APPENDIX 1

CAIRNGORM MOUNTAIN DEVELOPMENTS

REVIEW OF NATURAL RETREATS BUSINESS PLAN ASPIRATIONS FOR MOUNTAIN BIKING AND USE OF AN ARTIFICIAL SKI SLOPE – AUGUST 2016 (revised Feb 2017)
(includes Mountain Biking, which is not now part of Natural Retreats plans)

1 SUMMARY

Although Cairngorm is an established destination, the mountain operation needs to increase visitor footfall and spend over the summer period to secure viability. This cannot be achieved entirely through catering and retail offerings. A new package of activity infrastructure based around mountain bike trails, artificial ski slope and Ptarmigan improvements is proposed and based on Natural Retreats' *Explore, Dream, Discover* approach.

Many ski centres in Europe and North America have diversified in this way, mainly to help address the current aging and declining mainstream skiing market and to boost summer income. Skiing retains something of a middle class image, whereas action sports like mountain biking, bmx biking, surfing, skateboarding, parkour and freestyle snowsports share roots and have a more popular "urban" meme with entry possible by almost any "athletically minded kid".

These groupings are less focused on landscape and more on developing their individual performance and ideas on "laps" with others in a supportive social setting like a terrain/freestyle park or bike track. They will be a significant part of the new potential customer base for Cairngorm over the next 15 -20 years. Yet, Natural Retreats face a number of challenges with this investment and attracting future customers.

<u>**Artificial Slope and Freestyle Park**</u>	<u>**Bike Trail Centre**</u>
Opportunities	
• Artificial slope and freestyle park would help with reduced early season and spring snow	• Bike trails would provide alternative summer activity at Cairngorm Mountain
• CML ops staff focused on opening the hill – terrain park in top bowl often lower priority so free style facility near to Day Lodge would help improve satisfaction	• Could attract new 'downhiller'/all mountain rider market and a younger 'thrills' group activity market
• Air bags and kicker would help local market with reduced risk training	• May attract adventurous families already visiting the National Park.
• Would provide new family entry level activities like tubing	• Aviemore a hub for mountain biking with established providers/services and accommodation
• Spectators and off slope spending	• Uplift facility provides unusual added attraction
• Staffing and skills locally available – but shortage of affordable housing	• Staffing and skills locally available – but shortage of affordable housing
Weaknesses	
• Travel time and distance to Cairngorm	• Travel time and distance to Cairngorm
• Small local market – most urban based	• Small local market – most urban based
• 66% of National Park visitors are regular returners but may not wish to spend if there is a slope close to where they live	• 66% of National Park visitors are regular returners but may not wish to use uplift as frequently
• Weather	• Weather and exposure

• Lack of fit with older National Park visitor profile	• Lack of fit with popularity of leisure cycling market through forest and moor
• Competition for slope space/time between local users and entry level visitors	• Displacement from other businesses and service providers – bike hire/ sales/ guides
• Competition with established, subsidised facilities in Aberdeen, Glasgow and Edinburgh	• Relatively high cost of uplift, bike hire and equipment – although comparable with Bike Park Wales
Threats	
• Complex planning conditions	• Complex planning conditions and Section 50 agreement
• Vociferous critique from conservation, wild land and purist leisure lobby	• Vociferous critique from conservation, wild land and purist leisure lobby
• Technical requirements e.g. slope irrigation	• Technical requirements for trail build and maintenance
• Tubing already offered at a small site at Coylumbridge – with other activities	• Biking offered at other nearby sites including Laggan and Glenlivet
• Over optimistic visitor numbers	• Over optimistic visitor numbers
Needs	
• Responsive, innovative management that understands changing market needs	• Responsive, innovative management that understands changing market needs

There are number of specific reasons to be cautious over the plans and projections. In particular:

- Base case visitor number projections and growth patterns to 2022 are optimistic;
- Base case income projections per visitor seem ambitious;
- The capital cost for trail construction to get the required quality of build;
- Displacement occurring in Aviemore and Glenmore, particularly with respect to mountain biking (hire) and catering;
- Major planning issues to be addressed, particularly with reference to trail construction, operation and maintenance – a number of which could be 'show stoppers';
- Operational matters, health and safety, 'leakage' of riders onto plateau or Northern corries, monitoring.

Caution is warranted by conclusions expressed in (a) Ekosgen 2015 Adventure Tourism report for HIE that most people come to 'be' in the Scottish great outdoors, but only a relative few (perhaps 10%-15%) actually go out to 'do' or to 'buy' adventure. Feedback from the sector suggests that adventurous labelling can be enticing, but also exclusionary; (b) TRC 2011 Scottish Snow Sports Review for SE and HIE that lack of shelter and the extreme terrain also inhibits summer activity markets, i.e. comfort for family markets, etc; (c) CNPA 2015 Visitor Survey that in the context of the estimated 1.6 million annual visitors (1 million to Glenmore) to the entire Cairngorms National Park – the 240,000 that currently visit Cairngorm Mountain is 15% of the total. In 2022, visitor projections for Cairngorm Mountain are almost 1 in 5 of all current visitors to the National Park.

For an expanded justification of this caution see the following more detailed analysis in this paper.

The prices in this paper are as paid by the customer (i.e. including VAT).

2 PROPOSED MOUNTAIN BIKE FACILITY

A mountain bike hub with 15.3km of new or repurposed routes with green, blue and black trails using the funicular as uplift to start at Ptarmigan and finish at Day Lodge. Bike hire and coaching offered. Facility based on

- Target Market – families, beginners and intermediate mountain users
- Base case estimate of 55,000 bikers per annum by 2022
- £69 package for bike hire, uplift and lesson
- Different from other established trail centres (mainly forest based)

Analysis of Mountain Bike Facility

Competitors

Data on levels of use at other competitor locations, most with free access, is sparse.

Mountain Bike Trail Centres Location and distance/travel time from Aviemore	Facilities	Cost
Wolf Trax Laggan 25 miles 0.45hrs FCS Partnership	Café and Bike Hire Orange, Black, red and green trails No uplift Estimated 16,000 riders per annum	£3 car park fee Half day Hire £16 Full day Hire £20 - £30 Incl Helmet
Glen Livet Mountain Bike Trails 27 miles 0.40hrs Crown Estate Partnership	Café and Bike Hire Blue and red trails No uplift Estimated 10,000 – 15,000 per annum	Half day Hire £16 Full day Hire £25
Lecht Ski Area 35 miles 0.50hrs	Red, Blue Trails Skills park (obstacles for bikes) Café, no Bike Hire Chairlift uplift Anecdotal estimates suggest less than 5,000 per annum	£30 day multi trip uplift on chair £25 for 4 hours £7 chairlift Bike track £10
Abriachan Forest Trust Mountain Bike Trails 40 miles 1.05hrs	Green, blue, red trails No uplift Family orientated Close to Inverness	Free
Red Rocks Learnie 43miles 1hr	Black, blue and green trails Orange – extreme	£2 all day parking fee
DH Farm, Banff 68 miles 1.25hr	Bike Park Orange with Black Red with Black Toilets, BBQ	£7 Parking £30 all day uplift
Nevis Range Fort William 62 miles 1.30 hrs	Café and Bike Hire Downhill and XC Routes Bike school Bike wash and showers Gondola Uplift and Green, blue, red trail	Gondola £32 multi trip £14 single trip £60 two-day pass, £128-week pass Reduced Youth (12-17) and local club rates

	Orange – World Cup downhill (Only official UCI World Cup downhill bike track) World Cup stages and World Championships	Price includes gondola access, contribution to track maintenance, limited first aid, fee to FCS Weekend vehicle uplift (£3 per bike) to forest XC trail
Glenshee Mountain Bike Track 68 miles 1.45 hrs	Blue Trail Chairlift Uplift Café	No uplift access for bikes in 2016 as new chair has no bike brackets
Dunkeld, Pitlochry, Blair Atholl 70 miles 1.30hrs	Local services Range of trails – Forest roads and single track	Car park charge £3 Free
Glencoe 80 miles 1.40 hrs	Café and Bike Hire Downhill and XC Routes Chair Uplift Coaching Black and red trail (more planned)	Bike Hire XC £25 Incl Helmet £10 extra for full face Bike Hire Downhill £50 Incl Body Armour Uplift day £25 Season pass £150 Single trip £10 Junior and family rates
Highland Wildcat Trails Golspie 80 miles 1.40 hrs	Community Company Services in village 18km Trails (£600k) Black, red and blue trails Orange – extreme	£3 per car – dropped from £5 Donations Free
South of Scotland Tweed Valley and 7 Stanes	Multiple trail centre and bike park options, Bike hire, Café Service providers offer transport to and from the trails. Other services include skills training and guided rides along with accommodation and bike hire and additional activity tours and day trips. Estimated 200,000	Car park charges £3 per day £32 per day uplift
Wales	Multiple trail centre and bike park options Bike Park Wales is the UK's only commercial bike park	Car park charges BPW - Day ride pass + uplift from £32 Hire – £40 -45 per day ½ day coaching + all day uplift £80
England	Multiple trail centre and bike park options, Forest of Dean, Devon, Lakes, Yorkshire	Car park charges
Europe	Most European ski areas have bike trails	

Mountain Bike Skills Tracks		
Badaguish Free Ride Trails	Training	
Glenmore Lodge	Training	
Bike Hire		
Aviemore	Bothy Bikes Mikes Bikes – Aviemore and Inverdruie Active Outdoors Bike Hire Glenmore Mountain Bike Hire Outdoor Discovery	£20-day hire
Grantown on Spey	Basecamp Bikes Craggan Outdoors	£25-day hire – hard tail £50-day hire full suspension

Segments

Varley and Taylor (2013) using a Survey Monkey survey of 92 riders confirmed the popularity of the generic mountain biking style, although the self-classification of 32% of riders into all-mountain and 30% into trail rider, compared with 25% with the traditional cross-country genre, appears to verify the rising importance of longer-travel suspension do-it- all bikes and 29ers, as well as the expansion and blurring of mountain biking genres.

In 2012, only 4% of mountain bikers called themselves downhillers, which confirms its niche status. Downhill has struggled (especially racing) in past years. Down-hillers, similar to ski racers, tend to be young people (mainly male) with either their own funding or supported by their parents. Down-hill bikes and associated equipment (full face helmets and body armour) are very expensive. TRC (2011) noted Downhill Mountain Biker onsite daily spend of £21.50 (2009/10 prices ex VAT) was twice that of sightseers and similar to that spent by downhill skiers.

Families and beginners appear to be most keen on off road leisure riding on 'hard tail' mountain bikes, rather than full suspension bikes, best suited for forest tracks and trails in Glenmore and the lower Strath areas closer to villages. And, there is a growing popularity of informally developed off road bike routes and routes 'from the front door' of accommodation providers. Anecdotally, it is suggested that bike routes at the Lecht and Glenshee ski areas involving mechanical uplift to high points have experienced limited popularity.

Some experienced riders eschew Trail Centres because they are not 'cool', too busy, faster riders get held up all the time by slower ones, the terrain is not challenging enough and they have to pay for parking.

Gender

SMBDC (2009) identified male dominance within mountain biking and more recent research suggest that this dominance remains with many fewer girls than boys taking up mountain biking. Girls rely more on enthusiastic parents than social and peer groups to maintain their participation levels as gaps in strength and technical skills can widen rapidly in teenage years. The respondents to surveys by Varley and Taylor (2013) were overwhelmingly male (90%/80% respectively). The 7stanes CIC Evaluation Report 2012 found 87% male and 13% female riders.

Mountain biking, especially on more exposed open rocky terrain as found at Cairngorm, is generally perceived as an activity of technical challenge and risk taking requiring strength and technique. This tends to be perpetuated by images of young males in extreme action poses.

Road biking show less of a gap, and recently female cycling role models and success in major sporting events like the Olympics plus fitness and travel trends has seen more female activity. Only 14% of cycling event competitors in 2014 were female.

Under-represented groups

In addition to women, under-represented groups in mountain biking segments include those with poor health, disabilities, ethnic minorities or those with low incomes. The less privileged are less likely to bike, especially at trail centres, as equipment is too expensive and they need suitable transport to carry both people and bikes.

Age

The greatest proportion of both sets of respondents to surveys carried out in competitor mountain bikes hubs in the Tweed Valley by Varley and Taylor (2013) were aged 26-40 (57%/34%), followed by those in the 41-55 age group (31%/29%). Some families were represented but children tended to have parents who were established bikers. The 7stanes CIC Evaluation Report 2012 found ages of mountain bikers to be 17% 18-30, 56% 31-45, 24% 46-60.

Willingness to travel

Varley and Taylor (2013) report the face to face interviewees at the Tweed Valley survey in 2012 came from a wide range of locations: 34% from England (many from Newcastle), 25% from Edinburgh and 24% from both the ‘Borders’ and the ‘rest of Scotland’.

The 7stanes CIC Evaluation Report 2012 found that 29% of riders came from outside Scotland and 7% were international. Of these 71% were in the AB & C1 social economic group, 40% of stayed overnight and 90% use digital channels to source information.

The finding suggests that riders are willing to travel for the right type of product. Survey Monkey results suggested that 54% of people were willing to travel over 100 miles to access trails, 24% were willing to travel 51-100 miles and 17% will only travel up to 50 miles.

The geographical spread of Survey Monkey respondents, relative to the Tweed Valley, supported this picture.

- Glasgow area: 94
- Edinburgh area: 78
- Tayside/Perthshire: 45
- Borders: 26
- Grampian: 24
- Highlands: 20
- England: 19
- North America: 4
- Other: 49

Motivation

Motivations derived from Varley and Taylor (2013) for mountain bikers who use comparable competitor hubs included:

Push factors

- Seeking fun, enjoyment and novelty
- Escapism
- Adventure and exploration
- Physical exercise
- A sociable activity
- Mastering the challenge
- Having risk seeking thrills and endorphin rush
- An accessible, ‘weather versatile’ and flexible pursuit

Pull factors

- Well designed, marked and maintained all weather flowing rideable trails
- Some adventurous and thrilling single track trail sections
- Good trail head features – food, drink, ‘craic’, atmosphere and knowledgeable staff
- Attractive scenery
- Guided options
- Personal and online recommendations
- Endorsement from well-known mountain bikers
- Image and reputation
- Past experience

Market Constraints

- Seasons
- Weather
- Perception mountain biking makes you dirty and wet
- Some degree of risk – especially on steeper trails
- Time
- Money
- Health and Fitness
- Young people need a parent to drive
- Language of biking (as with other technical sports) can be a barrier to new entrants

Mountain Bike Market Development

Historical context

Mountain biking centres in Scotland have mainly evolved through investment by FCS on sites within the National Forest Estate. Riders have got used to the relatively low costs involved, other than equipment and travel. FCS stopped developing new trails and trail centres in 2008. Up to that date mountain biking had benefited from an estimated £10 million of investment, nearly all from the public funding sources. Assessments highlighted questionable sustainability of trail centres, particularly the cost of management and maintenance, and a need to boost industry professionalism to ensure a robust footing for the future.

Without dedicated trails mountain biking on the Scottish hills is very arduous, requiring a high level of fitness and skill, advanced planning, and technologically sophisticated bikes (usually with full suspension). Riding conditions are fickle and harsh due to inclement weather or ground conditions like bog, rock, ice and snow.

Business perspectives

Varley and Taylor (2013) gathered opinions on three years (2009 -12) of mountain bike-related businesses via a Survey Monkey (26 responses from 110 business sent a link). Of those 26 business that responded when asked how the industry has fared over that timeframe, 54% considered that the industry had grown by about 10% and 4% by around 20%. Conversely, 9% felt that the industry had remained static while 32% stated that the industry had contracted in size. The respondents were also asked how their own business had fared 2009 -12. 17% stated that they had experienced negative growth, 25% of businesses had seen no growth, while 29% each saw either 10% or 20% growth.

Varley and Taylor (2013) suggest that the economic impact of mountain biking in Scotland to 2012 fell below the EKOS (2009) cumulative 'partial growth' 2009-12 scenario figure for potential future net expenditure of £11.3m. They suggest that an increase in the range of £5.5 m - £8 m was considered to be a more realistic estimation of the growth in the economic value of mountain biking in Scotland from 2009 - 2012. Of the regions, the Highlands were forecast to achieve a 20% growth in value to £9.31 million based on 287,585 additional annual trips with 30% growth in Aberdeenshire and 50% growth in Perthshire.

Varley and Taylor (2013) applied the partial growth predictions to EKOS 's baseline figures and concluded that if the same growth scenario is adopted, and planned developments are only partially implemented, economic growth of the sector is predicted to be in the region of £14 m - £18 m from 2012 -17.

Varley and Taylor (2013) noted 41% of bikers spent 2-5 days per year on overnight mountain biking trips, 17% spend 6-10 days and another 9% 11 days or more, and they suggest in order to increase the trip frequency of mountain biking 'visitors', both those who are tourists and those riding on day trips, a number of key improvements need to be made.

Strategic perspectives

Varley and Taylor (2013) conclude that if the figures for the self-labelled all mountain, trail rider and cross-country bikers were combined, 87% in total, there is a sizeable proportion of mountain bikers who are not only capable of riding up the hills prior to the descent, but amongst them there are a large number who enjoy the physical challenge of the ascent as an integral and enjoyable part of their mountain biking experience.

In that sense utilising mechanical uplift, such as at Cairngorm, may not appeal to a large number of riders, beyond perhaps as a one off experience. Anecdotal accounts of low numbers using ski hill trails at the Lecht and Glenshee appear to support this conclusion.

In addition, long continuous sweeping downhills tend to erode the social enjoyment and interaction of groups and families. Riders of different abilities and fitness will split up as there is little incentive to stop to regroup at the natural gathering points of hill bases or summits, path junctions or water crossings found on most cross country trails.

TRC (2011) noted that:

"The visitor market has growing expectations of product quality driven by overseas skiing experiences. The Scottish ski product is poor by comparison, hampered by a lack of funding / investment. Public money has been available in the past for new facilities; however, the lack of public money available for replacement and refurbishment, poor cashflow and the lack of debt funding possibilities is a major constraint."

Clusters

Developing Mountain Biking in Scotland advocate developing facilities closer to centres of population and increasing family friendly facilities in key tourism areas. The Highlands are seen as a key cluster with a number of hubs. There are already between 10 and 15 developing sites.

Varley and Taylor (2013) acknowledged that downhills *(having cycled uphill)* are a prime motivation for many riders, and the development of centres with a focus on uplift facilities is therefore suggested to be a lower priority, especially for the application of public funds, than more strategic trail centre developments near to centres of population.

Skills training opportunities

Most mountain bikers are self-taught or learn from more experienced riders. However, the Scottish National Outdoor Training Centre, Glenmore Lodge, for example is playing an increasing role in supporting the development of mountain bike activity and especially the training of leaders and mountain bike tutors. This may increase the number of riders taking lessons or courses by providing more qualified mountain bike tutors and instructors, but it is anticipated take up will remain quite small and niche.

Events

Although there is evidence of fluctuation in the numbers of participants and organised events from World Cup stages at Nevis Range to the 24 hr 'Strathpuffer' staged in February in Strathpeffer there is no doubt that mountain biking events can draw in large numbers of riders, and associated support crews and spectators, with significant direct and indirect local economic benefits. Around 20,000 people attend the World Cup days at Nevis Range. Generating £2.7 million in economic impact for the area, the event in 2014 relied on 30% public funding and 150 volunteers. Event timing may also mean professional teams and riders pack up quickly and move on to the next event, minimising their stay and that of spectators.

Managing race events while still allowing full public access on an open site like Cairngorm could be difficult.

Trail grading and construction

Planning, designing, building and maintaining mountain bike trails, especially in exposed, erosion prone mountain terrain, such as at Cairngorm, has become a specialised and technically demanding activity. Smoother trails, while technically easier, promote higher speeds and then braking which may cause erosion. Water gullies have to be shallower to allow bike wheels to cross. Trails, like mountain paths, may create a cross-section that attracts and holds snow and ice.

Precipitation – rain and snow is 2,250 mm on the Cairngorm summits and frost heave breaks up path surfaces. Climate change is predicted to bring increased intensity and frequency of extreme rainfall leading to heightened risk of major soil erosion, especially if vegetation cover is removed for trails and because regeneration at altitude is extremely slow. New trails may also be considered detrimental to landforms and heritage geomorphology of glacial disposition and erosion

Varley and Taylor (2013) report that the Nevis Range downhill course costs more in upkeep than it gets from income. Foster (2014) highlighted the work necessary to keep the course in order including airlifting in hundreds of tons of material to repair worn sections. Most of the work higher up the mountain is done by hand. Water piped from burns with lime is applied to keep the dust down on berms. Surfaces have to be whackerplated into place.

Unsurprisingly, Developing Mountain Biking in Scotland advocate promoting low input and low maintenance sustainable natural trails.

22km of planned trails with estimated £1.4m capital cost, equivalent to £64 per metre. Hand built mountain footpaths can cost this and more.

Health and safety

The exposed mountain environment on Cairngorm and frequency of adverse weather conditions will raise some health and safety issues. Days will be lost due to rain, low mist, wind, lightening and possible snow lie early season or late spring.

Alongside climbing and hill walking accidents Cairngorm Mountain Rescue report increasing numbers of mountain bike related incidents, along with other mountain activities including running and air sports such as parapenting. One reason given is the advances in mountain bike technology allowing riders to cross more rugged terrain and the relative speed of movement that allows riders to cover greater distances than those on foot. Late season snow that is soft during the day but freezes at night leaving a hard surface in the morning is also a notable hazard. The expectation is that riders will 'leak' from any formal trail system out onto the Cairngorm plateau and beyond.

Mountain rescue in Scotland is currently free, but it is reasonable to assume with more riders on Cairngorm trails the likelihood of incidents will increase. The severity of traumas may also be serious as riders will have a greater chance of falling on bare rock and stone rather than the vegetation and mud found more frequently on woodland trails. Foster (2014) advised that injuries were worst on the Nevis Range red trail, with 8 rescuers required to stretcher riders off the hill from sections inaccessible by vehicle or the gondola.

Commentary on Gravity Logic Initial Consultation & Feasibility Analysis 2015

In our view the report's authors, while very experienced in the Canadian/North American mountain biking environment, are less experienced in planning, construction and operations in a Scottish context.

We agree with many of the challenges at Cairngorm that Gravity Logic highlight but we would emphasise the following key points:

- We question the willingness of the market to travel in the way bikers use Bike Park Wales
- We agree the terrain is very open and exposed, with no tree cover
- We agree on the concept of a bike patrol but would question the cost of a team and the practicalities of operation
- We agree the need for first aid and evacuation procedure, but access by vehicle to many points on the trails would be impossible, and we note that mountain rescue in Scotland relies on volunteers to stretcher out casualties and/or helicopters
- We would emphasise that 'Key Stakeholders' are also regulators – especially with regard to planning
- We agree trail construction methods, cost and visual impacts will be major issues and suggest they could be 'show stoppers'
- Maintenance will an issue with a possible need to airlift in new materials

- In particular, the approach to mountain hydrology, sourcing materials, dealing with organic materials and protected species does not sufficiently acknowledge the Cairngorm context
- We agree uplift capacity could be a significant barrier
- We did not see any comment on access legislation or the closed system
- We note the report identifies 120 days opening for 7.5 hrs per day

3 PROPOSED ARTIFICIAL SKI SLOPE FACILITY

CML propose an artificial ski slope facility with new 60 x 20 m intermediate slope and an adjacent 60 x 30 m nursery slope. Snowflex, a product in use worldwide, is the preferred synthetic slope surface. Independent uplift. Additional slope profiling undertaken to permit future expansion. Air bags and kicker for technical training. Facility based on

- Location close to Day Lodge with existing associated facilities
- Target Market: Families, beginners and intermediate mountain users (specialist training)
- Base case estimate 64,512 user hours by 2022, and 13,951 users
- £68 slope lesson plus hire package for 4 hours
- £24 intermediate day pass for 8 hours

Analysis of the artificial ski slope facility

Competitors

Competitor outdoor artificial slope locations are mainly closer to large centres of population and in places likely to experience less extreme weather conditions than Cairngorm Mountain. Even during the summer period, Cairngorm is likely to lose a number of days to poor weather, but the slopes could be used in the winter when snow covered.

There are two older, small artificial slopes in and around Aviemore at Coylumbridge and Loch Insh already offering activities like tubing or basic lessons and ski hire, both with adjacent accommodation, café and other activities on the site. At Glen Feshie there is a slope with lodge accommodation available. Four small commercially run slopes in the National Park have removed their artificial surfaces in recent years.

A group of snowsports enthusiasts are currently considering a multi-activity centre centred around a dry ski slope in or close to Inverness. Inverness Backcountry Snowsports Club and Cairngorm Ski Club have been assisted by Snowsport Scotland to take forward discussions on a facility which would include a dry ski slope for all levels, a café and possibilities for activities such as tubing, mountain biking, and orienteering as well as general facilities. A working group is surveying potential demand. This would be a competitor for a new Cairngorm facility – although the rationale for such a facility in Inverness would reduce if the Natural Retreats project goes ahead.

Location	Facilities
In vicinity of Cairngorm Mountain	
Loch Insh Watersports and Skiing Centre	60m slope Café and equipment hire
Aviemore Discovery Hilton Coylumbridge Hotel	30 x 10m slope Tubing and lessons, Cafe
Glenmore Lodge[1] (Not open to the wider public)	70x20m slope Floodlights, uplift, roller ski track Cafe
Lagganlia Outdoor Centre, Glen Feshie near Kincraig	60 x 10m prosnow surface slope with a small poma lift. Total capacity of 20 on the slope. Hire price from £6 per person per hour. Exclusive hire £150 per day. Lessons from £14.40 per person. ½ day session £5 for competent skiers/boarders
Glenmore (Hay field)	Grass sledging (mobile activity)
Glenmore Café Shop and Bar	Artificial surface removed

[1] Discussions with Glenmore Lodge indicate that they will prefer to use the larger NR slope for their training programmes.

MacDonald Aviemore Resort	Artificial surface and tow removed
Lochanhully Lodges, Carrbridge	Artificial surface removed
Craigendarroch, Ballater	Artificial surface removed
Elsewhere in Scotland	
Aberdeen Snow Sports Centre Club run to reduce costs	150 m Snowflex slope Free style, Skiing, boarding, tubing Lessons, coaching, camps, equipment maintenance Tow, Escalator, floodlights Caters for parties – Tubing plus food - £16 per person £14/hr taster lesson or coaching £20 daily hire of full equipment set (Concessions £12) Full equipment service £35
Alford Snow Sports Centre Aberdeenshire Council	70m slope and 30m trainer slope Skiing, boarding, tubing. Uplift, floodlights
Ancrum Outdoor Centre, Dundee	50m slope
Arbroath Royal Marine Base Condor	100m Snowflex slope
Bearsden Ski and Board Centre, Glasgow	120m Snowflex slope and kickers Skiing, boarding, tubing Bar, café and shop
Firpark Ski Centre, Tillicoultry Clackmannanshire Council	120m slope Skiing, boarding, tubing
Glasgow Ski Centre, Bellahouston Park	100m Snowflex main slope Nursery, Beginners slopes Café bar
Glencoe Ski Centre	60m slope for tubing £5 per hour Café Accommodation, Micro lodges, camping, hook ups
Mid Lothian Snow Sports Centre, near Edinburgh Midlothian Council	400m - Britain's biggest artificial slope. Two main SNOWFLEX slopes, two nursery slopes, jump slope Skiing, boarding, tubing Café
Newmilns Snow and Sports Complex East Ayrshire Secured £450k investment in 2010	110 metre slope + 35 metre beginners slope Skiing, boarding, tubing (£8/hr) 2-hour lift pass £14 Learn to ski or snowboard in a day (£55 for family of four) Schools, groups, parties, ladies’ nights
Polmonthill Ski Centre, Falkirk	100m slope Floodlit Sprinkler system and button tow Ski lessons
Snow Factor, Braehead Centre, Glasgow	200m indoor slope and artificial snow Range of other activities and services
England and Wales	Ski Club of Great Britain have identified 58 artificial ski centres in England and Wales

Market profile

People often visit dry slopes for a pre-season warm up or to sample skiing or snowboarding for the first time. Coaching can enhance technique and give people experience and skill in basic movement.

Many people find it more financially viable to travel to or train at their nearest artificial slope and there are around 70 sites across the UK with taster session, equipment hire and lessons on offer plus added value activities like tubing and group events.

Indoor snow domes have overtaken some of the larger outdoor dry ski slopes like the Sheffield Ski Village – now abandoned. However, most slopes are outside and although subject to weather, their location means they generally do not experience extreme conditions such as may be found in the mountains, although users still need protective clothing and helmets are advised. Lighting enables slopes to open for extended hours with parking, refreshments and toilets.

TRC (2011) considered that the Scottish ski market is a fixed size – a finite number of people ski. They estimated, based on Mintel adult participation rates of between 3.5% and 4.4%, that the potential adult market for Scottish skiing amongst Scottish residents is between 150,000 and 190,000 people.

Young people already travel from the National Park area to Aberdeen or Glasgow to use training facilities at artificial slopes and the more expert ones will progress to the Alps or North America. How readily young people will travel from cities to Cairngorm is uncertain. Sites in city locations run as charities by clubs or trusts can offer discounted rates to younger people on limited incomes. It can take up to 15 years for snowsports competitors able to compete at national or international level to emerge, and funding can be a major barrier.

Air bags and kickers can provide opportunities for reduced risk training and allow participants to develop confidence and muscle memory and practice turns and moves in relative safety. Other groups such as skate boarders, surfers and cyclists may also be attracted to use air bags.

Facilities

Historically, approaches to artificial slope facility design have been ad hoc and inconsistent. For an artificial slope to offer safe and reliable facilities for a comprehensive range of snow sport disciplines careful design will be required. The Snowsport England National Facilities Strategy 2011 highlights a range of standards for slopes and terrain parks.

Most older slopes use a synthetic diamond shaped brush Dendix material with a metal core. Proslope is a newer form of brush matting surface. Snowflex, a carpet type monofilament, as proposed at Cairngorm, is considered more user friendly and more dry slopes are beginning to use this type of surface. The standard and quality of facilities has a direct impact on the level of satisfaction which users gain from participation and whether their experiences lead to sustained participation

Demand

Snowsport England's 2011-5 strategy considers that centres should be matched to the demands and needs of a defined population to be successful. Primary catchment areas for snowsport centres differ between types of facility (natural, synthetic matting and artificial snow – slopes, terrain parks with kickers and half pipes), and therefore catchments range between 20-40 minute drive time. The same is apparent for secondary catchments with drive times depending on facility type ranging from 40-120 minute drive time. Four categories of artificial slope sites were identified.

Category	Population catchment	Drive time Mins	Facilities	Visitor numbers	Capital cost £
A	2 million	60	1 x Slope type 1 - 1 x Slope type 3 - 2 x Slope type 4 - 1 x Terrain park type 2 - 1 x Fun activity area - Purpose built changing - Restaurant and Bar - Accommodation	150,000	3m

B	800,000 +	40	1 x Slope type 1 - 1 x Slope type 3 - 1 x Terrain park type 1 - 1 x Fun activity area - Purpose built changing - Restaurant and Bar	80,000	2m
C	250,000 +	30	1 x Slope type 1 - 1 x Slope type 3 or 4 - 1 x Terrain park type 1 - 1 x Fun activity area or no separate area - Multi-purpose changing - Café or snack bar/vending	15,000	1.2m
D	50,000 +	30	1 x Slope type 1,2 or no nursery - 1 x Slope type 4 or 5 - Multi-purpose changing or no changing - Snack bar/ vending or no catering	5,000	0.6m

The proposed facility at Cairngorm is perhaps comparable to Category C. Drive times to Cairngorm from larger centres of population are clearly much greater. However, population catchment is only one consideration and other key factors include year round use, maximum length of slope, separate nursery slope, and separate terrain park. Artificial slopes may open adaptive skiing provision to wider audiences and ability levels. Demand management can be manipulated by measures such as specific day or time incentives, frequent user incentives and peak load premiums.

The Cairngorm Freestyle Park is located in the upper bowl and can be a lower priority when the rest of the hill needs to be open for skiers. A smaller, more accessible park near the Day Lodge would meet some users demands and could also supplement use early season and spring when snow cover could be limited.

Snowsport England’s Slope Tracker research report (data from 11 of circa 70 sites) showed continued growth in snowsports participation numbers at indoor snow centres and artificial slopes across England into 2015. After the Sochi Winter Olympics, October to December 2014 saw a 10.6% growth compared to the same quarter in the 2013. However, this dropped to 1.8% growth in the first quarter of 2015, compared to the first quarter of 2014 suggesting a short lived Olympic effect.

Since then, slopes have reporting mixed results, with most slopes reporting modest increases in participation, but some slopes recording a decline. Market research on users recorded high loyalty, high frequency of use, high satisfaction and high advocacy suggesting relatively small numbers using their local slope but on a more regular basis. Fawke (2015) reports that attracting people to use artificial slopes and retaining customers, particularly out of season, continues to be hard work.

With the right viewing facilities snow sports can provide "thrills and spills" for spectators. Users as well as spectators can be enticed into café and shop to increase “off slope” revenues. Seeing what is happening can encourage people to have a go at simpler activities like tubing, perhaps leading to skiing or boarding lessons.

Snowsport Scotland (SSS) is the national governing body for snowsports in Scotland representing snowsports clubs, professionals and competitors on pathways, from grass roots participation to high performance sport. SSS note that “the snowsports landscape in Scotland is complex, varied and multifaceted, which brings opportunity and challenge in equal measure to the delivery of a national snowsports strategy”. The 2014 -15 SSS Annual Review recorded 36 clubs representing 6,670 members.

TRC (2011) noted that

“It is extremely difficult to extrapolate international snowsports market trends into a Scottish context as the overseas ski market is driven by week-long holidays and not short breaks or day visits.”

Segmentation

The Baby Boomers, who enjoy skiing on Cairngorm and have many of the second home/ holiday home/retirement home properties in the Cairngorms National Park or can afford the costs of taking a few trips to the mountain every season, are the cohort that have the wealth, time and investment that allows them to maximize their slope time.

They are (or were before the current economic issues) the wealthiest generation in history, benefiting not only from being in mature, well-paying jobs during the height of the economic boom years of the late 90's and early 2000's, but from also having been the beneficiaries of the largest post war transfer of inter-generational wealth from their parents.

Their property investments also encouraged them to continue to spend their summer and winter leisure time in the National Park area rather than other destinations as they already owned and were paying for these assets. Many are now in, or close to, retirement with independent children – they may still ski on Cairngorm when snow and weather conditions are suitable, as will their extended families, but it is suggested that they are less likely to avail themselves of dry ski slopes or indeed mountain bike tracks on Cairngorm at other times of the year.

As economic and demographic conditions change, this market will decline and while some assert that younger participants will replace the Baby Boomers, research seems to suggest otherwise and as skiing is a relatively expensive pastime, it may be an activity that is reduced or replaced when money is tight.

The Snowsport England National Facilities Strategy of 2011 considered that those most likely to take part in snowsport are currently *settling down males, comfortable midlife males and competitive male urbanites.* The top three segments are the same for those that are most likely to want to take part (have a latent demand). Other segments with a latent demand include *sports team lads, comfortable retired couples and pub league team mates*.

4 STRATEGIC CONSIDERATIONS FOR MOUNTAIN BIKE, ARTIFICIAL SLOPE AND PTARMIGAN EXPANSION

Market profile

CBP 2016 noted that across the National Park, as in recent years, visitors from Scotland represented nearly half of the overall visitor base (46%). The presence of these Scotland based visitors was again particularly notable during the Q4 (October to December) and Q1 (January to March) periods.

On a par with previous years, visitors from England in 2015/16 made up roughly 30% of all visitors. That being said, 2015/16 saw record lows and highs of the number of English visitors, dipping to 27% in Q3 2015 and rising to 34% of all visitors in Q1 2016.

Consistent with recent years, overseas visitors accounted for around a sixth of all visitors in the Park area. Highlighting the seasonality issues many tourism businesses face, there were twice as many overseas visitors during the Q2 (April to June) and Q3 (July to September) periods compared to the shoulder periods of the year.

In 2014-15, respondents were more likely to be within the higher socioeconomic group – 76% fell into the ABC1 group compared to 65% in 2009-10.

Sixty-six percent of visitors are repeat visitors. Almost one fifth have been more than 20 times in the last five years, indicating at least four visits per year.

Frome the 2015 visitor survey the most commonly mentioned reasons for visiting the Cairngorms were:

- Beautiful scenery/countryside (mentioned by 35%)
- Enjoyed a previous visit (18%)
- Walking/hill walking (18%)
- Peace and quiet/relaxation (17%)
- Skiing (11%)
- Cycling/Mountain biking (7%)

Between 13% and 14% mentioned more active sports such as cycling (up from 5% in 2009/10) and skiing (down from 17% in 2009/10) when asked what they will do on this trip. Visitors to Badenoch were the least likely to visit for beautiful scenery, peace and quiet and sightseeing, and more drawn by the cycling/biking – mentioned by 22%. 16% of visitors surveyed in Cairngorm, Glenmore and Rothiemurchus said they were cycling. As would be expected most people went cycling during the summer and autumn/spring seasons. The CNPA believes Glenmore has around 1 million visitors per year. They anticipate further growth in visitor numbers and note that approval exists for a new settlement of up to 1,500 house at Am Camus Mor on Rothiemurchus Estate. Some local stakeholders are not convinced that the numbers are that high.

The Scottish Snowsports Review by TRC (2011) reported that

"Visitor numbers on the funicular in recent years have declined due to a number of factors including: poor summer and winter weather; lack of appeal for repeat visitors; value for money issues due to short experience time – the funicular round trip only lasts 15 minutes; and lack of other facilities on site to encourage visitors to stay longer and spend money eg walks, mountain biking, children's activities."

Further TRC (2011) considered that a Mountain Biking Bike Park – multishort trails was a potential diversification.

“There was potential high mass market usage (see Ski resorts Whistler and Lets Gets), beginners to expert, Family, Weekend Warrior use, high visitor spend. They considered that there was a Market Gap in Scottish mountain biking product. Works better in variable terrain, there is concern over weather, wind and the need for shelter. Must be aimed at families and intermediates to succeed. Must be accessible and positioned as entry level to downhill mountain biking. (good trail hierarchy required). Needs accommodation close by. Better in resort locations. Terrain assessment and accessibility critical and feasibility and sustainability assessment.”

Tubing Family and Younger.

Increases the range of snowsports facilities, attractive to families and small groups. A safer option than sledging / tobogganing.

All centres apart from The Lecht as these facilities are already in place.

Dry Ski Slope Beginners, Family, Schools.

Helps to improve access into the sport and protects tuition facilities in times of little snow. These facilities however have a high infrastructure and operating cost, and need good access to beginners markets.

All centres apart from the Lecht, as dry skiing was not viable and removed. This facility has greater opportunity of success at Nevis Range and Cairngorm.

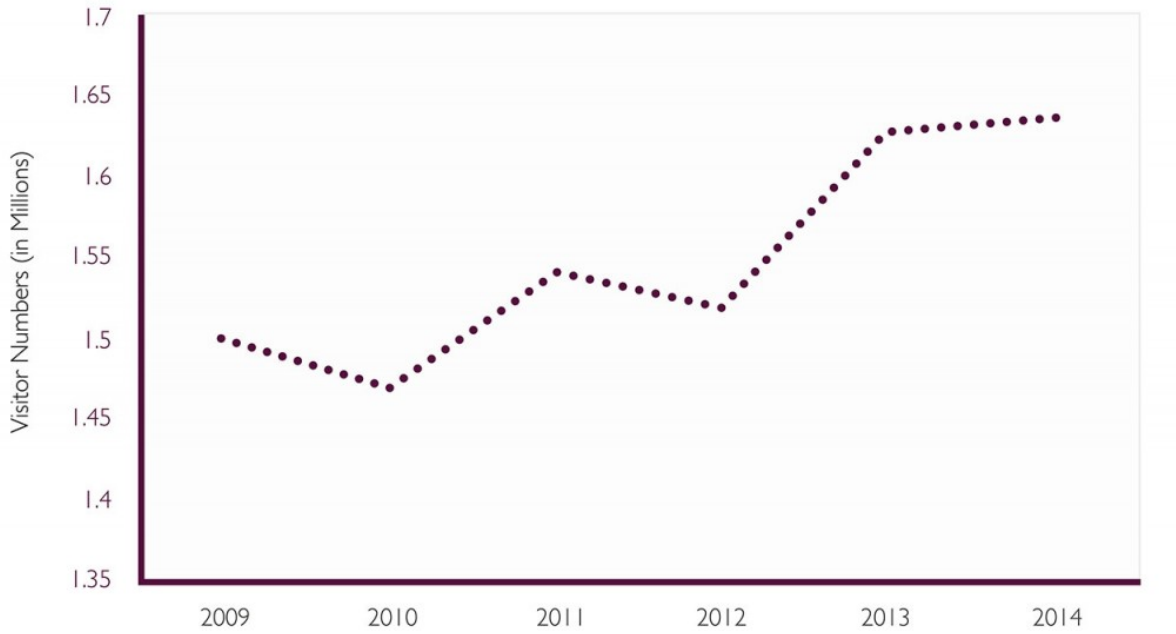
The Ekosgen 2015 Adventure Tourism in Scotland Report identified geographic clusters of adventure tourism operators in Scotland. Aviemore and Fort William are the most recognisably ‘outdoor’ centre clusters in Scotland. The report describes Aviemore as follows:

“Aviemore also offers a similar spread of commercial and autonomous activities as Fort William and has a busier year-round adventure product. It has a dramatic setting and in the Cairngorms the next highest mountains in Scotland. Aviemore possesses first-class snowsports activities, along with an extensive walking, cycling and wildlife watching offer. It benefits from having a family-accessible terrain and setting, and an arguably more attractive centre with a stronger ‘alpine’ feel. Very importantly, it is rather more accessible than Fort William, by dint of its location on the A9 and a much faster rail link, putting Inverness and central belt consumers (and visitors through their airports) within easier reach. It is also host to the national outdoor centre at Glenmore Lodge.”

The report concludes that there are few innovative adventure travel providers in Scotland keen to develop their offer to the public and harness information technology to communicate and sell their experiential products to a discerning international audience.

Furthermore, the report suggests that Scotland’s ‘natural capital’ is very much underestimated, whilst the economic / market importance of its adventure product is both over sold and misunderstood – an important issue for Cairngorm. Critically the report concludes that most people come to ‘be’ in the Scottish great outdoors, and only a relative few (perhaps 10%-15%) actually go out to ‘do’ or to ‘buy’ adventure.

Visitor numbers to the National Park



Access

Although access to Cairngorm is governed by the right of responsible access arising from the Land Reform (Scotland) Act 2003 and guided by the Scottish Outdoor Access Code, summer access onto the open hill from the Ptarmigan and top station for visitors using the funicular uplift is restricted by the 'closed system'.

The 'closed system' is a Section 50 Agreement signed as part of the planning consent for the funicular railway and is an agreement between the operator, Highland Council and Scottish Natural Heritage. This is open to review and has been modified on several occasions to allow guided excursions (guided walks and bike descents) and access to the top station.

Any changes would need to demonstrate that they guarantee the integrity of the system and do not cause damage to the designated sites next to the ski area, although there is a lobby campaigning for removal of the closed system. Sanctions such as withdrawal of uplift rights would only apply to those riders who have purchased tickets.

Planning

There are no specific planning policies in the Cairngorms National Park Local Development Plan 2015 that cover the mountain bike, artificial slope and Ptarmigan expansion proposals. However, demonstrating collective fit with the four Park aims and a number of policies are likely to apply should a planning application be made. Relevant policies are:

Policy 2 Supporting Economic Growth

Policy 3 Sustainable Design

Policy 4 Natural Heritage

Policy 5 Landscape

Policy 8 Sport and Recreation

The main potential impacts considered in any decision on planning consent are likely to be those on landscape (Cairngorm NSA) character and experience, protected species and the adjacent natural heritage designations in an IUCN Category 5 Protected Landscape and National Park. Nearly 50% of the National Park has been designated as of national and international importance for its natural heritage (including Sites of Special Scientific Interest, Special Areas of Conservation, Special Protected Areas, National Nature Reserves and Ramsar sites). The ski area is surrounded by designated sites and adjacent to a 'Wild Land' area.

New "manmade" tracks and route markers or areas of artificial ski slope on relatively untouched parts of the site will not conserve the landscape and planners will assess if other benefits such as economic growth outweigh the impacts caused by landscape change and increased use by people.

Any possible ancillary equipment such as dry slope re-profiling to include jumps and half pipes, drainage, uplift, lighting and watering systems would also have an impact.

It is likely there will be significant representations by a wide range of local and national interests and substantial publicity relating to any planning application for new tracks and/or dry ski slope installations. Mountain bikers' presence in terms of numbers and perceived erosion potential and wildlife impact may create tension with established hill users including walkers and wildlife watchers. Equally paths may experience some unintentional 'dual' use leading to possible conflict as access rights do not confer a superior use.

Planners are likely to take into account the current ski infrastructure already providing a significant visual detractor in this locality, with skiing being the established use. Making use of existing ski infrastructure to help accommodate alternative uses and activities can be acceptable; however, the fact that this infrastructure exists may not presume in favour of developments that would be otherwise inappropriate or unacceptable in principle or in detail. Highly detailed specifications, quantities and method statements on design, construction and maintenance are likely to be required by the planning authority including prior assessments and surveys. Preparing these will carry an upfront cost.

Planners may consider that whilst most users would generally use purpose built trails, the risk of the formation of further informal tracks on the hillside through usage by bikes with possible further degradation to the natural heritage should be highlighted. To reduce this risk, it would be expected that a system for managing bikers to encourage them to use the purpose built trails and to avoid the formation of informal trails and erosion on the open hillside would be included in any conditions. Equally, conditions requiring regular reporting on management and maintenance and a full reinstatement scheme may be imposed in the event the scheme proved unsuccessful. Safeguards may also be sought with regard to managing existing routes from the car park down the Alt Mor to Glenmore and across the base of the northern corries towards Ben Macdhui and the Lairig Ghru.

A multi-agency partnership is currently working on proposals to improve the visitor experience at Glenmore. The number of visitors to Glenmore Forest Park is estimated at 150,000 pa, with 80,000 to the current Visitor Centre. The Forestry Commission, SYHA and HighLife Highland wish to construct a new Glenmore Visitor Centre with Visitor Welcome features, Outdoor Learning, Residential Centre and Visitor Services, Access infrastructure, Parking and Landscape enhancement. A café/restaurant (larger than the current 'Mor' café) with a panoramic view of Cairngorm and the Northern Corries will be a key element in financial projections.

Local business confidence

In 2015/16, the Cairngorms Business Barometer showed that business performance across the National Park was slightly subdued compared to the past two years. Uncertain weather and the national living wage introduced in April 2016 will place a greater strain on local businesses going forward. The on-going low oil prices of 2015/16 mitigated increasing supplier costs and encouraged people to travel further and more regularly but this is a volatile commodity and prices could easily increase in the future. However, almost half of all businesses indicated they had increased their investment in buildings and infrastructure in 2015/16 compared to the year before.

Business confidence in the National Park area from 2015/16 for the next 24 months was scored at an average of 6.63 using a 1 to 10 rating scale, where 1 was ‘very low’ and 10 was ‘very high’ – although this was prior to the Brexit vote.

5 IMPLICATIONS FOR NATURAL RETREATS PROJECTIONS

Both biking and artificial slope user numbers are very difficult to predict, but based on the evidence above, the following levels of use (annual visitor numbers) might be considered.

Bike Trails Assumptions

Trails in operation 6 months from May to September/October (depending on the skiing season and weather).

Rider numbers

- Gravity Logic Report uses 120 days at 7.5 hours per day
- Natural Retreats assumed operation over 8-month period or 240 days. We think this is too long given weather and ground conditions.
- We suggest 180-day season (10% - 20% lost due to weather) – say 160 operational days at 6 hours per day.
- Suggest 50% of NR's base case is more realistic

Assume 3 ascents per day per rider, 3 funicular trains per hour (10 -4) for 6 hours – 18 trains per day. Could run evening trains in the summer? Link to late restaurant opening at the Ptarmigan.

Bike hire prices OK

Uplift prices OK

Lesson price OK – depends on length

	2017	2018	2019	2020	2021	2022
160 days 50% of NR	1875	7500	12500	17500	22500	27500
Riders/day		47	78	109	140	172
Ascents/day		141	234	327	420	516
Bikes/funicular journeys		8	13	18	23	29
NR – base case	3750	15000	25000	35000	45000	55000
NR – breakeven	1140	14475	14475	14475	14475	14475
NR – 50%	1875	7500	12500	17500	22500	27500
NR – 30%	1125	4500	7500	10500	13500	16500

Caution

- NR advise bikes can be stacked vertically on trolley slid into compartment. Riders likely to be more clustered in the middle of the day.
- Additional time loading and unloading bikes on the funicular, with access through public areas in Day Lodge and Ptarmigan via stairs. Additional staff cost for loading?
- Accidental damage to fixtures and fittings?
- Potential loss of space for non-biking public at peak times. Surplus space as riders not descending on funicular.
- Suggest bike patrol numbers may be light to give safety cover and evacuation capacity. Possible additional operational costs for maintaining bike hire fleet, protective clothing plus storage and trail maintenance.

Artificial Slope Assumptions

NR assume operation over 8-month period or 240 days at 8 hours per day. We think this could be extended to 10 months into the ski season with 300 operational days – 6 hours per day average.

Slope areas – 60m x 30m and 60m x 20m – two areas total 3,000m^2

3,000m2 slope technical capacity is 100-120 users per hour (as advised by Snowflex). Recommend lower capacity figure be adopted

Theoretical max capacity – 300 days x 6hr x 100 users = 180,000 user hours

Other operators pricing at £14 per hour ski/snowboard, and £5 per hour tubing

Snowflex advises normal operating conditions (urban locations) are 25% - 30% of max capacity – 45,000 hrs for a 300m2 slope. We are suggesting for a rural location operating conditions should be considered as 12.5% of max capacity as normal operating conditions.

	2017	2018	2019	2020	2021	2022
300 days 25%	45000	45000	45000	45000	45000	45000
300days 12.5%	22500	22500	22500	22500	22500	22500
NR – base case	16128	64512	64512	64512	64512	64512
NR – breakeven	3311	41842	26151	20921	20921	20921
NR – 50%	8064	32256	32256	32256	32256	32256
NR – 30%	4838	19354	19354	19354	19354	19354

Caution

The proportions of users who would be tubing, hiring equipment or taking lessons/coaching will be important in income generation. Split in assumptions seems reasonable.

Snowflex recommend £0.20 to £0.30 collected per ticket hour for repairs and maintenance. May be greater in more extreme conditions on Cairngorm Mountain.

Other adventure activities

There are a range of other activities on offer in the Aviemore area that could be considered alternatives to mountain biking or use of an artificial ski slope. Cost per person.

- Gorge walk swim – ½ day £40, kids half price
- Family Float Trip – ½ day £40, kids half price
- Climbing/Abseil or Gorge Swim and – ½ day £40, kids half price
- Canyoning – £55
- White Water Rafting – £55
- Tree Zone - £27 – family £80
- Zip line – £25
- Guided hill walks £50 – Private guiding £150 per day
- Survival/ Bushcraft – ½ day £25 Full day £60

6 SOURCES

Cairngorms National Park Local Development Plan 2015

CNP 2015 Cairngorms Visitor Survey 2014/15

CBP 2016 Cairngorms Business Barometer 2015-16 Annual Summary Report Prepared for Cairngorms Business Partnership - May 2016

EKOS 2009 report Economic Value of Mountain Biking in Scotland for Scottish Enterprise

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SMBDC 2009 The Sustainable Development of Mountain Biking in Scotland a National Strategic Framework

Snowsport England Facilities Strategy 2011 – 2015

TRC 2011 Scottish Snowsports Strategic Review for HIE and SE

Varley, P and Taylor, S 2013 Developing Mountain Biking in Scotland: Review of mountain biking developments and potential opportunities in the Scottish Enterprise area. Centre for Recreation and Tourism Research UHI