Sparsholt College

Nature Conservation in Iceland

A Study for the Farmers Club of London

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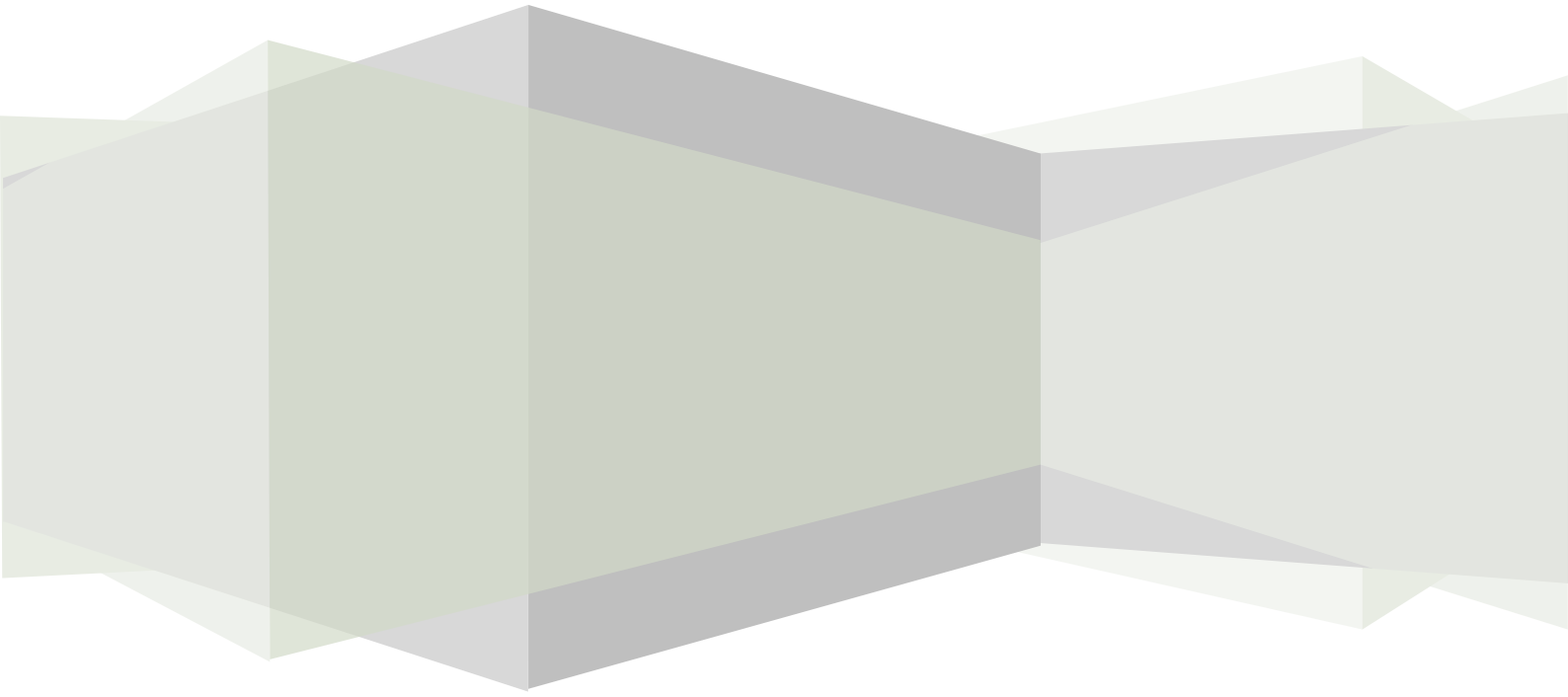

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INTRODUCTION & BACKGROUND TO THE STUDY

I had previously visited Iceland in 2008 while on a 5 day sponsored riding trek for the British Horse Society. I had always known that I wanted to visit the country, but when I arrived I found a landscape more beautiful and spectacular than I had imagined. As an ecologist this of course spurred my interest in finding out more about the wildlife of the country and while I found this to be limited due to the northern latitude of the island and the fact that the landform itself, in geological terms, is very recent, it retained a particular diversity found nowhere else. The vegetative communities are of course reminiscent of our own upland landscapes with bryophyte and alpine herb and dwarf shrub groups being the core representatives and the migrant bird fauna is well studied. Beyond this data is difficult to find, certainly in English, however the library of the Linnean Society of London did produce a very interesting series of folio works produced in the 1970s covering a huge range of the flora & fauna groups. Sadly, as a specialist in chiroptology (the study of bats) there are no bats resident in the country, but never the less I still wanted to know more about how this remote northern island protected its wildlife resource, and how nature conservation interests were managed.

With the opportunity the Farmers Club provided I was of course able to do this. The purpose behind this research project originally was to investigate the apparently simplistic, elegant method of nature conservation proposed in the key piece of legislation (The Nature Conservation Act 1999), however as will be shown in this report, my discussions with various organisations and individuals led me to investigate a much wider range of issues which are raised in this small community. Iceland was chosen as a focus for this work as an example of a country which, unlike our own is not subject to European legislation which forms the backbone of most of our domestic legislation from a nature conservation perspective. As a small island with a very restricted population my original idea was that it should be relatively simple to control and manage nature conservation interests in this situation. As the remainder of this report shows, in reality this is anything but the case.

Iceland is a volcanic island situated on the mid-Atlantic fault line and therefore from a geological perspective makes a fascinating study. The satellite image in Figure 1 shows this major tectonic plate boundary line clearly extending through the Atlantic with Iceland located within a particularly active zone, while Figure 2 shows how these fault lines cross the island. Figure 3 shows and example of the impact of these fault lines on the ground with a view of the fault line in Þingvellier National Park.

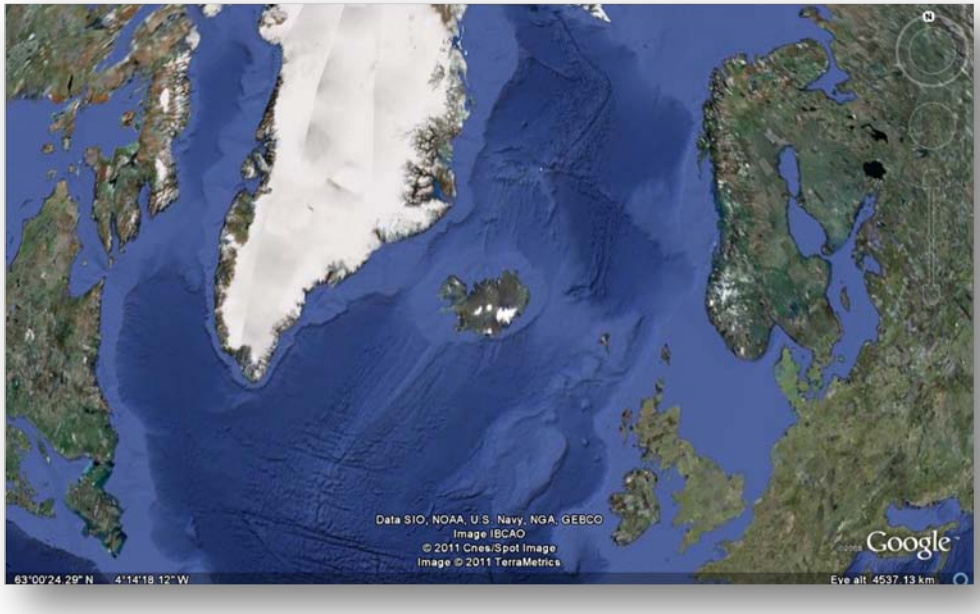

FIGURE 1 – LOCATION OF ICELAND ON THE MID-ATLANTIC FAULT LINE (GOOGLE EARTH)

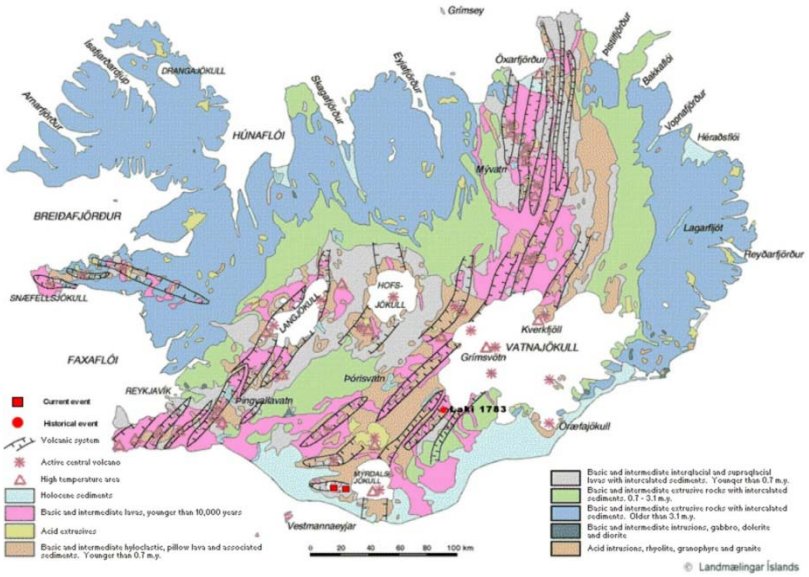

FIGURE 2 – LOCATION OF MAJOR FAULT LINES IN ICELAND (LANDMÆLINGER ÍSLANDS)

FIGURE 3 – VIEW OF FAULT LINES AT ÞINGVELLIER NATIONAL PARK

The consequence of this is to subdivide Iceland's ecosystems into 3 main environments: the highlands, the lowlands and the permanent glaciers.

The glacial regions cover around 11% of the land area of Iceland are of course dominated by an arctic desert landscape. Wildlife is significantly restricted by the permanent ice, however in the summer the melt zones become dominated by arctic tundra communities. The greater biodiversity exists within the highland and lowland zones. There is a distinct boundary between these zones, which can be seen most clearly from the air but is noticeable by anyone journeying around the country. The highland communities are composed of typical mountain communities, with significant areas of bare rock exposures coupled with strong bryophyte and alpine floral communities. Unfortunately due to the timing of my visit in October many of the mountain roads were already impassable so I was not able to do research in this environment. The majority of human activity including the major permanent settlements and agricultural development occur in the lowland zones. While significant proportions of the lowland zone are composed of volcanic deposits (around 60% of the country is lava field or volcanic desert), this is also the area of greatest soil formation and therefore of highest habitat development. Communities are broadly recognisable as similar to those found in upland habitats in the UK with the vegetation dominated with upland heath/cowberry(*vaccinium vitis-*

idea)/crowberry (*Empetrum nigrum*)/bearberry (*Uva ursi*) and bryophyte communities with sphagnum rich mires and dwarf willow scrub in areas where soil has established enough to support larger species. Woodland habitats are now largely extinct outside of non-native plantations. Tree cover has reduced from what is thought to be an original 30% to less than 1.5% of the land area, most of which is to the north east of the country. The country does also support some extreme rarities in its fauna. The most notable of these is the algal balls found in lake Mývatn. These algae are found only in Iceland (known as Kúluskítur) and Japan (known as Marimo) and are a highly unusual growth form of *Aegagropila linnaei*. The Natural History Museum of Iceland keeps live specimens of these so while I was unable to visit lake Mývatn, I was able to view these unusual specimens (Figure 4).

FIGURE 4 – LIVE *AEGAGROPILA LINNAEI* (KÚLUSKÍTUR) IN THE NATURAL HISTORY MUSEUM OF ICELAND

From a wildlife perspective, being a relatively new terrestrial environment (with of course new land still being created through volcanic activity) this has itself limited the diversity of species which have reached and colonised this island. While of a size comparable to Ireland, it is relatively distant from other islands or mainlands and therefore, simply considering MacArthur & Wilson's theory of island biogeography, the flora & fauna will naturally be restricted. The loose & friable material which makes up most of the country has not yet eroded & developed into strong soils and this itself is also a limiting factor. Iceland is most widely known for its migratory bird populations, with particular strongholds in the north-eastern area being

intensively researched and its importance for supporting global bird populations is internationally recognised. Its mammal fauna is highly restricted, with the most well known species arguably being the arctic fox (*Vulpes lagopus*). This is also the only true native terrestrial mammal with other species such as the American mink (*Neovison vison*), reindeer (*Rangifer tarandus*) and 2 species of mice being human introduction. Marine mammals however are more diverse with minke whale (*Balaenoptera acutorostrata*), sperm whale (*Physeter macrocephalus*), orca (*Orcinus orca*), pilot whale (*Globicephala macrorhynchus*) and white beaked dolphin (*Lagenorhynchus albirostris*) recorded from Iceland's waters and grey and harbor (common) seal (*Halichoerus gryypus* and *Phoca vitulina*) are also common along its shores and I have been fortunate enough to see minke whale and white-beaked dolphin on both of my visits to Iceland. As previously mentioned, as a bat specialist it is disappointing to note that there are no bat species native to the island, however several individuals of the American Northern Bat (or Big Brown Bat *Eptesicus fuscus*) have been blown by strong winds onto the island, but all records have been of bats which have died through exhaustion after the journey. The Natural History Museum of Iceland however did have one specimen which I was able to view (Figure 5).

FIGURE 5 – *EPTESICUS FUSCUS* AT THE NATURAL HISTORY MUSEUM OF ICELAND

From a human perspective, conditions have always been harsh with long winters & short summers and little soil of any real note, farming has particular challenges. The population of the country has always been low and at times the people have suffered from extreme poverty. Various attempts have been made to improve the conditions of the population, but of course more recently they are known for their work in the financial and business sectors. The current population is 318,000, $^{2}/_{3}$rds of which live in the capital, Reykjavík. The remainder live in the other major towns or in farmsteads & small villages scattered around the lowland coast of the country.

Tourism is a major industry in the country and with ease of flights from the US, the UK and the Nordic countries to the east it is a popular travel destination, which in itself brings of course its own pressures to the country. The remainder of this report considers the various impacts of the human population on the natural environment of Iceland and how the legislation, government, organisations and general public look to protect its ecosystems.

THE LEGISLATION

The core legislation relating to nature conservation in Iceland is The Nature Conservation Act, 1999. Prior to my visit I of course studied this in detail, and found it to be much more simplistic than any of our domestic or European Legislation. The UK's core legislation relating to nature conservation has had a varied history and includes domestic legislation such as the Wildlife & Countryside Action 1981 (as amended) to interpretations of European legislation such as the Habitats Regulations 1994 which translates the European Habitats Directive into national legislation. Much of our legislation has been amended through statutory instruments and Regulations which has resulted in a somewhat complicated system. As an example, many of our protected species are covered by both the Wildlife and Countryside Act and the Habitats Regulations. The penalties for offences, which are broadly similar in both pieces of legislation differ (there is no custodial sentence within the Habitats Regulations, but this is included in the Wildlife and Countryside Act) however the regulations for species licensing come from the Habitats Regulations. While this is in the process of review, this complication is not restricted to regulation of impacts to protected species but can be found throughout UK legislation. Coupled with our legislative system is the network of policy. Much of this is derived through the planning system such as the Planning Policy Statements: PPS9 – Biodiversity & Geological Conservation is a significant tool in protection of habitats in the UK through the planning process, but is itself supported by two main guidance documents and Government Circulars. The Biodiversity Action Plan process was derived from international calls for protection of biodiversity centered around the 1992 Earth Summit in Rio and represented the UK's response to becoming a signatory to that agreement. The policies derived from both the UK and Local Biodiversity Action Plan process have been highly influential in the success of nature conservation in the UK through targeting actions across a significant range of organisations and highlighting, through development of strong data, the need and methods of conservation for our rarest, most threatened or most notable habitats and

species. While our framework of legislation and policy for nature conservation has much to suggest that it has had significant influence in protecting, and indeed in some cases enhancing, our biodiversity, it cannot be argued that regardless of our attempts to protect our habitats and species, biodiversity is still declining in the UK. Not only are many of our rarities (those which of course attract more interest and therefore conservation effort) still in decline, but species widely considered common are also showing evidence of decline. There have been some successes of course, the increasing population of the otter (*Lutra lutra*) being one of the most notable of recent years, however our legislation still fails to protect habitats, over-emphasis on targets within Natural England arguably is too prescriptive and there is little ability within our current framework to have significant consideration for landscape scale ecology or ecosystem services.

However, having worked for a number of years directly with nature conservation legislation through my work as senior ecologist for Hampshire County Council and understanding the positive work that can be achieved through our system, I had questions over whether the legislation in Iceland was too simplistic. There seemed to be little supporting information or policy and my concerns which I wanted to draw out during my visit was whether the legislation was too simplistic and too broad to actually function effectively. In order to address this, I was able to secure meetings with a range of organisations, including government departments and NGO's. My discussions with these organisations ultimately bore this concern out. Ólafur Jónsson, the Divisional Manager for the Department for Natural Resources at Umhverfisstofnun (the Icelandic Environment Agency) was particularly helpful in discussing the various loopholes that occur with this piece of legislation from a practical day-to-day sense. Working in a similar position as my previous role within a government organisation it became clear that this legislation does not have the precedent of testing that is necessary to make legislation interpretable and lacks the ministerial backing from higher government to make it enforceable. Ministerial support was a topic which was also discussed with the Umhverfisstofnun and it raised a key issue. The recent instability within government in Iceland is causing particular problems with enforcement and a lack of a driving force behind new policy and legislation necessary for effective protection. The post-holder for position of Minister for the Environment has changed 5 times in 5 years and this lack of continuity has resulted in a lack of a long-term view point on conservation and an ethos of short-termism in government which can never be a good sign for nature conservation which relies on foresight and the long-term view point for effective guidance and protection.

Another aspect of the legislation which was researched was the Statutory Nature Conservation Organisations. The legislation refers to the Nature Conservation Agency and defines the roles of this organisation, but in my research prior to my visit I could find no contacts for this organisation. Kristinn of the Institute of Natural History was able to clarify this position. The Nature Conservation Agency replaced the Nature Conservation Council in 1996, however since the production of the Nature Conservation Act this Agency has been merged with the Wildlife Shooting Institute and Public Health Institute into the Environment Agency. It was disappointing to note that he felt that this was a significant loss in terms of protection of the environment as much of the nature conservation work of the Environment Agency has now been substantially reduced. This is highlighted by the lack of site protection. While the legislation provides for the protection of sites of nature conservation interest, of the list of 88 sites proposed to the Ministry for the Environment only 14 have been ratified, partially due to funding constraints in the current economic climate.

THE ORGANISATIONS

When researching who to approach for information prior to my visit I was pleased to see such a wide range of organisations involved in nature conservation in the country. The structure of these organisations is broadly similar to our own with a range of governmental organisations such as Umhverfisstofnun and Umhverfisráðuneytið (the Ministry for the Environment) supported, or indeed contested by, a range of non-governmental organisations such as Fuglavernd (The Icelandic Society for the Protection of Birds) and Landvernd (The Icelandic Environment Association), and research institutions such as Landhúnaðarháskóli Íslands (The Agricultural University of Iceland) and Náttúrufræðistofnun (the Icelandic Institute of Natural History). Several cross-border Nordic consortiums also have interest in the nature conservation of the country such as CAFF (Conservation of Arctic Flora & Fauna) which has its base in Akureyri, the northern capital of Iceland. This range of organisations was much closer to familiar territory for me and highlighted the strong interest that there is in conserving this important environment. The range and scope of these organisations gives a strong voice to conservation in this country and perhaps highlights the need for greater legislative and national policy protection to support the work which is being done here.

THE ISSUES

For the remainder of this report I intend to consider what I see as the main challenges for conservation in Iceland based on my research with the various individuals and organisations I was able to meet with. The key issues which were identified during this project were: species and habitat protection; non-natives and invasive species; recreation & human activities; planning & building control; food security and farming; and energy production.

SPECIES AND HABITAT PROTECTION

Species and habitat protection directly receives a much lower standard of protection than we find in the UK. The Nature Conservation Act focuses on habitats and makes no reference to species specifically. What is highlighted however is protection of landscapes and within that protection of habitats. Similar to the UK, specific habitats are not listed for protection and this has long been highlighted as a particular concern with UK legislation. Specific species receive no mention in the legislation and it is difficult to find where these are given legal protection. Legislation relating to hunting (Act on Hunting and Control of Birds and Wild Mammals, 1994) exists, however English translations were not accessible through the Environment Agency, however this of course only relates to one aspect of species protection. With a lower population level and historically a higher requirement for any available food source, historic protection of species has not has the drivers that it has in the UK with its history of wildlife recording so this perhaps is unsurprising. A long conversation over this was had during discussions with representatives of Fulgavernd, the NGO which is concerned with protection of birds in Iceland. It was particularly interesting to note that this organisation was very positive about Iceland entering the EU for precisely that reason. Entry to the EU would require translation of the Birds Directive and Habitats Directive into national legislation and therefore enforce protection for a range of species found in Iceland, particularly the migratory birds found in the country. The question here would be how the legislation would be translated, and indeed if the current species list in the various annexes of the EU Directives would need to be modified to take account of the species found in the widening area of the European Union. If Nordic countries such as Iceland do apply for inclusion into Europe, which may be restricted to only a subset of the Nordic communities, it would substantially alter the range of habitats and species within the land area of Europe and may require modification of the legislation to incorporate this sufficiently. There is however precedent for this as in 2007 the Habitats Directive

was modified following the inclusion of Bulgaria and Romania with 2 additional biogeographic regions (the Black Sea and Steppe) incorporated into the legislation.

NON-NATIVES AND INVASIVE SPECIES

Non-native and invasive species are a particular interesting case in this country. From a livestock perspective in particular, the Icelanders manage one of the tightest security systems possible. Animals are not allowed to be imported into the country and animals bred in the country, once exported, are not allowed to return. This both ensures that their species are pure-bred, essential both for their ability to cope with the challenging environment and their marketability, and also a significant reduction in disease problems within livestock.

From a wild species perspective however there are particular challenges. With the control of livestock imports, wild animal imports are also controlled. There are still however some non-native species present in the country from historical releases. The reindeer herds were originally introduced to the country to help the poorer farming communities, however the Icelanders did not adapt well to the nomadic lifestyle of a reindeer herder and the animals were allowed to become feral. Only a small number still appear to remain however towards the north of the country, but where they do exisit, as the only large herbivore they have a significant impact on the native vegetation. The American mink, as in the UK, has become feral following release and escape from the fur farms it was imported for. It has a significant impact on bird populations where it does remain and this is a focus of a number of organisations in the country. The wider problems however relate to invasive floral species. Agriculture is of course extremely difficult in this environment and soil stability remains a particular challenge. With little naturally developed soil, retaining what there is is crucial. Consequently there has for around 30 years been a soil stability programme which has involved seeding of vast areas of land with plants to hold and develop soil. Alaskan Lupin (*Lupinus nootkatensis*) is one of the species which is predominantly used for this purpose, and has been used to stabilize soil since the 1940s however it has become so widespread that it has become invasive across vast swathes of the countryside, swamping out native floral communities as it does so (Figure 6).

FIGURE 6 – ALASKAN LUPIN (*LUPINUS NOOTKATENSIS*)

It is a particular challenge for the Ministry for the Environment which comprises departments who have differing roles and responsibilities. On one hand the Ministry promotes soil stability programmes who use *L. nootkatensis* as part of this programme, and on the other hand Umhverfisstofnun are removing it through invasive species control programmes. Tree planting is also a particular issue for the country. The native tree fauna is predominantly composed of dwarf willow & birch species and is limited by both the arctic conditions and poor soil quality. The vast majority of native woodland has been lost with only small remnants holding on in the north of the country. Tree planting however of conifer species such as pines and larch is widespread in areas where soil can be stabilised suitably and this of course removes areas of land suitable, or previously colonised by native flora. With importation of any material being expensive, the drive to produce home-grown timber is high, however it does appear that tree planting has been somewhat uncontrolled with extensive plantations surplanting significant areas of native flora. Protection is afforded to sites which receive designation through the Nature Conservation Act (such as the National Park sites) however elsewhere conversion to plantation appears to have much lower control. Outside of the plantation sites there was also evidence of natural regeneration of conifer species in the heathland communities in a number of locations.

RECREATION AND HUMAN ACTIVITIES

Tourism has previously been mentioned as one of the key industries in the country. While obviously not renowned as a beach resort, tourists to Iceland can broadly be subdivided into two categories: the walkers/ramblers/wildlife watchers and the adventure/activity type. The first category are of course mainly there to view the landscape or wildlife and as such promote nature conservation interests through their desire to see a truly wild landscape. Indeed this appears to be having an influence throughout the tourism sector. The vast majority of tourist sites, hotels and activities actively promoted their 'green credentials' with various grading systems for different sectors of the industry observed. Many companies were seen to be actively promoting environmental issues and significant positive work appears to be being done throughout the sector on minimising the environmental impacts of the tourist industry. Another aspect to this category of tourists is the visiting volunteer groups. Umhverfisstofnun's rangering team have made strong links with the British Trust for Conservation Volunteers and through this now international organisation arrange for summer volunteer teams to join the ranger departments to assist with wardening of sites and in particular with practical conservation management. This connection of the ranger teams with international volunteers not only ensures that conservation work is completed on the national park areas, but also that a global focus remains on protection of Icelands habitats and species.

The second category of tourists however have the potential for much greater wildlife disturbance or habitat damage. Iceland offers a wide range of activities such as off-road driving, ATV/snowmobile driving and these have been recognised as potentially highly damaging operations with which Umhverfisstofnun have particular concerns. During my discussions with this organisation it became clear that the problems being seen here are very similar to what we see in the UK with regards to so-called 'green-laneing' and the lessons that have been learnt here have significant relevance to Iceland. The use of motorised vehicles has been demonstrated to have a significant impact on natural habitats, and again the key issue that is found in Iceland is the lack of soil structure. With young soils with a high mineral content and low humic matter the soils are highly prone to damage and erosion and once eroded the damage is extremely difficult to reverse. The Nature Conservation Act contains significant sections which consider where specific potentially damaging operations can take place, but there does still appear to be significant conflict between interests of nature conservation and activity-led tourism.

With regards to planning & building control, with a relatively low population which is focussed around Reykjavik, the main impacts of building for dwelling houses is significantly lower than in the densely populated UK. However one issue which was particularly noted was, certainly around the south coast of the island, a tendency for the building of second homes or holiday homes in the countryside. Whole areas around the central south coast have become peppered with small second homes and this does appear to be causing detriment to the local environment. This issue was raised with Umhverfisstofnun and was agreed that this unplanned development is a concern, however since the financial crisis has of course abated somewhat. There does however seem to be little consideration for environmental issues within dwelling development and much of this type of development seems to have little control. As Iceland's financial situation improves there is a concern that this issue may raise itself again and the spread of dwelling houses will continue. While, due to its scale, this does not necessarily require large areas of land under impermeable surfaces which is one of the key concerns in planning in the UK, the most crucial impact will be one of disturbance. Many areas in Iceland have received little human disturbance due to the difficulties of access (or indeed the need to access them). These developments which are spread over large areas of land bring humans much further into the countryside and with them the disturbance impacts on wildlife will be much higher. This could be a particular concern for ground nesting bird species such as the Ptarmigan *Lagopus muta*. While this species is considered to be of particular rarity in the UK, indeed I considered myself lucky to see one on a recent visit to the Cairngorms, in Iceland they are particularly numerous being well adapted to the habitats found here. They have of course been widely hunted in Iceland being a relatively readily accessible food source (the Icelandic name for the Ptarmigan translates as 'Christmas Dinner'), however remain numerous. As a ground nesting species however they are particularly prone to disturbance from machinery, humans and dogs so the expansion of housing into the countryside must remain a concern. The overall planning system has also changed and that is causing concern. Björgólgur Þorsteinsson of Landvernd raised a particular concern over a lack of national planning policy and direction, with all planning decisions now being taken at a local scale and feels that this is largely responsible for the second home developments. With 78 Local Authorities but no large scale development plan there is a lack of direction in planning overall and this becomes a particular problem when considering larger scale developments.

On a positive note however, a number of buildings which were identified during the visit showed a strong inclination towards 'green' building techniques. The main

council building in Reykjavik is a particularly good example of a green walled building (Figure 7) and green roofs were also common. Green roofs of course are something of a historical feature of Iceland with many of the buildings of the original Viking settlers being turf buildings (although sadly only reconstructions of these still exist due to their decomposable nature). Figure 8 shows a relatively recent green-roofed guest house on the south west coast.

FIGURE 7 – THE RATHAUS IN REYKJAVIK SHOWING ITS GREEN WALLS

FIGURE 8 – HOF GUESTHOUSE SHOWING ITS GREEN ROOF COMPOSED OF TURF FROM THE LOCAL AREA

Industrial development however is a greater concern. With cheap electricity and some significant mineral reserves, Iceland is a focus for development of a range of industries, with the most highly controversial being the aluminium industry. Production of aluminium has the potential for significant environmental disasters and the threat of this is a particular concern amongst the general public. Public protests have been held over the stated intent of a US aluminium corporation to develop large scale plants in the country; however the prospect of jobs in the current economic climate means that developments such as this may well be given the go-ahead by the government. Umhverfisstofnun's pollution control however seems to be far more effectual than its direct nature conservation control and this means that these issues should be given the control necessary if they are given planning consent.

ENERGY PRODUCTION

Coupled with the issue of industrial development is the question of energy production. While not originally on my agenda and somewhat of an expansion of the research, opportunities arose while in the country to investigate this issue. With no coal or oil reserves, production of energy by these means is expensive; however Iceland has two particular advantages for energy production, its steep mountain streams and its position on a tectonic plate boundary. This means that it is highly efficient to produce energy from hydroelectricity and geothermal power and consequently electricity is so cheap that it is by far the most common energy source. Indeed both have been widely exploited for generations, with photographs of the geothermal springs being used in the 1900's displayed in an excellent exhibition in one of Reykjavik's parks (Figure 9).

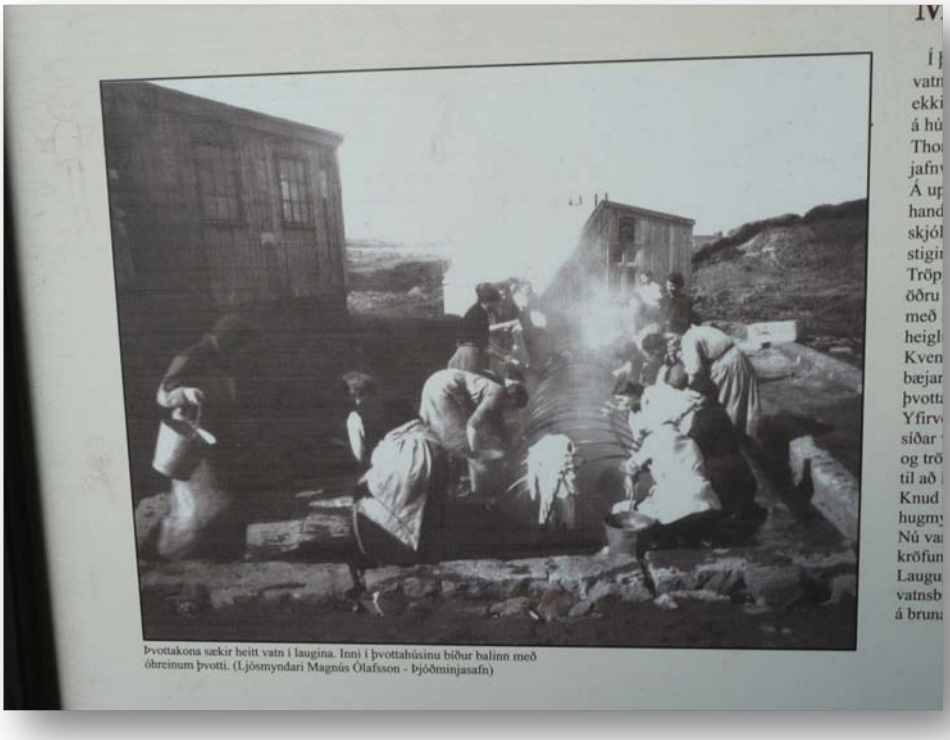

FIGURE 9 – PHOTOGRAPH SHOWING USE OF GEOTHERMAL SPRINGS IN 1900

The newly built geothermal plants bring cheap energy to the vast majority of the population in a manner which produces little environmental cost, the photographs of smog clouds over Reykjavik are consigned to history, while the country is now a world-leader in the development of this technology (Figure 10).

FIGURE 10 SHOWING PART OF THE WORKINGS OF A GEOTHERMAL PLANT

Geothermal plants produce so much energy that the hot water by-product is used as underfloor heating in the pavements and car parks to melt snow during the winter. However there are concerns over loss of high temperature water and its impacts on the habitats and species that have developed to utilise this environmental niche. Efforts are made through the process to ensure that water of sufficient temperature is returned, but notwithstanding, this appears to be one of the least environmentally damaging large scale energy options available and it is to be hoped that the work done here can be used to develop this form of technology globally.

Hydroelectric power, while renewable, however has more concerns associated with it. With high mountain ranges in the centre of the country there is significant energy available in the water systems, however the production of hydroelectricity requires the production of dams and reservoirs for control and this itself raises significant environmental issues. There is significant public pressure concerning the potential loss of large areas of upland habitats through valley flooding for hydroelectricity production. Figure 11 shows a map which predicts area of land loss in proposed hydroelectrical reservoirs to highlight these concerns.

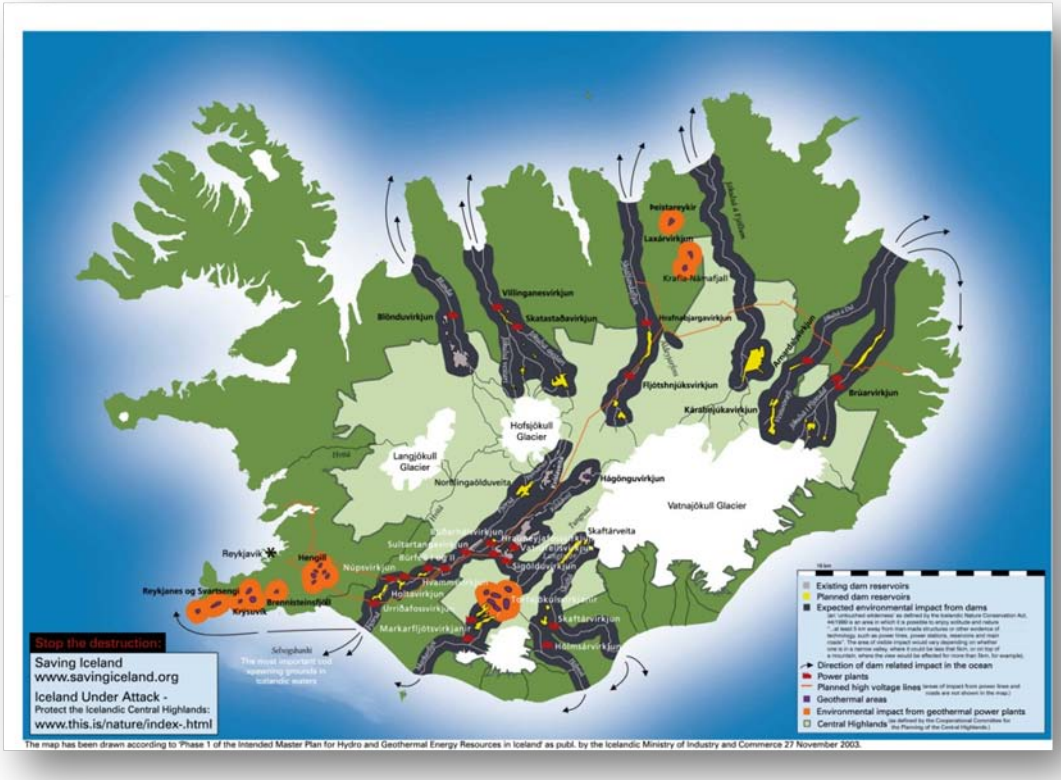

FIGURE 11 – AREAS OF LAND WHICH POTENTIALLY COULD BE LOST TO HYDROELECTRICAL RESERVOIR DEVELOPMENT UNDER CURRENT PROPOSALS.

This predicts impacts on areas of land which have both high landscape and nature conservation value and the relative merits of the production of energy by these means over the loss of important habitats and communities is a key area of conflict.

FOOD SECURITY AND FARMING

Farming is so intrinsically linked to nature conservation that of course it had to be a significant focus of the research. Ólafur of Bændasamtok Íslands (the Farmers Association of Iceland) were particularly helpful in my research hear. The first point to note is how proud the Icelanders are of their excellent livestock, and this of course directly relates to food security. With high fuel prices, imported food is expensive so a crucial element of food security is home food production and indeed Iceland is currently 100% self-sufficient in meat, eggs and dairy produce. Icelandic lamb is of particularly high quality and is also due to its double layer coat excellently adapted to live in the extremely challenging conditions found in Iceland (see Figure 12).

FIGURE 12 – ICELANDIC SHEEP

Significant research is given to genetic conservation of this breed as well as ensuring disease risk is kept to a minimum. While some farmers are now lobbying for importing livestock breeds from outside the country it is widely thought throughout the country that this is not to be supported and to work on improving the breed through selective breeding rather than importing new stock to the country. Icelandic food is widely promoted in the country, indeed during the visit the government had taken the decision to ask MacDonald's to leave the country as it refused to use Icelandic produce. This level of food protection is one of the key arguments against Iceland entering the EU as these controls would not be possible under the regulations of Europe and consequently Bændasamtok Íslands campaigns against application for inclusion. A key outcome of discussions was how hard Icelandic farmers work to promote conservation, looking at grazing pressures on native vegetation within both their pasture land and commoning forms of grazing, which are highly prevalent across the whole country. Pasture management and previous attempts at land drainage and its implications for nature conservation were also discussed at length. Kristann of the Institute of Natural History was however slightly less supportive, highlighting the issues of overgrazing found in some parts of the island. This was particularly reminiscent of arguments which have often been contested in the New Forest where areas of undergrazing and overgrazing by commoned animals raise concern by ecologists and conservationists working to enhance the biodiversity of the area. There is however evidence to suggest that the

vegetated area of the lowlands has reduced over time. Written records from the 1300's do suggest that a greater proportion of the country has previously been vegetated and the increase in grazing pressure has been cited as a possible cause of this, although reduction in woodland area and changing climate is also likely to be a substantial factor here. The Steffenson Arctic Institute also raised the issue of grazing pressure and its impacts on sensitive habitats. Most notably the concerns here were from increased horse grazing pressure. The Icelandic horse has in recent years become much more popular both with the Icelanders and with tourists. Globally there has also been an increasing market for Icelandic horses, particularly in Germany. With increased horse breeding and horse keeping grazing pressure is increasing much quicker than would be anticipated simply from sheep grazing pressure.

As a response to increased livestock, silage production has also increased, and with it the requirement for increased use of fertilisers. This is an expensive process in a country with no oil resources, however there has been a notable change in the area of land which is drained and fertilised for silage production. This has resulted not only in habitat loss but in increased nitrification of water and soil resources and alterations to hydrology which has caused substantial changes to vegetation communities, particularly around the southern lowlands. Consequently the South Iceland Agricultural University has been undertaking substantial research looking into the issues of ditches and nutrient enrichment and has been experimenting with filling in existing drainage ditches, a proposal which has met with conflicting opinions. It was also noted that watermeadow systems were historically used in parts of the island, however these, as with the watermeadow systems in the UK have now become defunct. Ólfur also raised the issue of the number of farms which are now becoming derelict with many potential young farmers moving to Reykjavik and leaving farming. Of course this has long been an area of concern in the UK as well as in Iceland, however the predominant situation for abandoned farms in Iceland is that they simply become derelict. Therefore there is potential for previous wetland systems to be restored and in places this is occurring, but the Farmers Association disagrees with the research of the South Iceland Agricultural University which suggests that substantial areas of wetland could be recreated in this way. With a lack of funding or governmental will it remains unlikely that large scale restoration could occur.

CONCLUSIONS

The main recurring theme which arose during my research was the question of EU entry. The decision whether to enter the EU has both significant positives and significant negative sides to it. From a pure nature conservation view point, it would enable the country to adopt species and habitat protection legislation to a level it currently does not have and there appears to be no ministerial driver to administer by any internal mechanisms. However, the relative costs of entering the EU with regard to loss of control of markets in particular, raises significant concerns. As an ecologist by trade I am of course swayed by the nature conservation arguments, however I have seen EU translations of Directives into domestic legislation here and they do not themselves provide the ideal answer which is perhaps perceived by some. The governmental instability is a key issue here. If the government, in particular the position of the Minister for the Environment, can take a longer-term view of nature conservation the issues could be resolved without the need for entry to the EU and enable the country to retain its autonomy. There are a wide range of organisations and individuals connected to nature conservation, however ministerial support will only become a key factor if nature conservation has the support of the general public. The current financial situation in the country has somewhat overridden these concerns and there were feelings in many of the organisations that I contacted that nature conservation has somewhat fallen out of favour with the general public in recent years.

The range of organisations and clear interest in nature conservation in the country is heartening, however I was somewhat put in mind of the nature conservation issues we saw in the UK in the 1980's/90's with strong NGO support, and indeed highly qualified and experienced individuals working within government organisations, however with little backing either from higher government or the court system for species and habitat protection. In the UK this situation has improved, and it is to be hoped that with increasing global interest in Iceland, not just from the financial perspective but through increasing tourism, increased interest in the landscape and biodiversity of the island, that pressure can be brought on the government to support the work of its NGO's, research institutions and Environment Agency.

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