimum flow of 800 Igpm for 1.5hrs (total 72,000 Igal).

Projected water requirements for snowmaking will require additional water sources. Accordingly, to realize its full potential, CMR needs to secure a sustainable and adequate water supply. This is predicated on the following:

- Continual climate change adds uncertainty to the ski industry with regards to reliable snow-line, snow quantity, and snow quality, making available water extremely important for snowmaking;
- Domestic water demand will increase alongside the resort commercial and residential development at the resort;
- Domestic water demand will increase alongside the growth in day use skiers, resort guests and staff;
- Summer use of the resort will require a year round sustainable water supply for resort operations, increased day use visitation and the proposed expanded overnight accommodation for visitors, staff and residents.

Table 4-10 Water Demand Estimate

	Accom. Units	Density (visits/unit)	Resident (Igcd)	Occupancy	Housing Total (Igal)	Annual Visitation (2016/2017)	Day Use (Igcd)	Day Use Total* (Igal)	Daily Demand (Igal)	Predicted Annual Demand (Igal)
2001 Area Structure Plan										
Existing	131	3.5	50	100%	8,367,625	93,000	15	1,157,850	26,097	9,525,475
Buildout	225	3.5	50	100%	14,371,875	93,000	15	1,157,850	42,547	15,529,725
2017 Master Development Plan										
Buildout	406	3.5	50	100%	25,933,250	187,000	15	2,805,000	77,394	28,248,950
Smowmaking										33,038,625
Totals										61,287,575

*Per the CMR 2001 ASP, 17% of Day Use visits are attributed to Residents and accounted for in Housing Total

Igcd = Imperial Gallons per Capita Per Day

Igal = Imperial Gallons

It is estimated that CMR will need in the order of 61.3 million imperial gallons of water annually to meet their needs at buildout. It is estimated that approximately 28.3 million gallons will be required for domestic consumption and 33 million gallons will be needed for snowmaking (see Table 4-10) .

As noted, CMR is currently developing facilities plans for its snowmaking system which will include a sustainable water source collected from within the current LOC. Following Provincial approval, the new water collection system will be able to meet CMR's snowmaking water demand.

4.6.3 Sewage Treatment

Sewage from CMR is treated using wastewater lagoons. The lagoons have a capacity equal to that of the current water supply infrastructure to provide a margin of safety. As a result of this extra precaution, the lagoons are currently operating at half of the designed maximum capacity on peak winter days, and have the capacity to accommodate the committed and planned development at CMR to the buildout of the current ASP. From the wastewater lagoons, the treated effluent is disposed of using an irrigation system (Alberta Environment approval No. 18777-01-00). This system will need to be evaluated and upgraded accordingly to align with an amended ASP

4.6.4 Fire Protection

The Castle Mountain Resort and community fire protection responsibility falls to Pincher Creek Fire Rescue. The pincher Creek fire department does respond as far as CMR. It maintains fire crews and a water tanker base in Pincher Creek, AB, 40km away from CMR.

4.7 LICENSE OF OCCUPATION

In order to accommodate the envisioned growth of CMR to buildout, the License of Occupation (LOC) Boundary will require adjustment. The proposed revision will be negotiated with the Province as the new Area Structure Plan will be negociated with the MD.

As illustrated in Figure 4-22, the existing LOC is 1,295 hectares (3,200 acres). As proposed, the LOC will be refined to be more accurately aligned with the use of the land. While the capacity of the resort will increase, the size of the proposed LOC will decrease to 1,268 hectares (3,133 acres) resulting in a net increase to the size of the Castle Wildlands Provincial Park. The largest change occurs at the south end of the resort with the addition of the much needed beginner ski terrain and the backcountry ski pod designed to complement backcountry access and recreation in the Park.

Castle Mountain Resort
Master Development Plan
2017
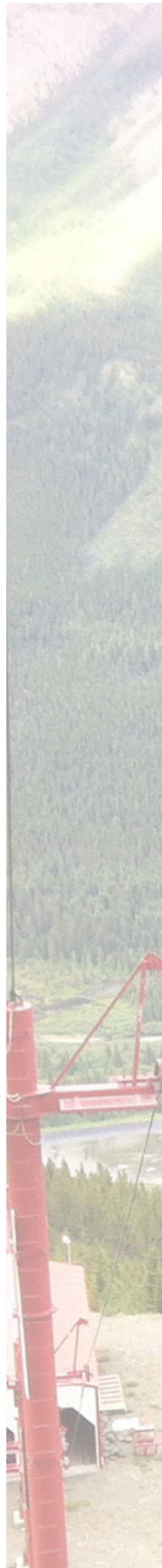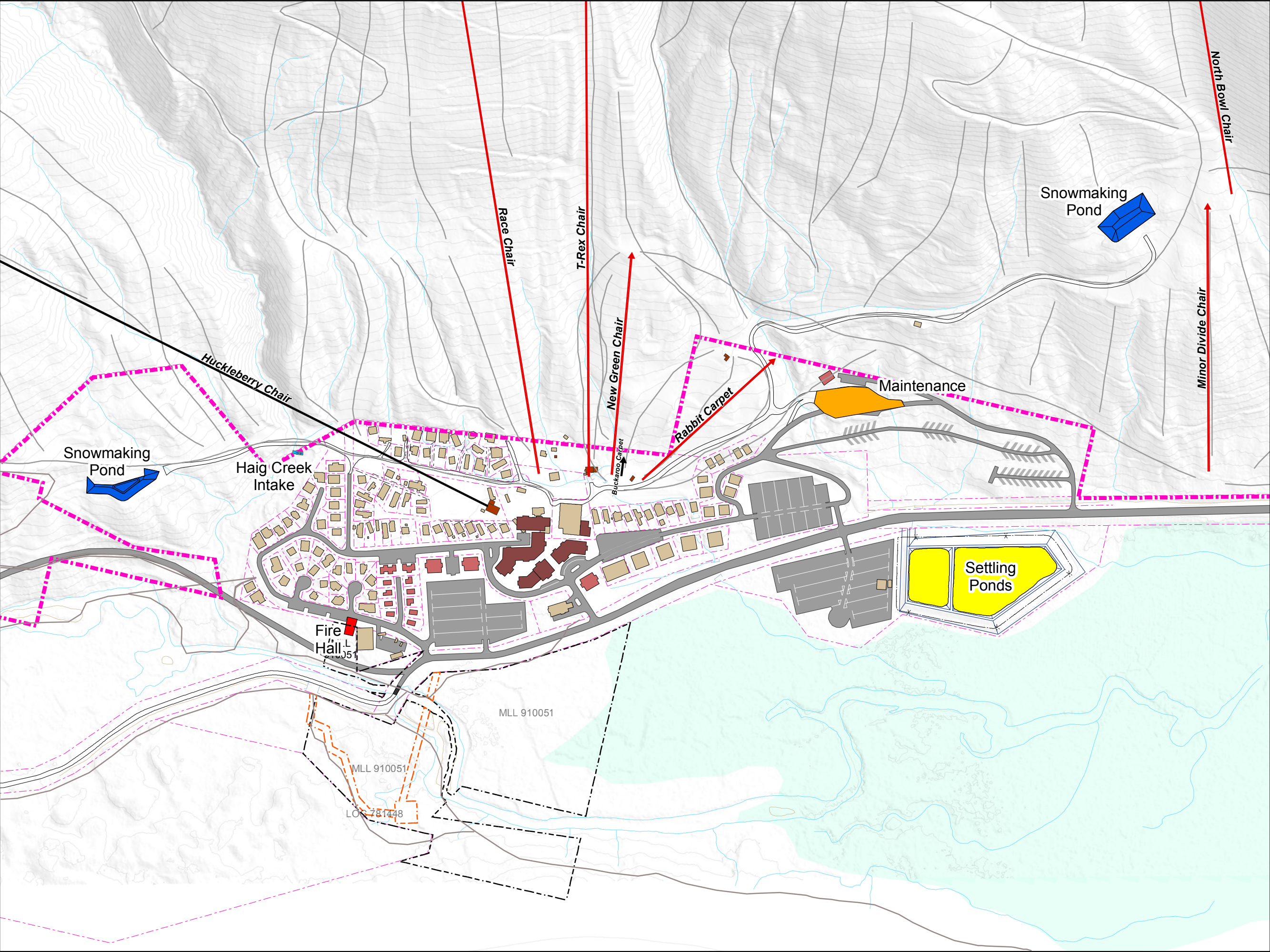
Legend
- LOC 781448
- MLL 910051
- Snowmaking Ponds
- Creek Intake
- Fire Hall
- Maintenance
- Settling Ponds
- Existing Ski Lifts
- Proposed Ski Lifts
- Ski Trails
- License of Occupation
- 5m Contours
- West Castle Wetlands

Map labels:
- North Bowl Chair
- Snowmaking Pond
- Race Chair
- T-Rex Chair
- New Green Chair
- Minor Divide Chair
- Rabbit Carpet
- Buckaroo Carpet
- Maintenance
- Huckleberry Chair
- Snowmaking Pond
- Haig Creek Intake
- Settling Ponds
- Fire Hall
- MLL 910051
- LOC 781448

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Meters

Infrastructure Plan

Figure 4-21

Castle Mountain Resort
Master Development Plan
2017

LOC 781448
MLL 910051
Existing Ski Lifts
Potential Ski Lifts
Existing LOC
Proposed LOC
West Castle Wetlands

Existing LOC
(1,295 Ha / 3,200 Acres)

Proposed LOC
(1,268 Ha / 3,133 Acres)

Tamarack Chair

G T-Bar

Haig One Chair

North Bowl Chair

Backcountry Chair

Haig Two Chair

Haig Three Chair

Huckleberry Chair

T-Rex Chair

Race Chair

New Green Chair

Rabbit Carpet

Minor Divide Chair

Beginner Chair

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Meters

Proposed LOC
Boundary Adjustment

Figure 4-22
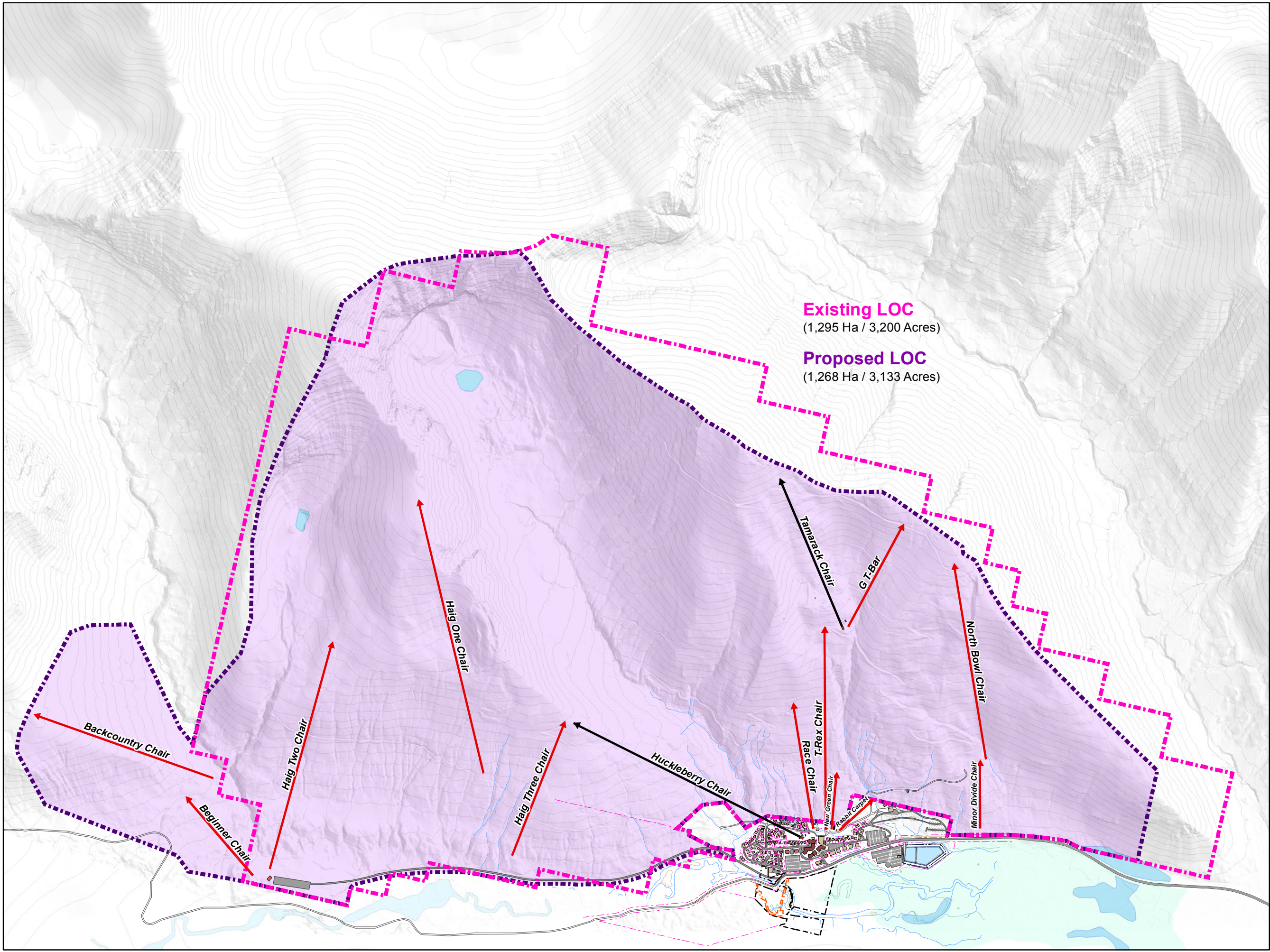
4.8 IMPLEMENTATION OF STRATEGY

4.8.1 Introduction

The pace of implementation of the CMR Master Development Plan will be driven by the resort marketplace and economic conditions. However, a series of short term implementation strategies have been identified, designed to set the plan in motion. These are:

- Obtain approval of the MDP;
- Work with the MD to create a new ASP reflecting the MDP;
- Continue to make incremental improvements to the resort respecting the ultimate needs of the MDP;
- Working with the Province, initiate access to and the development of the proposed snowmaking sys-tem and reservoirs, confirming water source and capacity requirements;
- Initiate detailed design for Haig One (lifts and trails);
- Prioritize summer recreation plan facilities for development;
- Initiate detailed design for first summer use facility.

On a longer time frame the implementation strategies would be expanded to include:

- Construct Haig One (lift and trails);
- Construct first phase of summer facilities;
- Construct the first and second phase of the proposed snowmaking system;
- Initiate dialogue with the Province to determine the best mechanism to enable the development of the Beginner Chair (lifts and trails), the Backcountry Chair (lifts and trails), the access road to the proposed Satellite Base Area. One option may be the realignment of the LOC Boundary to enable a net increase of Park land (Figure 4-21);
- Initiate dialogue with the Province to determine the best mechanism to enable the development of a new catskiing operation relocated in the Syncline Valley;
- Finalize design, construct and relocate the Green Chair (lifts and trails);
- Prioritize next steps of development as per the MDP.

Each of these strategies is directly aligned with the vision of CMR becoming a highly successful backcountry oriented, all-season, international and regional destination mountain resort.
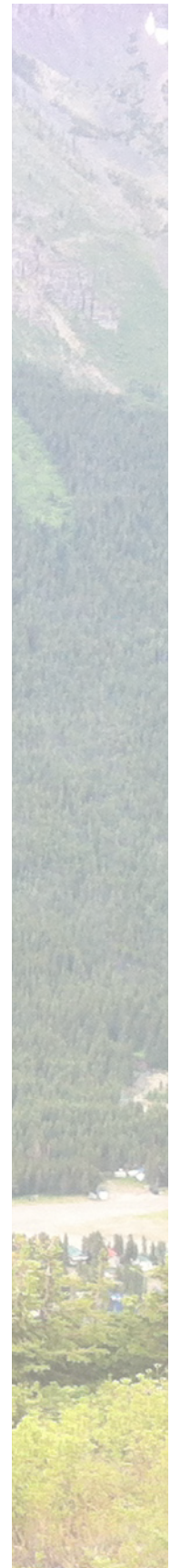
4.8.2   Phased Mountain Facilities Development

The gradual development of CMR is envisioned to occur over three or more phases (see Figure 4-23). Each phase is a self contained product, effectively able to function as a finished resort offering with both the mountain and the base area development complementing each other.   The phases will be triggered based on demand from the skier marketplace.

Phase One will include:
• Haig One Chair & Associated trail development;
• Initial expansion of the Village base;
• Initial mountain bike/Nordic area trail design and development.

Phase Two will include:
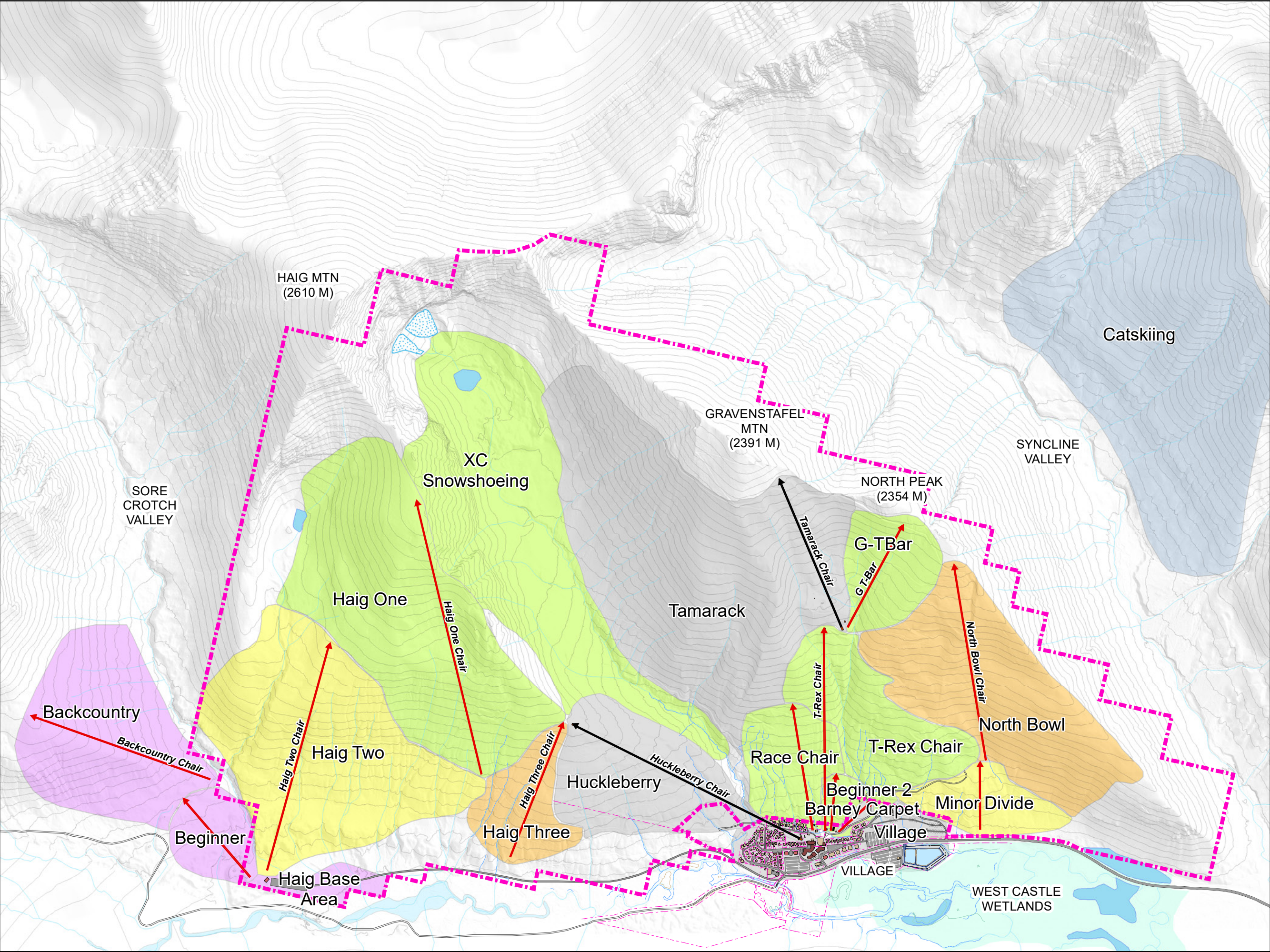• Haig Two Chair & Associated trail development.

Phase Three will include:
• Haig Three Chair & Associated trail development.

Future Phases will include:
• Existing Area Infill;
• Minor Divide and North Bowl Chairs;
• Aerial Adventure Park with Zipline Tour;
• Backcountry and Beginner Chairs with Satellite Base Area.

Catching Air at Castle Mountain
Photo: CMR, 2016

Castle Mountain Resort
Master Development Plan
2017

HAIG MTN
(2610 M)

SORE
CROTCH
VALLEY

Catskiing

GRAVENSTAFEL
MTN
(2391 M)

SYNCLINE
VALLEY

NORTH PEAK
(2354 M)

XC
Snowshoeing

Haig One

Tamarack

G-TBar

Haig One Chair

Tamarack Chair

G T-Bar

Backcountry

Backcountry Chair

Haig Two Chair

Haig Two

Haig Three Chair

Huckleberry Chair

Huckleberry

Haig Three

T-Rex Chair

Race Chair

North Bowl Chair

North Bowl

T-Rex Chair

Beginner 2

Minor Divide

Beginner

Barney Carpet

Village

Haig Base
Area

VILLAGE

WEST CASTLE
WETLANDS

Existing LOC
West Castle Wetlands
Ski Pods by Phase
Existing
Phase 1
Phase 2
Phase 3
Future Phase
Proposed Catskiing

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                          Meters

Proposed Phased
Mountain Expansion

Figure 4-23

4.9 CASTLE MOUNTAIN MASTER DEVELOPMENT PLAN

The Castle Mountain Master Development Plan at buildout is illustrated in Figures 4-24 to 4-25 and summarized in Table 4-11. This plan represents a well balanced and integrated mountain resort development consistent with the CMR's planned vision, goals and objectives.

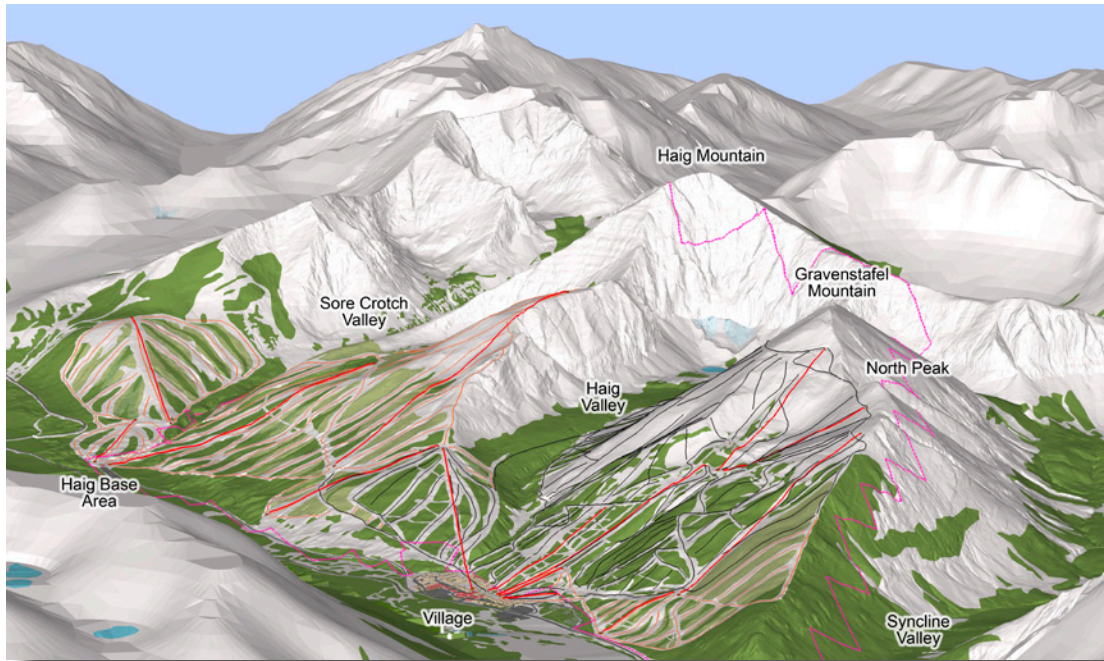| Castle Mountain Resort Master Development Plan Summary May 2017			
	Existing Conditions	Proposed Development (*including replacement)	Total Development at Buildout
Ski Lifts and Trails			
Carpet Lifts	1	1	1
T-Bar	1	1	1
Double Chair	2	2	4
Triple Chair	2	0	2
Quad Chair	0	6	6
Total Lifts*	6	12	14
Ski Trails	84	85	169
Gladed Trails (ha)	70	205	275
Skiable Terrain (ha)	363	398	761
Comfortable Carrying Capacity (CCC) (skiers per day)	1710	2242	3952
Additional Winter Activities – Capacity			
Cross-country Skiing	25	25	50
Snowshoeing	25	25	50
Catskiing	24	0	24
Backcountry Skiing	0	50	50
Total*	74	100	174
Summer Activities – Capacity			
Downhill Mountain Biking	0	200	200
Cross-country Mountain Biking	0	250	250
Backcountry Touring	0	50	50
Via Ferrata	0	50	50
Hiking	0	100	100
Aerial Adventure Park	0	150	150
Events, Camps	0	100	100
Total	0	900	900
Balanced Capacity and Development Units			
Additional/Passive Guests	90	116	206
Balanced Resort Capacity	1900	2432	4332
Accommodation Units	131	275	406
Annual Visitation			
Winter	90,000	66,000	156,000
Summer	3,000	28,000	31,000
Total	93,000	94,000	187,000

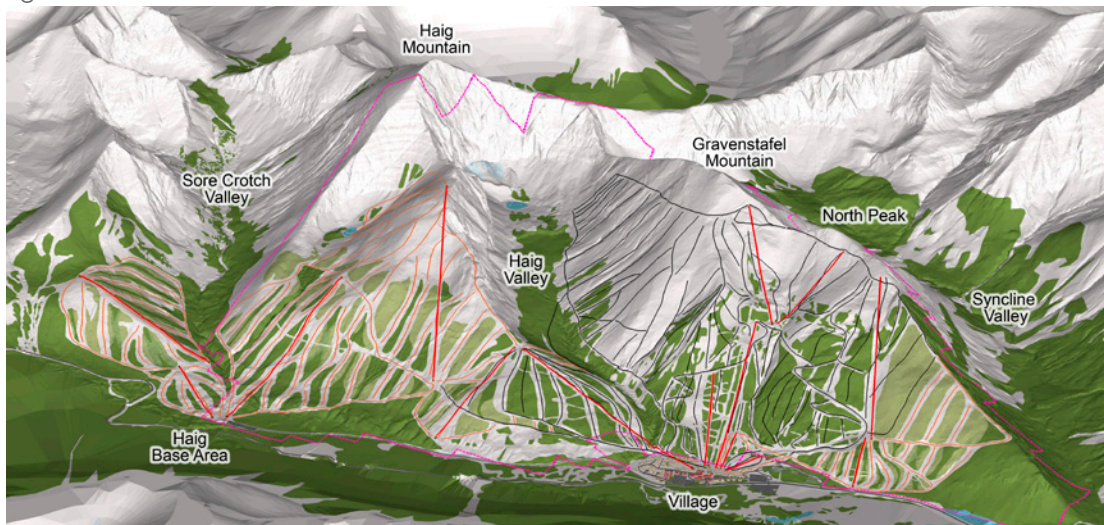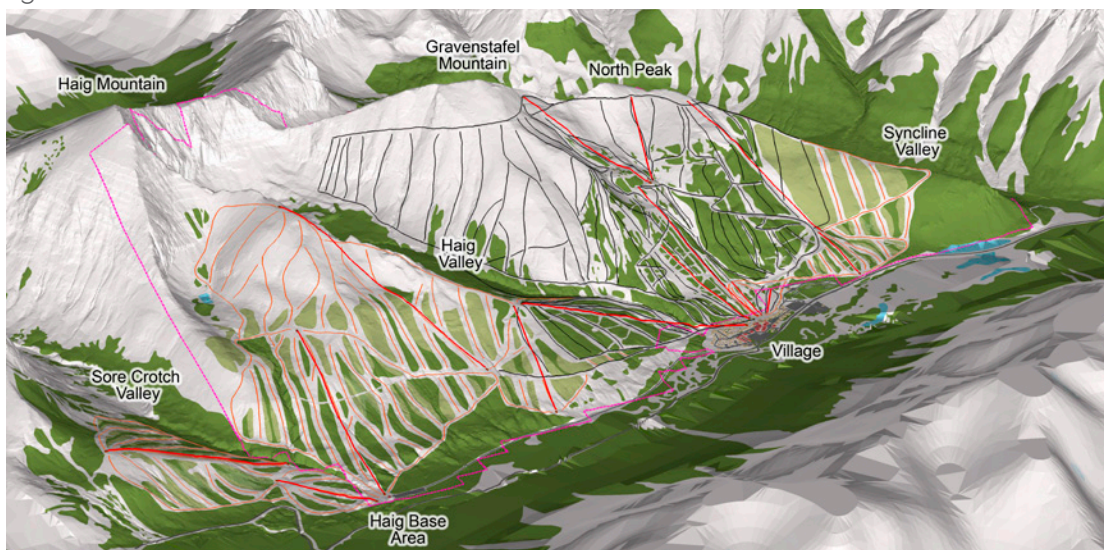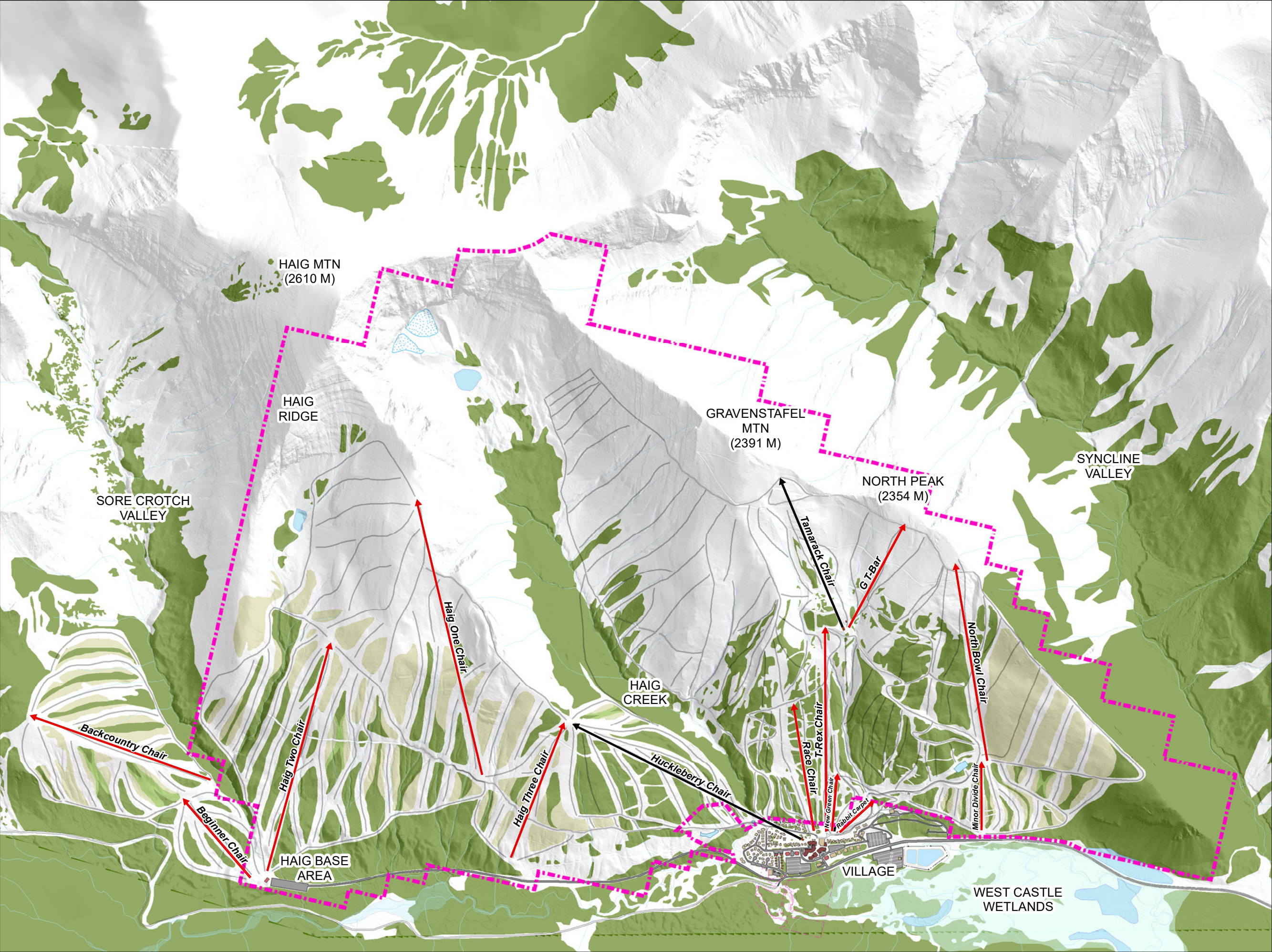*Figure 4-24a: 3D View*

Figure 4-24b: 3D View

Figure 4-24c: 3D View

Castle Mountain Resort
Master Development Plan
2017

Legend
- Existing LOC
- West Castle Wetlands
- Existing Ski Lifts
- Proposed Ski Lifts
- Ski Trails
- Proposed Glading
  - Thin Glading
  - Dense Glading
  - Proposed Vegetation

HAIG MTN
(2610 M)

HAIG
RIDGE

SORE CROTCH
VALLEY

GRAVENSTAFEL
MTN
(2391 M)

NORTH PEAK
(2354 M)

SYNCLINE
VALLEY

HAIG
CREEK

Tamarack Chair

G T-Bar

North Bowl Chair

Haig One Chair

Haig Two Chair

Haig Three Chair

Huckleberry Chair

Backcountry Chair

Beginner Chair

Race Chair

T-Rex Chair

New Green Chair

Rabbit Carpet

Minor Divide Chair

HAIG BASE
AREA

VILLAGE

WEST CASTLE
WETLANDS

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1:20,000

0   150   300   600
Meters

Master
Development Plan

Figure 4-25

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