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Dear Mark,

**KIRKAN WIND FARM, GARVE, HIGHLAND**

Thank you for giving Marine Scotland Science (MSS) the opportunity to provide comment on freshwater and diadromous fish and fisheries in the Environmental Impact Assessment Report (EIAR) for the proposed Kirkan wind farm.

The proposed development consists of 17 turbines and associated hard standing areas, access tracks (including 5 watercourse crossings), 2 permanent meteorological masts, 2 borrow pits, construction compounds, substation/control buildings, underground cables and an energy storage facility. Felling of approximately 16 ha of native trees forms part of the enabling works.

The proposed development area is drained by watercourses within the Black Water catchment; the Black Water flows into the River Conon. These watercourses support brown trout populations, which are listed as priority species for conservation in the Scottish Biodiversity List, and are also stocked with salmon as part of a compensatory measure for impacts imposed on fish populations by the Conon Basin Hydro Electric Scheme.

Fish habitat surveys were carried out by the developer. However, no electrofishing surveys were carried out to determine the presence and abundance of fish species in the watercourses within and downstream of the proposed development. In our response to the

scoping report, MSS recommended that these site characterisation surveys were carried out to provide information on the potential impacts on fish populations as a result of the proposed development, from which appropriate site specific mitigation measures could be drawn up and a strategically designed integrated water quality and fish population monitoring programme established.

A fish and water quality monitoring plan is discussed in the EIAR; we advise that the developer consults our generic monitoring programme guidelines (<https://www2.gov.scot/Topics/marine/Salmon-Trout-Coarse/Freshwater/Research/onshoreren>) paying particular attention to carrying out baseline water quality and fish populations surveys at least 12 months prior to construction commencing, during construction and for at least one year after construction is complete. We recommend fully quantitative electrofishing surveys and that hydrochemical sampling (including turbidity and flow data) is carried out, at sites potentially impacted and at control sites, at least on a monthly frequency (with more frequent sampling (e.g. weekly) during periods of construction when adjacent to watercourses) and that hydrochemical parameters are analysed in a UKAS accredited laboratory.

The potential impacts on water quality and fish populations associated with the proposed felling operations (e.g. leaching of nutrients) and the potential cumulative impacts of adjacent wind farms and other developments (including the hydroelectric scheme) should be considered in the monitoring programme, including the measurement of nitrates and phosphates and the selection of control sites, sites which are unlikely to be impacted by any developments. MSS advises that the developer adheres to the UK Forest and Water Guidelines, particularly in the removal of felled material from within and adjacent to watercourses.

MSS welcomes the consideration of fish movement requirements in the design of the proposed watercourse crossings, the 50m buffer between infrastructure and all watercourses, the regular visual inspections of watercourses which will be carried out by the appointed Ecological Clerk of Works, and the use of SuDS drainage principles.

In summary, MSS recommends that the developer carries out site characterisation surveys to assess the presence and abundance of fish species in the watercourses. From this information the developer should establish a robust integrated water quality and fish

population monitoring programme to try to ensure fish populations, which are already under pressure as a result of the hydro-electric scheme, are protected from impacts associated with the proposed wind farm development.

Kind regards,

Dr Emily E. Bridcut