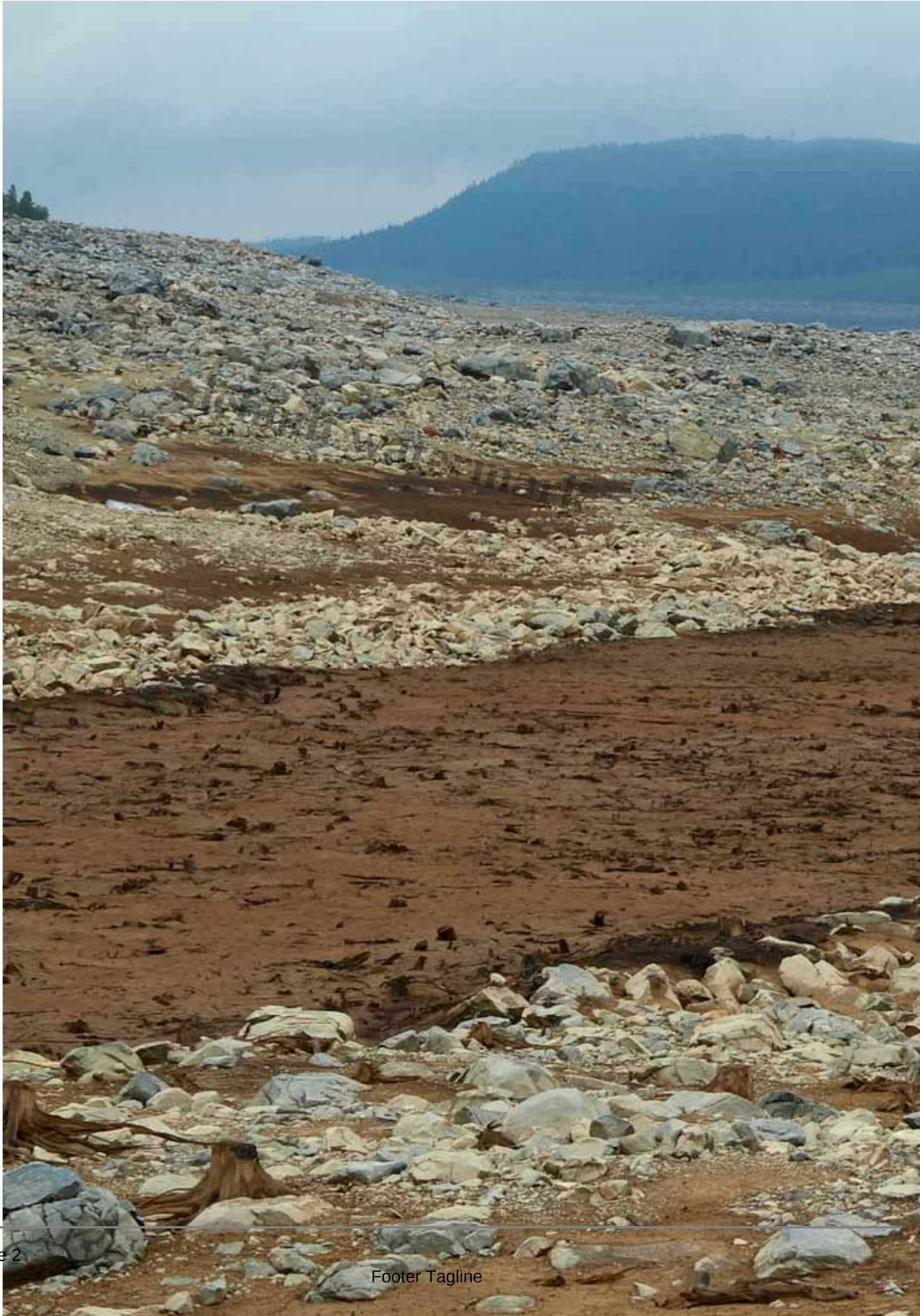


The perils of pump storage hydro

Description

default watermark



The impact of hydro, Flasjon, Sweden. Photo credit Ingemar Naslund

This short piece is very much a supplementary to my article ‘‘The Hidden Horrors of Hydro’’ featured [here](#) on 23rd of August 2018 and of course the catalyst was the more recent (3rd July) article on pumped storage in Scotland by Dave Morris ([see here](#)). I was minded to do so because the negative profundity of pumped storage hydro on both visual amenity in the landscape and freshwater ecology is vastly greater than even the already devastating effects of ‘‘standard’’ hydro, as outlined in the 2018 article.



Flasjon, Sweden. Photo credit Ingemar Naslund

Essentially, apart from the obvious visual impact of the barren draw-down zone in standard hydro, the biological impacts centre around the disappearance, due to periodic desiccation, of the living and dead plant material that forms the basis of the food for aquatic invertebrates. These in turn feed higher animals, most obviously fish and aquatic birds. Research over many decades in Scandinavian hydro-reservoirs indicates that well over 50% of the production of aquatic invertebrates may be lost, that

regulation amplitudes [fluctuations in water levels] of over 5 metres will wipe out major food items such as the freshwater shrimp, *Gammarus* and the severity of the impacts is related to the increasing degree of regulation amplitude.

Scotland lacks the detailed long-term studies carried out in Scandinavian reservoirs, but we are fortunate in having a comparative study of three lochs in the western Grampians carried out by then student, Elizabeth McMorrine for her degree dissertation, which gives us a measure of insight previously lacking [Lochaber-Hydrological-Scheme-Impacts-Dissertation-1](#). The three lochs, in ascending order of regulation amplitude were Loch na h-Earba, Loch Laggan and Loch Treig, all in the same watershed.

Loch	Max. Depth (m)	Mean Depth (m)	Area (ha)
Na-H-Earba	24.6	10.8	
Laggan	53	20.7	
Treig	133	63	

Table 1: Bathymetrical details of each Loch involved in the study

Table credit Elizabeth McMorrine

The first named is of course the target for the proposed new pump storage reservoir.

	Mayfly Nymph	Gammarous Shrimp	Diving Beetle	True Worm	Water Mite
Na-H-Earba	30	51	12	50	25
Laggan	7	29	6	9	0
Treig	0	0	0	0	0
Total	37	80	18	59	25

Table 3: Invertebrate species and population totals of each of t

Table credit Elizabeth McMorrine

The data showed that the loch with the least regulation amplitude (Lochan na h-Earba) had the highest fish catches in the netting sampling and the highest number and diversity of species in the invertebrate samples and that the loch with the greatest regulation amplitude (Loch Treig), had the lowest catches of fish and invertebrates. Loch Laggan was intermediate in all aspects.

OK, just an insight from one study, but itâ??s interesting and significant, nonetheless since the Pumped Storage hydro proposal would change the regulation amplitude at Lochan na hâ??Earba from 1-2m a year to 18m, potentially each day, while the top reservoir, Loch Leamhain, would fluctuate by up to 70m.



Lupins at Loch Laggan. Restoration of draw down zones is possible where variation in regulation amplitude is limited. Photo credit Ron Greer.

All three lochs, like the majority of other Scottish hydro-reservoirs, currently have a seasonal regulation regime which, by and large, means that there are months of low water levels during the summer growing season for terrestrial plants. This characteristic opens up possibilities for potential remedial measures, using plants, such as some tree species and more especially the Nootka Lupin, (as mentioned in the 2018 article and more recently in the youtube film “Scotland’s Missing Forests by Lesley Riddoch [see here](#)) that are tolerant of winter inundation.

The very nature of pump storage regulation amplitudes, being very large and very short term between high and low, with no seasonal stability, render these options null and void. Pumped storage presents no opportunity for either terrestrial or aquatic plants to colonize the large draw-down zone and presents a major, if not impossible challenge, for native species, especially fish. At Lochan na h-Earba it will leave us looking at a man-made environment that is an intractable aquatic and terrestrial desert.

Category

1. Other parts Scotland

Tags

1. conservation

2. renewables
3. restoration
4. Scottish Government

Date Created

July 13, 2026

Author

ron-greer

default watermark