THJORSARVER: PROTECTING A UNIQUE ASSET IN PERPETUITY

This report provides an assessment of the importance of the Thjorsarver area of the central highlands of Iceland, comments on proposals for further hydro-electric power development, and makes suggestions for the improved protection and greater visitor access.

Status of Thjorsarver

Since March 1991 part of the area has been recognised as a wetland of international importance under the Ramsar Convention. The inscription states: “tundra meadows dissected by numerous glacial and spring-fed streams, the site includes abundant pools and lakes and extensive marshland dominated by sedges. The site is surrounded by a desert composed of volcanic sand. It is the most important nesting area in Iceland for the goose *Anser brachyrhynchus* supporting about 10,000 pairs.”

Thjorsarver is the largest area of vegetated wetland in the highlands of Iceland. It is basically a hydro-morphological-vegetation system comprising the following elements: open channels and sand bars in the Thjorsa River and its tributaries fed from both glacial and non-glacial sources, patterned ground typical of taiga and tundra conditions with a diversity of vegetation mosaics and extensive pool systems. It is the breeding ground for around 10,000 pink-footed geese, some 4.4% of the population in the Iceland/Greenland biogeographic zone.

Thjorsarver as a wetland and natural feature cannot just be seen in isolation as it is part of much larger system. This system begins with the Hofsjokull ice cap and its outlet glaciers – Blautukvislarjokull, Mulajokull and Þjorsarjokull - to the south and east. The ice cap rests in part on a collapsed volcanic caldera some 300m deep. The upstanding remnants of the caldera wall rise as nunataks above the ice cap. Numerous hills at the ice front, including Arnarfell, Olafsfell and Hjurtafell, act as obstructions and cause the ice streams to divide and deliver their meltwater through separate channel systems to the main river. The outlet glaciers have very wide fronts and Mulajokull is one of the best examples globally of a piedmont glacier. These glaciers provide the water source for the anastomosing streams which in turn provide the life blood of the Thjorsarver system as without water and the sediment transported by the rivers the complex would not exist. Downstream from Thjorsarver the river enters a canyon around 12kms long with a series of waterfalls in the main stream, notably Dynkur and Gljufurleitarfoss, and at the junction of the side valleys with the main valley. At the southern extremity of this canyon the river flows into the Sultartangalon reservoir; this is part of the hydro-electric power scheme on the Thjorsa River and its main tributary the Tungnaa. The system from the watershed on the Hofsjokull to the point where the Thjorsa River exits from the canyon is of great international ecological and geomorphological significance.

In addition, there is the visual and aesthetic component of this natural area. Whether flying over it or crossing the rivers or standing on one of the hills, such as Bishops Hill (Biskupaþúfa), the backdrop of the ice cap and outlet glaciers, the nunataks and peripheral hills, the huge rivers and sediment banks, and the wetland and pool systems, together provide a diversity of landscape rarely seen any where on earth and certainly unique in Iceland. Also the varying light conditions provide a remarkable aesthetic dimension to the landscape.

The area also has strong cultural associations with the farming communities to the south on either side of the river who have traditionally used the area for summer grazing and still do so. The annual cycle of taking the sheep out in the spring to the lands above the canyon and bringing them back home in the late summer is an important part of the social calendar.

For all of these natural, aesthetic and cultural reasons the whole area from the mouth of the canyon to the summit of the Hofsjokull ice cap is worthy of protection as a natural dynamic system.

Proposals for hydro-electricity development

At present there are two hydro-electric power developments in the Thjorsarver area. There is a small dam impounding an area of about 3 sq. km (Þjórsárlón) and an offtake pipe from the dam into the Kvislavatn controlled reservoir system to the south east. Otherwise the river is untouched until it flows into the Sultartangalon reservoir.

Proposals for the construction of dams in the Thjorsarver area, as part of the extension of the Thjorsa hydro-electricity scheme, have been under discussion for some years. An earlier scheme, which would have entailed a 1, 115 m long dam and a 29 sq km reservoir, was not approved. A smaller scheme is now being presented, as a result of the formal environmental assessment (EIA) that ended in January 2003 with the rejection of the original proposal. The scheme comprises 2 reservoirs on the upper part of the Thjorsa – Arnarfellslón (0.3 sq km) [also named Þjórsárjökulslón] and Vesturkvíslarlón (4 sq km) in addition to the existing Thjorsarlon - with connecting engineered channels. The position of these engineering works means that they will impede and reduce the supply of water and sediment to the Þjorsarver system. Further downstream, but still well above the entrance to the canyon, a further reservoir is proposed – Nordlingaoldulon (3.1 – 5.3 sq km) on the Þjorsa itself and other rivers further east. These will inevitably reduce the flows of water and sediment in the middle and lower reaches of Thjorsarver and therefore affect the natural functioning and integrity of the system.

There are two issues arising from these new proposals: one of principle and one of detail.

The national and international significance of Thjorsarver has led some commentators to consider that there should be no further development of hydro-electricity in the Thjorsarver area. This has a great deal to commend it from the natural heritage standpoint. Any dam and reservoir will impede the flow of water and sediment which are vital to the health and maintenance of the system and will also have a greater impact on the water level and aesthetic attractions of the canyon than the current dam and offtakes. There is a counter argument that the system has already been modified and therefore is not pristine. This argument is weak as the extent of modification in Thjorsarver is very small in proportion to the total discharge from the Thjorsa system as a whole. There may well be economies of scale for the power company in developing facilities in the Þjorsarver area, but the current proposals should not be judged on the basis of power generation economics alone. The proposals require a full economic appraisal of the costs and benefits to the environment and natural resources using standard quantitative and qualitative tests, such as contingent valuation.

Also the Master Plan for Development of Hydro and Geothermal Energy in Iceland (published in November 2003) indicates that there are alternatives in the lower Thjorsa catchment as well as in other less environmentally sensitive catchments in the south and west of Iceland. These should be given prior consideration in order to meet the apparent needs for further power generation. Unless the natural resource values are thoroughly investigated, it is not possible to decide in favour of hydro-electric development in any way which is in tune with the Icelandic government's sustainable development strategy ('Welfare for the Future: Iceland's National Strategy for Sustainable Development 2002-2020') and its international responsibility to protect a Ramsar site.

The issue in detail is not whether a scheme goes ahead but the scale of the Nordlingaoldulon dam and the water level behind it. There has been a great deal of debate and some confusion about the actual maximum water level proposed and the extent of draw down below this level. The levels indicated in the Landsvirkjun proposals are 566 and 568m above sea level. All of this debate suggests that the planning by the developers has been less precise than is needed in such an environmentally sensitive area. It is accepted that concessions have been made in reducing the scale of the development. These have led some of the state environmental authorities, such as Umhverfisstofnun, on the basis of what impact the project would have within the boundaries of the protected area, to accept that the revised scaled down facilities should be allowed to go ahead. However, I consider that a more radical appraisal of the effects on the natural functioning of the system and the full environmental costs and benefits is required before such a judgement can be delivered and a final decision made. These assessments need to be truly independent of the developers of the scheme and to be of the highest objectivity.

Protection measures

The area was designated as a Ramsar site in 1990. The boundaries of the Ramsar site are artificial and appear to have been drawn in a rather arbitrary manner. They do not reflect the boundaries of natural features or natural systems. There are no other natural protection mechanisms applied to the area.

Umhverfisstofnun in its 2003 report to the Minister for the Environment on nature protection areas in Iceland recommended that the Thjorsarver Ramsar site be about doubled in size. Specifically, the agency recommended an extension down the mainstream of the Thjorsa River to the exit from the canyon, plus widening of the protected area to the east and west from the present position. The Environment Minister's proposals published in October 2003 did not include any extension to the protected areas in Thjorsarver in the programme for 2004 to 2008. This is a major disappointment given the strength of the arguments in favour of extension and the scale of proposals for new protected areas and extensions to existing ones elsewhere in Iceland. Maybe the Minister's proposals reflect a decision within government that the revised plans for hydro-electric development should be allowed to go ahead.

If the best international practice were followed, then the whole of the Thjorsarver system from the watershed of the southern flowing drainage on the Hofsjokull to the exit from the canyon into the Sultartangalon reservoir should be protected. Applying the internationally accepted criteria for the management of protected areas, developed

by IUCN-The World Conservation Union, suggests that the area would qualify as a Category II Protected Area defined as a "protected area managed mainly for ecosystem protection and recreation". The IUCN internationally recognised management objectives that are most relevant to this area are:

> "To protect natural and scenic areas of national and international significance for spiritual, scientific, educational, recreational or tourist purposes;
> To perpetuate, in as natural a state as possible, representative examples of physiographic regions, biotic communities, genetic resources, and species, and to provide ecological stability and diversity; and
> To eliminate and thereafter prevent exploitation or occupation inimical to the purposes of designation."

This approach is entirely in tune with the objectives of the Ramsar Convention and therefore the current protection status, i.e. "to develop and maintain an international network of wetlands which are important for the conservation of global biodiversity, and for sustaining human life through the ecological and hydrological functions they perform". To develop the reservoirs, even on the more limited scale now proposed ,will therefore breach Iceland's approval and implementation of the Ramsar Convention.

Within the envelope of protection suggested above under IUCN Category II status, various levels of informal activity which would not damage the natural heritage and which would enhance public understanding and enjoyment of the area could be put in place. The traditional grazing and the more recent recreational activities of hiking, climbing and snow scooters would be able to continue. Indeed, there is potential for improving visitor access to the area provided this is done in a manner and at a scale entirely in sympathy with the natural heritage and its ecological and wider environmental carrying capacity.

There has been some limited and informal consideration as to whether Thjorsarver should be proposed as a candidate World Heritage Site under the UNESCO World Heritage Convention. The systematic assessment undertaken by the Nordic Council in the 1990s ('Nordic World Heritage') did not include this area in proposals for new World Heritage Sites. While I consider Thjorsarver to be of international significance, a more through assessment would be required against the World Heritage criteria to judge whether the area is of 'outstanding universal significance'. The combination of features and the importance of the natural functioning of the system as a whole point to potential strong candidacy.

Conclusions and recommendations

The Thjorsarver area, as currently protected as a Ramsar site, and the wider catchment from the southern flowing watershed of the Hofsjokull ice cap to the exit from the canyon on the Thjorsa, are of national and international importance as a hydrological-geomorphological-vegetational system in northerly latitude. The current protected area is insufficient to reflect these natural values and also the visual, aesthetic and cultural values of the area. Proposals by Umhverfisstofnun reported in 2003 to extend the size of the protected area, rejected by the Environment Minister, should be approved. In addition, the area should be extended to the south flowing watershed on the Hofsjokull ice cap. The area justifies Category II status under the IUCN Guidelines for Protected Area Management Categories.

The area should be formally evaluated under the UNESCO World heritage Site criteria by the Icelandic authorities to decide whether it should be put forward as a canadiate Site.

At present there are only minimal effects from hydro-electric developments in the Thjorsarver area. The original proposals for further development have been scaled back and this should be welcomed. However, the new proposals will still have a profound and detrimental effect on the ecology, hydrology and geomorphology of the system, and in turn affect detrimentally the visual, aesthetic and cultural values of the area. It is surprising therefore that the state authorities advising on the revised proposals have been supportive of the scaled-down development going ahead. I conclude that developments, even of the scale now proposed, will have profound detrimental effects and should be refused. Independent objective assessment is required to assess fully, quantitatively and qualitatively, the social, economic, cultural and environmental costs and benefits using standard methodology. There should also be further comparative assessment of the alternatives on the lower courses of the Thjorsa and other rivers in the south and east of Iceland in the context of the recently published master plan. These other locations could provide the same scale of power generation but without the same detrimental effects on the environment and traditions of the area.

There is no basis from the assessments carried out to date to allow approval of the revised scheme. New and larger projected area measures should be developed and implemented as a matter of priority.

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Brief CV of Roger Crofts:
Trained as a geographer and geomorphologist working in Scotland, Svalbard and Ireland. Worked in UK government based in Scotland as adviser and latterly an administrator on rural economic and social development and environment policy and management. Founder CEO of Scottish Natural Heritage, the government's agency for landscape and nature conservation and sustainable development. Currently environmental and management adviser, author, lecturer and non-executive director. Visited Iceland many times and travelled widely around the country: 'along with Scotland, Iceland is the most special place on Earth for me'.