

Living Laboratory Study Visit Report



Iceland 2018

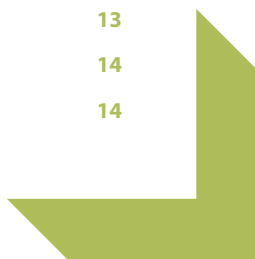
T1.3 Sharing Path Management Knowledge, Exchange of Experience and Learning T2.2 Upskilling & Toolkits

by Newry Mourne & Down District Council and Mourne Heritage Trust with with Soil Conservation Service of Iceland

Iceland Living Laboratory Study Visit Report: A Practitioners Perspective, 26 June - 2 July, 2018

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Chapter 1

Introduction

In June 2018, ASCENT partners from Newry, Mourne and Down District Council and their sub-partners from the Mourne Heritage Trust in Northern Ireland took part in a Living Laboratory study visit to Iceland in order to inspect alternative approaches to footpath work and general upland conservation. The trip was hosted by the Soil Conservation Service of Iceland (SCSI), and included site visits to major tourist destinations in Reykjanes and south Iceland for the purpose of assessing and enhancing upland sustainability in the face of increasing visitor interest.


During the trip, ASCENT partners were also welcomed by members of the Icelandic Forestry Service, the Environment Agency, and Vatnajökull National Park, who provided invaluable opportunities to meet on site and discuss key issues pertaining to each agency.

During the study trip, several key themes were revisited numerous times. Responding to increasing visitor pressures was a prevalent issue, particularly as the country has experienced a surge of tourism in recent years, increasing from 595,000 in 2000 to almost 2.2 million in 2017 (Icelandic Tourism Board). Celebrities, social media and consumer demand for adventure tourism has incentivised rapid tourism growth in the country, which has caused an increasing necessity for sustainable solutions to protect sensitive upland habitats.

Another key theme throughout the Icelandic trip was the varying conservation methodologies of different land authorities. Examples include the controversial use of Nootka lupine plants (*Lupinus nootkatensis*). (N.B. 2018 was the last year SCSI, as a body responsible for soil protection, used the plant as a means of soil conservation, as well as the differing path styles at tourist attractions.) These examples demonstrate the difficulties in providing a homogenised approach to site management in the country.

Lastly, the climatic nature of the country posed its own limitations, with practical path work projects restricted to the summer months and the short-term nature of ranger job roles.

Throughout the Icelandic study trip, these themes were discussed with the help of site visits, which have formed the basis of case studies in order to explore the issues further. Many issues, such as increasing tourism levels, are prevalent across all ASCENT partners' sites. Other issues, such as weather and seasonal restrictions limiting opportunities to improve upland tourism infrastructure, are common across all partners in the Northern Periphery and Arctic regions.

A photograph of a person sitting on a mossy rock overlooking a river in a canyon. The person is wearing a white and black striped shirt and a grey beanie. The canyon walls are covered in green moss and the river flows through the center. A large green arrow points from the text box to the person.

Canadian Pop Singer Justin Bieber sparked a surge of tourism in the Fjarðargljúfur canyon, which appeared in the artist's music video.

Chapter 2

Visitor Increases


According to the Icelandic Tourism Board, visitor numbers to Iceland have faced a rapid increase in recent years, with growth apparent even on an annual basis. This is exemplified by the surge of foreign visitor numbers in recent years, which amounted to a 24.2% increase between 2016 and 2017. This has had a dramatic influence on the country, with tourism accounting for 10% of the country's GDP as of 2016, making it one of the largest contributors to Iceland's GDP behind fishing and banking (Financial Times, 2017).

Several factors have influenced the tourism 'boom' in Iceland, including the 2010 eruption of Eyjafjallajökull, which disrupted flights across the world and shone a spotlight on the country. Cheap landing fees encouraged an increase in budget airlines, which could incentivise tourists with inexpensive flights. Furthermore, the prominence of Icelandic scenery in popular culture, such as music videos and the popular television series 'Game of Thrones', has also deepened interest in the country as a tourist destination (Financial Times, 2017). From annual visitor surveys taken by the Tourism Board, it was apparent that a key draw for visitors was the variety and quality of nature-based activities. In particular, the wild, unspoiled and seemingly untouched landscape was a massive motivation for tourists to visit the area.

In addition, the temporal fluctuations of tourism in Iceland have also changed, with 'off peak' tourism occurring more often outside of summer months.

This has raised a number of challenges for land conservation in Iceland. In April 2018, the Park Ranger Society of Iceland released a statement calling for more consistent, year-round protection for natural sites amid personnel shortages affecting the industry.

'The stream of tourists has increased many times over in just a few years, and is now considerable all year round, but land management has, unfortunately, not been able to keep up,' the statement reads. 'The need for land management services throughout the year has never been greater.' (The Telegraph, April 2018). This demonstrates that Iceland's current seasonal approach to land management is no longer sustainable, as tourism is no longer limited to the summer months.



The 2010 eruption of Eyjafjallajökull was a contributing factor to the tourism increase in the early 2010's.

2.1

Visitor Impact on Fjarðargljúfur

During the study trip, ASCENT partners visited several sites affected by increasing tourism. Fjarðargljúfur canyon, west of Kirkjubæjarklaustur in south-east Iceland was one such example. A Natural Heritage site maintained by the Icelandic Environmental Agency, this area gained international recognition after being displayed in a prominent music video made by popular artist Justin Bieber. Since then, the area's visitor numbers have skyrocketed, with an 82% increase between 2016 and 2017. Many tourists in the area seek to recreate Bieber's visit, which showed the artist walking along one of the numerous canyon juts. The original path, which was composed of hardened aggregate, was not able to cope with the influx of visitors, and erosion scars and braiding were apparent along the route.

The Environment Agency responded to visitor pressures by placing Geogrid Terram along more damaged parts of the path towards the main canyon waterfall. Rope borders were also placed in order to counteract erosion spread or braiding, as well as to deter visitors from traversing out along the sensitive canyon juts. Environmental Agency staff were utilised to monitor visitor behaviour and to enforce the restrictions placed.

While these measures were effective, it was noted that the Geogrid Terram was an expensive response to path erosion, and had also become undercut by soil wash-out, causing the grid to be suspended; an effect like walking on a bridge. Although damage to the path looked significant at first glance, partners agreed that the trail was a relatively easy fix, and could possibly be a good area to experiment with different responses, such as 'high and dry' path work, sheep wool path over boggy areas, or basalt gravel. It was also recommended that one of the cliff juts be left available for the public to make use of, in order to preserve the rest of the overhangs from apparent braiding. Additionally (or alternatively) more signage could be placed in order to make visitors aware of the viewing platform available alongside the waterfall, approximately one mile from the beginning of the trail.

This case study was an interesting example of how visitor numbers can be influenced by social media, often seemingly overnight. The rapid acceleration of visitor numbers is becoming a common trend witnessed by land managers (such as Trolltunga in Norway, and Cuilcagh

Mountain, also known as 'the Stairway to Heaven' in Northern Ireland). Usually the trend is highly documented and often places land managers under pressure to be seen to be tackling the subsequent effects. This often can involve extreme, reactive measures which can be costly, ill-suited and applied as a 'rapid response' measure, rather than a long-term management strategy.

It was agreed that a support and advisement body was becoming more and more necessary for land managers, in order for them to tackle issues as they occur in a strategic manner. Creating a systematic 'emergency response' procedure for future visitor spikes is also being discussed as an outcome of the ASCENT project.

As social media and 'screen' or 'selfie' tourism motivations become more prevalent, it is imperative that case studies such as Fjarðargljúfur, Trolltunga and Cuilcagh Mountain are closely monitored to uncover the short- and long-term effects of their popularity spikes.

Erosion is apparent along the canyon juts of Fjarðargljúfur's Eastern Canyon ridge. Rope barriers do not deter all visitors.



Geogrid Terram placed to stabilise path and reduce footfall erosion. Rope barriers reduced instances of visitors straying off the path line.



2.2

A Different Kind of Tourism

ASCENT partners spent one and a half days in the Básar camp within Thórsmörk Nature Reserve in order to view path work completed by conservation volunteers there. The volunteer scheme was managed by the Forest Service and was set up by a coordinator, originally from England, who had established the scheme on a trial period and had watched it successfully grow over a period of several years. The scheme offered tourists an opportunity to visit Iceland as a volunteer path member, and for a fee of £400-£650 - depending on stay duration - camp site fees, food, training and day-to-day living expenses were covered. The popularity of the scheme demonstrates a clear demand for adventure/experience holidays in the country, and how this can be used to increase the sustainability of increased tourism.

ASCENT partners reviewed the path work and commented on how suitable it was for the area. It was noted that the application of 'constant effort' on the short ring routes around Thórsmörk meant that volunteer groups could work and rework sites consistently, leaving behind a robust and sustainable path consisting of wood, stone and aggregate. Partners compared the site to Northern Ireland's Glen River trail, which has been improved by the efforts of a weekly volunteer path team, and knowledgeable team members who have a good understanding of the site (in terms of drainage, visitor flow etc.). In particular, ASCENT partners were keen to experiment with similar experience/working holidays in other areas as an outcome of the ASCENT project.

In comparison, a similar volunteer programme also operated in Dyrhóley Nature Reserve, which was organised by the Environmental Agency. Once again, the popularity of the programme seemed high, and the volunteers benefited from a week of training in addition to accommodation, which was provided. However, ASCENT partners noted that the group was largely unsupervised, and that the week's training was insufficient to undertake path repairs without experienced personnel to plan out the workload. The volunteer workers were enthusiastic and completed path maintenance to the best of their abilities, but, at times, paths were overly engineered or misplaced. Ill-placed water bars or unsustainable lines, for example, were chosen as the main route.



Environmental Agency Volunteers showcasing their work for ASCENT Partners at Dyrhóley Nature Reserve

It was also noted that the volunteers would benefit from additional protective equipment, such as improved waterproof and insulated clothing. Nonetheless, the volunteers seemed to enjoy the work in very extreme weather conditions, and were proud of their hard-won accomplishments, demonstrating an enthusiasm for extreme adventure/working holiday packages, which offer many benefits, such as sharing local knowledge and craft, benefiting the wider environment, and offsetting the impact of tourism in sensitive areas.

Working holidays or experience-based tourism proved to be a successful means of providing alternative, more sustainable forms of tourism for Iceland. The high level of interest in the programmes, particularly with young adults, proved that there is a demand for similar programmes, which could perhaps be implemented in other ASCENT countries. It was noted that a key draw for participants was the country itself, which appealed to many people because of its wild and widely unknown nature. Similar programmes would perhaps be successful in other ASCENT partner countries, but may have to include additional features (such as indoor accommodation) in order to create the same appeal. ASCENT partners also noted that programmes such as these could tie into other European programmes, such as ERASMUS, in order to offer more for volunteers.



ASCENT Project Partners reviewing volunteer path work at Thórsörk with Coordinator Chas (Left).

Chapter 3

Conservation in practice

3.1

Nootka Lupine

Conservation practice in Iceland focuses on the protection of sensitive vegetation and soil protection. Soils in Iceland are - by and large - derived from parent volcanic materials, with a high mineral content and a low percentage of clay. Soils here are therefore highly susceptible to erosion from wind and water, in addition to the increasing risk from human interference (for example, illegal off-road driving).

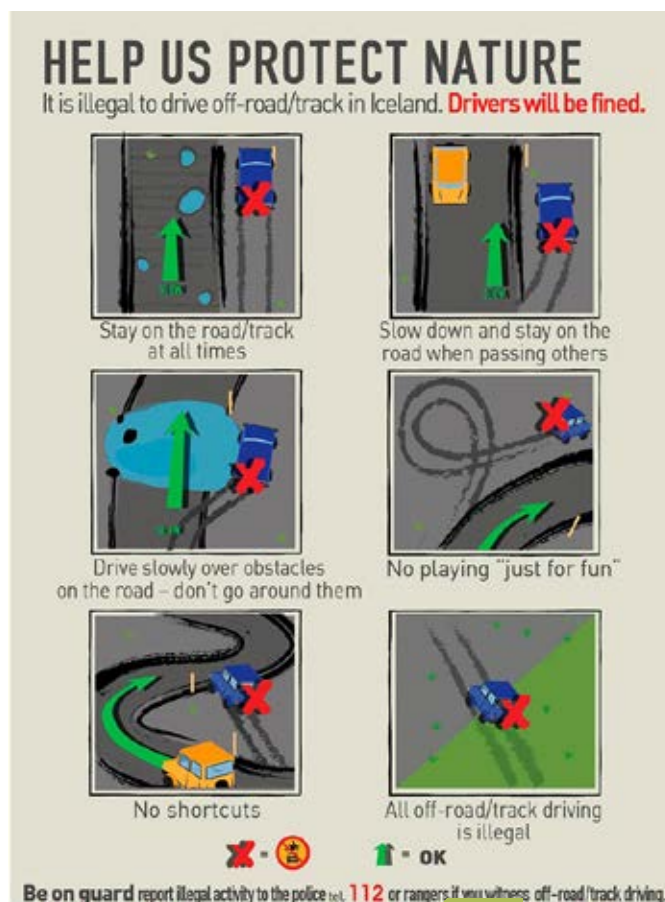
non-native Nootka lupine (*Lupinus nootkatensis*) plants were sown in the 20th century by the Icelandic Forestry Service (and SCSI for that matter - especially in the later years when SCSI started manufacturing lupine seeds in the Nineties, causing great spread, although the Forestry Service brought the plant to Iceland in the Fifties). This was done in a wide-scale attempt to combat topsoil erosion, speed up land reclamation and help with reforestation (Benediktsson, K. 2015 'Floral hazards: Nootka lupin in Iceland and the complex politics of invasive life').

<https://onlinelibrary.wiley.com/doi/full/10.1111/geob.12070>

The plant is highly effective as a pioneer plant, proficient at improving soil fertility in barren areas due to its rapid growth and nitrogen-fixing capabilities. Despite the pedological benefits of the plant, Nootka lupine has a tendency to create monocultures, which can both prevent other plants from growing and can suffocate more delicate flora. This is a particular concern in the central highlands of Iceland, where delicate *Racomitrium* spp. communities could be permanently transformed by encroaching lupine.



Lupinus nootkatensis plants stretching along a roadside.



Posters detailing Iceland's off-road driving laws are highly publicised

The usage of the 'Alaskan Wolf' lupine is highly controversial due to the habitat challenges which can arise, however, many land management authorities, such as the Forestry Service and Road Service, have relied on the plant to restore nitrogen to the soil and to aid the recovery of native tree species. Many alternatives have been proposed, such as grasses (lyme grass, Kentucky blue grass, red fescue, or Italian ryegrass); legumes (clover, vetch, and sea pea); or fertiliser with no seed. So far, however, no major regulations have been changed.

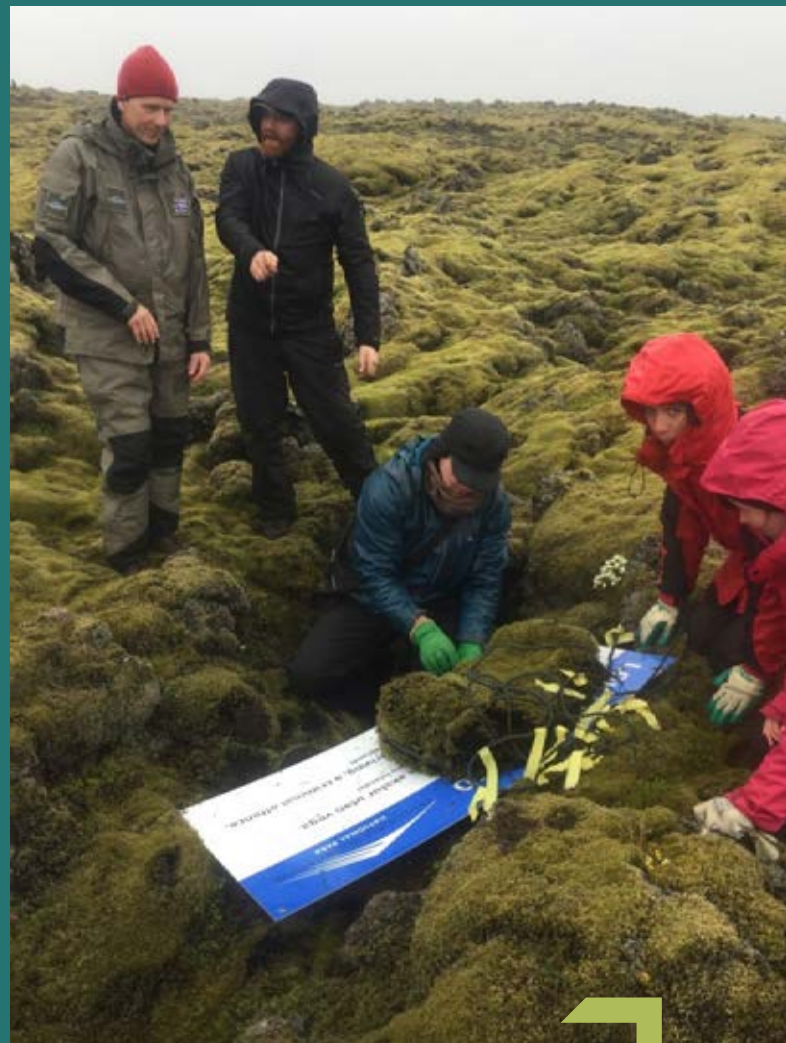
Path and road systems in Iceland were seen as a key means of protecting the sensitive soil and plant species found in the country. Stringent laws against off-road driving – leading to heavy fines - are an effective means to ensure that drivers comply with the law, and the rules against off-road driving have been publicised widely in travel guides, posters, tourist offices and road signs. Off-road restrictions were also enforced for walkers in nature reserves, such as the territory of Eldgjá.

3.2

Eldgjá (ASCENT Site)

The south-western part of Vatnajökulspjóðgarður includes many well-known places, including Eldgjá. The park contains areas of pristine wilderness and unique geological formations. These formations are due to volcanic eruptions on long fissures, forming surface features such as hyaloclastite ridges, crater rows, and gaping chasms. The ecosystem of the area is shaped by volcanic eruptions, high precipitation, and a short growing period. The vegetation typically consists of mosses and lichens, including thick hummocks of fringe moss on Skaftáreldahraun lava, which prevents higher plants from growing. The density of moss and lichen is quite unique in its prevalence, where it forms 90% or more of the plant coverage.

Although the moss is dense, it is also highly sensitive, and even minimum trampling can leave lasting marks, which can take decades to recover. Footfall erosion is therefore a key risk to the area, particularly as tourism increases. The Environmental Agency, which maintains the area, has responded to the increasing risk by hiring ranger staff to monitor the sites and enforce site rules. They do this by meeting all tourists (who normally arrive via tour buses) at the main car park, explaining the rules carefully and even offering to guide them along the first section to ensure that walkers stay on the path.



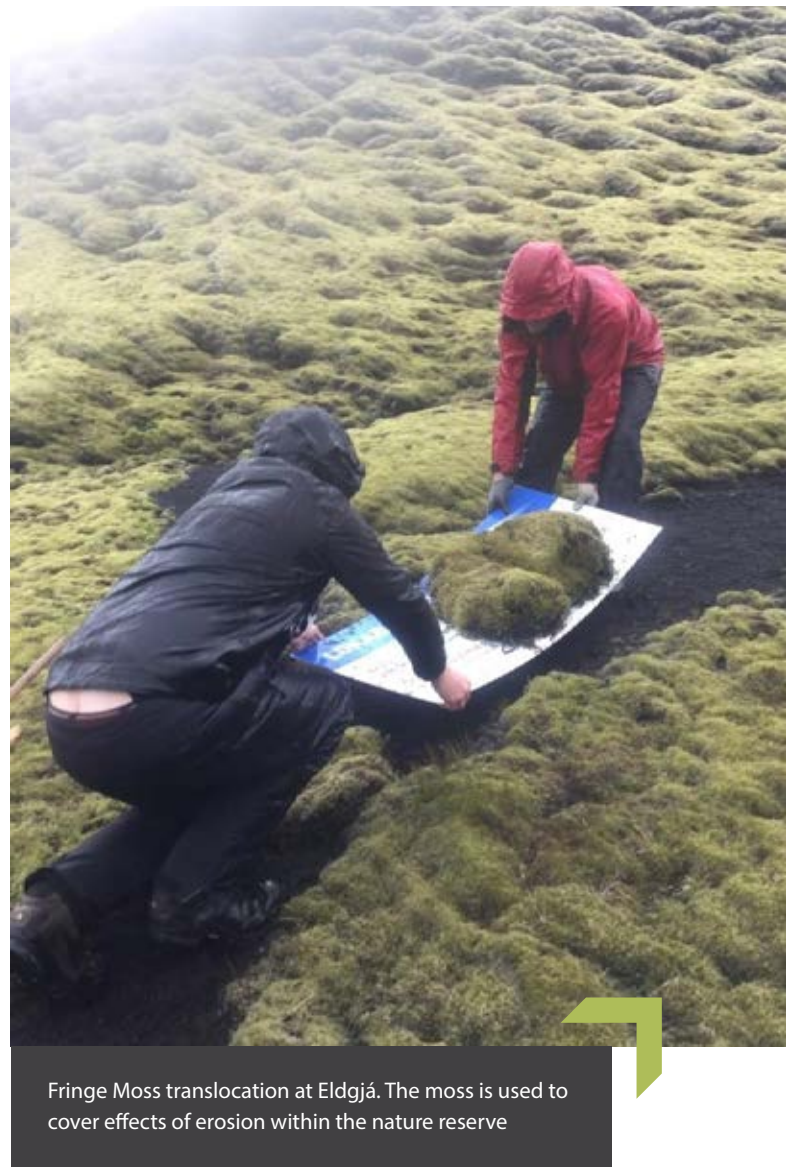
Fringe Moss translocation at Eldgjá. The moss is used to cover effects of erosion within the nature reserve

Drivers or hikers, who deviate from the trails can face heavy fines, however the ranger team often offer to waive fines in lieu of offenders helping to repair their damage. It is generally agreed that this is a popular option, which helps reduce resentment and repeat offences.

While visiting the area, project partners completed the circular route to the summit of Laki. This rock and aggregate mountainous path had been considerably damaged by snow melt during the spring season, with large areas affected by trail erosion and dislodgement. Park rangers mentioned the difficulties in maintaining the paths due to the limitations of the summer season for work (the area is inaccessible during heavy snow cover) and the limited staff working on the site. Some path work was completed by Environmental Agency volunteers, who dedicate a week's work to the site each year.

The ASCENT path team noted that the area had a lot of native materials (tuff rock, aggregate from rock till) available for path repair and construction, and was therefore a suitable site for more long-term attention at minimal cost. ASCENT partners suggested that changing the line to follow the natural contours of the initial ascent path might be effective in reducing the effects of weathering, rather than the current 'fall-line' trail. Partners discussed organising a ranger 'exchange' as a follow-up to the ASCENT project, so that partners could 'swap' experienced path builders to work on sites such as Laki for a brief period, while also providing training for less-experienced workers.

During this site visit, project partners also took part in a demonstration of moss translocation: an experimental method of repairing the effects of erosion on the fringe moss landscape by extracting squares of the delicate vegetation from areas of dense vegetation, and transporting the extracted plants on to eroded sites. When successful, this activity helps lessen the impact of erosion on the landscape, and blocks the view of braided lines, which visitors may attempt to traverse. So far, this methodology has been successful.



Fringe Moss translocation at Eldgjá. The moss is used to cover effects of erosion within the nature reserve

Chapter 4

Path Projects

During the ASCENT study visit, partners visited several examples of path work projects in order to supply feedback and suggestions.

A new trail constructed at Landmannalaugar at the beginning of the Laugavegur hiking trail was inspected. The trail was re-developed and constructed by local path contractor, Gunnar Oli Gudjonsson, in order to improve the durability of the route in anticipation of increased visitation in the future, and to protect the habitat. However, the finalised work came under some scrutiny by the funders, who were concerned that aspects of the work were incongruous to the nature of the 55km challenging trail, which includes crossing mountain summits and camping in isolated conditions. ASCENT partners thought that the path was well constructed and would be suitable for short hikes or trips to view points. However, the nature of the path, which consisted of a standard, homogeneous aggregate path may give less-able walkers a false sense of expectation of what they would encounter if they continued into the more remote landscape, where they would be vulnerable.

While visiting popular tourist destinations, stark differences could be seen in the investment made to visitor infrastructure. For example, the popular Thingvellir National Park, one of two UNESCO sites in Iceland, and owned in part by the church, was clearly managed for the high influx of visitors the area receives daily. The path was a mixture of boardwalk, gravel and stone pitch, providing visitors with a clear, hardy trail effectively preserving the landscape. Man-made waterfalls (created centuries ago, when Thingvellir was the home of the parliament and people needed water), and visitor interpretation and viewing platforms provided positive feature points to guide visitors along the trail. Also, the very nature of the park, showcasing the impressive effects of continental drift, contributed to containing visitor movement within the ridge canyon.



Thingvellir National Park displayed a robust path infrastructure consisting of boardwalk, gravel and stone pitch. Visitor Interpretation was available, as well as multiple car parks, a visitor centre and numerous amenities.

The investment in this popular tourist attraction was juxtaposed with Seljalandsfoss waterfall in the southern region of Iceland. This waterfall is highly visited, due to the path which leads visitors behind the waterfall. The area is jointly owned by the Environmental Agency and private landowners, who each manage one part of the site. Despite the popularity of the area, little has been done to build on this interest for the good of the site. Plans are currently being made to develop a more robust car park on the Environmental Agency's side (with private landowners to share in profits). The area would, however, greatly benefit from investment in order to expand and develop it further. The Environmental Agency, for example, cordoned off desire lines that visitors had been making in order to climb to the cliffs on top of the waterfall, citing both visitor safety and protection of the rare mosses and nesting birds that could be affected by the activity. However, a strategic path consisting of metal railing, stone or wooden steps could easily mitigate these dangers, and provide visitors with another activity to draw them to the area. An example would be the wood and metal staircase present at Skogafoss waterfall.

In general, ASCENT partners felt that more could be done to profit from Iceland's rising tourism industry, including: establishing car park fees; additional infrastructure; and incentivising private businesses and landowners to involve themselves within popular landmarks. This, in turn, could help land managers invest more thoroughly in their sites, and, with strategic visitor infrastructure, protect the sites from rising popularity.



Seljalandsfoss waterfall has mixed path infrastructure. Work could be done to homogenise visitor infrastructure across similar tourism sites

Chapter 5

Mt. Úlfarsfell (ASCENT site)

The last area visited by ASCENT partners was Mt. Úlfarsfell, which is a small mountain around 296 meters high, located south of Mosfellsbaer, a town around 12km from Iceland's capital of Reykjavik.

The top of the mountain is known for its view over Mt. Esja, the Blue Mountains, the Reykjavik area and Faxaflói bay, the Reykjanes peninsula and the Hengill geothermal area. It is relatively unknown from a tourism point of view, as the mountain is often overshadowed by the larger Mt. Esja. However, the area is popular with local people from the Mosfellsbaer, who utilise it for a variety of activities such as hiking, trail running, or taking part in activities organised by the local forestry group.

A unique feature of the area is the forested lower and mid sections of the mountain which, as stated by Icelandic partners, are relatively rare in Iceland. The forest was planted by the local Forestry Service to encourage more widespread reforestation, and this work continues on the eastern slopes, where lupine plantations have been used to prepare the grounds for tree growth. The local forestry group also participates in these activities, and has helped develop an arboretum of rare trees, which is viewable with signage along the wooded trails.

The foothills of Mt. Úlfarsfell are currently undergoing development for the creation of a 22-hectare graveyard for Reykjavik, which was commissioned prior to the 2008 economic collapse in Iceland.

ASCENT partners shared ideas on the current trail network, which is comprised as a mixture of forested walks to upland hikes, with varying difficulties to suit those of all abilities. Respectful of the fact that the more difficult trails were highly popular with locals, ASCENT partners agreed that path improvement would be useful, but that soft-touch methods would suit the area. Rock and aggregate materials, for example, can be easily extracted from the site to improve path infrastructure where necessary, while one very steep trail following a river channel could be improved with some stone-pitching measures to create more steps. Some drainage would also vastly improve the path. Other areas would benefit from soft-touch, constant effort, from, for example, a volunteer group, in order to keep an eye on drainage and braiding issues.

The top of Úlfarsfell would also benefit from a clearer path system to match the visitor infrastructure already in place (such as signage, seating etc.). This could be used to guide visitors to natural view/ feature points and to better indicate the nature of the trails (i.e., 'steep', 'suitable for families' etc.).



Discussing light-touch works to maintain forestry paths.



The summit of Úlfarsfell, with the city of Reykjavik visible beneath.

Chapter 6

Conclusion

The ASCENT Living Laboratory study visit to Iceland proved to be a useful exchange of experience and ideas. Increasing tourism numbers over the last decade have stimulated necessary conversations within Icelandic government authorities and land managers on how best to protect landscapes while still profiting from visitors; an issue that is shared with other ASCENT partners.

One consistent issue was the need to discontinue free parking at tourist attractions so that popular sites can start generating income. This, in turn, could be used to install better visitor infrastructure at sites. Areas such as Thingvellir National Park demonstrate how large quantities of tourists can be managed if suitable investment is in place. Several positive steps forward have already been implemented by Icelandic land authorities, such as plans to improve car parking facilities at both Seljalandsfoss and Skogafoss waterfalls. Creating larger parking areas further away from attractions is a major step in a positive direction.

Another area discussed by the by ASCENT partners was the need for consistency across tourism sites, and a more strategic approach to the management of different attractions (for example, waterfalls, canyons, volcanic sites, viewpoints): an approach which could facilitate a more uniform and less ad hoc land management policy.

Exploring alternative, 'green tourism' opportunities in other ASCENT project areas has now been discussed following review of the current Icelandic model. This is to be explored as a positive output of the ASCENT project. Likewise, the idea of a ranger upskilling programme to develop capacity and strengthen skills in path work should also be explored as a project output and legacy activity.

Chapter 7

Further Information

The above information was gained and interpreted through ASCENT Project documentation conducted by the Mourne Heritage Trust (MHT) on behalf of the NMDDC. Video interviews and further visit documentation linking to this report is available for this report by contacting Matthew Bushby at matthew.bushby@mourne.co.uk, or by contacting our offices at Silent Valley Gate Lodge, 74 Head Road, Kilkeel, Co. Down, Northern Ireland, BT344PU, 028417 65489.

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