



Appendix IX - Hydrology

Operations

All operations on Scotland's National Forests and Lands (NFL) will adhere to the UK Forestry Standard (UKFS) (2017), section 6.7 - Forests and Water, and the Water Environment (Controlled Activities)(Scotland) Regulations (CAR) and the General Binding Rules published by Scottish Environment Protection Agency (SEPA). Operations will also be carried out in accordance with 'Managing Forest Operations to Protect the Water Environment' (FC, 2019) and the Forest and Water Scotland Initiative booklet.

SEPA is implementing the Water Framework Directive (WFD) in Scotland which is a legal framework for the protection, improvement and sustainable use of all water bodies in the environment across Europe. All water bodies across Scotland have been assessed for ecological and chemical status and catchment plans have been drawn up to ensure water bodies are brought up to an acceptable level. North Region lies entirely within the Scotland river basin district, and is covered by the third River Basin Management Plan (2021 – 2027).

The two aims of the Water Framework Directive (WFD) are to improve water bodies to acceptable ecological status/potential (by 2015, but later if this was not feasible) and to prevent any deterioration in ecological status/potential. North Region considers it vital that no operational planning or delivery lead to any deterioration of the water bodies or water dependant habitats within the Land Management Plan area including tributaries and water bodies directly above or below the NFL.

It is acknowledged that water bodies have suffered from inappropriate forestry practices in the past due to plantation edges being too close to watercourses, intensive cultivation and poorly implemented drainage. It is also recognised that invasive non-native species (INNS) can have impacts on the condition of areas protected under the Habitats Directive for species or habitats important at a European scale and those nationally important for biodiversity. They are recognised as a significant risk to the water environment in the (3rd) River Basin Management Plan for the Scotland River Basin District (2021 – 2027).

Given the possibility of contamination from management activities on upstream populations of riparian INNS, any control efforts will always be undertaken with this in mind, and it is proposed that links will continue to be made with existing projects such as the biosecurity plans which are being produced by the Rivers and Fisheries Trusts Scotland. Invasive plants have been recorded on a small scale in the plan area. Removal works have been delivered to reduce rhododendron

(*Rhododendron ponticum*) as well as Japanese knotweed (*Reynoutria japonica*) and will continue during the coming plan period. Routine survey work will continue throughout the plan period and any occurrence dealt with, complying fully with best practice guidance.

Water crossings for proposed roads infrastructure will be planned and delivered in accordance with the Engineering in the Water Environment Best Practice Guide (River Crossings) (2010) and within the structure of the Controlled Activities Regulations (CAR). It is acknowledged that the storage of oil will be carried out in accordance with the Water Environment (Oil Storage) (Scotland) Regulations 2006.

As a minimum, The Water Environment (Diffuse Pollution) (Scotland) Regulations 2008 General Binding Rules will be followed. These rules cover the storage and application of fertiliser, cultivation of land, discharge of site water, construction of roads and use of pesticides. These are considered operational planning issues and as such mitigation and method are not detailed in the LMP document itself, but through an established and robust system of recorded work planning and pre-commencement planning. The associated documentation being available for viewing as required by stakeholders.

North Region Planning staff will contact SEPA prior to commencing engineering works in, or in the vicinity of, inland surface waters to determine the level of authorisation required. Site-specific mitigation for engineering works is not a matter for this Plan; however Forestry Civil Engineering will adhere to all planning protocols that apply at the time of construction.

Surface water drains will not discharge directly into the water environment. North Region staff will remediate legacy drains of this type to avoid siltation problems during and after forestry operations by using tree roots and other natural methods to install anti siltation devices during harvesting operations and addressing the drains permanently during subsequent ground preparation operations. When natural means are not available plastic dams or semi-permeable netting might be used temporarily. When operations are finished these will be removed and reused.

Where opportunities exist to deliver environmental improvement by the alteration or removal of inappropriately designed or redundant structures - for instance upgrading of a culvert to allow fish passage or removal of a redundant weir - this will be undertaken in consultation with the relevant stakeholders and we will register the operation on the SEPA website. Opportunities for morphological and ecological improvements may also be considered.

Forestry has a significant role to play in mitigating the effects of climate change. Building resilience against extreme weather events underpins all our proposals but is particularly relevant in relation to protecting overhead power line networks, public road infrastructure and water courses. Many instances of historical, artificial cultivation and drainage across Scotland's NFL are inappropriate for current future climate predictions and will be addressed by the adoption of

less intensive techniques into the future and complemented by the establishment of a network of protective native riparian woodland where appropriate. Details of the proposed riparian woodland that will provide a buffer on all identified watercourses (average 30 metres from each bank) is shown spatially in **Map 6 – Future Habitats and Species**.

Tree guards might be used to protect more palatable species in riparian areas from browsing damage. When tree guards are being used this will be recorded using our work planning process and mapping software. Tree guards will be inspected annually and removed when no longer necessary. If possible tree guards will be reused on other sites.

Where specific operations produce waste material not detailed above, North Region staff will liaise directly with SEPA to establish the level of permission/licensing required on a site by site basis.

Private water supplies

There are no private water supplies within our grounds in this LMP area, but three have been identified outside our ground that are downstream of a watercourse, and so may be affected by forest works. These lie at Lynebeg – NH 7651 3397, Wester Lairgs NH 7040 3488 and at Lairgandour NH 7201 3776.

1. Of these, only the site at Wester Lairgs is both downstream and within 50m of the forest proper – to this end we will plant low-density broadleaves at an average of 60m from the PWS, and take extra precautions during the work planning process to indicate the sensitivity of the site, and to allow for continuous monitoring.
2. The site at Lynebeg is upstream of the forest, and very close to private dwellings, so will be afforded extra protection by these elements. The presence of the PWS will be noted during the work planning stage and monitored during works.
3. The site at Lairgandour is well downstream of the forest, but extra precautions will be implemented when harvesting the upstream coupe, and the users informed when works are due to take place.

All private water supplies that may be affected by activity in the forest blocks have been identified (as shown on water map) and their abstraction point has been ground-truthed during the development of this LMP. The catchment above the abstraction point is understood and has been considered in relation to designing in appropriate riparian protection buffers over time to help protect the private water supply quality of future operations. In addition, at an operational level (FLS workplan level), throughout the duration of the plan, the specific protection zones and protection measures will be identified and communicated to all operatives to ensure the water quality is protected during the operational phases.

SEPA's response to the consultation is as follows:

- SEPA does not hold information on private water supplies [PWS]. It is therefore imperative to contact the Local Authority Environmental Health Department to establish whether they hold any details on any private water supplies in or around your Plan area. All efforts must be made to glean information from homeowners/occupiers on private water supply source areas, header tanks and transfer pipework. If any of these are identified adjacent to or within the proposed area, then great care MUST be taken to protect water quality. All operations must strive to go beyond compliance with best practice to fully protect the entire source area. All source areas must be afforded maximum protection from machinery damage, compaction and pollution from all forest activities, including future operations. This also applies to water transfer pipework. The buffer distances highlighted in the Know the Rules Booklet are minimum distances and greater buffers must be allocated where source areas are extensive or boundaries unknown. Note that the given 50m buffer is a minimum buffer area and should be exceeded depending on how extensive the supply source area is or if there is any doubt as to the risk of an activity impacting a supply.
- Whilst the 50m minimum buffer is intended to afford protection to public and private water supplies, the forest planting design is crucial to protect these supplies from water quantity changes due to forest establishment. Whilst low density broadleaf trees are acceptable around the edges of the water supply source area boundary, conifers should be kept back from the source area due to the water scarcity pressures they may place upon the supply.

Flooding

The forest blocks straddle two catchments. One catchment flows to the Nairn Flooding Objective Target Area (OTA) and the other flows to the Forres OTA. Objective target areas are set by SEPA, they are those areas prone to flooding downstream from the forest. Because forest cover is low in both catchments (in relation to Appendix 2 of "Designing and managing forests and woodlands to reduce flood risk") then felling is unlikely to be large enough to significantly increase flood risk. Additionally, the standard set in the UKFS requires permanent riparian buffers and this feature alone helps slow the flow of water and acts as natural flood management, helping to reduce the peak flows at downstream flood points.

The Highland Council, in partnership with Argyll and Bute Council, Scottish Water, Forestry Commission Scotland, Scottish Environment Protection Agency, Cairngorms National Park Authority and Loch Lomond and the Trossachs National Park Authority has published The Highland and Argyll Local Flood Risk Management Plan 2016 – 2022.

(http://www.highland.gov.uk/downloads/file/16173/the_draft_highland_7_argyll_local_flood_risk_management_plan_lpd01). The Highland and Argyll Local Flood Risk Management Plan has identified 40 areas where the risk of flooding is greatest – these areas are referred to as the Potentially Vulnerable Areas (PVA). No PVA's coincide with the LMP area or are downstream of the LMP area as per SEPA's Flood Maps (<http://map.sepa.org.uk/floodmap/map.htm>).

The LMP area interacts with the following water features:

Designated areas:

Littlemill fluvioglacial landform SSSI - Geological feature with associated lochans, kettle holes and drumlins.

Bodies of groundwater (as identified by SEPA) in the plan area:

- 1) Findhorn and Muckle Burn Sand and Gravel
- 2) Strathnairn Sand and Gravel
- 3) Strathnairn, Speyside and Cairngorms

Bodies of surface waters (as identified by SEPA) in the plan area:

Name	Type	Overall Condition
Allt na Fuar-ghlaic	River	Good
River Farnack	River	Moderate
Moy Burn	River	Good
Funtack Burn	River	Good

Catchment areas (as identified by SEPA) in the plan area:

Though unrecognised by SEPA, the Loch Farr catchment area will also interact with the LMP area.

Name	Type	Overall Condition
Loch Moy	Loch	High
Allt na Fuar-ghlaic	River	Good
River Farnack	River	Moderate
Moy Burn	River	Good
Dalriach Burn	River	Good
River Nairn – River Farnack confluence to source	River	Poor
River Nairn – Moray Firth to River Farnack confluence	River	Good