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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

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Document for information

**Hydropower Development in Iceland:
Damage to habitats and species of European importance**

Report by the NGOs

Document prepared by

BirdLife International (Represented by the Icelandic Society for the Protection of Birds (Fuglaverndarfélag Íslands) and the Royal Society for the Protection of Birds, UK), *Icelandic Nature Conservation Association (INCA)*, *Wildfowl & Wetlands Trust (WWT)*, *World Wide Fund For Nature (WWF)*

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ANNEX I Draft Recommendation for consideration by the Bern Convention Standing Committee

1. Introduction

BirdLife International, the Icelandic Nature Conservation Association (INCA), the Wildfowl & Wetlands Trust (WWT), and the World Wide Fund For Nature (WWF), hereafter referred to as 'the NGO partners', call on the 23rd Meeting of the Bern Convention's Standing Committee (1-5 December 2003), to:

- open a case file on the detrimental impacts of hydropower development in Iceland on habitats and species of European conservation importance;
- adopt the appended draft recommendation (Annex I) urging the government of Iceland to honour its international conservation commitments and to rectify material breaches of the Bern Convention, including specific actions at two sites.

Using two cases of current hydropower development proposals, this paper demonstrates that the government of Iceland continues to support energy schemes with short-term economic and political benefits at the expense of irreversible damage to ecosystems, habitats and species, including species listed in Appendices II and III of the Bern Convention, "endangered natural habitats requiring specific conservation measures" as set out in Resolution 4 (adopted by the Convention's Standing Committee in December 1996), and "species requiring specific habitat conservation measures" listed under Resolution 6 (adopted by the Standing Committee in December 1998)¹.

2. Ecologically sustainable hydropower and Icelandic Energy Policy

2.1 Background²

Since the oil crisis of the 1970s, Iceland has made concerted efforts to replace dependence on imported oil products with energy generation from domestic sources, notably hydro and geothermal power. Iceland is rich in both types of resource, with only about 25% of the country's hydropower potential (taking into account technical feasibility and environmental considerations), and less than 10% of available geothermal power, having been harnessed to date. This ready access to abundant renewable energy means that Iceland has assigned high priority in its economic development strategy to attracting foreign investment from energy-intensive industries, such as aluminium smelting. At present, about two-thirds of Iceland's hydropower goes to heavy industry, and one third to domestic uses. If the Kárahnjúkar hydropower project is implemented (see section 3 below), this proportion will increase to almost 80%³. Realising potential for electricity export by submarine cable is also a key element of the government's national economic development plans.

There are many examples from around the world showing that the exploitation of hydropower as a renewable natural resource is not necessarily ecologically sustainable or acceptable⁴. The recent report of the World Commission on Dams and related work undertaken by the Convention on Biological Diversity and the 'Ramsar' Convention on Wetlands (among other intergovernmental frameworks), has reinforced and mainstreamed this perspective, while the European Union's Water Framework Directive is also promoting an integrated approach to river basin management. As a

¹ These two Standing Committee Resolutions underpin identification and designation of Areas of Special Conservation Interest under the Bern Convention's 'Emerald Network'. Qualifying sites in Iceland are under threat of ecological damage from hydropower schemes.

² Source: Government of Iceland, Ministry of Industry and Commerce

<http://government.is/interpro/ivr/ivreng.nsf/pages/344886A871936F30002568D30038828D>

³ By comparison, in Norway, the country perhaps most comparable to Iceland, only about 20% of hydropower goes to industry, with 80% to domestic uses.

⁴ For example, in December 2002 the supreme administrative court of Finland ruled that the proposed Vuotos dam was unacceptable due to the impacts it would have on a site of European importance for nature conservation.

consequence, the international community is now equipped with more information and a greater range of policy and technical tools than ever before to support environmentally responsible decision-making, including in-depth exploration of alternatives to constructing new dams.

2.2 Rhetoric and reality

“It is the Government’s policy to promote increased utilisation of renewable energy resources in harmony with the environment”. Government of Iceland⁵

While the above quote sets out a laudable policy goal – and implies a recognition that increased use of renewable energy may not always be in harmony with the environment, thereby requiring special caution and care – the reality of hydropower development in Iceland is somewhat different.

It is the NGO partners’ view that the government of Iceland has supported, and continues to support, hydropower development projects that are ecologically unsustainable, in favour of short-term economic and political gain. This view is vividly illustrated by the two case studies detailed in sections 3 and 4 below. In the first case, Kárahnjúkar hydropower station, the government has given its approval to a project that will *inter alia*:

- Partially destroy one of Europe’s last remaining large tracts of wilderness.
- Have an internationally significant negative impact on Bern Convention Appendix III species, including the Icelandic breeding populations of pink-footed goose *Anser brachyrhynchus* and greylag goose *A. anser*. Iceland shares responsibility for management of both these flyway populations with the UK and – in the case of the pink-footed goose – also with Greenland (Denmark).
- Cause detrimental ecological changes to Úthérð and Eyjabakkar Important Bird Areas with consequent adverse impacts on Bern Convention Appendix II and Appendix III species.
- Have a negative effect on the declining Icelandic population of harbour seal *Phoca vitulina*, also a Bern Convention Appendix III species, and on species listed under Standing Committee Resolution 6 (December 1998) as being in need of specific conservation measures.
- Damage or – in some cases – destroy the habitats of internationally important mosses, lichens and invertebrates.

In the case of the second hydropower development proposal, at Nordlingaalda, close to Thjórsárver Nature Reserve and Ramsar site, the government of Iceland has recently approved a project that – whilst less damaging than earlier versions – still leaves serious environmental questions inadequately answered, with definitive and detailed plans for this latest proposal still pending. Potential remains for lasting damage to a landscape and habitats of international importance, including palsa mires, which are recognised under the Bern Convention (Standing Committee Resolution 4, December 1996) as being in need of specific conservation measures.

In both cases, the Icelandic authorities (including the Icelandic Planning Agency and the Ministry of Environment itself) have, at different stages, discounted environmental impact assessment studies showing project proposals to be ecologically unacceptable.

2.3 Master Plan for Hydro and Geothermal Energy Resources in Iceland⁶

The government of Iceland initiated development of a ‘Master Plan for Hydro and Geothermal Energy Resources in Iceland’ (hereafter referred to as ‘the Master Plan’) in 1999. The Ministry of Industry and Commerce, in cooperation with the Ministry of Environment, established a Steering Committee of 16 members, chaired by a representative of the National Energy Authority, to develop a proposal for the Master Plan. The Steering Committee is supported by some 50 experts in four Working Groups,

⁵ Source: Government of Iceland website, February 2003

<http://government.is/interpro/ivr/ivreng.nsf/pages/344886A871936F30002568D30038828D>

⁶ See: www.landvernd.is/natturuaf/enska/master_plan.html

the chairs of which participate in the Steering Committee. Three of the Working Groups are evaluating the likely impacts of proposals on specific sectors and fields of interest:

Working Group 1: flora and fauna, geology, hydrology, landscape, cultural heritage

Working Group 2: farming, fishing, hunting, re-vegetation, recreation

Working Group 3: economic activities, employment and regional development

Working Group 4 is charged with the actual identification and description of potential power projects, both hydro and geothermal.

The government has underlined that the process for developing the Master Plan is to be based on best-available scientific information, with significant efforts to inform and involve the wider public. However, though the Working Groups are currently (March 2003) finalising the first phase of their work, the process for synthesizing the groups' findings and producing a draft Master Plan has yet to be agreed within the Steering Committee, and the relative weighting to be given to environmental and economic factors (among others) is far from clear. Furthermore, there is no firm timetable for publishing the draft and even then the government is not under any legal obligation to accept or act on the proposals contained in the plan.

The NGO partners are concerned that these shortcomings in the Master Plan process mean that an opportunity to set an innovative, economically and ecologically sustainable, strategic direction for Icelandic energy policy is liable to be missed. In particular, there appears to be a high risk of the findings from Working Group 1 being overridden by economic considerations.

A preliminary ranking of potential locations for energy generation undertaken by the Master Plan Steering Committee in 2002 showed that two of the four most environmentally unacceptable sites in the country were the subject of ongoing projects supported by the government and National Power Company. These two examples are summarised below, focusing on expected damage to biodiversity and with specific reference to the Bern Convention.

3. Case one: Kárahnjúkar hydropower project

3.1 Project overview

In order to provide electricity for a new aluminium smelter at Reydarfjörður on the north-east coast of Iceland, two free-flowing glacial rivers are due to be regulated, a 57 km² reservoir created, and many tens of kilometres of roads, tunnels and other infrastructure built. The smelter itself is to be constructed by the multinational Alcoa corporation, under an agreement with the government of Iceland and the Icelandic National Power Company 'Landsvirkjun' (jointly owned by the state of Iceland, city of Reykjavik, and town of Akureyri). Proponents of the scheme argue that the project is vital for securing the socio-economic future of a remote region suffering from depopulation and a limited range of employment opportunities.

Under the scheme, the river 'Jökulsá á Dal'⁷ (150 km in length) would be dammed and water from the new 'Háslón' reservoir transferred by tunnel to a power station. Water from the upper part of the river 'Jökulsá í Fljótsdal' (140 km) would also be transferred by tunnel to the power station, entailing the construction of two further reservoirs. Once it had passed through the power station turbines, all the water would be discharged into the lower Jökulsá í Fljótsdal, before flowing into Lagarfljót lake and river. The environmental impact assessment (EIA) statement highlights the disruption to the natural functioning of the river system that the dams and diversions will cause.

Economically, the scheme depends on loans from International Financial Institutions, underwritten by the Icelandic authorities, effectively providing indirect state subsidies. A thorough economic

⁷ Also known as 'Jökulsá á Bru'

evaluation commissioned by the Iceland Nature Conservation Association (INCA)⁸ estimates that proceeding with Kárahnjúkar hydropower project will entail annual losses for Landsvirkjun of USD 36 million. Challenging Landsvirkjun's claim that the scheme will be profitable, INCA believes that the power company's "assumptions regarding cost and time overruns and aluminium price trends are highly optimistic".

The main elements of the scheme are shown below in Figure 1.

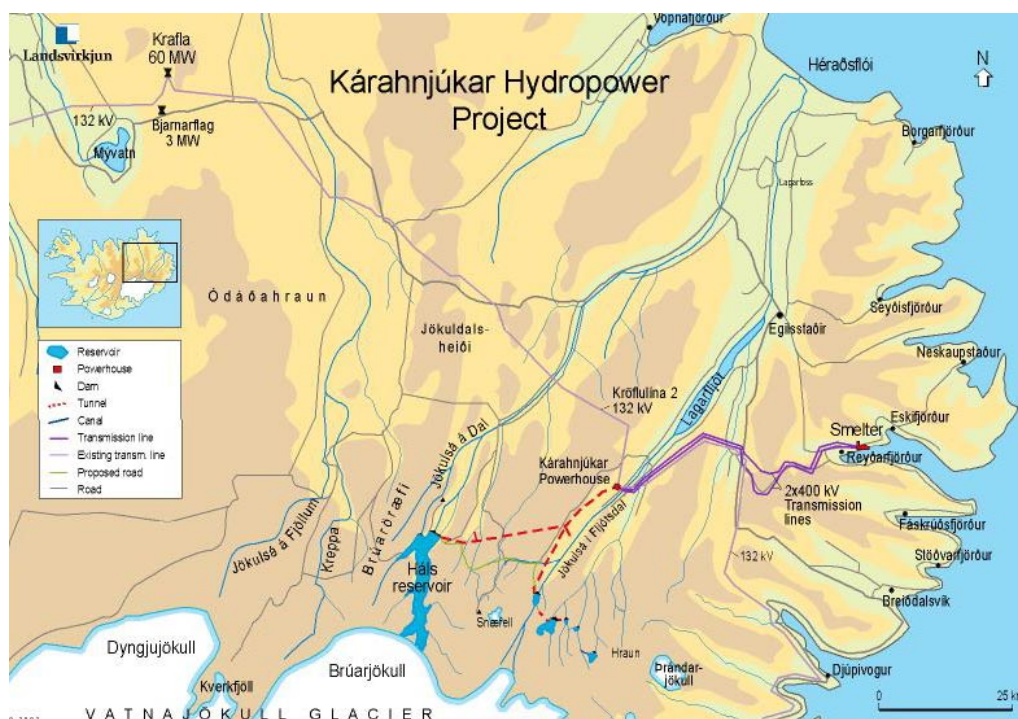


Figure 1: Map showing the main elements of the Kárahnjúkar hydropower scheme. The dashed line shows the water transfer tunnels. Transmission lines will take electricity generated at the power station to the Alcoa aluminium smelter at Reydarfjörður on the east coast. Hálslón reservoir ('Hálslón' in Icelandic) will destroy 57 km² of outstanding natural habitat. Two smaller new reservoirs are shown in the upper part of the Jökulsá í Fljótssdal catchment. Both of these will have detrimental impacts on biodiversity, including Eyjabakkar Important Bird Area, which is also located in the upper catchment of the Jökulsá í Fljótssdal. Úthérð Important Bird Area (also referred to under biodiversity impacts) is located at the mouth of the two rivers in the coastal lowlands adjacent to Héraðsflói bay in the far north-east of the area shown. Source: Landsvirkjun, www.karahnjukar.is/EN/

3.2 Expected biodiversity impacts

"As a whole, the area of study has a high conservation value in the judgement of the Institute of Natural History". Kárahnjúkar EIA statement⁷

(a) Impacts on birds

Some 3,800 pairs of pink-footed geese *Anser brachyrhynchus* (Bern Convention Appendix III) nest in the catchments of the rivers Jökulsá á Dal and Jökulsá í Fljótssdal. The Icelandic Institute of Natural History estimates that, of these, some 2,200 pairs (approximately 5% of the overall number of

⁸ Source: INCA report, 2002: *Kárahnjúkar Hydropower Project Estimate of Profitability*, English version available from www.inca.is

breeding pairs in the flyway population⁹ and 6% of the breeding pairs in Iceland), could suffer detrimental impacts due to the Kárahnjúkar development. For example, the nest sites of some 500 pairs will be destroyed by Háslón alone, and other pairs are likely to abandon their breeding territories due to construction and increased human activity elsewhere in the region. There is no scientific data to support the contention that these birds can simply move to 'vacant' habitat elsewhere.

Úthérð Important Bird Area (IBA) is an area of coastal lowlands at the mouth of the two rivers. Its riparian marshes, streams, lakes, pools and extensive sedge-dominated mires are important for nesting Arctic skua *Stercorarius parasiticus* (up to 4% of European population, 0.5% global population), great skua *Catharacta skua* (up to 2% of the global population), greylag goose *Anser anser* (see below), red-throated diver *Gavia stellata* (Bern Convention Appendix II species, 220 pairs, up to 10% of Icelandic population), Slavonian grebe *Podiceps auritus* (Bern Convention Appendix II species, 20 pairs – c.4% of declining Icelandic population), and pintail *Anas acuta* (up to 20% of Icelandic population).

The EIA statement for Kárahnjúkar hydropower development demonstrates that there will be changes to the hydrology and vegetation cover to parts of Úthérð IBA (e.g. reduction of river flow, leading to stabilisation of riverine flats and their colonisation by vegetation), but the impact of these changes on nesting and moulting birds cannot be predicted with any certainty. Application of the precautionary approach would mean avoiding such changes in the first place.

Greylag goose is recognised as Vulnerable in the 'Red List of Threatened Species in Iceland' produced by the Icelandic Institute of Natural History, having declined by 21% between 1989 and 1999. Úthérð is the single most important site in Iceland for this species (both nesting and moulting), holding a minimum of 10% of the relevant biogeographical/flyway population¹⁰, but the potential impact of the Kárahnjúkar development has not been adequately addressed.

Eyjabakkar IBA, in the upper part of the Jökulsá í Fljótsdal catchment holds up to 10,000 moulting pink-footed geese (around 4.2% of the overall flyway population¹¹ and a higher percentage of the national population). These are non-breeders associated with the breeding colonies elsewhere in the Kárahnjúkar impact area. Two new reservoirs 'Ufsárlón' and 'Kelduárlón' will have direct and indirect adverse impacts on the IBA with unpredictable consequences for numbers of moulting geese. Once again, the precautionary approach should be applied to prevent these impacts.

(b) Loss of vegetation cover

Soil erosion is a very serious problem in Iceland and much of the country's original vegetation cover has already been lost. The area that would be flooded by the Háslón reservoir contains some of the best and most intact examples of the original Icelandic highland vegetation and is proposed by the Icelandic Institute of Natural History for inclusion in the national Nature Conservation Plan, currently in preparation, but unlikely to be published before mid-2003. Erosion and dust from the shores of the reservoir, access roads and other infrastructure pose serious indirect threats to vegetated areas in addition to those areas subject to direct loss from construction and inundation.

"Encroachment by Háslón reservoir on heath habitat will probably lead to considerable disruption, or even destruction, of habitats occupied by rare species". Kárahnjúkar EIA statement

⁹ Source: Icelandic Institute of Natural History, which currently estimates up to 40,000 breeding pairs in Iceland; and *European Bird Populations – Estimates and Trends* (BirdLife International, 2001), which gives 2,500-5000 breeding pairs in Greenland.

¹⁰ Source for overall biogeographical/flyway population estimate of 89,100 individuals breeding entirely in Iceland and wintering mainly in the UK with small numbers in Ireland: *Waterbird Population Estimates Third Edition*, Wetlands International, 2002.

¹¹ Source for overall biogeographical/flyway population estimate of 240,000 individuals breeding in Iceland and Greenland and wintering entirely in the UK: *Waterbird Population Estimates Third Edition*, Wetlands International, 2002.

(c) Impacts on lichens, mosses and vascular plants

According to the Icelandic Institute of Natural History¹², the following rare plant species were found in the basin due to be flooded by Hálslón reservoir:

Two globally threatened lichens: *Arthonia glebosa* and *Melanelia agnata*, plus 14 nationally rare lichens, five of them red listed (or candidates to be red listed): *Arthonia glebosa*, *Collema polycarpon*¹³, *Endocarpon pulvinatum*, *Phaeorrhiza nimbosa*, *Leciophysma finnmarckicum*.

Nineteen nationally rare mosses (bryophytes), two of them red listed: *Bryum nitidulum* and *Schistidium venetum*

One nationally rare species of vascular plant: *Erigeron humilis*.

(d) Impacts on invertebrates

The Icelandic Institute of Natural History has reported¹⁴ the following rare and globally significant insect species from the Hálslón basin:

Two potentially new species for science (not yet certified): a gnat *Exechia* sp. (Mycetophilidae) and a parasitic wasp *Pseudectoma* sp. (Encyrtidae).

Two rare moths: *Stenoptilia islandicus* (Pterophoridae) – other than Iceland, known only from a few localities in Greenland, Norway and Canada; and *Rhyacia quadrangula* (Noctuidae) – found in Canada and Greenland, with Iceland being the only European range state.

A gnat *Allodia embla* (Mycetophilidae) – originally described from Icelandic specimens. A leaf-miner fly *Phytomyza hedingi* (Agromyzidae) – found in several places in the Icelandic highlands, but only one record from other countries. A shore fly *Scatella tenuicosta f. thermarum* (Ephydriidae) – found only in geothermal areas in Iceland. A spider *Islandiana princeps* (Linyphiidae) – a high Arctic species found also in Greenland, Canada and Alaska.

(e) Impacts on mammals and fish

The proposed development will decrease sediment supply to the coast of Héradsflói bay, thereby stimulating erosion and landward retreat of the shoreline. This will have a negative impact on the breeding habitat for the harbour seal *Phoca vitulina* (Bern Convention Appendix III species; Icelandic population about 20,000 but 67% decline over the last 20 years from c.45,000 individuals in 1980 to c.15,000 in 2000¹⁵). Úthérð, at the delta of Jökulsá á Dal and Lagarfljót, is the most important breeding site in northern and eastern Iceland, holding 400-600 cows with pups, or about 10% of the Icelandic population (more if bulls and immatures are included).

The EIA statement shows that the project is likely to have an overall negative impact on migratory fish, including trout and salmon (*Salmo salar*, Bern Convention Appendix III species), due to changes in the volume and timing of river flows, as well as changes to water temperature and sediment load.

“Damming Jökulsá á Dal and diverting it into Fljótsdalur will result in considerable changes for a 120-km stretch of the river below the dam. Instability in the Jökulsá á Dal ecological system because

¹² Source: Kárahnjúkar Hydropower Project: Impact of Hálslón on vegetation, invertebrates and birds. Icelandic Institute of Natural History, 2001.

¹³ Only known site will be lost if the project proceeds.

¹⁴ Source: Kárahnjúkar Hydropower Project: Impact of Hálslón on vegetation, invertebrates and birds. Icelandic Institute of Natural History, 2001.

¹⁵ Source: Icelandic Marine Research Institute data

of spillwater is likely to result in such unfavourable conditions for salmon that a stock of any economic value is unlikely to be sustained". Kárahnjúkar EIA statement.

Although not native to Iceland, reindeer *Rangifer tarandus* have been naturalised for around 200 years, are regarded by Icelanders as wild animals and are an important cultural symbol and socio-economic resource, supporting hunting and tourism. The area of the Kárahnjúkar development is one of the most important in Iceland for reindeer, with a major calving area in the valley of the Jökulsá á Dal.

3.3 Wider environmental impacts

The area of the Kárahnjúkar development is one of the last true wilderness areas remaining in Europe and one that both Icelandic and international NGOs believe should be designated as a National Park. Progression of the project will cause irreparable damage to national and global natural heritage. For example, the scheme would completely alter the hydrological regime of two of the three rivers draining the Vatnajökull glacier, thus changing forever the functioning of the region's freshwater ecosystems and the habitats and species they support.

3.4 Sustainability of the scheme

The NGO partners regard the Kárahnjúkar hydropower project as fundamentally unsustainable, since the projected lifespan of the scheme is only 50-80 years due to the high rate of sedimentation in Hálslón reservoir. Since 1965, the average sedimentation load of Jökulsá á Dal has been 10 million cubic metres per year, not taking into account the regular 'glacier surges' that occur from the Brúarjökull lobe of the Vatnajökull glacier. These surges have, historically, not only caused large-scale flooding, but also massive increases in sediment loading. For example, in 1963, a large surge saw Bruarjökull advancing 8.5 km within about six months. It is thought likely that a new glacier surge will occur within the next 30 years and that this would significantly reduce the current calculations of the power station's lifetime.

3.5 Summary chronology

2001

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|-------------|---|
| 1 August | Icelandic Planning Agency rejects Kárahnjúkar project on grounds that environmental costs would be too high. |
| 20 December | In response to an appeal by Landsvirkjun, the Minister of Environment, Ms Siv Fridleifsdóttir, overturns the Planning Agency's decision and grants approval to the project subject to 20 environmental conditions ¹⁶ . Icelandic NGOs mount a legal challenge to the Minister's decision. At the time of writing (March 2003) the case is under consideration in the Icelandic Courts. |

2002

- | | |
|----------|--|
| 19 April | Joint Action Plan signed by Landsvirkjun and Alcoa corporation. |
| 19 July | Memorandum of Understanding agreed by government of Iceland, Landsvirkjun and Alcoa. |

¹⁶ The NGO partners believe that these are wholly inadequate to render the scheme environmentally acceptable and that in many cases there is insufficient scientific evidence to support proposed technical mitigation measures.

2003

10 January	Alcoa Board of Directors announces approval of plans for the new smelter at a cost of USD 1.1 billion over four years. An Alcoa news release hails the development as “the most environmentally friendly aluminium production facility in the world”.
16 January	After a lengthy process marked by strong disagreement and public protests, Reykjavik City Council agrees, by nine votes to five, to underwrite the loan required by Landsvirkjun for the hydropower development. Akureyri Town Council also votes in favour of underwriting the loan. (Both councils are co-owners of Landsvirkjun, along with the Icelandic government).
February	Landsvirkjun begins awarding tenders to contractors.
March	Landsvirkjun publishes photographs on its Kárahnjúkar website of rock blasting as part of preliminary construction work.
5 March	National and international NGOs urge the International Financial Institutions involved in loan provision to Landsvirkjun to halt any further funding on the grounds of unacceptable environmental impact and questionable economics.
6 March	The proposal for construction of the aluminium plant at Reydarfjörður is passed by the Icelandic parliament by 41 votes to nine. A Green Party proposal for a national referendum on the issue is defeated by 35 votes to six. There are heated scenes when the results are made public, with demonstrators shouting “This is a tragic day.” Alcoa issues a statement welcoming the decision and reasserting its environmental credentials.

3.6 Next steps

The NGOs will maintain vigorous opposition to the Kárahnjúkar hydropower scheme through the pending court case (due to be heard on 3 April, with a ruling possible some 2–3 weeks later), by drawing attention of the International Financial Institutions and international contractors to the environmental damage arising from the scheme, by further lobbying of the Alcoa corporation, and by continuing to highlight breaches of Iceland’s formal international conservation commitments.

4. Case two: Nordlingaalda hydropower dam (Thjórsárver)

4.1 Overview

A recent ruling by the Icelandic Minister of Environment gave permission for Landsvirkjun (the National Power Company) to implement a hydropower development project partially within one of Iceland’s most important sites for biodiversity conservation and the most important nesting area in the world for pink-footed goose. Though the approved development looks set to be less damaging than earlier proposals, there are still areas for significant concern over the project’s likely environmental impacts.

There also remains the wider question of how the government of Iceland could have permitted proposals contravening national and international environmental legislation, including the Bern Convention, to have reached such an advanced stage.

4.2 Site description and chronology of key events

Thjórsárver covers an area of approximately 120 km² in the central highlands of Iceland. Fed by the Thjórsá river, it is a complex of tundra meadows intersected with numerous glacial and spring-fed

streams, with many ponds, pools, lakes and marshes and permafrost mounds or 'palsas' (a habitat type listed in Bern Convention standing Committee Resolution 4 as being in need of specific conservation measures¹⁷).

The Thjórsá river currently generates most of the hydroelectricity produced in Iceland. Proposals to permanently inundate the Thjórsárver wetlands, through construction of a dam, reservoir and tunnel diversion at Nordlingaalda, as part of hydropower developments, date back more than 30 years. The following is a brief summary of the key events since then. A map of Landsvirkjun's most recent proposals can be found in Figure 2, while Figure 3 shows the scheme granted outline government approval in January 2003.

Key events

1960s	Landsvirkjun (the National Power Company of Iceland) announces plans to construct a 200 km ² reservoir (with dam wall reaching 593 m a.s.l.) that will inundate virtually all the Thjórsárver wetlands, including the pink-footed goose breeding grounds.
1981	The project is abandoned due to public pressure. Thjórsárver Nature Reserve is established, though with provision for the possibility of a dam to be built to an altitude of up to 581 m a.s.l. providing this is acceptable to the Nature Conservation Agency and providing that scientific research shows the dam will not harm the wetlands.
1990	The Icelandic government designates 37,500 ha of Thjórsárver as a 'Wetland of International Importance' (or 'Ramsar Site') under the Convention of Wetlands, thereby accepting a commitment to take special measures for its conservation.
2001	Landsvirkjun proposes a dam at 581 m a.s.l. with a reservoir covering > 60 km ² . Criticism from scientists and local residents leads to the project being reduced again to a dam with a maximum height of 26 m and a reservoir of 29 km ² (of which 7.2 km ² within the Nature Reserve and Ramsar Site). Local people adopt a unanimous resolution against hydropower development in the area.
March 2002	Landsvirkjun submits a new Environmental Impact Assessment statement to the Icelandic Planning Agency, in conformity with the Environmental Impact Assessment Act no. 106/2000, which entered into force in June 2000.
30 April 2002	Landsvirkjun releases its EIA statement to the public, arguing that the planned development will affect only a minor part of the Thjórsárver wetlands' vegetated area and that the project is the most economically viable means of providing energy for an expanding aluminium smelter close to Reykjavik.
13 August 2002	The Icelandic Planning Agency gives its approval (with six conditions) to a dam at 575 or 578 m a.s.l., but not at 581 m a.s.l. An appeal refers the Planning Agency's decision to the Minister of Environment, who has power to confirm or overturn the approval.
November 2002	Major public meeting in Reykjavik demonstrates considerable opposition to development in or around Thjórsárver.

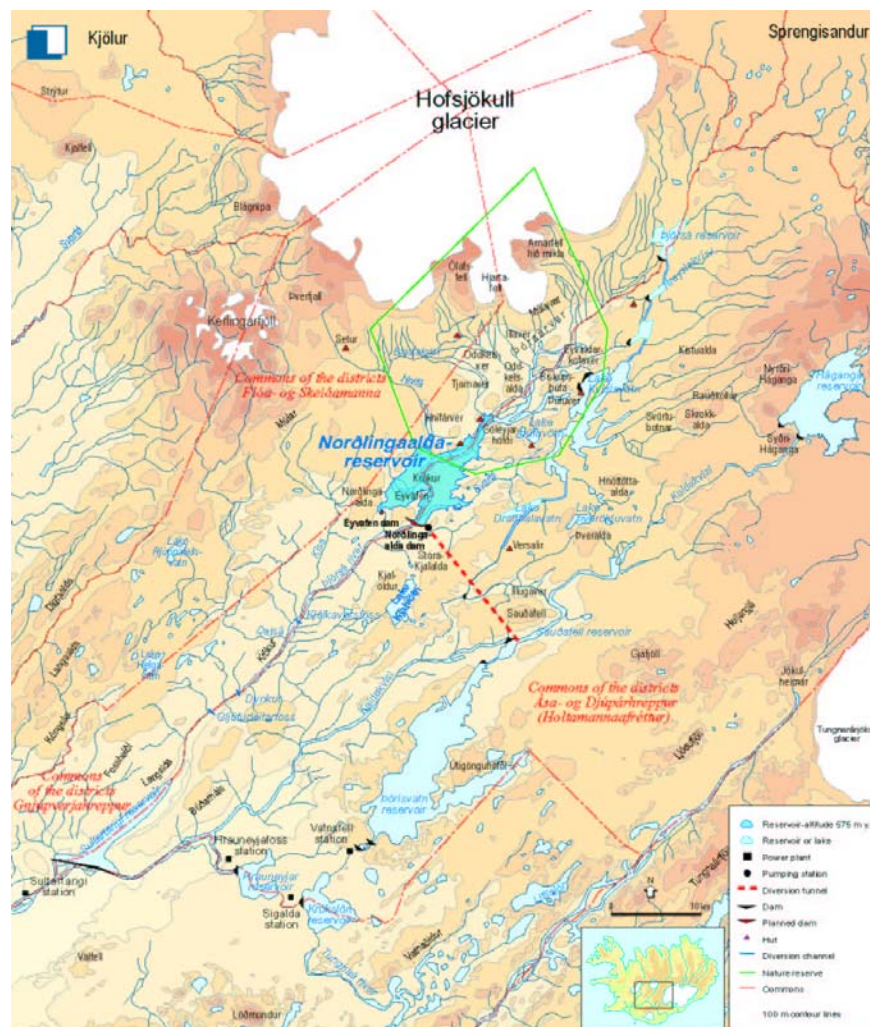
¹⁷ Palsas are rare in a European context. They occur sporadically over the central highlands of Iceland but are very common in Thjórsárver.

30 January 2003 Substitute Minister of the Environment, Jón Kristjánsson (Minister of Health), rules that the project can only proceed in a highly modified form, with a Nordlingaalda reservoir of only 3km², entirely outside the protected area, and with a dam wall at 566 m above sea level. The approval still includes provision for an upstream 'sedimentation basin' – in reality a diversion scheme that will capture 70-80% of the flow of the last two-remaining unregulated tributaries flowing into the northern part of the protected area.

February/
March 2003

Details of the government-approved scheme and its full environmental impacts remain unclear. Landsvirkjun submits to Parliament a proposal for a dam at 568.5 m a.s.l., which would create a reservoir larger than 6km² – more than double the size approved in the Ministerial ruling of 30 January.

Figure 2: Map showing the main elements of the proposed Nordlingaalda hydropower scheme. The Thjórsá river would be dammed, creating Nordlingaalda reservoir. Water would be transferred by tunnel into the neighbouring catchment and used to feed power stations downstream. Thjórsárver Nature Reserve and Ramsar site lies immediately upstream of Nordlingaalda. The 27 km² reservoir shown was rejected by the Substitute Minister of Environment in January 2003 in favour of a much smaller reservoir, but environmental concerns remain. Map source: Landsvirkjun, www.nordlingaalda.is/english/pdf/map.pdf



[illegible]

The Thjórsárver region is the largest vegetated area of the Icelandic highlands that has not been severely altered by sheep grazing. It is therefore the best remaining example of the country's original highland vegetation, representing not only an outstanding part of Iceland's natural heritage, but also a reference for vegetation restoration programmes. It also contains the most extensive permafrost area in Iceland. Thjórsárver's wetlands are unusually productive and diverse. Among the most important of these are palsa mires, a habitat recognised under Bern Convention Standing Committee Resolution 4 as requiring special conservation measures. The region is the most biodiverse in the highlands for all groups of plants (flowering plants, lichens and mosses).

The most important part of the region for biodiversity conservation has national and international protected area status, having been designated as a Nature Reserve under Icelandic law in 1981, and as a 'Ramsar site' (37,500 ha) under the Convention on Wetlands in 1990. The same area has also been recognised by BirdLife International as an Important Bird Area since 1989, though NGOs and scientists believe there are grounds for extending the protected area.

The most recent proposal by Landsvirkjun, on which the 30 January 2003 governmental ruling was based would have *inter alia*:

- led to widespread ecosystem degradation through bank erosion and ground-water fluctuations (the latter affecting the delicate balance between permafrost and tundra vegetation).
- destroyed pink-footed goose habitat leading to the loss of nest sites for at least 1.5% of the birds breeding in Iceland and Greenland – an internationally significant impact.

Although the government's 30 January ruling gave preliminary approval to a smaller scheme than requested by Landsvirkjun, significant questions remain regarding its ecological acceptability and next steps. These concerns are discussed below.

4.4 Ongoing concerns about impacts on biodiversity

In addition to the 3 km² Nordlingaalda reservoir, the government-approved scheme includes a 'sedimentation basin' that would be constructed upstream of the protected area. This would in fact be much more than a sedimentation basin, being a diversion reservoir for up to 80% of the flow of the last two-remaining unregulated tributaries flowing into the northern part of the protected area. This water would be diverted to the east, for use at downstream power stations, only re-entering the Thjórsá river below the protected area. The likely ecological impacts of the construction and operation of this system have not yet been adequately addressed. The NGO partners point out that:

- The upper 8 km of the river channels within the protected area, downstream of the 'sedimentation basin', would have dramatically reduced flows, being virtually dry for extended periods of time. This will change the hydrological functioning of the area (both surface- and groundwater) and lead to increased vulnerability to wind erosion.
- Reduced sediment loading downstream of the 'sedimentation basin' may lead to long-term vegetation changes because of lower nutrient inputs.

The diversion would also have significant landscape impacts, being highly visible from one of the most famous mountain viewpoints in Iceland.

4.5 Wider policy questions raised by the Nordlingaalda/Thjórsárver case

- Should ANY major development be permitted in such an outstanding natural area with multiple international biodiversity and landscape values that have taken thousands of years to develop?
- How and why did the government of Iceland allow successive hydropower development proposals in clear breach of international agreements, including the Bern and Ramsar Conventions, to progress so far through the planning process, consuming enormous amounts of public money and effort?
- Why has the government supported energy development options that would enable industrial development to proceed as cheaply and rapidly as possible, disregarding more capital- and time-intensive options that would have fewer long-term environmental costs?
- Why is it only 13 years after Thjórsárver was designated an internationally protected area that the government has stepped in to prevent partial inundation of the site?
- Why has the boundary of Thjórsárver Nature Reserve and Ramsar Site not been extended to embrace the whole area worthy of protected area status?
- Why has the government failed to develop more ecologically sustainable energy solutions in tandem with its policy of attracting international aluminium companies to use cheap 'renewable' power sources?

4.6 Next steps

During the preparation of this report, Landsvirkjun submitted a request to the Icelandic Parliament for permission to increase the approved height of the dam to 568.5 m a.s.l. This would more than double the area of the reservoir at Nordlingaalda permitted by the Ministerial ruling in January 2003. The NGOs will vigorously oppose any such amendment and will continue to press for a comprehensive environmental impact assessment for the January 2003 'approved version' of the scheme. The NGO position remains that any proposal having detrimental impacts on the ecological functioning of Thjórsárver should be abandoned.

5. Findings

Overall hydropower policy

- 5.1 The government of Iceland continues to support an outmoded and discredited model of dam building and river diversion at odds with modern concepts of integrated river basin management (IRBM) and therefore out of step with the approach of other European countries (for example, IRBM is at the heart of the EU's Water Framework Directive).
- 5.2 In developing hydropower resources, the government of Iceland has failed to provide adequate protection to fragile ecosystems and the biodiversity that these support. In addition, the NGO partners believe there are strong reasons to doubt the long-term economic justification and 'physical' sustainability of individual hydropower schemes (the latter due to infilling of reservoirs by sediment accumulation within a few decades).
- 5.3 The government of Iceland has failed to demonstrate convincingly that all possible alternatives, including non-hydropower solutions, have been explored to avoid or reduce damage to internationally important habitats and species.
- 5.4 The government of Iceland has failed to undertake a strategic environmental assessment of the cumulative impacts upon biodiversity of its overall hydropower development programme, and to use this for guiding pursuit of national environmental, social and economic goals.
- 5.5 The government of Iceland has favoured short-term and questionable economic gain over bequeathing a unique natural heritage to future generations of Icelanders and other Europeans, including those nations that share populations of migratory birds with Iceland.
- 5.6 The process for finalising the energy Master Plan and translating it into government policy is unclear, as are the means by which the Plan will attempt to resolve economic and environmental conflicts.

Kárahnjúkar hydropower scheme

- 5.7 The government of Iceland rejected the advice of its own Planning Agency in giving the go-ahead to the Kárahnjúkar hydropower scheme, in spite of the clearest possible evidence that the project has unacceptable environmental costs.
- 5.8 The NGO partners understand the need and political will in Iceland to promote stable rural communities and combat migration to urban centres. However, strategies to promote such policies are only acceptable if the long-term environmental costs are both minimised and justified by the proven value of their socio-economic outcomes (in compliance with Bern Convention Article 9 – see 5.13 below). The Kárahnjúkar project has repeatedly been shown to have very high environmental costs, whereas the social and economic benefits have been poorly documented.

Nordlingaalda/Thjórsárver hydropower scheme

- 5.9 The government of Iceland has given preliminary approval for a hydropower scheme that, while less ecologically damaging than previous proposals, will still damage the ecosystem functioning of Thjórsárver, which qualifies for inclusion in the Emerald Network and which is of global importance for its biodiversity and landscape.

Material breaches of the Bern Convention

- 5.10 The government of Iceland is in material breach of Article 3.1 which requires each Contracting Party to “...take steps to promote national policies for the conservation of wild flora, wild fauna and natural habitats, with particular attention to endangered and vulnerable species...and endangered habitats...”. The EIA statement for the Kárahnjúkar hydropower project, together with information from the government’s own nature conservation advisers, shows that the development will have adverse impacts on species and habitats of national and international conservation importance.
- 5.11 The government of Iceland is in material breach of Article 4.3 which requires: “The Contracting Parties undertake to give special attention to the protection of areas that are of importance for the migratory species specified in Appendices II and III...”. It is clear that Iceland cannot be regarded as respecting this provision of the Convention whilst supporting the Kárahnjúkar and Nordlingaalda/Thjórsárver hydropower projects. The development is liable to have detrimental impacts on internationally significant numbers (i.e. > 1%) of the relevant flyway populations of pink-footed goose *Anser brachyrhynchus* and greylag goose *A. anser*, both Bern Convention Appendix III species.
- 5.12 The government of Iceland is in material breach of Article 7 that stipulates: “Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the protection of the wild fauna species specified in Appendix III”. In supporting the Kárahnjúkar hydropower project, and in particular in overturning its Planning Agency’s rejection of the scheme, the government of Iceland has failed to take the appropriate or necessary administrative measures to ensure protection of the species mentioned in 5.11 above, as well as other Appendix III bird species, plus the declining Icelandic population of harbour seal *Phoca vitulina*.
- 5.13 Article 9 makes provision for certain exceptions from the provisions of Articles 4 and 7 “provided that there is no other satisfactory solution and that the exception will not be detrimental to the survival of the population concerned:.....in the interests of public health and safety, air safety or other overriding public interests”. In the view of the NGO partners making this submission, the government of Iceland has so-far failed to demonstrate that (a) other potentially satisfactory solutions for meeting the country’s energy needs have been fully investigated and assessed in terms of their environmental and socio-economic sustainability; or (b) that there are “overriding public interests” in favour of either the Kárahnjúkar or Nordlingaalda/Thjórsárver hydropower developments.
- 5.14 In addition to the specific breaches of the Convention referred to above, the NGO partners also believe that the government of Iceland has shown only minimal compliance with Article 3.2 which states: “Each Contracting Party undertakes, in its planning and development policies....to have regard to the conservation of wild flora and fauna”. It is clear that impacts on biodiversity have been given very little weight indeed in comparison with short-term economic and political interests.

- 5.15 The Thjórsárver region is a candidate site for the Emerald Network, being of particular importance for palsa mires, a habitat recognised in Bern Convention Resolution 4 (December 1996) as “requiring specific conservation measures” in line with Resolution 1 (1989) on the conservation of habitats, and Recommendation 14 (1989) on species habitat conservation and the conservation of endangered natural habitats. The latest hydropower development proposals are still liable to have adverse hydrological impacts on ecosystem functioning and may therefore conflict with Iceland’s obligations under Resolution 4.

6. Recommendations

Icelandic Energy Policy

The NGO partners call on the Standing Committee to urge the government of Iceland:

- 6.1 To conduct an urgent strategic environmental assessment of the cumulative impacts of all planned hydropower and geothermal developments within its territory, and integrate the findings into the energy Master Plan (see below).
- 6.2 To ensure that the energy Master Plan:
- Is finalised by 30 June 2003 through a transparent, inclusive, participatory and timely process, giving due weight to the findings of all Working Groups;
 - Is guided by a clear vision based on ecological, social and economic sustainability;
 - Places the cumulative impacts of all planned energy developments within its territory in the context of overall national environmental, social and economic goals.
 - Provides an integrated, strategic framework for future development of energy resources in Iceland;
 - Applies the precautionary principle/approach in selecting and prioritising potential energy projects;
 - Is used (assuming that it meets the above criteria) by the government, public bodies and the private sector to guide and prioritise future energy policy, legislation, project development and capital investments;
 - Provides for the cancellation or radical amendment of existing proposals shown to be ecologically (and/or economically) unsustainable.
- 6.3 The NGO Partners call on the Standing Committee to urge the government of Iceland, and in particular, the National Power Company Landsvirkjun, to abandon the outmoded ‘dam and divert’ paradigm and instead to embrace the contemporary ‘integrated river basin management’ approach being applied elsewhere in Europe, as exemplified by the EU Water Framework Directive.

Kárahnjúkar hydropower scheme

The NGO partners call on the Standing Committee to urge the government of Iceland to:

- 6.4 Respect the clear evidence of the EIA statement and the decision of the Icelandic Planning Agency and to withdraw its support for the scheme on the basis of unacceptable environmental impacts.
- 6.5 Examine other less environmentally damaging solutions for meeting the energy needs of the Reydarfjörður aluminium smelting plant.

- 6.6 Ensure that all proposals include provision for rigorous, long-term monitoring of environmental impacts, including the effectiveness of any environmental mitigation measures/conditions required.
- 6.7 Provide permanent statutory protection to Eyjabakkar and Úthérad Important Bird Areas as part of a representative network of protected areas in the eastern highlands. This should be within the framework of the forthcoming national Nature Conservation Plan, and as a contribution to implementation of the Emerald Network in Iceland.

Nordlingaalda/Thjórsárver

The NGO partners call on the Standing Committee to urge the government of Iceland to:

- 6.8 Ensure that all elements of the hydropower development scheme given outline approval in January 2003 are subject to complete and rigorous environmental impact assessment, with special attention to the potential hydrological and other impacts of the upstream 'sedimentation basin'.
- 6.9 Abandon the scheme if it is shown that damage would be caused, or is likely to be caused, to ecosystem functioning and thereby to habitats/species of national or international importance.
- 6.10 Resist any pressure to reinstate elements of previously discredited hydropower proposals for the region.
- 6.11 Extend the boundaries of the Nature Reserve and Ramsar Site to ensure the ecological integrity of the area, and to include the extended site in the Emerald Network.

Material breaches of the Bern Convention

- 6.12 The NGO partners urge the Standing Committee to adopt the draft Recommendation attached as Annex I and to call on the government of Iceland to take the steps necessary for rectifying the material breaches of the Bern Convention identified in sections 5.9 to 5.14 of this report, and.

ANNEX I

Draft Recommendation for consideration by the Bern Convention Standing Committee

Convention on the Conservation
of European Wildlife and Natural Habitats

Standing Committee

Recommendation No.n (2003) concerning the impacts of hydropower development in Iceland on habitats and species of European importance

(Adopted by the Standing Committee on n December 2003)

The Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats, acting under the terms of Article 14 of the Convention;

Having regard to the aims of the Convention to conserve wild fauna and its natural habitats;

Recalling that Article 3, paragraphs 1 and 2 of the Convention require Contracting Parties to:

- take steps to promote national policies for the conservation of wild flora, wild fauna and natural habitats, with particular attention to endangered and vulnerable species, especially endemic ones, and endangered habitats;
- undertake, in their planning and development policies....to have regard to the conservation of wild flora and fauna;

Further recalling that Article 4, paragraphs 1 to 3 of the Convention require Contracting Parties to:

- take appropriate and necessary legislative and administrative measures to ensure the conservation of the habitats of the wild flora and fauna species, especially those specified in Appendices I and II, and the conservation of endangered natural habitats;
- in their planning and development policies to have regard to the conservation requirements of the areas protected under paragraph 4.1, so as to avoid or minimise as far as possible any deterioration of such areas;
- undertake to give special attention to the protection of areas that are of importance for the migratory species specified in Appendices II and III of the Convention;

Also recalling that Article 7, paragraph 1, and Article 9, paragraph 1, provide that:

- Each Contracting Party shall take appropriate and necessary legislative and administrative measures to ensure the protection of the wild fauna species specified in Appendix III.
- Each Contracting Party may make exceptions from the provisions of Articles 4....and 7...provided that there is no other satisfactory solution and that the exception will not be detrimental to the survival of the population concerned.....in the interests of public health and safety....or other overriding public interests;

Noting that Standing Committee Resolution No.4 (1996) lists endangered natural habitats requiring specific conservation measures, that Standing Committee Resolution No.6 (1998) lists species requiring specific conservation measures, and that both of these texts underpin the identification of Areas of Special Conservation Interest for inclusion in the Convention's 'Emerald Network';

Concerned that planned hydropower development projects in Iceland, and in particular the Kárahnjúkar and Nordlingaalda/Thjórsárver hydropower schemes, may have detrimental impacts on species and habitats of European importance and, in particular on:

- species listed in Appendix III of the Convention (especially internationally important numbers of pink-footed goose *Anser brachyrhynchus* and greylag goose *A. anser*);
- a habitat type (palsa mires) listed in Standing Committee Resolution No.4;
- species listed in Standing Committee Resolution No.6;
- internationally important mosses, lichens and invertebrates;

RECOMMENDS that the government of Iceland:

1. Applies in full the provisions of Articles 3, 4, 7 and 9 of the Convention in relation to planned hydropower development projects within its territory;
2. Conducts an urgent strategic environmental assessment of the cumulative impacts of all such projects;
3. Applies the principles of integrated river basin management in its planning and assessment of all such projects;
4. Ensures that all such projects include provision for rigorous, long-term monitoring of environmental impacts, including the effectiveness of any environmental mitigation measures/conditions required;
5. Ensures that the national energy Master Plan currently under development:
 - is finalised in 2003 through a transparent, inclusive, participatory and timely process;
 - is guided by a clear vision based on ecological, social and economic sustainability;
 - provides an integrated, strategic framework for future development of energy resources in Iceland;
 - applies the precautionary principle/approach in selecting and prioritising potential energy projects;
 - is used (assuming that it meets the above criteria) by the government, public bodies and the private sector to guide and prioritise future energy policy, legislation, project development and capital investments;
 - provides for the cancellation or radical amendment of existing proposals shown to be ecologically (and/or economically) unsustainable.
6. Halts all construction work for the Kárahnjúkar hydropower project pending the outcome of 7 and 8 below.
7. Reconsiders its support for the Kárahnjúkar hydropower project in the light of the decision of the Icelandic Planning Agency to reject the project on grounds of unacceptable environmental impacts.
8. Examines other less environmentally damaging solutions for meeting the energy needs of the Reydarfjörður aluminium smelting plant.
9. Ensures that all elements of the hydropower development scheme for Nordlingaalda/Thjórsárver, given outline approval in January 2003, are subject to complete and rigorous environmental impact assessment, with special attention to the potential hydrological and other impacts of the upstream ‘sedimentation basin’.

10. Withdraws support for the scheme if it is shown that damage would be caused, or is likely to be caused, to ecosystem functioning and thereby to habitats and species of European importance.
11. Within the framework of the new Icelandic Nature Conservation Plan, extends the boundaries of Thjórsárver Nature Reserve and Ramsar Site to include all those areas of European importance for biodiversity conservation, provides permanent statutory protection to Úthérad and Eyjabakkar Important Bird Areas, and includes all three of these sites in the Emerald Network.