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How we are implementing the Practice Guide '*Managing Forests in Acid Sensitive Water Catchments*' in Wales

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1. Summary

Natural Resources Wales are both the forestry regulator and the water regulatory authority for Wales.

The guide is to demonstrate how NRW is implementing the UKFS Forest & Water Good Forest Practice requirement:-

“Where new planting or restocking is proposed within the catchments of water bodies at risk of acidification, an assessment of the contribution of forestry to acidification and the recovery process should be carried out; details of the assessment procedure should be agreed with the water regulatory authority.”

We assess proposals for new planting, felling, and restocking using the methodology set out in the Practice Guide *Managing Forests in Acid Sensitive Catchments* (referred to as ‘the Practice Guide’ in this document) to protect areas known to be vulnerable to ecological damage resulting from freshwater acidification.

This Implementation Guide should be read in conjunction with the Practice Guide and the UKFS [Forests and Water Guidelines](#).

2. Introduction

Acidification affects large parts of Wales and remains a significant reason for many of our rivers and lakes not achieving the objective of Good Ecological Status (GES) under the EU Water Framework Directive (WFD).

Whilst reductions in emissions of acidifying atmospheric pollutants has brought about improvements in water quality, acidification continues to cause adverse impacts on freshwater ecology, including fisheries.

Forestry is known to influence the degree of acidification, principally due to the ability of forest canopies (conifer and broadleaved trees) to capture more acidifying pollutants (sulphur and nitrogen) from the atmosphere than shorter types of vegetation. As a result, there is a need to manage forestry within vulnerable areas in a way that ensures it does not lead to increased acidification or delay the recovery of waters to GES.

The Practice Guide applies to all water bodies where trees or the felling of trees are causing, or have the potential to cause, them to fail, or be at risk of failing, GES, by exacerbating acidification problems.

The UKFS sets out the legal and good forestry practice framework in the UK giving forest and woodland owners, managers and practitioners the information they need to comply with and meet the requirements of sustainable forest management. The Practice Guide provides supplementary information and identifies a need to assess the sensitivity of certain freshwater catchments to acidification in the following circumstances:

- When considering proposals to establish new woodland under the EIA regulatory process for afforestation

- When considering felling licence applications and the inclusion of conditions for restocking
- When considering proposals for felling trees to convert to another land use under the EIA regulatory process for deforestation (where the proposals exceed the thresholds set out in the Practice Guide)
- When developing plans and proposals for managing the Welsh Government Woodland Estate

The requirements apply equally to proposals that are supported through Rural Development Plan payments administered by Welsh Government.

3. Principles

We will apply the following principles in our application of the Practice Guide:

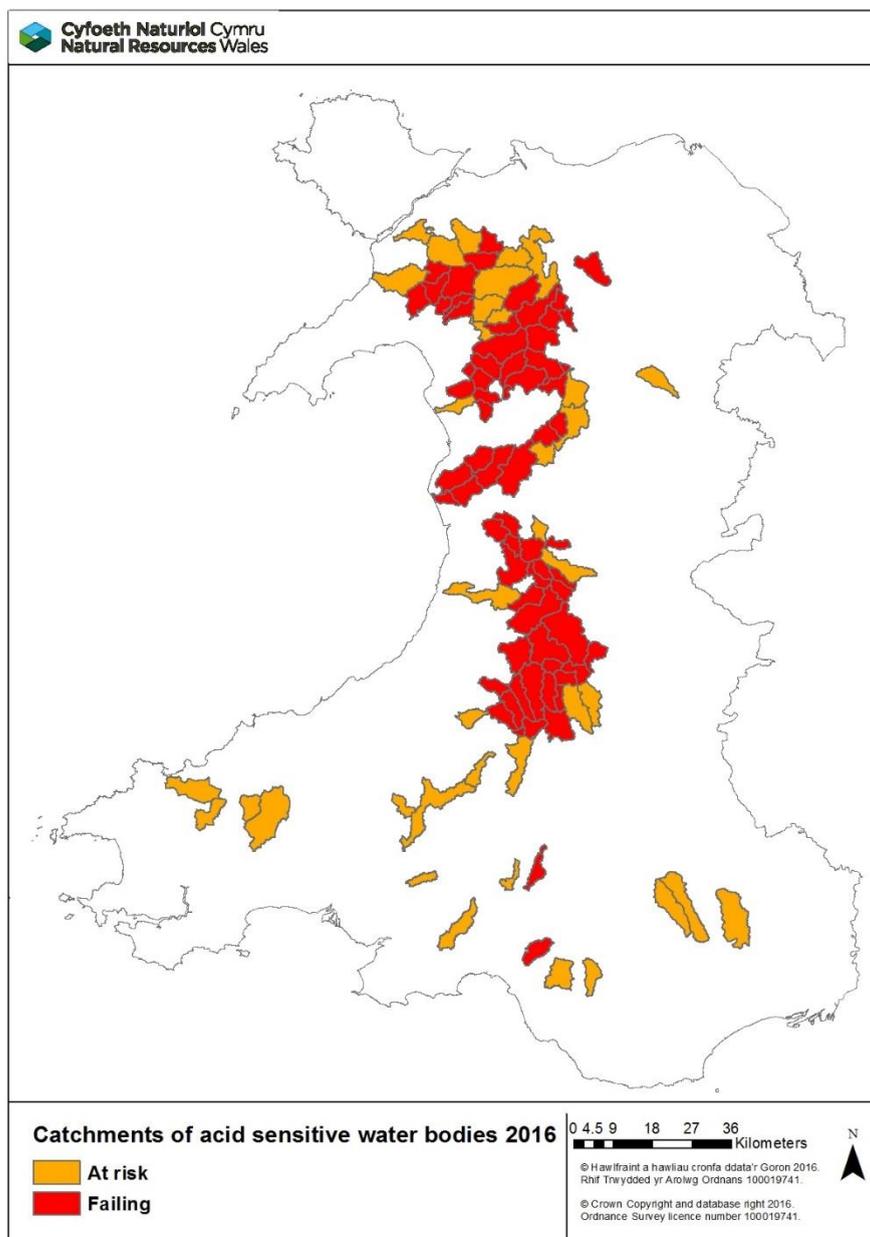
- We will not require the Practice Guide to be applied retrospectively to already approved forest management plans or conditions of approved felling licences.
- We will encourage the use of appropriate forest management measures to minimise the impact of forestry .
- We will aim to minimise delays to affected applications, and ensure that we carry out our role in a pragmatic and timely manner.
- We will apply the requirements of the Practice Guide in the woodlands we manage on behalf of the Welsh Government.
- Where we need additional information to support a proposal we will work with you to agree what needs to be done.
- We will require the applicant to meet all sampling and laboratory costs of demonstrating that their plans will not negatively impact on water quality.
- Where there is a requirement for you to commission water samples as part of a regulatory process, the 'clock will stop' on the timeframe until they have been collected and analysed and we will discuss any extension to the stated timeframes with you.
- Any appeals arising from the application of the Practice Guide will be through the respective appeals process for the EIA or felling licence.

4. Is my proposal in an acid sensitive water catchment?

We will examine applications to see if they fall within an acid sensitive catchment but you can check your own proposal using the [current version of the mapping](#) available on Welsh Government's *Lle* website.

For illustration, Map 1 shows the catchments of acid sensitive water bodies for 2016 where water bodies are failing or are at risk of failing the Good Ecological Status objective of the EU Water Framework Directive.

Map 1: Catchments of acid sensitive water bodies in Wales (2016)¹



¹ The acid sensitive areas in Wales differ from those shown on the map in the Practice Guide because the risk assessment and classification for Wales was updated in 2016.

5. New planting in Acid Sensitive Catchments – Critical Load Assessments

The critical load is the level of deposition of acidifying compounds that can be accommodated before chemical changes cause long-term harmful effects on ecosystems. A Critical Load Assessment (CLA) uses water chemistry data to calculate the critical load and determine whether it is exceeded or if will be exceeded as a consequence of a proposal.

5.1 When is an Assessment required?

We will only require a CLA for proposed new planting when it is in an 'At Risk' or 'Failing' Acid Sensitive catchment and:-

- any part of the land is in a National Nature Reserve, Special Area of Conservation, Special Protection Area, or Site of Special Scientific Interest, or
- a CLA² has previously been carried out which indicates that the critical load is already exceeded and the proposed planting is over 5 ha, or
- the woodland design does **not** meet the enhanced requirements listed below (these are enhanced versions of selected UKFS guidelines and requirements specific to acid sensitive areas)

Enhanced Requirements

1. Watercourses and waterbodies are identified and appropriate buffer areas established and maintained to protect aquatic and riparian zones from adjacent activities.
2. Forest drainage are planned and, where necessary, existing drains are realigned to ensure that water is discharged slowly into buffer areas and not directly into watercourses
3. Forest composition is diversified so that no more than 75% of the forest management unit is allocated to a single species and a minimum of the following are incorporated: • 20% open space; • 10% of other species or ground managed for environmental objectives; • 5% native broadleaved trees or shrubs.
4. Plan for a mix of shaded and lightly shaded habitat within the riparian zone – around 50% canopy cover on average but guided by local circumstances and the requirements of priority species.
5. In the riparian zone, favour locally native tree and shrub species and control the spread of invasive and non-native species.
6. Limit the planting of alder to less than 10% of the area within riparian zones.
7. For water-bound roads and tracks, avoid using material resulting in metallic, sulphide-rich or strongly acidic polluted water run-off.
8. Within defined buffer areas, limit cultivation to hinge mounding.
9. Avoid forest drains discharging directly into watercourses.

² Where we know this we will let you know. We cannot provide the supporting evidence where this has been privately funded for an applicant's own purposes unless they give their consent.

10. Align forest drains to run at a maximum gradient of 2° (3.5%) and lead them towards the heads of valleys.
11. No discharge from drains shall result in the de-stabilisation of the banks or bed of the receiving watercourse
12. Road construction limited to outside riparian buffer areas, except where they cross water courses.
13. When culverts are to be installed, site them at the point where a watercourse is intercepted by a road or track to avoid discharging the watercourse into the road-side drain.

5.2 What steps need to be taken?

Step 1 You must apply to NRW for an [EIA opinion determination](#). You will need to submit an [Opinion Form](#) to the Permitting (Forestry) team at forestregulations@cyfoethnaturiolcymru.gov.uk.

Prior to submitting your application you should check whether the proposal is within a 'failing' or 'at risk' catchment by using the information available on the Welsh Government's *Lle* website. If it is then you should check whether we hold information which would indicate that the critical load is already exceeded.

Step 2 Where the proposal meets the criteria identified in 5.1.1 above then we will continue with the EIA opinion determination without asking you for further information.

Where it does not then step 3 will be required.

Step 3 We will then assess whether the proposed new planting is in a catchment or sub-catchment with over 30% existing closed canopy cover or if the new planting will take the closed canopy to over 30% cover.

If the proposed new planting is in a catchment or sub-catchment with less than 30% closed canopy we will usually be able to continue with the EIA opinion determination without asking you for further information.

In carrying out this assessment we will use available information such as National Forest Inventory, aerial photographs, OS maps, and local knowledge. We will not take into account shelterbelts, hedgerows, or small farm woodlands of < 5ha

Step 4 If the proposed new planting area is in a catchment or sub-catchment with over 30% closed canopy, a CLA will be needed and the clock will stop for the EIA opinion process.

If a CLA is required, we will ask you to engage with a competent laboratory to collect and analyse water samples (see Section 8). We can advise on possible laboratories but you will need to negotiate the terms and conditions of the water sampling and reporting, including the fees and completion time, with the selected laboratory.

The laboratory will advise on the water sampling methodology. The laboratory will analyse the samples and provide you with a report. If the initial water sampling analysis is inconclusive, the laboratory may recommend that the water sample is repeated a further two times in accordance with the Practice Guide.

Step 5 If the CLA report states that the acid deposition is less than the critical load your proposed new planting will be considered unlikely to pose a risk. We will restart the EIA opinion process and send you a response within the 28 day period.

Step 6 If the CLA report states that the critical load is exceeded, the water body will be considered at risk of further acidification from the proposed new planting. The EIA opinion will, therefore, conclude that your proposed new planting could have a significant environmental impact, regardless of whether there are other sources of acidification in the catchment that are not related to forestry.

In this case, your main option will be to reduce the scale of planting to below 30% closed forest canopy in the catchment, or to achieve this through redesign of existing forest. If this option is feasible, we can discuss this with you and amend the EIA opinion application. We will then re-assess the EIA opinion and make a new determination within 28 days.

You may prefer to reduce the scale of planting before you commit to a CLA and you can also discuss this option with us.

6. Felling in Acid Sensitive Catchments – Site Impact Assessments

A Site Impact Assessment (SIA) is a method of determining whether felling plans could have an adverse impact on the freshwater environment through the release of nitrates, which can cause acidification. Not every felling operation will require an assessment.

6.1 Do I need a Site Impact Assessment?

The UKFS requires a site impact assessment where a proposed felling is in an 'At Risk' or 'Failing' Acid Sensitive catchment and the proposal will result in more than 20% of that individual catchment being felled in any three year period (a rolling 36 month period). This is a cumulative threshold and felling by others in the catchment will also be considered when calculating the total.

No site impact assessment will be required for:

- small scale felling that does not require a felling licence
- thinning operations; due to the normal small scale of such operations and expected retention by adjacent trees of any nitrate released

6.2 What steps need to be taken?

Step 1 You should apply to us for a [Felling Licence in the usual way](#).

We usually have a 10 week timescale for dealing with your Felling Licence Application (FLA). However, where more information is required, such as for a Site Impact Assessment, we may need more time to make a decision – this will be discussed with you.

You may also require an [Environmental Impact Assessment](#) if you **do not** want to restock following felling.

Step 2 We will check whether the application falls within an acid sensitive area. If it does, we will calculate the percentage of the catchment(s) that has been felled, or has already been approved for felling, in the 36 months prior to your proposed felling. More than one applicant may apply for licences within the same catchment.

We will inform you if your proposal exceeds the catchment threshold.

In some exceptional circumstances, such as for felling to control pests and diseases or where partial felling will lead to windthrow and an increased risk of sedimentation of watercourses, we may agree to make exceptions but we will usually require management measures to limit the risk or impact of nitrate leaching rather than progressing to step 3.

Step 3 Should your proposal exceed the threshold it will need to be supported by water chemistry results as part of an SIA to show that the affected catchments are capable of buffering the increased acidification risk. We will carry out the SIA but you will usually need to provide the water chemistry data.

We will check to see if we have any water chemistry data for the site. If further evidence is required, we will ask you to commission a competent laboratory to collect and analyse high flow water samples for Acid Neutralizing Capacity (ANC). Alternatively, you may wish to amend your proposals to fall within the thresholds and we can advise you on this.

You will need to negotiate the terms and conditions of the water sampling and reporting, including the fees and completion time, with the selected laboratory.

This laboratory will advise on the water sampling methodology. The laboratory will analyse the water samples and provide you with a report.

The ANC assessment is simpler than that required for restocking, and should you need water chemistry data to support your restocking plans, it may be cost effective to undertake this at the same time as collecting water samples for the felling determination (see Section 7 for restocking guidance)

Step 5 If the ANC is greater than 30 microequivalents per litre, your proposed felling will be determined not to pose a risk of acidification and your felling licence can be considered as normal.

Step 6 If the ANC is less than 30 microequivalents per litre, your proposed felling will be determined to pose a risk of having an adverse impact on the freshwater environment and we will not normally issue a licence.

You will need to either amend your FLA to come below the 20% threshold or delay it until there has been the required 3 years since other felling within the catchment. We can discuss options with you.

In some exceptional circumstances, such as for felling to control pests and diseases or where partial felling will lead to windthrow and an increased risk of sedimentation of watercourses, we may agree to make exceptions but we will usually require management measures to limit the risk or impact of nitrate leaching.

7. Restocking in Acid Sensitive Catchments

Maintaining woodland cover and avoiding deforestation is a priority under Welsh Government's [Woodlands for Wales](#) strategy. Furthermore, due to reductions in pollutant emissions, restocked trees will be exposed to much lower pollution levels than during the previous rotation. Therefore restocking following felling will, in most cases, be approved and be included as a condition of any Felling Licence.

However, where possible, we would expect forest management in 'Failing' catchments to include the management measures at 7.1.1 below. You should include your restocking proposals as part of your [Felling Licence Application \(FLA\)](#) in the usual way.

7.1 Management Measures

These may be through long term management rather than an immediate aim and some may not be practical or achievable in particular forests due to factors such as terrain, accessibility, elevation, wind, previous management history etc.:-

- Consider converting to continuous cover forestry or low impact silvicultural systems where possible.
- Aim for early clearance of and increasing size of riparian zones, including those around narrow channels (<1m)
- Aim to realign drains to remove linkages between artificial forest drainage and natural watercourses
- Aim to maintain boggy or wet areas as open space
- Disconnect roadside drains from natural watercourses
- Avoid whole tree harvesting and ensure all watercourses (natural or artificial) are kept clear of any brash.

We may ask to see how you have considered these.

8. Water Sampling options

Where water sampling is required it must be conducted by suitably trained individuals – this may be arranged by your chosen laboratory, or another contractor to be agreed with us. Analysis must be undertaken by a suitably competent laboratory with adequate detection limits as specified in the Practice Guide.

We can advise you of suitable laboratories and your chosen laboratory must be agreed with us before you commission their services.

8.1 Critical Load Assessments

For Critical Load Assessments there are two sampling methodologies; high flow sampling method and the analogue method: and the most appropriate should be discussed with the selected laboratory agreed with us.

High flow sampling

Time of year and flow conditions may restrict when samples can be collected, which may delay your proposal but samples are normally only taken on one occasion. The laboratory must provide the data and associated results as part of a report which includes the data

collection method, an assessment of confidence in the results, and evidence of the high flow characteristics at the time of sampling.

Although high flow sampling can be cheaper than the alternative, results from a single sampling occasion may not carry a high degree of confidence. Where results are close (below, but within 20% of the critical load) the Practice Guide requires sampling to be repeated on a second and third occasion which can have an impact on timescales and costs.

Analogue sampling

Sampling can be undertaken at any time of year and in any flow conditions, as long as they can also be supported by sampling from suitable long-term monitoring sites.

This method requires four consecutive monthly samples to be coordinated with the long-term monitoring sample collection. It is potentially more expensive as there are more samples to be collected and analysed but the method can provide greater confidence in the results produced.

8.2 Acid Neutralising Capacity

Acid neutralising capacity (ANC) is a measure of the overall buffering capacity of the receiving waters against the acid load. This is a simpler analysis than CLA since it does not need to take into consideration any capturing of acid pollutants from the atmosphere. The threshold used is one that will only permit felling where the receiving waters are sufficiently buffered against any nitrate pulse to protect salmonid fish.

9. Liming

NRW's approach to the liming of forest streams to compensate for acidification is covered in NRW's approach to liming.

10. Contacts for further information

Information regarding the Forest & Water Guidelines is available from sfmt@cyfoethnaturiolcymru.gov.uk

Information regarding the regulation of forestry in Wales is available from forestregulations@cyfoethnaturiolcymru.gov.uk

Information regarding NRW's role in Glastir woodland schemes is available from glastirqueries@cyfoethnaturiolcymru.gov.uk

11. Useful Links

- [Practice guide for managing forests in acid sensitive catchments](#)
- [Forestry Commission's Research Note on Forestry and Surface Water Acidification](#)
- [Forest Research pages on forests and water](#)
- [UKFS Forests and Water Guidelines](#)
- [Tree Felling Licences](#)
- [Quick Guide to Forestry EIA](#)
- [Glastir woodland scheme \(NRW information\)](#)
- [Water Watch Wales](#)
- [Lle Glastir Woodland Creation Opportunities Map](#)
- [Water Framework Directive Acidification Risk Assessment Methodology](#)
- [WFD Acid Sensitive Waterbodies Cycle 2 \(2016\) Data download from Lle](#)
- [The UK Forestry standard](#)

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