DALRADIAN GOLD LIMITED

ECOLOGYSOLUTIONS

Part of the ES Group

DISCHARGE LICENCE 068/12/3 CURRAGHINALT, GORTIN COUNTY TYRONE

Shadow HABITATS REGULATIONS ASSESSMENT

Pursuant to Regulation 43 of the Conservation (Natural Habitats &c.) Regulations (Northern Ireland) 1995

January 2020
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ecology solutions for planners and developers

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PLANS

APPENDICES

1. INTRODUCTION

1.1. Background

1.1.1. Ecology Solutions was instructed by Dalradian Gold Limited ("DGL" the Applicant), in relation to matters concerning Discharge Consent 068/12/3, relevant to land at Curraghinalt, Gortin, County Tyrone (the Application Site).

1.1.2. The Application is for the discharge of site drainage arising from the DGL site at Curraghinalt, Gortin, County Tyrone, BT79 7SF. Discharge is to the waterway at Irish Grid Reference H 5707 8690, known as the Curraghinalt Burn. This is a small tributary of the Owenkillew River, with the Owenkillew River designated as a Special Area of Conservation (SAC). As such, the Owenkillew River SAC is considered to be a receiving waterbody of the water discharged from the Application Site.

1.1.3. The location of the Application Site in context with the SAC is shown on Plan ECO1.

1.1.4. The nature of the operations to be licensed, in tandem with the direct hydrological links to the SAC, means that Regulation 43 of the The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 ("Habitats Regulations") is engaged.

1.1.5. Ecology Solutions was commissioned to undertake a review of available, relevant, information and assess the proposals in the light of the tests included at Regulation 43 of the Habitats Regulations. Further detail on the Habitats Regulations and the application of the relevant legal tests is included at Section 2 of this report.

1.1.6. This sHRA considers the implications for the SAC which could arise from the discharge of water from the Application Site. The information is presented such that in discharging its legal duties, the Competent Authority (in this instance DAERA) can undertake an Appropriate Assessment where that is deemed necessary.

1.1.7. It should be noted that the Application relevant to Discharge Consent application 068/12/3 includes variations to Consent 068/12/2. Those variations are:

(i) Removal of the criterion / limit relating to "total Zinc" and replacement with a dissolved Zinc criterion;
(ii) Inclusion of the new dissolved Zinc criterion in order to comply with the SR351[1] standard; and
(iii) Criteria / limits relating to dissolved Copper to be updated to include bioavailable equivalent concentrations.

1.1.8. It is noted that the Application itself seeks to vary the existing Consent, so it is in line with current guidance and standards. Measures are already in

[1] The Water Framework Directive (Classification, Priority Substances and Shellfish Waters) Regulations (Northern Ireland) 2015

place to mitigate potential environmental effects of the site activities, in line with agreed and adopted strategies and in compliance with previous discharge consents. This assessment takes a holistic view of the proposed activities and resulting potential implications for the SAC.

1.1.9. An HRA was undertaken by NIEA (2014) in relation to relevant planning applications K/2013/0072/F, K/2014/0246 and K/2014/0387 and this has been used to inform this assessment where appropriate.

1.1.10. It is of relevance that current jurisprudence necessitates an approach to assessment (under the Habitats Regulations) which is fundamentally different to that which would have applied in 2017 (when the Application was made) and in previous years. This is a matter discussed in Section 2 of this assessment report.

1.1.11. In undertaking this assessment, specific regard has been had, *inter alia*, to the following documents / sources of information:

a) The Consent to Discharge Effluent (Review) dated 6th February 2014;
b) NIEA Casework Report (including HRA), pursuant to K/2013/0072/F, K/2014/0246 and K/2014/0387 dated 26th September 2014;
c) NIEA Internal Memo relating to the removal of planning conditions 25 and 26 from planning approval K/2013/0072/F, dated 13th February 2015;
d) Completed Application Form (W01) relating to an application to vary an existing consent to discharge, pursuant to the water (Northern Ireland) Order 1999;
e) Report titled “Review of Discharge Criteria for Licence 068/12/2 at Curraghinalt, Gortin, County Tyrone, BT79 7SF”, produced by Kaya Consulting Limited and dated January 2020
f) Standard Natura Data Form for the Owenkillew River SAC;
g) Formal Conservation Objectives for the Owenkillew River SAC; and
h) Owenkillew River SAC “Reasons for Designation as a Special Area of Conservation”.

1.1.12. The following section of this sHRA describes relevant jurisprudence and associated guidance, with baseline information and an assessment of the implications for the SAC considered in subsequent sections.

2. LEGISLATION, CASE LAW AND RELEVANT GUIDANCE

Legislation

2.1. The location of the Application Site in relation to the Owenkillew River SAC, means that the EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (Habitats Directive) is relevant. This Directive is transposed in Northern Ireland (NI) legislation through the Habitats Regulations (1995) (as amended).

2.2. The relevant Directives and corresponding NI legislation is discussed below.

Habitats Directive

2.3. Under the EC Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, commonly referred to as "the Habitats Directive" (Council Directive 92/43/EEC), Member States are required to take special measures to maintain the distribution and abundance of certain priority habitats and species (listed in Annexes I and II of the Directive). In particular, each Member State is required to designate the most suitable sites as SACs. All such SACs will form part of the Natura 2000 network under article 3(1) of the Habitats Directive.

2.4. Article 2(3) sets out that Member States have a duty, in exercising their obligations under the Habitats Directive, to:

> *".. take account of economic, social and cultural requirements and local characteristics."*

2.5. There is an obligation under the Habitats Directive for Member States to designate sites before turning to measures for their protection.

2.6. Article 6(2) requires Member States to take appropriate steps to avoid the deterioration of natural habitats and disturbance of species for which the sites have been designated, in so far as the disturbance could be significant in relation to the objectives of the Directive. Article 6(3) and Article 6(4) require that a plan or project not directly connected with the management of the site, but likely to have a significant effect upon it, either individually or in combination with other plans or projects, must be subject to an appropriate assessment of its implications on the site, in view of the sites conservation objectives.

2.7. Having undertaken an appropriate assessment, the competent authority may agree to a plan or project where it can be concluded that it will not adversely affect the integrity of the site. In light of a negative assessment on the implications for the integrity of the site, Article 6(4) provides that the plan or project may still proceed where it can be demonstrated that there are no alternatives and there are imperative reasons of over-riding public interest as to why it must proceed. In the event that a plan or project is to proceed on the basis of imperative reasons of over-riding public interest, by direction of Article 6(4), compensatory measures must be put in place to ensure that the overall coherence of the Natura 2000 network is protected.

The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995

2.8. The Habitats Regulations, transpose the requirements of the Habitats Directive into NI legislation. The Habitats Regulations aim to protect a network of sites in NI that have rare or important habitats and species in order to safeguard biodiversity.

2.9. Under the Habitats Regulations, Competent Authorities have a duty to ensure that all the activities they regulate have no adverse effect on the integrity of any of the Natura 2000 sites. Regulation 43 of the Habitats Regulations 1995 requires that:

> *"43(1) A competent authority before deciding to undertake, or give any consent, permission or other authorisation for a plan or project, which: -*
>
> *(a) is likely to have a significant effect on a European site in Great Britain (either alone or in combination with other plans or projects) and*
> *(b) is not directly connected with or necessary for the management of the site,*
>
> *shall make an appropriate assessment of the implications for the site in view of that site's conservation objectives.*
>
> *…*
>
> *43(5) In light of the conclusions of the assessment, and subject to regulation 44, the authority shall agree to a plan or project only after having ascertained that it will not adversely affect the integrity of the European site.*
>
> *…*
>
> *43(6) In considering whether a plan or project will adversely affect the integrity of the site, the authority shall have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the consent, permission or other authorisation should be given.*
>
> *…"*

2.11. Regulation 43 of the Habitats Regulations therefore sets out a two stage process. The first test is to determine whether the plan / project is likely to have a significant effect on the European site, the second test (if applicable) is to determine whether the plan / project will affect the integrity of the European site.

2.12. Some key concepts of the Habitats Directive and Habitats Regulations have been clarified through case law. The most pertinent cases are discussed below.

Case Law

Waddenzee Judgement

2.13. In the 'Waddenzee' case the European Court of Justice considered the trigger for 'Appropriate Assessment'. It decided that an appropriate assessment is

required for a plan or project where there is a probability or a risk that it will have a significant effect on the SPA. The Judgement states [at paragraph 3(a)] that:

> *"…any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects."*

2.14. Hence the need for an appropriate assessment should be determined on a precautionary basis.

2.15. The Judgement gives clarity that the test of 'likely significant effect' should also be undertaken in view of the European site's conservation objectives. It is stated at paragraph 3(b)] that:

> *"where a plan or project not directly connected with or necessary to the management of a site is likely to undermine the site's conservation objectives, it must be considered likely to have a significant effect on that site."*

2.16. Paragraph 4 of the Judgement emphasises the requirement for the appropriate assessment to rely on objective scientific information:

> *"…an appropriate assessment…implies that, prior to its approval, all the aspects of the plan or project which can, by themselves or in combination with other plans or projects, affect the site's conservation objectives must be identified in the light of the best scientific knowledge in the field. The competent national authorities, taking account of the appropriate assessment of the implications…for the site concerned in the light of the site's conservation objectives, are to authorise such an activity only if they have made certain that it will not adversely affect the integrity of that site. That is the case where no reasonable scientific doubt remains as to the absence of such effects."*

2.17. In terms of Objective evidence, the decision in Smyth v Secretary of State for Communities & Local Government[2] (the Exminster Marshes decision) the English Court of Appeal clarified at Paragraph 46 to 48 of the Judgement that objective evidence includes that knowledge, experience and expertise of an expert. The contention brought before the Court of Appeal was that an expert witness's evidence amounted "merely to assertion, unsupported by any objective evidence".

2.18. However the Court of Appeal rejected this assertion, finding that:

> Para 46. "*Three points should be made. First, I consider that on a fair reading of Mr Goodwin's proof of evidence it can be seen that he has drawn on specific information relevant to the SPA and the SAC, as well as*

[2] [2-15] EWCA Civ 174

the development site and proposed mitigation measures, in a manner which supports in an entirely conventional and acceptable way his expressions of opinion as an ecological expert. By way of example, at paras. 10.4 and 10.5 of his proof, he pointed out that, contrary to the suggestion made by GIE's representative at the inquiry, it was not appropriate to use the analogy of mitigation measures developed for heathland sites (a 400m exclusion zone), where ground nesting birds might be subject to predation by cats, since for the SPA "the designating bird features are wintering or passage species and access to large parts of the site is not possible in any event" (because it is marshland or cut off by water). He referred to the Interim Report and the Disturbance Study, as appropriate. Mr Goodwin demonstrated a good understanding of the particular ecological and mitigation features relevant to the SPA and the SAC. Contrary to Mr Jones's contention, Mr Goodwin's evidence was very far from being unsupported, free-standing assertion."

Para 47. "*Secondly, in my view it is acceptable and to be expected that an expert will draw on his own background knowledge, experience and expertise in the field to inform the opinions which constitute his evidence to a relevant decision-maker (here, the Inspector). That is, indeed, in large part the point of looking to expert witnesses to provide assistance on technical matters. In this case, Mr Goodwin's own practical experience, the practical experience of ecologists generally and the knowledge shared between them all informed the expertise which he was able to bring to bear in giving his views regarding the effects of the development and the practical impact and viability of the mitigation options which he reviewed in his proof of evidence."*

Para 48. "*Thirdly, expert evidence of the kind given by Mr Goodwin was objective evidence on which the competent authority, the Inspector, was entitled to rely in making his assessment for the purposes of Article 6(3) of the Directive. Where, as in this case, an assessment is called for of impacts on bird species and of how large numbers of people might be expected to react to incentives to direct their recreational habits away from a protected site or of how on-site control measures could be expected to limit their impact, the views of an expert ecologist drawing on his practical experience and knowledge of the effectiveness of ecological initiatives elsewhere may constitute highly material and relevant objective evidence. The Inspector clearly thought he would be assisted by such evidence, which is why he adjourned the inquiry to provide an opportunity for Bellway to provide it. It cannot be said that this indicates any error of approach on the part of the Inspector. On the contrary, in my view it indicates the care with which the Inspector approached the question of application of the Habitats Directive in this case."*

Dilly Lane Decision

2.19. In applying the tests of the Habitats Regulations it is important to refer to the Judgment of Justice Sullivan (as he was then) in relation to the decision handed down in the English High Court regarding the case of Hart District Council v The Secretary of State for Communities and Local Government,

Luckmore Ltd and Barratt Homes Ltd (commonly known as "the Dilly Lane Judgment")[3].

2.20. The Secretary of State's decision to allow an appeal in relation to applications for a total of 170 new homes on a greenfield site off Dilly Lane, Hartley Witney, was challenged in the English High Court by Hart District Council. The legal challenge was made on the grounds that the Secretary of State had erred in departing from her Inspector's conclusions as to the effects on the Thames Basin Heaths SPA. A key issue for the case was whether mitigation measures should be disregarded when assessing whether the project would have a significant effect on the SPA. Mr Justice Sullivan ruled in favour of the Secretary of State after concluding that there was no absolute legal rule that mitigation measures should be disregarded in assessing whether the new homes would have significant effect on the SPA. Mr Justice Sullivan states at paragraph 55 of his judgement:

> *"The competent authority is not considering the likely effect of some hypothetical project in the abstract. The exercise is a practical one which requires the competent authority to consider the likely effect of the particular project for which permission is being sought. If certain features (to use a neutral term) have been incorporated into that project, there is no sensible reason why those features should be ignored at the initial, screening, stage merely because they have been incorporated into the project in order to avoid, or mitigate, any likely effect on the SPA."*

2.21. As such, it was judged right and proper that mitigation or avoidance measures, which form a feature of a plan / project should be viewed as integral to the plan / project and not excluded when considering the likely significance test, in this instance at Regulation 43(1).

2.22. It should however be noted that more recent case law provides different guidance on the application of the test at Regulation 43(1). Relevant case law is discussed below within this section.

Sweetman Case

2.23. Further guidance in relation to the consideration of impacts in the light of the Habitats Regulations is provided in the Sweetman case[4]. The case as set out by the Advocate General considered in detail the test for likely significant effect in paragraphs 50 and 51*:*

> *"50. The test which that expert assessment must determine is whether the plan or project in question has 'an adverse effect on the integrity of the site', since that is the basis on which the competent national authorities must reach their decision. The threshold at this (the second) stage is noticeably higher than that laid down at the first stage. That is because the question (to use more simple terminology) is not 'should we bother to check' (the question at the first stage) but rather 'what will happen to the site if this plan or project goes ahead; and is that consistent with*

[3] [2008] EWHC 1204 (Admin).
[4] Case C-258/11 CJEU 11 April 2013

> *"maintaining or restoring the favourable conservation status" of the habitat or species concerned'…*
>
> *51. It is plain, however, that the threshold laid down at this stage of Article 6(3) may not be set too high, since the assessment must be undertaken having rigorous regard to the precautionary principle. That principle applies where there is uncertainty as to the existence or extent of risks. The competent national authorities may grant authorisation to a plan or project only if they are convinced that it will not adversely affect the integrity of the site concerned. If doubt remains as to the absence of adverse effects, they must refuse authorisation."*

2.24. The Court of Justice of the European Union (CJEU) agreed with the Advocate General's conclusions, and held*:*

> *"40. Authorisation for a plan or project, as referred to in Article 6(3) of the Habitats Directive, may therefore be given only on condition that the competent authorities – once all aspects of the plan or project have been identified which can, by themselves or in combination with other plans or projects, affect the conservation objectives of the site concerned, and in the light of the best scientific knowledge in the field – are certain that the plan or project will not have lasting adverse effects on the integrity of that site. That is so where no reasonable scientific doubt remains as to the absence of such effects."*

2.25. Hence a plan or project may be authorised only if no reasonable scientific doubt remains as to the absence of effects. Reasonable scientific doubt will exist if the evidence is not sufficiently conclusive, or if there are gaps in the information*.*

The A5 Judgment

2.26. The A5 judgement[5] handed down by Mr Justice Stephens provides guidance in relation to the application of the Habitats Regulations/Directive on two main counts. The first being the requirement to demonstrate the efficacy of mitigation. The second being the fact that a clear difference exists between what is required of a screening assessment and what is required of an Appropriate Assessment.

2.27. At paragraph 89 Mr Justice Stephens considers the Judgment of Mr Justice Sullivan in relation to the Dilly Lane case (as referred to above). He states;

> *"[89] In R (on the application of Hart District Council) v Secretary of State for the Communities and Local Government the competent authority was not the developer. In that case Sullivan J stated:*
>
> *'If the competent authority does not agree with the proponents' view as to the likely efficacy of the proposed mitigation measures, or is left in some doubt as to the efficacy, then it will require an appropriate assessment because it will not have been able to exclude the risk of a*

[5] [2013] NIQB 30

> *significant effect on the basis of objective information (see Waddenzee above)."*

2.28. He goes on:

> *"I consider that is the test to be applied by the competent authority, namely if it is left in some doubt as to the efficacy of the mitigation measures. In this case the Department is both the competent authority and the developer but that does not relieve the Department of its obligation to have an appropriate assessment if it is left in some doubt as to the efficacy of the mitigation measures."*

2.29. Thus the Judgment is clear that the efficacy of the mitigation must be demonstrable if the Competent Authority are to hold at the first stage of the legal tests being applied (namely at Regulation 43(1), and not move to undertake an Appropriate Assessment.

2.30. Paragraph 91 gives direction as to what is required of a screening assessment and what is required of an Appropriate Assessment. It is stated:

> *"[91] A screening opinion is different from an appropriate assessment which involves detailed consideration. The screening opinion does not require all considerations to be mentioned."*

People over Wind (Sweetman II) [C323/17]

2.31. This CJEU judgment concerned a Preliminary Ruling in Case C-323/17. A request for a preliminary ruling was made to the CJEU concerning the interpretation of Article 6(3) of Council Directive 92/43/EEC (the Habitats Directive). The request was made in relation to proceedings brought by 'People Over Wind', and Mr Peter Sweetman against Coillte Teoranta. The ruling is as follows:

> *"Article 6(3) of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that, in order to determine whether it is necessary to carry out, subsequently, an appropriate assessment of the implications, for a site concerned, of a plan or project, it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site."*

2.32. The ruling from the CJEU, departs from previous domestic jurisprudence (in particular the Dilly Lane Decision, discussed above), where it was deemed acceptable to include consideration of any mitigation / avoidance measures, which formed an integral part of the plan or project, in considering the first stage of assessment and screening for likely significant effects on a European site (or Ramsar site). In that case, where it could be concluded that no likely significant effect arises there was no recourse to move to Appropriate Assessment and address the Integrity test.

2.33. In view of this ruling from the CJEU, in addressing the test at Regulation 43(1) of the Habitats Regulations, it is necessary to undertake the screening

assessment in the absence of any consideration of avoidance or mitigation measures.

ESB Wind Developments (Sweetman III) [Case C164/17]

2.34. In this case a request for a preliminary ruling was made to the CJEU concerning the interpretation of Articles 6(3) and 6(4) of Council Directive 92/43/EEC (the Habitats Directive). The request was made in relation to proceedings brought by Mr Peter Sweetman and Edel Grace against the decision of An Bord Pleanála (National Planning Appeals Board, Ireland) concerning the latter's decision to grant ESB Wind Developments Ltd and Coillte permission for a wind farm project within an SPA. The ruling was handed down on 25th July 2018.

2.35. For the purpose of the application of Articles 6(3) and 6(4) of the Directive, this ruling distinguishes between 'mitigation' that consists of measures intended to avoid or reduce harm to the protected site, and measures intended to compensate for any harm (Compensatory measures). It is stated:

> *"Article 6 of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora must be interpreted as meaning that, where it is intended to carry out a project on a site designated for the protection and conservation of certain species, of which the area suitable for providing for the needs of a protected species fluctuates over time, and the temporary or permanent effect of that project will be that some parts of the site will no longer be able to provide a suitable habitat for the species in question, the fact that the project includes measures to ensure that, after an appropriate assessment of the implications of the project has been carried out and throughout the lifetime of the project, the part of the site that is in fact likely to provide a suitable habitat will not be reduced and indeed may be enhanced may not be taken into account for the purpose of the assessment that must be carried out in accordance with Article 6(3) of the directive to ensure that the project in question will not adversely affect the integrity of the site concerned; that fact falls to be considered, if need be, under Article 6(4) of the directive."*

2.36. The ruling clarifies (in the context of the specifics of that project) what constitutes mitigation and what should correctly be termed compensation. It confirms that mitigation should be subject to Appropriate Assessment under article 6(3) but that measures designed to compensate for any harm rather than prevent it, cannot be considered under article 6(3) (Appropriate Assessment). In such instances, the proposal must be considered under article 6(4) and thus it cannot be permitted unless there are, "Imperative Reasons of Overriding Public Interest".

Holohan Judgment

2.37. In the case of Holohan v. An Bord Pleanála the CJEU considered the appropriate assessment procedure to be adopted when considering potential impacts on a European Site. In considering this case, the CJEU ruled, amongst other matters:

a) An appropriate assessment (AA) must catalogue the entirety of the habitat types and species for which a site is protected.

b) It must also identify and examine the implications of the proposed project for the species present on that site and for which that site has not been listed. Additionally, it must examine the implications for habitat types and species outside the boundaries of the protected site, insofar as those implications are liable to affect the site's Conservation Objectives.

c) Where the competent authority rejects findings of an expert that additional information must be obtained, the Appropriate Assessment must include a detailed statement dispelling all reasonable scientific doubt concerning effects on the protected site.

Guidance and other Relevant Documents

2.38. Guidance on the interpretation of key terms and concepts contained within the European and NI legislation of relevance to European designated sites is provided through several documents issued by the European Commission and national organisations such as the Joint Nature Conservation Committee ("JNCC") and the DOE Northern Ireland[6]. This guidance is discussed below.

Natura Standard Data Forms

2.39. A standard reporting format has been developed for Natura 2000 sites (SACs and Special Protection Areas – SPAs) to ensure that the relevant site selection information is reported and stored in a consistent manner that can be easily made available.

2.40. A standard reporting form for SPAs and SACs was developed by the European Commission and published in 1996. The form is used for all sites designated, or proposed to be designated as SPAs and SACs under the relevant Directives, with the information to be stored on a central database.

2.41. Article 4 of the Habitats Directive provides the legal basis for providing the data. Article 4 states that information shall include a map of the site, its name, location, extent and the data resulting from application of the criteria specified in Annex III and that this shall be provided in a format established by the Commission.

2.42. Whilst it is the relevant country agency (i.e. Northern Ireland Environment Agency (NIEA)) that is responsible for designating a site, it is the JNCC who are responsible for collating the lists of European and international designated sites, together with relevant supporting information. The Natura 2000 Data Forms for SPAs and SACs are therefore made available by the JNCC.

[6] Now the DfI. Additionally the Northern Ireland Environment Agency is now in the Department of Agriculture, Environment & Rural Affairs (DAERA)

2.43. Within the explanatory notes for Natura Standard Data Forms (European Commission 1996) the following "main objectives" of the Natura data form / database are given:

1. *"to provide the necessary information to enable the Commission, in partnership with the Member States, to co-ordinate measures to create a coherent NATURA 2000 network and to evaluate its effectiveness for the conservation of Annex I habitats and for the habitats of species listed in Annex II of Council Directive 92/43/EEC as well as the habitats of Annex I bird species and other migratory bird species covered by Council Directive 79/409/EEC."*

2. *"to provide information which will assist the Commission in other decision making capacities to ensure that the NATURA 2000 network is fully considered in other policy areas and sectors of the Commission's activities in particular regional, agricultural, energy, transport and tourism policies."*

3. *"to assist the Commission and the relevant committees in choosing actions for funding under LIFE and other financial instruments where data relevant to the conservation of sites, such as ownership and management practice, are likely to facilitate the decision making process."*

4. *"to provide a useful forum for the exchange and sharing of information on habitats and species of Community interest to the benefit of all Member States."*

Communication from the Commission on the Precautionary Principle (2000)

2.44. Enshrined within the Habitats Directive and Regulations (though not explicitly set out in either), based upon article 191 of the Treaty on the Functioning of the European Union, is the need to have due regard to the Precautionary Principle when assessing the risks posed to the integrity of the site(s). If a risk of significant effect to the integrity of a site cannot be excluded on the basis of objective information then the application of the precautionary principle requires no consent to be given for such a project.

2.45. The document titled "Communication from the Commission on the Precautionary Principle" (2000) (included at Annex 1) provides useful guidance in relation to the application of the Precautionary Principle in relation to European sites issues. Paragraph 6, sets out the six key matters for consideration when applying the Precautionary Principle. Paragraph 6 states:

"Where action is deemed necessary, measures based on the precautionary principle should be, inter alia:

- proportional to the chosen level of protection,
- non-discriminatory in their application,
- consistent with similar measures already taken,
- based on an examination of the potential benefits and costs of action or lack of action (including, where appropriate and feasible, an economic cost/benefit analysis),
- subject to review, in the light of new scientific data, and

-capable of assigning responsibility for producing the scientific evidence necessary for a more comprehensive risk assessment."

2.46. Under these bulleted points, the guidance gives specific definitions in relation to each of the above at pages 4 and 5, with further detail provided within section 6.

Managing Natura 2000 Sites (European Communities 2000)

2.47. The document entitled "Managing Natura 2000 Sites the provisions of article 6 of the Habitats Directive 92/43/CEE", published by the European Commission in 2000, provides guidelines to the Member States on the interpretation of certain key concepts used in Article 6 of the Habitats Directive. It should be noted that the section relating to Article 6(4) has subsequently been replaced through the publication of a further guidance document by the European Commission in 2007 entitled "Guidance document on Article 6(4) of the 'Habitats Directive', which is considered below under the relevant heading.

2.48. This document states at Section 2.3.3 that conservation measures must correspond to the ecological requirements of the habitats and species present for which the site is designated and that these requirements "*involve all the ecological needs necessary to ensure their favourable conservation status*".

2.49. At section 3.5 the guidance states, in relation to deterioration and disturbance of habitats or species:

"Deterioration or disturbance is assessed against the conservation status of species and habitats concerned. At a site level, the maintenance of the favourable conservation status has to be evaluated against the initial conditions provided in the Natura 2000 standard data forms when the site was proposed for selection or designation, according to the contribution of the site to the ecological coherence of the network. This notion should be interpreted in a dynamic way according to the evolution of the conservation status of the habitat or the species."

2.50. Section 4.4.1 sets out that in determining what may constitute a likely 'significant' effect one should take into account the conservation objectives for the site and other relevant baseline information. In the second paragraph of this section of the document it is stated:

"In this regard, the conservation objectives of a site as well as prior or baseline information about it can be very important in more precisely identifying conservation sensitivities."

2.51. Section 4.5.3 of the document sets out the duty of Member States to provide certain specific information in support of the inclusion of a site within the Natura 2000 network. This information is to be provided in a format specified by the European Commission (the Natura 2000 Standard Data Form).

2.52. A link is drawn between the Standard Data Form and the formation of the sites conservation objectives within the text box at the end of section 4.5.3 of the guidance where it is stated:

"The information provided according to the standard data form established by the Commission forms the basis for a Member State's establishment of the site's conservation objectives."

2.53. With regard to an assessment of the effects of a plan / project on the integrity of a site, the 'integrity of the site' is defined at Section 4.6.3 as:

"… the coherence of the site's ecological structure and function, across the whole area, or the habitats, complex of habitats and / or populations of species for which the site is or will be classified."

2.54. The guidance is clear, within the text box at the foot of page 39, that an assessment as to the implications of the plan / project on the integrity of the site should be limited to an assessment against the sites conservation objectives:

"The integrity of the site involves its ecological functions. The decision as to whether it is adversely affected should focus on and be limited to the site's conservation objectives."

2.55. Section 5 of the document deals with Article 6(4) of the Habitats Directive. Note that this section has been expanded upon and replaced by further guidance issued by the European Commission entitled "Guidance document on Article 6(4) of the Habitats Directive 92/43/EEC" (2007). This document is dealt with below at paragraphs 2.57 – 2.61.

Assessment of Plans and Projects Significantly Affecting Natura 2000 sites- Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission 2001)

2.56. This document, published by the European Commission in 2001, gives guidance on carrying out and reviewing those assessments required under Article 6(3) and (4) of the Habitats Directive. It is provided as supplementary guidance and does not over-ride or replace any of that set out within Managing Natura 2000 (European Commission 2000) which as stated at page 6 of the document, "*is the starting point for the interpretation of the key terms and phrases contained in the Habitats Directive*". The guidance provided is not mandatory and it is clearly set out that its use is "*optional and flexible*" and that it is for "*Member States to determine the procedural requirements deriving from the directive*".

2.57. The guidance sets out the key stages in following the tests contained within the Habitats Directive. Pertinent to this application, stages one and two are relevant. Stage one is the screening stage assessing the likelihood of a plan / project resulting in a significant effect upon the European site. The second comprises the appropriate assessment.

2.58. Section 3.2.4 is concerned with Appropriate Assessment and specifically, the assessment against the conservation objectives of the European Site. Box 9 provides a list of five example conservation objectives for differing broad habitat types. One such example, that for a coastal site, taken from Box 9 is provided below:

> *"to maintain the status of the European features of this coastal site in favourable condition, allowing for natural change. Features include coastal shingle vegetation and lagoons (within a candidate special area of conservation (SAC), which is also an SPA)."*

Common Standards Monitoring (JNCC February 2004)

2.59. Common Standards Monitoring is a means by which condition objectives for habitats, species, or other features of designated sites (e.g. SSSIs and SPAs) are set based on key attributes of the features.

2.60. The JNCC and the country Conservation Agencies (e.g. NIEA) developed guidance on the setting and assessment of condition objectives, as required under the Birds and Habitats Directives and set out a framework for this in 1999. This framework is provided in the form of Common Standards Monitoring ("CSM") guidance which comprises a suite of documents including an "Introduction to the Guidance Manual on Common Standards Monitoring" and several species/habitat specific documents. The Introduction to the Guidance Manual covers various relevant concepts and terms. It also provides a background to the setting of conservation objectives and sets out the desired approach to setting targets, monitoring, management and reporting on conservation measures in designated sites.

2.61. The Introduction to the CSM Guidance and CSM guidance for individual site attributes, sets out specific criteria regarding the identification of interest features, targets and methods of assessment. There is in-built flexibility and allowances for 'judgements to be made' when assessing, for example, favourable condition.

2.62. It is understood that NIEA applies the Common Standards Monitoring approach to European designated sites through an assessment of the ASSI condition. This is undertaken on a cycle of approximately 6 years. The assessment does not relate to the Conservation Objectives of the European site, but provides a tool for tailoring future management of the ASSI such that favourable condition of the interest features can be maintained or restored as appropriate.

Guidance document on Article 6(4) of the 'Habitats Directive' (European Commission 2007)

2.63. This document, published by the European Commission in 2007, is intended to provide clarification on key terms / concepts as referred to within "Managing Natura 2000 Sites" and replaces the section on Article 6(4) within that earlier document.

2.64. The Guidance document covers, in particular, the concepts of Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensation Measures, Overall coherence and the Opinion of the Commission.

2.65. With regard to ensuring the quality of an appropriate assessment, and to define exactly what needs to be compensated, it is stated at Section 1.3 that:

> *"Assessment procedures of plans or projects likely to affect Natura 2000 sites should guarantee full consideration of all elements contributing to the site integrity and to the overall coherence of the network, both in the definition of the baseline conditions and in the stages leading to identification of potential impacts, mitigation measures and residual impacts. These determine what has to be compensated, both in quality and quantity."*

2.66. The need to use information contained within the Natura Standard Data Form, in tandem with the sites conservation objectives, when undertaking an appropriate assessment is specifically referred to (under the second hyphenated point at Section 1.3 on page 5).

2.67. Section 1.3.2 gives guidance on the application of Article 6(4) in respect of reasons of overriding public importance and Section 1.4.1 gives guidance on the application of Article 6(4) in respect of compensatory measures.

Managing Natura 2000 Sites – The provisions of Article 6 of the habitats Directive 92/43/EEC

2.68. In January 2019 the European Commission published updated guidance in relation to managing Natura 2000 sites, following initial guidance published in 2000 (see above).

2.69. The primary purpose of the revision was to incorporate relevant rulings of the Court of Justice of the European Union (EU) which have been issued since the initial guidance was published in 2000. It also integrates, into a single document, other relevant European Commission notes / guidance documents. Those key rulings (of the Court of Justice of the EU) and other relevant European Commission notes / guidance are discussed above in this report. The revised guidance provides clarifications of key concepts to Member State, authorities and stakeholders involved in the management of Natura 2000 sites (e.g. SPAs and SACs).

Conservation Objectives

2.70. Whilst Regulation 43 of the Habitats Regulations is explicit in setting out that any assessment of the implications of the plan/project on a European designated site should be undertaken in view of the site's "conservation objectives", the term 'conservation objective' is not explicitly defined within the Regulations. The term "conservation objectives" appears at Article 6(3) of the Habitats Directive which sets out the process of assessment for a plan or project which may be likely to have an effect on a designated site, however the term itself is not defined.

2.71. To understand what is meant by the term "conservation objective" it is necessary to look at the Habitats Directive in light of relevant European and other guidance. That guidance is not always consistent or clear about the use of the term "conservation objectives". For the purposes of this assessment, reference is made to the formal "conservation objectives" mentioned in Article 6(3) and Regulation 43 as "Conservation Objectives".

2.72. The term "conservation" is defined within the Habitats Directive at Article 1(a):

> *"conservation means a series of measures required to maintain or restore the natural habitats and the populations of species of wild fauna and flora at a favourable status as defined in (e) and (i)".*

2.73. The term "conservation status of a natural habitat" is defined within the Habitats Directive at Article 1(e):

> *"conservation status of a natural habitat means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2."*

2.74. The term "conservation status of a species" is defined within the Habitats Directive at Article 1(i):

> *"conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2:*
>
> *The conservation status will be taken as 'favourable' when:*
>
> - *Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and*
> - *The natural range of the species is neither being reduced nor is it likely to be reduced for the foreseeable future, and*
> - *There is and will probably continue to be a sufficiently large habitat to maintain its populations on a long-term basis."*

2.75. Article 3 of the Habitats Directive sets out that Member States have a duty to designate (in accordance with Article 4 of the Directive) special areas of conservation and that where necessary Member States shall endeavor to improve the ecological coherence of Natura 2000.

2.76. Article 4(1) of the Habitats Directive states that Member States must provide a list of sites, indicating which Annex I habitats and species occurring on Annex II are present. This Article also clarifies the type of information that must be submitted for each listed site (map, name, location, extent and the results of the application of qualification criteria listed at Annex III of the Directive). This information provides the basis of the Natura 2000 Data Form discussed elsewhere within this document. Article 4(4) states:

> *"Once a site of Community importance has been adopted in accordance with the procedure laid down in paragraph 2, the Member State concerned shall designate that site as a special area of conservation as soon as possible within six years at most, establishing priorities in the light of the importance of the sites for the maintenance or restoration, at a favourable conservation status, of a natural habitat type in Annex 1 or a species in Annex 2 and for the coherence of Natura 2000, and in the light of the threats of degradation or destruction to which those sites are exposed."*

2.77. The formal Conservation Objectives for SPAs and SACs in Northern Ireland are published by NIEA, an agency within the Department of Agriculture, Environment and Rural Affairs ("DAERA"). Those Conservation Objectives applicable to the designated sites being considered as part of this assessment are included at Annex 1.

2.78. Full regard has been had to the significant weight to be applied to the formal Conservation Objectives when considering a plan or project and applying the tests of the Habitats Regulations. Regard has also been had to other relevant information including that available from the JNCC.

3. CONSERVATION STATUS OF THE SAC

3.1. As discussed previously, the Application Site is hydrologically connected to the Owenkillew River SAC.

3.2. Information relevant to the conservation status of this SAC is presented below.

3.3. **Summary information**

3.4. The Owenkillew River SAC includes a 42 km stretch of the river itself, together with its associated flora, fauna and adjacent semi-natural vegetation (primarily woodland) and its associated flora and fauna.

3.5. The Owenkillew River is a fast-flowing spate river, which is noted for the physical diversity and naturalness of the bank and channel together with the richness and naturalness of its flora and fauna. Flora includes, extensive beds of Stream Water Crowfoot *Ranunculus penicillatus* var. *penicillatus* and the largest population of Freshwater Pearl Mussel *Margaritifera margaritifera* Northern Ireland. In addition, the river is important for Otter *Lutra lutra* and Atlantic Salmon *Salmo salar*.

3.6. Adjacent woodlands include Drumlea and Mullan Woods ASSI and the Owenkillew and Glenelly Woods ASSI. These are two of the largest stands of Oak woodland in Northern Ireland.

3.7. **Qualifying Features**

3.7.1. The Owenkillew River SAC was designated in May 2005. Current information in relation to the classification of this site is included on the latest version of the Natura 2000 Standard Data Form, published on 25th January 2016 by the Joint Nature Conservation Committee (JNCC), who act as custodians of information in respect of Natura 2000 and Ramsar sites in the UK.

3.7.2. The SAC covers an area of 213.84ha and qualifies as an SAC by virtue of the presence of:

i. Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation for which it is considered to be one of the best areas in the United Kingdom;
ii. Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles for which this is considered to be one of the best areas in the United Kingdom;
iii. Bog woodland for which the area is considered to support a significant presence;
iv. Salmon, for which the area is considered to support a significant presence;
v. Otter, for which the area is considered to support a significant presence; and
vi. Freshwater Pearl Mussel *Margaritifera margaritifera*, for which this is considered to be one of the best areas in the United Kingdom.

3.7.3. Of the above, the water courses, old Sessile Oak woods and Freshwater Pearl Mussel are all principal features for which (SAC) site has been selected. Bog woodland, Otter and Atlantic Salmon are cited as being of secondary interest. All are however listed interest features of the SAC and the implications for each must be considered within a Habitats Regulations Assessment.

3.7.4. A copy of the Natura 2000 Standard Data Form is included at Annex 1, along with a copy of the document titled and "Reasons for designation as a Special Area of Conservation", which is available from the DAERA website.

3.8. Conservation Objectives

3.8.1. The Habitats Regulations require an appropriate assessment to be undertaken "in view of the site's nature conservation objectives". As discussed in section 2 of this assessment, conservation objectives are a statement of the measures required to maintain at, or restore to, favourable conservation status the natural habitats and/or the populations of species of wild fauna and flora for which the site has been selected. The conservation status of a species is defined as favourable when the population, range and natural habitats of the species are stable or increasing. Similarly, the conservation status of a habitat is favourable when the range, structure and function, and typical species thereof, are stable or increasing.

3.8.2. The current formal Conservation Objectives for the SAC (published 27th July 2017) are included at Annex 2. With reference to section 7 of the document included at Annex 2, the Conservation Objectives are as follows:

"The Conservation Objective for this site is:

To maintain (or restore where appropriate) the

- *Fresh Water Pearl Mussel Margaritifera margaritifera*
- *Water courses of plain to montane levels with the Ranunculus fluitans and Callitricho-Batrachion vegetation*
- *Old Sessile Oak woods with Ilex and Blechnum in the British Isles*
- *Bog Woodland*
- *Otter Lutra lutra*
- *Atlantic Salmon Salmo salar*

to favourable condition."

3.8.3. It is noted that within the formal Conservation Objectives document, Brook Lamprey *Lampetra planeri* is listed as a species which is present, but not at a level which merits listing as an SAC qualifying interest feature.

4. ASSESSMENT OF THE IMPLICATIONS OF THE PROPOSALS ON THE SAC

4.1. Section 2 of this document describes the legislation, case law and guidance of relevance to an assessment of the implications of a plan / project on a European site. Having regard to this legislation and supporting information, including relevant guidance and jurisprudence, it is clear that the assessment is a two-stage process, the first being the 'likely significant effect' stage, the second being the 'integrity test'. The assessment, for the purpose of addressing the relevant legal tests is concerned with the SAC (the implications for its Conservation Objectives). As such the consideration of effects is focussed upon the SAC boundary as mapped. It is however correct, having regard, in particular, to the Holohan Judgment (see above) to examine the implications for habitats and species outside the boundaries of the SAC, but only insofar as those implications could affect the site's Conservation Objectives. In this light, the 'assessment site' is the SAC, but in proceeding on a precautionary basis and to inform a robust assessment, detailed consideration has been given to effects which may arise on the Curraghinalt Burn which is a tributary of the Owenkillew River SAC.

4.2. This assessment is initially concerned with the (screening) 'likely significant effect' stage of the assessment process. In line with current and applicable case law, this must comprise a broad assessment of the proposals, in the absence of any mitigation or avoidance measures which may be required to address any identified potential significant effects on the SAC. For clarity, where any such measures are deemed necessary, they must be considered under the 'integrity test' associated with an Appropriate Assessment.

4.3. It is clear that the formal Conservation Objectives of the European site are the most important consideration in determining whether the plan / project will have an adverse effect on the site, including any effects on its integrity.

4.4. It is evident that there is a clear hierarchical approach to assessing effects on European sites in line with the Habitats Directive/Regulations. The primary test is that against the Conservation Objectives with other considerations following these. Such other considerations would include:

- Other features of interest associated with the site; and
- Other relevant baseline information for the site and its immediate surrounds.

4.4. In line with the above, whilst the qualifying interest features of the site and other baseline information have informed this assessment, the greatest weight has been placed upon the formal Conservation Objectives for the European site.

4.5. In addressing Regulation 43(1) of the Habitats Regulations, this section of the assessment report discusses the relevant potential pathways for a significant effect to occur. This information is presented having regard to the nature and scale of the proposed activity and other relevant information. In line with relevant jurisprudence, this screening exercise is undertaken at a 'high level' and in the absence of any consideration of required mitigation measures, even where such measures are integral to the proposals.

Screening of potential significant effects

4.6. The proposal is not directly connected with or necessary to the management of the SAC.

4.7. The proposal relates to the discharge of surface water from the site water treatment system, to the Curraghinalt Burn which is a tributary of the Owenkillew River SAC.

4.8. Water to be discharged arises from:

a) The underground (mineral) exploration tunnel;
b) Surface water run-off from the hardstanding / infrastructure area;
c) Surface water run-off from stored mineralised and waste rock; and
d) Return water from the underground and surface exploration drilling.

4.9. Foul sewage / wastewater arising from welfare facilities (e.g temporary portable toilets) is contained within a holding tank and removed from site to a licensed facility as required. Wastewater / effluent does not enter the water treatment system and would not form part of the discharge for which consent is sought.

4.10. In the light of the activities proposed and given the proximity to the SAC and direct hydrological connectivity of the SAC to the receiving waters (Curraghinalt Burn), it is considered that potential significant effects could arise in relation to adverse impacts on water quality from:

1. Increased sedimentation;
2. Hydrocarbons (e.g. from fuel / oils);
3. Toxic metals;
4. Chemicals used by the Applicant in line with undertaking any consented activities at the site;
5. Release of any pre-existing contaminants within the site as an indirect consequence of the site activities.

4.11. In view of the Conservation Objectives and reasons for designation of the SAC, it is considered that the above identified pathways for significant effects to arise would not affect Old Sessile Oak Woods. Such pathways are however considered to be directly relevant to the following qualifying interest features of the SAC:

a) Fresh Water Pearl Mussel;
b) Atlantic Salmon;
c) Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitricho-Batrachion* vegetation; and
d) Bog Woodland.

4.12. In addition, Otter may be indirectly adversely affected through a reduction in the quantity or quality of prey resources (e.g. fish).

4.13. It has been concluded that in the absence of specific mitigation (such as limit values for potentially toxic substances and a monitoring programme), there exists the potential for a likely significant effect to arise. As such, in line with relevant jurisprudence, it is considered necessary to move to the Appropriate

Assessment stage and determine whether it can be excluded that an adverse effect on the Integrity of the SAC will arise.

Appropriate Assessment and the Integrity test

4.14. Throughout this section of the assessment report, reference is made to the detailed technical report prepared by Kaya Consulting Limited and titled "Review of Discharge Criteria for Licence 068/12/2 at Curraghinalt, Gortin, County Tyrone, BT79 7SF" ("the Kaya Report"). That report should be read in conjunction with this sHRA report.

4.15. Discharge of water from the site is via a water management and treatment system. This includes a settlement tank, oil interceptor, lamella clarifier (Inclined Plate Settler – IPS) and pH control measures. Additional relevant mitigation and monitoring measures include:

a) Monitoring and reporting on water quality at the discharge point and in the Owenkillew River (five locations in total – see figure 3-1 of the Kaya Report);
b) Flow monitoring, using a v-notch weir at the entrance to the exploration tunnel, to measure discharge;
c) Continuous flow monitoring device located ahead of the discharge point into the Curraghinalt Burn;
d) Two pH probes and two total suspended solid probes are located ahead of the discharge point;
e) Where appropriate, use of Sulphuric acid (H_2SO_4) and Sodium hydroxide (NaOH) to control pH;
f) Use of a polymer solution to aid settlement of solids; and
g) pH and total suspended solid probes are linked to continual monitoring programme and an automatic shutdown facility.

4.16. As a means of ensuring that the aquatic environment (including designated sites, such as the SAC in this instance) is protected from harmful effects, Discharge Consents set strict limit values for relevant parameters. These are defined through detailed modelling undertaken in accordance with accepted industry guidance. Discharge Consent 068/12/2 included such limits and it would be expected that any new Discharge Consent would also include relevant limits.

4.17. The assessment below is focused upon whether the mitigation currently in place (see above), in tandem with parameter limits set within 068/12/2 and 068/12/3 can allow a conclusion of no adverse effect on the Integrity of the Owenkillew River SAC.

4.18. The Kaya report is comprehensive in its scope. It reviews the existing consented water discharge criteria against relevant standard assessment methods, proposes minor variations to any licence, and importantly, predicts the impacts of the discharges on receiving water quality with reference to relevant baseline and modelled data. The assessment refers to the criteria / limits applied through Discharge Consent 068/12/2 and relevant proposed revisions. Those limits associated with Discharge Consent 068/12/2 are set out in table 1-1 of the Kaya Report, with proposed revisions described at table 1-2 of the Kaya Report.

4.19. The reader's attention is drawn to the Kaya Report for the detail in relation to relevant standards and guidance, and the methodologies employed together with any justifications for the approach taken. Key information and conclusions are discussed below.

4.20. It should be noted that for Total Suspended Solids (TSS) Discharge Consent 068/12/2 sets a limit of 50mg/l. The Kaya assessment work has been undertaken using a limit of 25mg/l which is based upon the standard set within the Freshwater Fish Directive, subsequently replaced by the Water Framework Directive which sets no specific standard for TSS. However, it is also noted that for waters containing Freshwater Pearl Mussel, a limit value of 10mg/l is relevant, in accordance with the (unpublished) "Proposals for Owenkillew Sub Basement Management Plan". In this matter reference is drawn to the internal memo dated 13th February 2015 produced by NIEA, a copy of which is included at Annex 3. This memo confirms that, in the light of dilution arising as a result of discharge into the Curraghinalt Burn, further dilution in the Owenkillew River, and having undertaken detailed modelling, NIEA was content that the limit value of 50mg/l:

> *"…will protect the 10mg/litre suspended solids objective in the Owenkillew, subject to the upstream* concentrations *in the Owenkillew not exceeding this level"*.

4.21. As stated above, the Kaya assessment has proceeded on the basis of a TSS limit of 25mg/l being applied, a more precautionary limit than that assessed by NIEA. However, for robustness, the proposals are also tested against the limit value of 10mg/l where relevant.

4.22. Section 2 of the Kaya Report describes that discharge criteria and conditions are applied to consents in order to ensure that the discharge can be absorbed by the receiving water without harm to the aquatic environment and to avoid any breach of relevant standards or legislation. As already discussed above, Conditions (including criteria / limit values) are used by the consenting authority to secure the quality and quantity of the discharges.

4.23. Also, at Section 2 of the Kaya Report, it is confirmed that in reviewing consent applications, DAERA uses a "Monte Carlo" model to assess impacts which is consistent with methods employed by the Environment Agency (EA) for England and Wales and the Scottish Environment Protection Agency (SEPA). Reference is made to EA approach to the development of criteria / limits which includes initial screening tests and further detailed modelling, where necessary. It is that approach which is taken forward within the Kaya Report in order to provide the level of certainty required in relation to the findings of the detailed assessment work.

Screening tests

4.24. The following parameters are assessed in detail within the screening (and subsequent) tests (see Section 2.2 of the Kaya Report):

a) Total Suspended Solids;
b) Biological Oxygen Demand;

c) Zinc (dissolved);
d) Mercury (dissolved);
e) Cadmium (dissolved);
f) Iron (dissolved);
g) Copper (dissolved);
h) Chromium (dissolved);
i) Nickel (dissolved);
j) Arsenic (dissolved); and
k) Lead (dissolved).

4.25. It is confirmed that calculations for pH, water hardness, Total Zinc and oil / grease are not undertaken, with appropriate justifications given. In summary, for pH, simple dilution calculations are not appropriate for assessment purposes, there is no consented discharge concentration for 'hardness' and for oil and grease the limit is non-numeric (i.e. "no trace"). For "Total Zinc" the proposal is to replace this limit with one concerned with Dissolved Zinc.

4.26. The screening tests applied can broadly be described as:

1. *Does the discharge increase the relevant parameter concentration in the receiving water by >10% of the Environmental Quality Standard (EQS)?*

   The test is passed if the concentration is increased by less than 10% of the EQS.

2. *Is the parameter concentration in the receiving water now > EQS?*

   This test checks to see if the EQS is breached in view of the increase in background concentrations arising from the predicted concentrations associated with the discharge.

4.27. With reference to Section 2.2.1 of the Kaya Report and associated tables 2-1, 2-2 and 2-3, both tests are passed in all instances. It is noted that these tests have been conducted on a precautionary basis with reference to the maximum allowable concentrations of the relevant parameters. Additionally, it has been assumed for the purpose of the assessment that the discharge is direct to the SAC, as opposed to a tributary and this represents a further precautionary approach to the assessment.

4.28. Under these circumstances, where the screening tests are passed, it would not be necessary to undertake additional detailed modelling. However, to ensure the most robust assessment possible has been undertaken and to provide further certainty as to the nature and scale of any potential effects on the SAC, detailed modelling has been undertaken.

Detailed modelling

4.29. Section 2.3 of the discusses the results of the Monte Carlo ("backwards") modelling assessment. The approach calculates the permittable discharge concentrations and it provides a more accurate estimate of the levels of discharges which would comply with EQS values.

4.30. Table 2-4 of the Kaya Report shows the results of the Monte Carlo ("backwards") modelling. As can be seen from that table, the consented concentrations would pass the test, since for all parameters the discharge consent concentrations are lower than the calculated mean 'allowable' concentrations, indeed many are significantly lower.

4.31. Section 3 of the Kaya Report is concerned specifically with the impact of the discharges on the Owenkillew River adopting a "forwards modelling" approach, assuming maximum 'allowable' discharge concentrations (thus a conservative / precautionary approach) and in view of observed data. Again, the Monte Carlo software is used, in tandem with observed water quality data from the Curraghinalt Burn and Owenkillew River (from periods during the operation of the water treatment plant).

4.32. In undertaking this "forwards modelling" approach, the data shows (at table 3-2 of the Kaya Report) that for all parameters, the conservative Monte Carlo modelling predicts 10% of the EQS or lower. When the observed data is used (see table 3-3 of the Kaya Report), significantly lower than 10% increases relative to the EQS value (baseline mean) are predicted.

4.33. Regarding the forwards modelling, the Kaya Report concludes (at Section 3.1, page 24) that:

> *"All discharge criteria and observed concentrations are shown to be compliant in terms of the predicted increases in downstream concentrations and they are considered protective of the receiving environment."*

4.34. Specifically in relation to TSS, a matter discussed further above in relation to the application of relevant limit values, the data presented at tables 3-2 and 3-3 is of relevance. This shows that in accordance with observed upstream data, the proposed limit of 10mg/l is not breached (data shows 6.73mg/l). Furthermore, the calculated downstream data, which includes the site discharge, only gives rise to a very small increase in TSS and one which would not breach a limit of 10mg/l. For completeness, using the guideline of 10mg/l, discharges would result in an increase (in mean concentration in the receiving waters) of 2.9% of the EQS in line with Conservative Monte Carlo Modelling, and 1.1% in line with Modelling with Observed Data.

Additional test relating to "risk"

4.35. A further precautionary test was also applied, and this relates to an assessment of the level of risk that an EQS could be breached as a result of the discharges. This matter is discussed at Section 3.2 of the kaya Report. The test is whether the risk of exceedance is greater than 5% and the assessment isolates the impact of the discharge by presenting data for two scenarios, one with, and one without the discharge from the treatment plant. As referenced in the Kaya Report, the EA guidance states that Total Metals should be assessed as opposed to Dissolved Metals. Data for Total Metals is available from sampling location SW05 in the Owenkillew River and that data has been used in the assessment process, in tandem with Dissolved Metals data which is recorded in line with the extant Discharge Consent.

4.36. Table 3-4 (Dissolved Metals) and 3-5 (Total Metals) of the Kaya Report shows the results of the "non-compliance" calculations. As is demonstrated through this analysis, whilst the data shows three instances where a greater than 5% risk arise, in relation to BOD, Iron and Cadmium (Total Metals only), importantly the results show that the discharge from the site would have absolutely no impact on this risk in relation to BOD and Iron. Discharges falling within the permissible (i.e. consented in 2014) limits do not in any way increase, or decrease, the risk that the EQS could be breached for BOD and Iron. The Kaya Report states (Section 3.2, page 26) that:

> *"This means that the natural variability in these parameters within natural waters is such that there is a risk (15.7% chance for BOD) that the average of 12 monthly samples could exceed the EQS values. With the addition of the site discharge the risk of non-compliance remains for these parameters, but the results show that the Site discharge would have no (0%) impact on the risk of exceedance of the EQS value in the Owenkillew River."*

4.37. An increase in the risk of non-compliance is calculated for total cadmium, however, there is no exceedance in the risk predicted for dissolved cadmium. Since the EQS is based on dissolved metals, the results in Table 3-5 of the Kaya Report demonstrate that no change is required in the discharge criteria.

4.38. In the context of the 'risk' that relevant EQS values could be breached, no effect arises as a result of the discharges from the Application Site in view of the permissible, 2014 consented limits.

Review of observed data

4.39. Detailed information relating to observed water quality is contained at Section 3.3. of the Kaya Report. The data assessed relates to monthly recordings made at five locations along the Curraghinalt Burn and the Owenkillew River during the period September 2015 to May 2019. The sample locations are upstream and downstream of the site discharge point in the Curraghinalt Burn and, both upstream and downstream of the point where the Curraghinalt Burn discharges into the Owenkillew River.

4.40. The reader's attention is drawn to the data and conclusions contained at Section 3.3 of the Kaya Report. In particular, attention is drawn to Section 3.3.3 of the Kaya Report which discusses the assessment of data undertaken in relation to each relevant individual parameter. For all parameters the conclusion is that there is either "no evidence of any significant change", or no measurable effect / change in the concentrations in the Owenkillew River as a result of the (recorded) discharges.

4.41. In relation to the analysis of this recorded data, the Kaya Report concludes at Section 4 that:

> *"The analysis indicated that no observed samples in the discharge exceeded the discharge criteria. The analysis also concluded that there was no evidence of an increase in the background concentrations in the Owenkillew River as a result of discharges from the water treatment plant."*

4.42. It is noted that it was not possible to calculate bioavailable concentrations for Zinc and Copper since this requires coincident vales for dissolved organic carbon and dissolved calcium (not available from current data). The bioavailability of these elements is of particular importance to invertebrates (such as Freshwater Pearl Mussel). The proposed variation to Consent 068/12/2, as reflected in quashed consent 068/12/3, sets limits of 490ug/l and 16.2ug/l for dissolved Zinc and Copper respectively. These are equivalent to bioavailable limits which secure the required level of protection for the receiving environment.

4.43. Having regard to this information and also the 'risk' assessment (see above) relating to whether the discharges could breach the EQS values, it is clear that historic / current discharges (in line with previous Consents) and those associated with any new Consent granted which maintained similar water quality protection measures (limit values), currently do not, and would not in the future, alter background conditions.

Summary conclusion regarding the Integrity test

4.44. In view of the Conservation Objectives and qualifying interest features associated with the Owenkillew River SAC and in the light of the detailed survey and assessment work undertaken, and through the application of proposed measures to limit / reduce potentially harmful discharges, it can be concluded that no adverse effect on the integrity of the SAC would arise when the plan / project is considered both alone and in combination with other plans / projects.

5. SUMMARY AND CONCLUSIONS

5.1. Ecology Solutions was instructed by DGL in relation to matters concerning Discharge Consent 068/12/3, relevant to the Application Site.

5.2. The Application is for the discharge of site drainage arising from the Application Site. Discharge is to the waterway at Irish Grid Reference H 5707 8690, known as the Curraghinalt Burn. This is a small tributary of the Owenkillew River, with the Owenkillew River designated as an SAC. As such, the Owenkillew River SAC is considered to be a receiving waterbody of the water discharged from the Application Site.

5.3. The nature of the operations to be licensed, in tandem with the direct hydrological links to the SAC, means that Regulation 43 of the Habitats Regulations is engaged.

5.4. This sHRA considers the implications for the SAC which could arise from the discharge of water from the Application Site. The information is presented such that in discharging its legal duties, the Competent Authority (in this instance DAERA) can undertake an Appropriate Assessment where that is deemed necessary.

5.5. It has been determined that pathways for potential significant effects exist and mitigation is considered to be required. As such, the Competent Authority cannot hold at the first stage of Regulation 43(1), and an Appropriate Assessment must be undertaken. Specific and detailed assessment work has been undertaken in relation to water quality matters and this is reported and referenced within this sHRA. It is considered that the information presented in this report will allow the Competent Authority to undertake the Appropriate Assessment.

5.6. In the light of the assessment work undertaken and reported within this sHRA, the following can be concluded:

1) There is evidence that previous discharges (since the water treatment plant became operational) has not affected background concentrations of relevant parameters in the Owenkillew River SAC;
2) The water quality screening assessment demonstrates that discharges in line with those limits set by Consent 068/12/2 (and quashed 068/12/3), would pass the associated (water quality screening) tests;
3) Detailed modelling, undertaken to provide additional certainty, also confirms that that discharges in line with those limits set by Consent 068/12/2 (and quashed 068/12/3), would pass the associated (water quality) tests;
4) Discharges in line with those limits set by Consent 068/12/2 (and quashed 068/12/3), do not give rise to any increased risk that the EQS for relevant parameters would be breached;
5) In all instances, a precautionary approach to assessment has been adopted, giving further certainty as to the conclusions reached and the efficacy of the proposed protection measures for the SAC; and
6) The Conditions associated with quashed Consent 068/12/3, including cited limit values are appropriate to ensure that no adverse effect on the Owenkillew River SAC will arise.

5.7. Regarding Zinc and Copper, in order to allow bioavailable concentrations to be calculated in the future, as part of the site water quality monitoring programme, the Kaya Report recommends assessing dissolved organic Carbon and dissolved Calcium. It is considered that this measure is not required in order to reach the conclusion that discharges will not adversely affect the integrity of the SAC, since (as discussed above) appropriate proxy limit values can be applied. However, such additional testing would assist in the collation of documented evidence regarding the efficacy of the measures and limits and it would be open to DAERA, acting as Competent Authority under the Habitats Regulations to apply a Condition in this regard, should it conclude that this is necessary having undertaken its Appropriate Assessment.

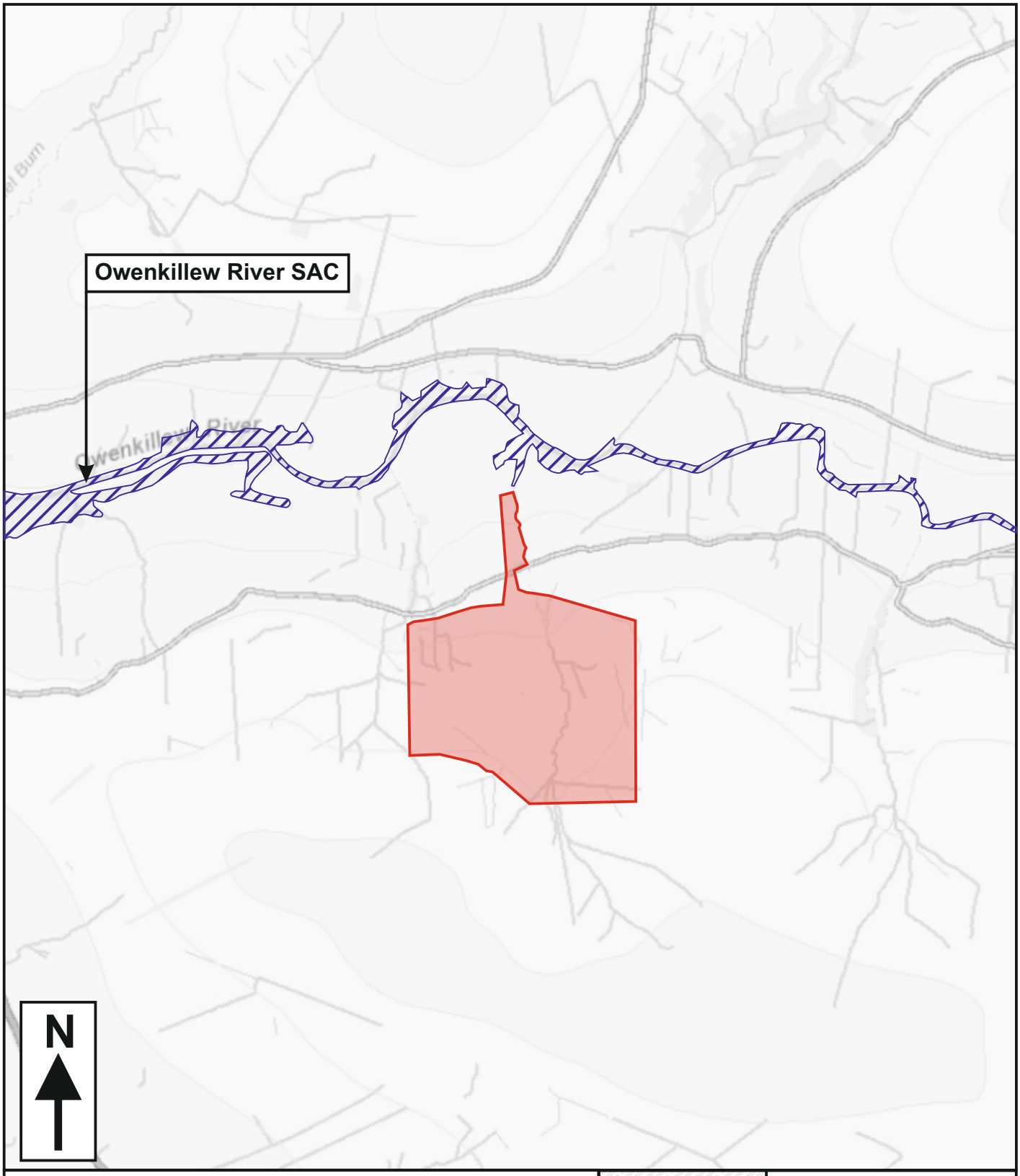
5.8. By way of overall conclusion, after mitigation, which would include the Conditioning of limit values for relevant parameters and appropriate monitoring, any effects would be nugatory (*de minimis*) and it is considered that in line with jurisprudence, a safe conclusion can be reached that no adverse effect on the integrity of the SAC would arise when the plan / project is considered both alone and in combination with other plans / projects.

PLANS & APPENDICES

PLANS

PLAN ECO1

Site Location and Relevant Designations



KEY:

APPLICATION SITE LOCATION

SPECIAL AREA OF CONSERVATION (SAC)

ECOLOGY SOLUTIONS
Part of the ES Group

Farncombe House
Farncombe Estate | Broadway
Worcestershire | WR12 7LJ

+44(0)1451 870767
info@ecologysolutions.co.uk
ecologysolutions.co.uk

8775: CURRAGHINALT,
GORTIN, COUNTY TYRONE

PLAN ECO1: SITE LOCATION
AND RELEVANT DESIGNATIONS

Rev: A

Jan 2020

APPENDICES

APPENDIX 1

Copies of Owenkillew River SAC Natura Standard Data Form and "Reasons for designation as a Special Area of Conservation"

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK0030233**

SITENAME **Owenkillew River**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

Back to top

1.1 Type	1.2 Site code
B	UK0030233

1.3 Site name

Owenkillew River

1.4 First Compilation date	1.5 Update date
2001-06	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	2001-06
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-05
National legal reference of SAC designation:	Regulations 6-7 and 10-12 of The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (http://www.legislation.gov.uk/nisr/1995/380/contents/made) as amended by The Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2004 (http://www.legislation.gov.uk/nisr/2004/435/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-7.132222222	54.72777778

2.2 Area [ha]:

213.84

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKN0	Northern Ireland

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
3260			75.14		G	A	C	B	B
91A0			79.44		G	B	C	A	B
91D0	X		1.5		G	B	C	A	C

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive

92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
F	1096	Lampetra planeri			p				P	DD	D			
M	1355	Lutra lutra			p				C	DD	C	B	C	C
I	1029	Margaritifera margaritifera			p	10000	10001	i		G	B	C	C	B
F	1106	Salmo salar			p	1001	10000	i		G	C	B	C	C

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N06	35.1
N14	4.0
N08	0.2
N07	4.5
N21	7.0
N16	45.2
N10	4.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: shingle,metamorphic,sand,neutral,nutrient-poor,sedimentary,igneous 2 Terrestrial: Geomorphology and landscape: upland,valley

4.2 Quality and importance

Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation for which this is considered to be one of the best areas in the United Kingdom. Old sessile oak woods with Ilex and Blechnum in the British Isles for which this is considered to be one of the best areas in the United Kingdom. Bog woodland for which the area is considered to support a significant presence. which is

considered to be rare as its total extent in the United Kingdom is estimated to be less than 1000 hectares. Salmo salar for which the area is considered to support a significant presence. Lutra lutra for which the area is considered to support a significant presence. Margaritifera margaritifera for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	J02		I
M	M01		O
H	I01		I
H	H01		O
M	F02		I
L	C03		I
L	C01		I
H	B02		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	J02		I
M	F02		I
M	B02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the DOENI link below provides access to the Conservation Objectives for this site. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

https://www.doeni.gov.uk/sites/default/files/publications/doe/land-information-owenkillew-river-conservation-objectives-2

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Northern Ireland Environment Agency
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

	Yes
	No, but in preparation
X	No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant page is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	Designated Special Protection Area	53
B	SAC (includes candidates Special Areas of Conservation, Sites of Community Importance and designated SAC)	53
C	SAC area the same as SPA. Note in the UK Natura 2000 submission this is only used for Gibraltar	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent	57
B	Good	57
C	Significant	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippopha□ rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	15%-100%	58
B	2%-15%	58
C	< 2%	58

3.1 Conservation status habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global grade habitat

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	15%-100%	62
B	2%-15%	62
C	< 2%	62
D	Non-significant population	62

3.2 Conservation status species (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global Grade (abbreviated to 'Glo.' Or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non breeding waterfowl assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic ressources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK02	Marine Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67

Reasons for Designation as a Special Area of Conservation

Area name: **Owenkillew River**

Administrative area: **Tyrone**

Component ASSI: **Drumlea and Mullan Woods**
Owenkillew and Glenelly Woods
Owenkillew River

This area has been designated as a Special Area of Conservation (SAC) because it contains habitat types and/or species which are rare or threatened within a European context. The ASSI citation describes the special interests for which the site was notified in the Northern Ireland context. [NB: not for marine interests below mean low water mark]. The interests for which the site was selected as ASSI may differ from the interests selected in a European context.

The habitats and/or species for which the area has been recommended as a candidate SAC are listed below. The reasons for their selection are listed, together with a brief description of the habitats and species as they typically occur across the UK. This area contains the interests described although it may not contain all the typical features.

The area is considered to have a high diversity of habitats/species of European importance.

European priority interest(s):

1. **Bog woodland**

- **which is considered to be rare as its total extent in the United Kingdom is estimated to be less than 1000 hectares.**
- **for which the area is considered to support a significant presence.**

Bog woodland. Areas of pine or birch on bogs or acid, peaty hollows, where the trees are evidently a long-established and stable part of the bog vegetation. These trees may be of considerable age, are usually stunted and twisted, and often support a diverse lichen flora. Woodland encroachment resulting from falling water tables is not true 'bog woodland'.

European interest(s):

2. ***Lutra lutra***

- **for which the area is considered to support a significant presence.**

Otter. Otters are semi-aquatic mammals, requiring both good fishing grounds for food and suitable shelter on land for resting and breeding. Once widespread in Europe, the otter population declined sharply during the 1960s and 1970s. It is now showing signs of recovery in the UK and is spreading to repopulate its former areas. The UK, and in particular Scotland, supports some of the largest concentrations of otters in Europe, with both freshwater and coastal populations.

3. *Margaritifera margaritifera*

- **for which this is considered to be one of the best areas in the United Kingdom.**

Freshwater pearl mussel. The freshwater pearl mussel spends its larval stage attached to the gills of salmon and trout. Eventually the larvae drop off and settle in the riverbed gravel where they grow to adulthood. The species is widely distributed in the northern hemisphere but populations have declined sharply throughout Europe. Threats to its survival include disturbance to gravel beds and flow rates, water pollution, and pearl-fishing. The UK is now considered to be the main European stronghold for this species but in recent years it has been lost or has ceased breeding at many sites.

4. Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

- **for which this is considered to be one of the best areas in the United Kingdom.**

Western acidic oak woodland. The western oak woods in the UK include a range of woodland types, some with much heather *Calluna vulgaris* and bilberry *Vaccinium myrtillus*, others more grassy. They typically have rich assemblages of Atlantic mosses and liverworts, distinctive birds, lichen communities, and ferns such as hard fern *Blechnum spicant*, lemon-scented fern *Oreopteris limbosperma* and various species of male- and buckler-fern *Dryopteris* species. Holly *Ilex aquifolium* is common in the understorey. Such woodland is most abundant in the western parts of England, Wales, Scotland and Northern Ireland.

5. Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation

- **for which this is considered to be one of the best areas in the United Kingdom.**

Rivers with floating vegetation often dominated by water-crowfoot. Rivers that support characteristic communities of water-crowfoot *Ranunculus* species, which often dominate the plant community in the river channel. This vegetation occurs in relatively unpolluted waters, in a diverse range of river types.

6. *Salmo salar*

- **for which the area is considered to support a significant presence.**

Atlantic salmon. The Atlantic salmon is the largest of our migratory fish and spawns in the least polluted rivers of north-west Europe. It has declined due to over-fishing at sea, pollution and barriers to migration within its spawning rivers. The UK supports a large proportion of the salmon population in the European Union.

The Register of European Sites in Northern Ireland	
Register reference number:	UK0030233
Date of Registration	13 May 2008
Signed by: G R Seymour	
on behalf of the Department of the Environment	

APPENDIX 2

Formal Conservation Objectives for the Owenkillew River SAC

OWENKILLEW RIVER SAC
UK0030233

CONSERVATION OBJECTIVES

Document Details

Title	*Owenkillew River SAC Conservation Objectives*
Prepared By	*R. McKeown*
Approved By	*P. Corbett*
Date Effective From	*27/07/2017*
Version Number	*V3*
Next Review Date	Nov 2020
Contact	cdp@doeni.gov.uk

Revision History:

Version	Date	Summary of Changes	Initials
V1	June 2013	Internal working document	PC
V2	January 2015	Complete review	RMK
V3	July 2017	Edit and minor correction	PC

Site relationships

The Owenkillew River SAC boundary adjoins the boundary of the River Foyle and Tributaries SAC.

1. INTRODUCTION

EU Member States have a clear responsibility under the Habitats and Birds Directives[1] to ensure that all habitats and species of Community Interest are maintained or restored to Favourable Conservation Status (FCS). Natura 2000 sites have a crucial role to play in achieving this overall objective since they are the most important core sites for these species and habitats. Each site must therefore be managed in a way that ensures it contributes as effectively as possible to helping the species and habitats for which it has been designated reach a favourable conservation status within the EU.

To ensure that each Natura 2000 site contributes fully to reaching this overall target of FCS, it is important to set clear conservation objectives for each individual site. These should define the desired state, within that particular site, of each of the species and habitat types for which the site was designated.

Once a site has been included in the Natura 2000 network, Member States are required to implement, on each site, the necessary conservation measures which correspond to the ecological requirements of the protected habitat types and species of Community Interest present, according to Article 6.1 of the Habitats Directive. They must also prevent any damaging activities that could significantly disturb those species and habitats (Article 6.2) and to protect the site from new potentially damaging plans and projects likely to have a significant effect on a Natura 2000 site (Article 6.3, 6.4).

Conservation measures can include both site-specific measures (i.e. management actions and/or management restrictions) and horizontal measures that apply to many Natura 2000 sites over a larger area (e.g. measures to reduce nitrate pollution or to regulate hunting or resource use).

In Northern Ireland, Natura 2000 sites are usually underpinned by the designation of an Area of Special Scientific Interest (ASSI) under the Environment (NI) Order 2002 (as amended).

[1] 92/43/EEC and 2009/147/EC (codified version of Directive 79/409/EEC as amended)

2. ROLE OF CONSERVATION OBJECTIVES

Conservation Objectives have a role in

- Conservation Planning and Management – guide management of sites, to maintain or restore the habitats and species in favourable condition

- Assessing Plans and Projects, as required under Article 6(3) of the Habitats Directive - Habitats Regulations Assessments (HRA) are required to assess proposed plans and projects in light of the site's conservation objectives.

- Monitoring and Reporting – Provide the basis for assessing the condition of a feature, the factors that affect it and the actions required.

3. DEFINITION OF FAVOURABLE CONSERVATION STATUS

Favourable Conservation Status is defined in Articles 1(e) and 1(i) of the Habitats Directive:

The conservation status of a natural habitat is the sum of the influences acting on it and its typical species that may affect its long-term natural distribution, structure and functions as well as the long term survival of its typical species. The conservation status of a natural habitat will be taken as favourable when:

- Its natural range and areas it covers within that range are stable or increasing, and
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
- The conservation status of its typical species is favourable as defined in Article 1(i).

For species, favourable conservation status is defined in Article 1(i) as when:

- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and;
- the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and;
- there is, and will probably continue to be, a sufficiently large habitat to maintain its population on a long term basis.

3.1 DEFINITION OF FAVOURABLE CONDITION

Favourable Condition is defined as "**the target condition for an interest feature in terms of the abundance, distribution and/or quality of that feature within the site**".

The standards for favourable condition (Common Standards) have been developed by JNCC and are applied throughout the UK. Achieving Favourable Condition on individual sites will make an important contribution to achieving Favourable Conservation Status across the Natura 2000 network.

4. SITE INFORMATION

COUNTY: TYRONE

GRID REFERENCE: IH 553868

LOWER GR: IH 409863 **UPPER GR:** IH 699862

AREA: 213.46 ha

5. SUMMARY SITE DESCRIPTION

The SAC includes the river (42 km stretch) and its associated riverine flora and fauna and adjacent semi-natural vegetation, primarily woodland flora and fauna. The river rises at an altitude of 415m and flows into the Strule at an altitude of 35m. It is a fast-flowing spate river; notable for the physical diversity and naturalness of the bank and channel, the richness and naturalness of its plant and animal communities, which includes extensive beds of Stream Water Crowfoot *Ranunculus penicillatus* var*. penicillatus* and the largest Northern Ireland population of the now rare Fresh Water Pearl Mussel *Margaritifera margaritifera*. In addition, the river is important for Otter *Lutra lutra* and Atlantic Salmon *Salmo salar*.

Adjacent woodlands which form part of the SAC include Drumlea and Mullan Woods ASSI and the Owenkillew and Glenelly Woods ASSI, two of the largest stands of Oak woodland in Northern Ireland. An area of localised waterlogging in the former woodland has resulted in the development of Bog Woodland.

Further details of the site are contained in the relevant ASSI Citations and Views About Management statements, which are available on the DAERA website (www.daera-ni.gov.uk).

5.1 BOUNDARY RATIONALE

Defining the extent of site boundaries for rivers is variable across the UK. The four options currently in use are:-

(1) whole catchments
(2) main river stem from source to mouth, tributaries and upland catchment
(3) main river stem from source to mouth and tributaries
(4) main river stem from source to mouth only

The option used is dependent on the qualifying features for that site and the current knowledge of distribution of that feature. In the case of the Owenkillew River, the main SAC qualifying features are *Margaritifera margaritifera* and *Ranunculus* communities, which are confined to the main channel.

The upper limits of the site have been determined by the restricted size of the channel. Downstream limit is at the confluence with the Strule, where the site joins with the adjacent River Foyle and Tributaries SAC.

The lateral boundary beyond the river channel follows the same guidelines as that for all ASSIs, which is dependent on the type and quality of adjacent habitat. Much of the SAC has limited adjacent habitat. Therefore, the boundary is frequently restricted to the top of the riverbank. However, in places, there is significant adjoining woodland interest, and this is generally included. In addition the SAC includes both Drumlea and Mullan Woods ASSI and the Owenkillew and Glenelly Woods ASSI.

The boundary uses permanent man-made features where possible. However, along some stretches of the river and woodland edge, such boundaries were absent and recognisable topographical or physical features such as breaks in slope, scrub or tree line were used.

6. SAC SELECTION FEATURES

Feature Type	Feature	Global Status	Size/ extent/ pop~
Species	Freshwater Pearl Mussel *Margaritifera margaritifera*	B	10,000
Habitat	Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitricho-Batrachion* vegetation	B	83% of channel length
Habitat	Old Sessile Oak woods with *Ilex* and *Blechnum* in the British Isles	B	79ha
Habitat	Bog Woodland	C	1.5ha
Species	Otter *Lutra lutra*	C	
Species	Atlantic Salmon *Salmo salar*	C	2,700*
Species	Brook Lamprey *Lampetra planeri*	D	P

Table 1. List of SAC selection features. Those with global status A-C will be referred to in ANNEX I.

The global status is an expert judgement of the overall value of the site for the conservation of the relevant Annex I habitat. Sites have been graded A, B or C - in the UK these gradings have been interpreted as follows:

A - Sites holding outstanding examples of the habitat in a European context.

B - Sites holding excellent stands of the habitat, significantly above the threshold for SSSI/ASSI notification but of somewhat lower value than grade A sites.

C - Examples of the habitat which are of at least national interest (i.e. usually above the thresholdfor SSSI/ASSI notification on terrestrial sites) but not significantly above this. These habitats are not the primary reason for SACs being selected.

D - Habitat present but not of sufficient extent or quality to merit listing as SAC feature.

There is therefore a distinction between the principal features for which sites have been selected (those graded A or B) and those which are only of secondary interest (those graded C). This is a useful distinction but it is important to note that all three grades are qualifying SAC interest features.

Click here to go to the Natura 2000 Standard Data Form for Owenkillew River SAC.

6.1 ASSI SELECTION FEATURES

Owenkillew River ASSI

Feature Type	Feature	Size/ extent/ pop~
Habitat	Series of river types present with corresponding macrophyte assemblages, ranging from ultra-oligotrophic, to mesotrophic types.	
Habitat	Oak Woodland	79 ha
Habitat	Wet Woodland	1.5 ha
Species	Freshwater Pearl Mussel *Margaritifera margaritifera*	
Species	Otter *Lutra lutra*	
Species	Atlantic Salmon *Salmo salar*	

Table 2. List of ASSI features.

7. CONSERVATION OBJECTIVES

The ***Conservation Objective*** for this site is:

To maintain (or restore where appropriate) the

- Fresh Water Pearl Mussel *Margaritifera margaritifera*
- Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitricho-Batrachion* vegetation
- Old Sessile Oak woods with *Ilex* and *Blechnum* in the British Isles
- Bog Woodland
- Otter *Lutra lutra*
- Atlantic Salmon *Salmo salar*

to favourable condition.

For each SAC feature, there are a number of component objectives which are outlined in the table below. These include a series of attributes, measures and targets which form the basis of *Condition Assessment*. The results of this will determine whether the feature is in favourable condition or not. The feature attributes and measures are found in the attached annex.

8. SAC SELECTION FEATURE OBJECTIVE REQUIREMENTS

Feature	Grade	Objective
Freshwater Pearl Mussel *Margaritifera margartifera*	B	Maintain and if feasible enhance population numbers through natural recruitment.
		Improve age structure of population.
		Improve water quality.
		Improve channel substrate quality by reducing siltation.
		Ensure host fish population is adequate for recruitment.
		Increase the amount of shading through marginal tree cover along those sections of river currently supporting this species.
Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitricho-Batrachion* vegetation	B	Maintain and if feasible enhance extent and composition of community.
		Improve water quality
		Improve channel substrate quality by reducing siltation.
		Maintain and if feasible enhance the river morphology
Old Sessile Oak woods with *Ilex* and *Blechnum* in the British Isles	B	Maintain and expand the extent of existing oak woodland. (There is an area of degraded bog, wetland and damp grassland which have the potential to develop into oak woodland
		Maintain and enhance Oak woodland species diversity and structural diversity.
		Maintain the diversity and quality of habitats associated with the Oak woodland, e.g. fen, swamp, grasslands, scrub, especially where these exhibit natural transition to Oak woodland
		Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation.
		Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.

Bog Woodland	C	Maintain and expand the extent of existing bog woodland. (There is an area of degraded bog, wetland and damp grassland that have the potential to develop into bog woodland.
		Maintain and enhance bog woodland species diversity and structural diversity.
		Maintain the diversity and quality of habitats associated with the bog woodland, e.g. fen, swamp, especially where these exhibit natural transition to swamp woodland.
		Seek nature conservation management over adjacent forested areas outside the ASSI where there may be potential for woodland rehabilitation.
		Seek nature conservation management over suitable areas immediately outside the ASSI where there may be potential for woodland expansion.
Otter *Lutra lutra*	C	Population numbers and distribution to be maintained and if possible, expanded.
		Maintain the extent and quality of suitable Otter habitat, in particular the chemical and biological quality of the water, and all associated wetland habitats
Atlantic Salmon *Salmo salar*	C	Maintain and if possible, expand existing population numbers and distribution
		Maintain and where possible, enhance the extent and quality of suitable Salmon habitat, in particular the chemical and biological quality of the water

9.1 ADDITIONAL ASSI FEATURE OBJECTIVE REQUIREMENTS

Feature	Component Objective
Series of river types present with corresponding macrophyte assemblages, ranging from ultra-oligotrophic, to mesotrophic types.	Maintain and if feasible enhance extent and composition of community.
	Improve water quality
	Improve channel substrate quality by reducing siltation.
	Maintain and if feasible enhance the river morphology
	Maintain the diversity and quality of habitats associated with the river e.g. bog, wet grasslands, scrub, swamp and oak woodland.
Oak Woodland	See SAC Selection Feature Objective Requirements table.
Wet Woodland	See SAC Selection Feature Objective Requirements table.
Freshwater Pearl Mussel *Margaritifera margaritifera*	See SAC Selection Feature Objective Requirements table.
Otter *Lutra lutra*	See SAC Selection Feature Objective Requirements table.
Atlantic Salmon *Salmo salar*	See SAC Selection Feature Objective Requirements table.

10. MANAGEMENT CONSIDERATIONS

Ownership

There are a total of 206 individuals or organisations with ownership or other rights associated with this site.

Adjoining Land Use

In the upper reaches, the river flows through a predominantly upland peatland landscape used for rough grazing. The river channel is generally unenclosed. Along its mid-reaches, the surrounding landscape is improved or semi-improved pasture used for silage and grazing, and is generally fenced from the surrounding land at least along one bank top. In the lower reaches, the main adjacent agricultural uses include tilled land and silage production as well as stock grazing. Here, a significant proportion of the river is bounded by woodland either as discrete woodland blocks along the valley side or as a thin bank top belt. The river channel and adjacent woodlands are only partially fenced.

11. MAIN THREATS, PRESSURES AND ACTIVITIES WITH IMPACTS ON THE SITE

Both on-site and off-site activities can potentially affect SAC/ASSI features. The list below is not exhaustive, but deals with the most likely factors that are either affecting Owenkillew River, or could affect it in the future.

Although **Fresh Water Pearl Mussel *Margaritifera margaritifera*, Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitricho-Batrachion* vegetation, Old Sessile Oak woods with *Ilex* and *Blechnum* in the British Isles, Bog Woodland, Otter *Lutra lutra* and Atlantic Salmon *Salmo salar*** are the qualifying SAC features, factors affecting ASSI features are also considered.

NOTE - Carrying out any of the Notifiable Operations listed in the ASSI schedule could affect the site.

RIVER HABITATS AND SPECIES

Water Quality/Eutrophication

Water quality is probably the most important single factor for the SAC and ASSI selection features, with both point and diffuse sources of pollution potentially damaging. These are dependent on human activities throughout the catchment, the majority of which are largely beyond the direct control of the current designation. The total catchment area feeding into the river is 45,469ha and consists of seven sub-catchment areas. The designation only includes the main channel of the Owenkillew and has excluded 36 minor tributaries (<=2.5m wide) and 6 major tributaries (>2.5m wide).

A significant portion of the upper catchment of this river and some of its tributaries are afforested; there is a potential for enrichment of the river during forestry operations (planting and fertiliser application).

Stock have open access to the channel in many sections and have caused poaching of the bank and channel. This represents another possible source of enrichment.

ACTION: Reduce enrichment of the water column by minimising point source pollution and through a catchment-wide campaign, encourage land owners to avoid excessive fertiliser inputs, thus reducing diffuse pollution. Restrict stock access to less sensitive watering points.

Channel & Bank Modification

The Owenkillew River has been extensively altered by man in the past, especially along the upper reach of the river, resulting in a reduction of the natural channel area available to *M. margaritifera* and macrophyte communities. The river has recovered somewhat from the effects of resectioning. Several fisheries weirs and

one fish counter have been recently created in the lower reach of the river. These modifications have changed the natural flow regime of the river.
The river is a designated watercourse, which requires the Rivers Agency to undertake regular maintenance under their statutory requirements.
ACTION: Future in-river works should be minimised as they reduce habitat and species diversity and threaten vulnerable shellfish populations. Due to the dynamic nature of rivers, work carried out at any point on the river may have a significant impact on the catchment as a whole.

Habitat enhancement schemes, such as the 'Salmonid Enhancement Programme' should be thoughtfully planned. Properly executed enhancement schemes can significantly improve the wildlife potential of rivers, but it is important to effectively manage the installation of structures such as weirs, as they may have a negative effect on species diversity by causing excessive damming of the channel. In the past, the construction of weirs by fishing clubs as part of the programme has locally altered the morphology of the river. Enhancement work should be limited to areas of river that have been extensively modified by past drainage schemes and which have lost much of their natural dynamic character.
ACTION: Initiate discussions with Loughs Agency/DARD Fisheries Division and Environmental Protection to co-ordinate action.

Substrate Siltation
A significant portion of the area is afforested (especially the upper catchments), with a potential risk of sediment release during forestry operations, especially clear-felling.
ACTION: Liaise with Forest Service during felling and re-stocking programmes to minimise potential impacts (including potential eutrophication from planting and fertiliser application).

Sand wash from a number of commercial sandpits in the upper reaches of the river has resulted in siltation of the riverbed downstream.
ACTION: Monitor and control sediment input levels immediately downstream of sandpits.

Where the bank and channel of the river are accessible to stock, damage to *Margaritifera* beds, Salmon spawning grounds and the macrophyte community may occur. Trampling has an obvious direct impact but in some sections of the river, trampling and poaching of the river bank and channel have caused erosion, resulting in siltation of the riverbed downstream.
ACTION: Restrict livestock access to drinking areas only.

Sand Extraction
Small-scale sand extraction from the riverbed has been an ongoing practice by farmers, particularly in the lower reaches of the river. This disturbance results in

damage to the river morphology and increase in sediment loading, thus directly and indirectly affecting spawning beds and the macrophyte community.
ACTION: Under the Notifiable Operations, this activity is prohibited; ensure compliance with the ASSI Schedule.

Fish Farms
Fish farms can have a very serious impact on rivers. Fish farms normally abstract water from the river and release effluent downstream. Where the abstraction is large relative to streamflow, the channel between points of abstraction and release may have a much reduced discharge and water velocity. The effect can be so extreme that the upstream movement of migrating fish and other water-borne wildlife is obstructed.

In addition, effluents from intensive fish farms may have a modified temperature and pH, may be contaminated with toxic materials and may carry waste and partly decomposed food and the metabolic products of the fish. This can lead to increased oxygen demand (and hence a low oxygen concentration in the water), increased suspended solids and enrichment of the recipient stream.

Proposals for fish farms in the area will require very careful environmental assessment. In particular, it is imperative to ensure that an adequate compensatory flow is maintained and that that the effluent is adequately treated.
ACTION: Review existing Water Act consents.

Water Extraction
A natural flow regime is essential for the maintenance of many of the selection features. Proposals for water extraction in the area will require very careful environmental assessment.
ACTION: Review existing Water Act consents.

Fly-tipping
Small-scale fly tipping has occurred along the river banks and in the river channel as well as in adjacent woodland.
ACTION: Removal of dumped material from the banks and channel and removal of any rubbish from the woodland, to prevent the build up of debris and so discourage further tipping.

Alien species
At present Giant Hogweed *Heracleum mantegazzianum* and Indian Balsam *Impatiens glandulifera* are present along the riverbanks only in limited sections of the lower river reaches.
ACTION: Monitor and if necessary control the spread of alien species .

WOODLAND HABITATS AND SPECIES

Grazing/Poaching/Tree barking and Browsing

Free access to some woodland by domestic stock and feral goats is causing direct damage to the ground flora community by poaching and trampling. Grazing, barking and browsing can prevent regeneration leading to profound changes in woodland structure and composition. Information on current grazing levels of domestic stock within privately owned woodland is not readily available. No information of the current population of feral goats is available.

ACTION: Investigate current grazing practices. Where necessary, reduce stocking pressure in woods to sustainable levels or exclude stock altogether by fencing off woodland under MOSS agreements. Undertake census of the current feral goat population. If necessary, initiate control measures to reduce numbers to acceptable levels.

Invasion by exotics

Exotic species are widespread in the Owenkillew Woodland. They vary in the degree of impact they have and the threats they pose – for example, species such as Sycamore *Acer pseudoplatanus*, Indian Balsam *Impatiens glandulifera*, Salmon Berry *Rubus spectabilis* can be very invasive, while some are not seen as a immediate threat due to their limited occurrence (e.g. Rhododendron *Rhododendron ponticum*), or slow rate of spread (e.g. Beech *Fagus sylvatica*).

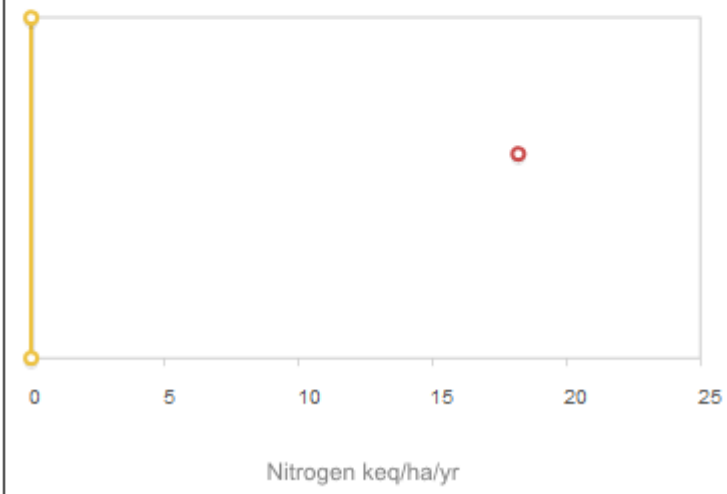
The most invasive species require management to control their spread – i.e. removal of seed sources. This is impractical with species such as Indian Balsam *Impatiens glandulifera* whose seed supply is partly recruited annually from water-borne seeds – indeed, it may be impossible to control the spread of this species, so research needs to be carried out to identify the effect it may have on the woodland community.

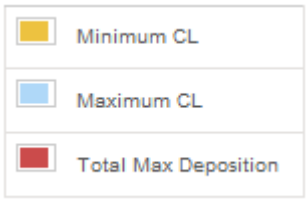
ACTION: Control invasive species where appropriate (e.g. Remove seeding Sycamore). Monitor other exotic species.

Nitrogen Deposition

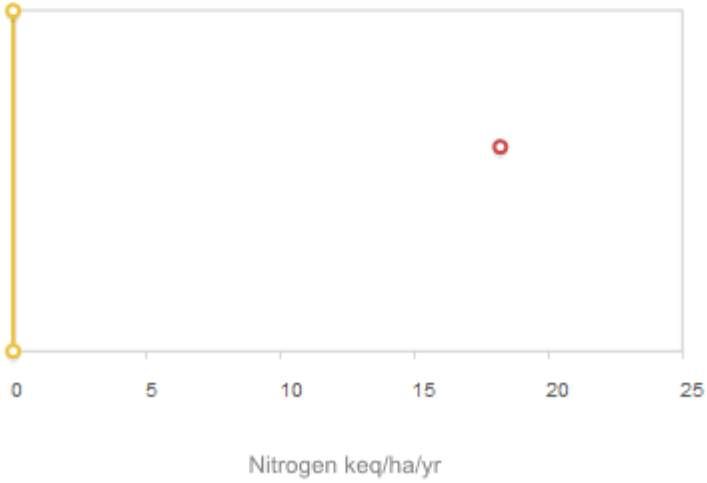
Excess nitrogen deposition can favour the growth of competitive plants and lead to changes in ecosystem structure or function and to a reduction in biodiversity. National scale studies show the potential adverse effects of excess nitrogen on natural and semi-natural habitats to be widespread across the UK. Lower and upper critical loads have been calculated for the Owenkillew River SAC.

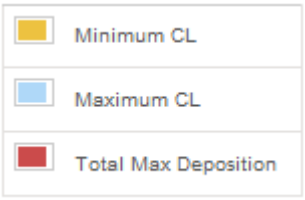
Feature: Margaritifera margaritifera - Freshwater pearl mussel
Critical Load Class: No comparable habitat with established critical load estimate available
Critical Loads (kg N/ha/yr): no critical loads available for this feature
Nitrogen Deposition (kg N/ha/yr):
Maximum: 18.2 Minimum: 10.2 Average: 12.4



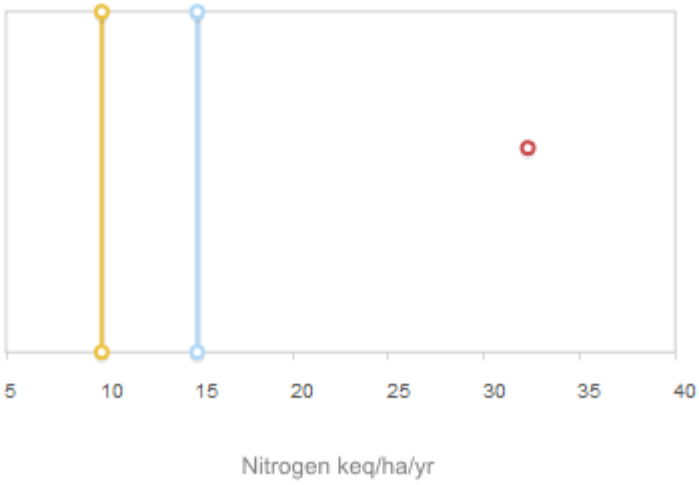


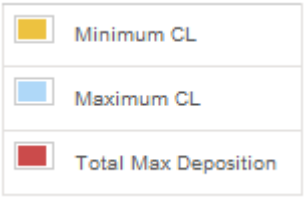
Feature: Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation
Critical Load Class: No comparable habitat with established critical load estimate available
Critical Loads (kg N/ha/yr): no critical loads available for this feature
Nitrogen Deposition (kg N/ha/yr):
Maximum: 18.2 Minimum: 10.2 Average: 12.4



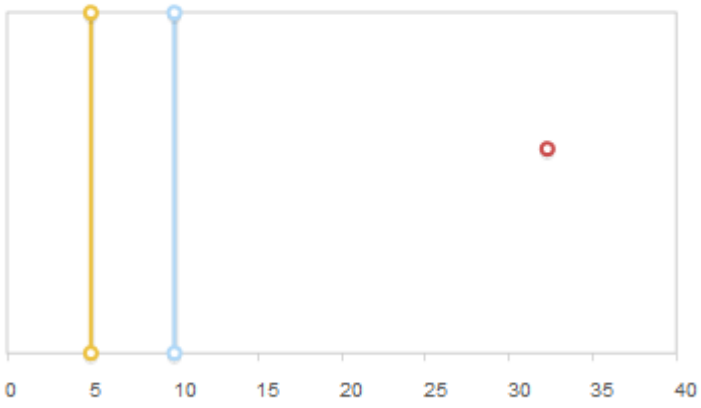


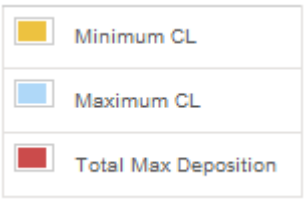
Feature: Old sessile oak woods with Ilex and Blechnum in the British Isles
Critical Load Class: Acidophilous Quercus-dominated woodland
Critical Loads (kg N/ha/yr): 10-15
Nitrogen Deposition (kg N/ha/yr):
Maximum: 32.3 Minimum: 23.9 Average: 26.5



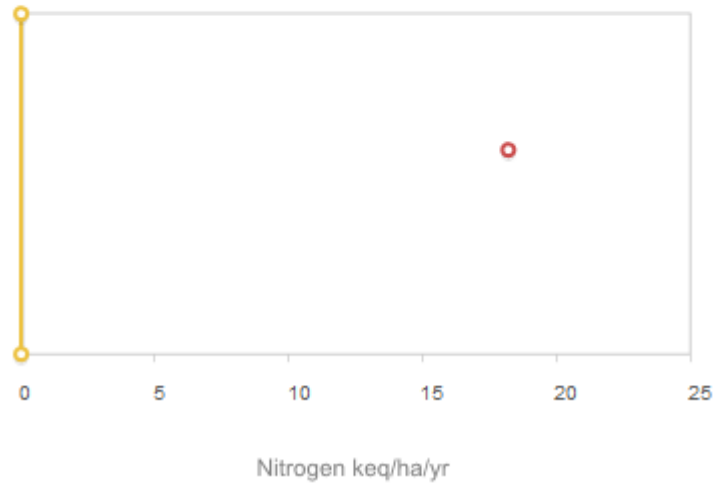


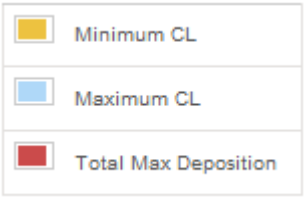
Feature: Bog woodland
Critical Load Class: Raised and blanket bogs
Critical Loads (kg N/ha/yr): 5-10
Nitrogen Deposition (kg N/ha/yr):
Maximum: 32.3 Minimum: 23.9 Average: 26.5



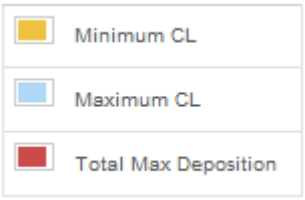


Feature: Lutra lutra - Otter
Critical Load Class: No comparable habitat with established critical load estimate available
Critical Loads (kg N/ha/yr): no critical loads available for this feature
Nitrogen Deposition (kg N/ha/yr):
Maximum: 18.2 Minimum: 10.2 Average: 12.4





Feature: Salmo salar - Atlantic salmon
Critical Load Class: No comparable habitat with established critical load estimate available
Critical Loads (kg N/ha/yr): no critical loads available for this feature
Nitrogen Deposition (kg N/ha/yr):
Maximum: 18.2 Minimum: 10.2 Average: 12.4



(Source: Air Pollution Information System (APIS) website- www.apis.ac.uk)

ACTION: Seek to maintain or where necessary, restore concentrations and deposition of air pollutants to at or below the site-relevant critical load.

Changes to surrounding land use

Any changes in local land-use e.g. agricultural intensification, drainage works and development) may be detrimental to the SAC.

ACTION: Reduce the risk of surrounding agricultural intensification by encouraging the adjacent owner/occupiers to enter into agri-environment schemes. Use Habitats Regulations Assessments (HRAs), through the planning process, to minimise any development risks adjacent to the SAC.

Climate Change
Northern Ireland faces changes to its climate over the next century. Indications are that we will face hotter, drier summers, warmer winters and more frequent extreme weather events.
ACTION: When developing SAC management plans, the likely future impacts of climate change should be considered and appropriate changes made.

12. MONITORING

Monitoring of SACs takes place using two monitoring techniques.

Site Integrity Monitoring (SIM) is carried out to ensure compliance with the ASSI/ SAC Schedule. The most likely processes of change will either be picked up by SIM (e.g. dumping, burning, turf cutting, grazing etc.) or will be comparatively slow (e.g. gradual degradation of the habitat).

These longer-term changes will be picked up by monitoring of the feature via **Site Condition Assessment** - this is carried out on a rolling basis to pick up subtle changes in the condition of the feature.

The method for Site Condition Assessment was agreed by the relevant JNCC-led Lead Co-ordination Network although the methodology has been modified to reflect individual site attributes in Northern Ireland.

12.1 MONITORING SUMMARY

1. *Monitor the integrity of the site (SIM or Compliance Monitoring)*

Complete boundary survey to ensure that the boundary features, where present are still intact. Ensure that there has been no tree felling, ground or riverbed disturbance, fly-tipping or inappropriate burning carried out within the SAC boundary. Evaluating stocking densities would also be desirable, whilst a check for feral goat damage should be carried out throughout the site. Inspection of river reaches with Pearl Mussel colonies should be undertaken once a year to ensure there has not been any pearl fishing. The SIM should be carried out once a year.

2. Monitor the condition of the site (Condition Assessment)
Monitor the key attributes for each of the SAC selection features. This will detect if the features are in favourable condition or not. See Annex I.

The favourable condition table provided in Annex 1 is intended to supplement the conservation objectives only in relation to management of established and ongoing activities and future reporting requirements on monitoring condition of the site and its features. It does <u>not by itself</u> provide a comprehensive basis on

which to assess plans and projects, but it does provide a basis to inform the scope and nature of any Habitats Regulations Assessment (HRA) that may be needed. It should be noted that completion of a HRA is a separate activity to condition monitoring, requiring consideration of issues specific to individual plans or projects.

13. REFERENCES

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ANNEX I

Feature 1 (SAC) – Freshwater Pearl Mussel *Margaritifera margartifera* (Status B)

(* = primary attribute. One failure among primary attribute = unfavourable condition)

Attribute	Measure	Targets	Comments
*Population dynamics	Number	Stable or increasing	
	Age structure	20% of population <20 years old with aged individuals (>60 years) also present	A least-cost methodology for monitoring this attribute is being investigated, involving the sampling of representative reaches within an SAC. An abundant supply of juvenile salmonids is vital to the survival of the larval stage. The relative importance of salmon and migratory and non-migratory brown trout populations to pearl mussel will vary between rivers. Physical and chemical conditions need to be suitable for the well being of all life stages of salmonids, including free access up the river and conditions in the estuary and lower river where the juveniles of migratory salmonids are present.
	Maximum age	80-110 years	
	Mortality rate	No more than 10% of the population in 10 years	
	Fish host populations: Juvenile salmonid densities (0+ and 1+ year classes)	Should be abundant (to be refined following the results of LIFE project on pearl mussel/fish host relationships)	

	Biological disturbance: Introductions	No stocking/translocation of pearl mussel unless agreed to be in the best interests of the population	Little work has been undertaken on pearl mussel genetics. However, given the sedentary nature of the pearl mussel, genetically discrete populations are likely.
		Absence of rainbow trout and brook trout and any other non-native species that may impair juvenile densities of salmon and brown/sea trout.	Rainbow trout and brook trout are resistant to glochidial infection and are, therefore, not suitable host species. Stocking of these species will create competition with native salmonids and is likely to reduce host opportunities for glochidia.
	Exploitation	No fishing for pearl mussels	
*Physical integrity	Disturbance of habitat	No disturbance of existing mussel beds by in-river activities	Relevant activities include fishing and watering stock (wading in the river) and canoeing (at access points to the river).
	River morphology	Maintain and where necessary restore [*to an extent characteristic of the river/reach*	

	River Substrate	<10% fines in top 30cm of substrates hosting juvenile & adult mussels.	Elevated levels of fines can clog substrates used by juvenile mussels and can impair adult feeding/respiration. The target for salmon has been used for pearl mussels in the absence of species-specific information Sources of fines include; run-off from arable land, land (especially banks) trampled by livestock, sewage and industrial discharges.
*Water quantity	Flow	Flow regime should be characteristic of the river. As a guideline, at least 90% of the naturalised daily mean flow should remain in the river throughout the year	
*Water quality:	Biological class. Environment Protection's General Quality Assessment scheme. Assess every years.	'A'	
	Ecosystem Class. Environment Protection's General Quality Assessment scheme. Assess every years	'A'	
	Pollution	No Sheep dip	

	Minimal Algae cover	Should be <5% coverage over mussel beds and potentially suitable areas of coarse substrate	Extent of filamentous algal growth: Algal mats can impair respiration, feeding, fertilisation and the release of glochidia.
	Suspended solids	Annual mean <10mg L-1	

Feature 2 (SAC) – Water courses of plain to montane levels with the *Ranunculus fluitans* and *Callitricho-Batrachion* vegetation (Status B)

(* = primary attribute. One failure among primary attribute = unfavourable condition)

Attribute	Measure	Targets	Comments
*Population dynamics	Extent	Coverage should be characteristic of river type.	High cover of *Ranunculus spp* is not necessarily indicative of favourable condition.
	Reproduction *(only applies where control measures are implemented)*	*Ranunculus* should be able to flower and set seed, in suitable habitat.	Flowering outside the normal period and weed cutting or other activities that do not leave patches (at least 25% in every 100 metres of river) to flower and set seed are indicators of unfavourable condition. Use of herbicides should be avoided.
*Macrophyte assemblage	Composition	Characteristic plant species should dominate the assemblage. Indicators of unfavourable condition should be rare.	The absence of *Ranunculus* and high frequency of occurrence of blanketweed and other algae, or dominance of *Potamogeton pectinatus* are signs of unfavourable condition.

Water quantity	Flow	Flow regime should be characteristic of the river. As a guideline, at least 90% of the naturalised daily mean flow should remain in the river throughout the year.	
Physical integrity	River morphology	Maintain and where necessary restore [*to an extent characteristic of the river/reach*]	
	River substrate	Channels should be dominated by clean gravels. Maximum fines content should not be too great to prevent the establishment of new plants.	Siltation of riverine sediments, caused by high particulate loads and/or reduced scour within the channel, is a major threat to interest features. Elevated fines levels can interfere with the establishment of *Ranunculus* plants. Sources of fines include; run-off from arable land, land (especially banks) trampled by livestock, sewage and industrial discharges.
*Water quality:	Biological class. Environment Protection's General Quality Assessment scheme. Assess every years.	'A'	

	Ecosystem Class. Environment Protection's General Quality Assessment scheme. Assess every years	'A'	
	Suspended solids	Annual mean <10mg L-1	
	Soluble Reactive Phosphorus	*Targets should be set in relation to river/reach types (and should be near background levels)* <0.02mg/l - upland watercourses <0.06mg/l mid-altitude watercourses on hard substrates	

ANNEX I

Feature 3 (SAC) - Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles (Status B)

* = primary attribute. One failure among primary attribute = unfavourable condition

Attribute	Targets	Method of Assessment	Comments
* Area of Oakwood	Maintain the extent of Oakwood at 79.3ha.	Visual estimate in 10x10m plots and across the extent of the woodland using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Loss due to natural processes (e.g. wind-throw during extreme storm) is acceptable.
Oakwood community diversity	Maintain presence of woodland communities, W11, W17, W9 & W7 as established at base line survey.	Visual estimate in 10x10m plots	
Presence of associated features and semi-natural habitats	Maintain existing associated features and semi-natural habitats (wet/bog woodland, wet heath, semi-natural grasslands etc.)	Visual estimate in 10x10m plots and across the extent of the ASSI using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Repeat monitoring of plots using GPS should indicate whether mosaics and associated habitats have changed or been lost. Note: Loss of associated habitats to Oakwood may be desirable in some instances.

* Structural variation (% cover)	Mean canopy cover greater than 70%	Estimate within the visual vicinity of the monitoring plots.	A well structured wood should have a well developed canopy and shrub layer.
	Mean shrub cover should be maintained between 20 - 50%	Estimate within the visual vicinity of the monitoring plots.	
	Maintain current levels of standard variation within reasonable limits for field, herb and moss cover. Where present assess cover of *Luzula sylvatica*.	Visual estimate in 10x10m plots.	At least the current level of structural diversity should be maintained for field cover, herb cover and moss cover. Limits to be set for each site after the baseline survey. Note: *L. sylvatica* may be dominant in many W11 oakwood communities. The percentage cover of this species may affect Oak regeneration, but more information is required before that assumption can be made.
		Visual estimate in 10x10m plots.	
		Visual estimate in 10x10m plots.	
		Visual estimate in 10x10m plots.	
	Mean cover of bare ground should be less than 5% Bare ground does not include boulders or rocks.	Visual estimate in 10x10m plots.	
* Age-class variation (DAFOR)	Young trees (5- 20cm diameter) at least occasional in 25% of plots	Estimate within the visual vicinity of the monitoring plots.	Age-class structure should be appropriate to the site, its history and management; however, in general, there should be a spread of different age-classes present, including young and over-mature trees. However, on very steep sided slopes with shallow soils, over-mature trees are unlikely to occur as larger trees are likely to fall over before becoming over –mature. Note, that in many cases achieving the set targets is a long term aim. However, providing the correct management practices are in place, this attribute may be recorded as Unfavourable - recovering.
	Mature trees (20 - 75cm diameter) at least frequent in 75% of plots	Estimate within the visual vicinity of the monitoring plots.	
	Over-mature trees (>75cm diameter) at least present in 10% of plots	Estimate within the visual vicinity of the monitoring plots.	

* Presence of standing and fallen dead wood (DAFOR)	Standing dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
	Fallen dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	
* Presence of epiphytes and climbers (DAFOR)	Epiphytes and climbers at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	Epiphytes and climbers are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
* Presence of epiphytic bryophytes and lichens (DAFOR)	Epiphytic bryophytes and lichens at least occasional in 70% of plots and frequent in 30% of plots.	Visual estimate in 10x10m plots.	Epiphytic bryophytes and lichens are an important component in all woodlands. However, in the extreme south east of Northern Ireland, where the climate is much warmer and drier, the generic limits may be set too high and may need amended for individual sites.
* Regeneration potential (DAFOR) Maintain current levels of native tree regeneration within reasonable limits for the current structure of the Oak woodland.	Regeneration of Oak seedlings.	Visual estimate in 10x10m plots.	The general aim is for the successful establishment of young stems (i.e. seedlings growing through to saplings to young trees) in gaps or on the edge of a stand at sufficient density to maintain canopy density over a 10 year period. Regeneration of Oak in particular is likely to be slow and sporadic; in some stands, there may currently not be sufficient and/or extensive enough gaps in the canopy for oak to regenerate. This does not necessarily indicate unfavourable condition.
	Regeneration of Oak saplings	Visual estimate in 10x10m plots.	
	Regeneration of other native seedlings.	Visual estimate in 10x10m plots.	
	Regeneration of other native saplings.	Visual estimate in 10x10m plots.	

* Cover of non-native species (all layers) (presence/absence)	Non–native invasive canopy species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	The canopy of the Oak woodland should be largely comprised of Oak trees. Non-native species are undesirable in the canopy, particularly invasive species such as Sycamore. In addition, non-native invasive species in any one layer is un-desirable. Note that non-invasive species are not viewed as a significant threat, and a low level of occurrence may be acceptable.
	Non–native invasive shrub species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non-native invasive canopy species seedlings/saplings should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non–native invasive ground flora species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
*Frequency and cover of eutrophication indicators: (DAFOR)	No one negative species no more than occasional throughout the wood and/or singly or together comprising more than 5% cover. *Galium aparine, Urtica dioica, Heracleum spp, Epilobium spp. Rumex obtusifolius* No more than occasional is equivalent to less than 40% occurrence in recorded plots.	Visual estimate in 10x10m plots.	
* Cover of *Pteridium* (% cover)	The mean cover of *Pteridium* for the wood should be less than	Visual estimate in 10x10m plots.	

	10%.		
* Cover of grasses (non-woodland species) (% cover)	The mean cover of grass for the wood should be less than 10%.	Visual estimate in 10x10m plots.	A high cover of grasses indicates past and/or present grazing. Where heavy grazing has been a past management practice, the natural woodland ground flora will take a considerable time to re-establish (time limits for restoration currently unknown). However, providing the grazing pressure has been addressed, and there is evidence that woodland flora is beginning to re-appear, this attribute may be recorded as unfavourable, recovering.
Management /Disturbance			
* Grazing (DAFOR)	Grazing should be recorded as no more than occasional over 80% of plots.	Estimate within the visual vicinity of the monitoring plots.	Grazing by domestic stock, where it occurs should be light resulting in minimal damage to the ground flora through poaching and damage to seedlings and saplings.
* Poaching by cattle (DAFOR)	Poaching should be absent, or recorded in less than 20% of plots and frequent in less than 10% of plots.	Visual estimate in 10x10m plots.	
*Frequency of recent goat damage (1-2 years) (DAFOR)	Recent goat damage should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
*Frequency of damage to seedlings/saplings (DAFOR)	Damage to seedling/saplings should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
Frequency of felling/coppicing (within 6 year monitoring cycle)	There should be no felling or coppicing of native trees or shrubs.	Visual estimate in 10x10m plots and across the extent of the ASSI using a	Felling non-native species as part of management for conservation is acceptable.

(DAFOR)		combination of aerial photographs, SIM and Condition Assessment structured walk.	
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the acid woodland indicators (W11 & W17 communities) listed below:- *Vaccinium myrtillus,* *Blechnum spicant,* *Dicranum spp.,* *Luzula pilosa,* *Rhytidiadelphus loreus*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained. However, the W11 & W17 communities should dominate the woodland.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the base-rich woodland indicators (W9 community) listed below:- *Sanicla europea,* *Geum urbanum,* *Polystichum setiferum,* *Aneomne nemorosa,* *Primula vulgaris.*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained.
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the flushed woodland indicators (W7 community) listed below:- *Carex remota,* *Ranunculus repens,* *Chrysosplenium oppositifolium,* *Filipendula ulmaria,* *Lysimachia nemorum.*	Visual estimate in 10x10m plots.	Within any Oak woodland, there may be pockets of base-rich woodland and or flushed woodland within the boundaries of the SAC. The diversity of these woodland communities should be maintained.

Presence of rare or scarce species specific to the site.	Maintain current levels of standard variation within reasonable limits for rare and notable species. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Name the species at least present along the length of the Condition Assessment structured walk.	

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

ANNEX 1

Feature 4 (SAC) – Bog woodland (Status C)

* = primary attribute. One failure among primary attribute = unfavourable condition

Attribute	Targets	Method of Assessment	Comments
* Area of Bog woodland	Maintain the extent of Bog woodland at 1.5ha.	Visual estimate in 10x10m plots and across the extent of the woodland using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Loss due to natural processes (e.g. wind-throw during extreme storm) is acceptable
Wet woodland community diversity	Maintain presence of the woodland communities W4 and W2 as established at base line survey.	Visual estimate in 10x10m plots	
Presence of associated features and semi-natural habitats	Maintain existing associated features and semi-natural habitats.	Visual estimate in 10x10m plots and across the extent of the ASSI using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Repeat monitoring of plots using GPS should indicate whether mosaics and associated habitats have changed or been lost. Note: Loss of associated habitats to Bog woodland may be desirable in some instances.
Vegetation structure			
* Structural Variation (% cover)	Mean canopy cover greater than 60%	Estimate within the visual vicinity of the monitoring plots.	A well structured wood should have a well developed canopy and shrub layer.

	Mean shrub cover should be maintained between 10-50%	Estimate within the visual vicinity of the monitoring plots.	
	Maintain current levels of standard variation within reasonable limits for field, herb cover and moss cover. In addition record the cover of *Molinia caerulea* and the cover of *Sphagnum* mosses.	Visual estimate in 10x10m plots.	At least the current level of structural diversity should be maintained for field cover, herb cover and moss cover.
		Visual estimate in 10x10m plots.	
		Visual estimate in 10x10m plots.	
		Visual estimate in 10x10m plots.	
		Visual estimate in 10x10m plots.	
	Mean cover of bare ground should be less than 5% Bare ground does not include boulders or rocks	Visual estimate in 10x10m plots.	
* Age-class variation (DAFOR)	Young trees (5- 20cm diameter) at least occasional in 25% of plots	Visual estimate in 10x10m plots.	Age-class structure should be appropriate to the site, its history and management; however, in general, there should be a spread of different age-classes present, including young and over-mature trees. Note that definition of young, mature and over-mature differs from drier woodland types, reflecting the fact that Birch will generally be the dominant species.
	Mature trees (20 - 75cm diameter) at least frequent in 50% of plots	Visual estimate in 10x10m plots.	
	Over-mature trees (>75cm diameter) at least present in 5% of plots	Visual estimate in 10x10m plots.	
* Presence of standing and fallen dead wood (DAFOR)	Standing dead wood at least occasional in 70% of plots and at least frequent in 30% of plots.	Visual estimate in 10x10m plots.	In wet woodland, dead wood is often abundant but because there tend to be fewer big trees the size of the fallen wood is often small.
	Fallen dead wood at least	Visual estimate in 10x10m	

	occasional in 70% of plots and at least frequent in 30% of plots.	plots.	
* Presence of epiphytes and climbers (DAFOR)	Epiphytes and climbers at least frequent in 10% of plots.	Visual estimate in 10x10m plots.	Epiphytes and climbers are an important component in all woodlands. However, they are less of a feature in Bog Woodlands than in other woodland types.
* Presence of epiphytic bryophytes and lichens (DAFOR)	Epiphytic bryophytes and lichens at least frequent in 75% of plots.	Visual estimate in 10x10m plots.	Epiphytic bryophytes and lichens are an important component in all woodlands, especially Bog woodlands.
* Regeneration potential (DAFOR) Maintain current levels of native tree regeneration within reasonable limits for the current structure of Bog woodland.	Regeneration of native seedlings.	Visual estimate in 10x10m plots.	The general aim is for the successful establishment of young stems (i.e. seedlings growing through to saplings to young trees) in gaps or on the edge of a stand at sufficient density to maintain canopy density over a 10 year period. Regeneration of some native species is likely to be slow and sporadic; in some stands, there may currently not be sufficient and/or extensive enough gaps for young trees to regenerate. This does not necessarily indicate unfavourable condition.
	Regeneration of native saplings.	Visual estimate in 10x10m plots.	
* Cover of non-native species (all layers) (presence/absence)	Non–native invasive canopy species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	The canopy of Bog Woodland should be largely comprised of Birch and Willow trees with associated native species. Non-native species are undesirable in the canopy, particularly invasive species such as Sycamore.
	Non–native invasive shrub species should be present in less than 20% of plots, but	Visual estimate in 10x10m plots.	

	never frequent.		In addition, non-native invasive species in any one layer is un-desirable. Note that non-invasive species are not viewed as a significant threat, and a low level of occurrence may be acceptable.
	Non-native invasive canopy species seedlings/saplings should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
	Non–native invasive ground flora species should be present in less than 20% of plots, but never frequent.	Visual estimate in 10x10m plots.	
* Frequency and cover of eutrophication indicators: (DAFOR)	No one negative species no more than occasional throughout the wood and/or singly or together comprising more than 5% cover. *Galium aparine, Urtica dioica, Heracleum spp, Epilobium spp. Rumex obtusifolius* No more than occasional is equivalent to less than 40% occurrence in recorded plots.	Visual estimate in 10x10m plots.	
* Cover of *Pteridium* (% cover)	The mean cover of *Pteridium* for the wood should be less than 10%.	Visual estimate in 10x10m plots.	
* Cover of grasses (excluding *Molinia* and woodland species) (% cover)	The mean cover of undesirable grass species for the wood should be less than 10%.	Visual estimate in 10x10m plots.	W4 *Betula pubescens-Molinia caerulea* woodland is the main bog woodland community in Northern Ireland and has a naturally high *Molinia* component of the ground flora. However, where *Molinia* is not predominant, a high grass component other than woodland species indicates past and/or

			present grazing and is undesirable. Nvertheless, providing the grazing pressure has been addressed, and there is evidence that woodland flora is beginning to re-appear, this attribute may be recorded as unfavourable, recovering.
Management /Disturbance			
*Grazing (DAFOR)	Grazing should be recorded as no more than occasional over 80% of plots.	Estimate within the visual vicinity of the monitoring plots.	Grazing by domestic stock, where it occurs should be light resulting in minimal damage to the ground flora through poaching and damage to seedlings and saplings.
*Poaching by cattle (DAFOR)	Poaching should be absent, or recorded in less than 20% of plots and frequent or more in less than 10 % of plots.	Visual estimate in 10x10m plots.	
*Frequency of recent goat damage (1-2 years) (DAFOR)	Recent goat damage should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
*Frequency of damage to seedlings/saplings (DAFOR)	Damage to seedling/saplings should be absent, or recorded in less than 20% of plots.	Visual estimate in 10x10m plots.	
Frequency of felling/coppicing (within 6 year monitoring cycle) (DAFOR)	There should be no felling or coppicing of native trees or shrubs.	Visual estimate in 10x10m plots and across the extent of the ASSI using a combination of aerial photographs, SIM and Condition Assessment structured walk.	Felling non-native species as part of management for conservation is acceptable.

Vegetation composition –			
Maintain the diversity of woodland species throughout the wood.	Record the % of plots with each of the Bog Woodland indicators (W2 and W4 communities) listed below:- *Betula pubescens,* *Salix cinerea,* *Filipendula ulmaria,* *Viola palustris,* *Phragmites australis,* *Molinia caerulea,* *Carex laevigata,* *Brachythecium rutabulum,* *Sphagnum squarrosum,* *S. recurvum,* *S. fimbriatum,* *S. palustris.*	Visual estimate in 10x10m plots.	
Indicators of Local Distinctiveness			
Presence of rare or scarce species specific to the site.	Maintain current levels of standard variation within reasonable limits for rare and notable species. If these species are not recorded on any one visit, it does not automatically make the site unfavourable.	Name the species at least present along the length of the Condition Assessment structured walk.	

Frequency -
1-20% = Rare
21-40% = Occasional
41- 60% = Frequent
> 60% = Constant

ANNEX 1

Feature 5 (SAC) – Otter *Lutra lutra* (Status C)

Attribute	Measure	Target	Notes
Presence of otters	Presence of one or more of the following signs within the site: Positive identification of otter spraint, footprints, tracks, paths, lying-up sites or feeding signs.	Signs of otters found at least once per year	Use data from other surveys or Ulster Museum, if available
	Sightings of otters.		
	Positive identification of holt(s).		
Bankside/ Waterside cover	Presence of cover: Mature trees, woodland, scrub, other tall bankside vegetation, reed and sedge beds.	No overall permanent decrease	Some change acceptable as long as it is appropriately mitigated
Water quality	EP water quality scale	Water quality should be at least category A or B, according to EP guidelines, with no pollution incidents	Refer to Environment Protection for data
Food Sources	Assessment of fish stocks and other food sources (e.g.amphibians)	Fish stocks appropriate to the nutrient status of the river, with no significant decline in fish biomass or species diversity	Refer to appropriate Agency for sample data if available (This information may need to be inferred from the water quality category).
Disturbance	Extent of public access to river	No significant change to river or bankside usage; no significant	

Attribute	Measure	Target	Notes
		development	
Flow rate	Mean annual flow rate	No reduction attributable to increased abstraction.	Refer to data from Rivers Agency if available
Site integrity	Total area	No reduction or fragmentation of area	

ANNEX 1

Feature 6 (SAC) – Atlantic Salmon (*Salmo salar*) (Status C)

(* = primary attribute. One failure among primary attribute = unfavourable condition)

Attribute	Measure	Targets	Comments
*Population dynamics	Number	Stable or increasing	
	Adult Run	Total run size at least matching an agreed reference level, including a seasonal pattern of migration characteristic of the river and maintenance of the multi-sea-winter component.	The N.I. equivalent of Environment Agency MBAL (Minimum Biological Acceptable Level) should be set for each catchment. Expectation needs to be tempered by the intrinsic ability of the river type to support salmon. Fish classification schemes operated regionally and nationally should permit an interpretation of performance.
	Juvenile population densities	These should not differ significantly from those expected for the river type/reach under conditions of high physical and chemical quality.	

	Biological disturbance: Introductions	The population should be naturally self-sustaining. There should be a presumption against stocking of salmon unless it is agreed to be necessary as an emergency interim measure to maintain population viability whilst underlying ecological problems are being addressed. No introduction, or stocking, of other species, or sub-species, at excessively high densities in salmon spawning and nursery areas. Effective screening on all fish farm intakes and discharges.	The nature conservation aim is to provide conditions in the river that support a healthy and natural population, achieved through habitat protection/restoration and the control of exploitation as necessary. Stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock; competition between stocked and naturally produced individuals, disease introduction and genetic alterations to the population. For these reasons, consideration of stocking is only justifiable in cases where population viability is threatened. Stock must come from within the same catchment area. The presence of artificially high densities of other fish creates unacceptably high levels of predatory and competitive pressure on juvenile salmon. Escapes from fish farms are a form of uncontrolled introduction and should be prevented.

*Population dynamics	Exploitation	All exploitation should be sustainable without compromising any components of the stock.	Controls on exploitation should include migratory passage to the SAC within territorial waters, including estuarine and coastal net fisheries, as well as exploitation within the SAC from rod fisheries.
*Physical integrity	Disturbance of habitat	No artificial barriers significantly impairing adults from reaching existing and historical spawning grounds, and smolts from reaching the sea.	In all river types, artificial barriers should be made passable. Natural barriers to potentially suitable spawning areas should not be circumvented.
	River morphology	Maintain and where necessary restore the characteristic physical features of the river channel, banks & riparian zone.	The characteristic channel morphology provides the diversity of water depths, current velocities and substrate types necessary to fulfil the spawning, juvenile and migratory requirements of the species. The close proximity of different habitats facilitates movement to new preferred habitats with age. Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this impact are not acceptable within the SAC, whilst restoration *may/will* be needed in some reaches.

	River Substrate	Clean gravels should dominate channels. <10% fines in top 30cm of spawning gravels	Elevated levels of fines can interfere with egg & fry survival through suffocation of eggs and loss of interstitial refugee for fry. Sources of fines include; run-off from arable land, land (especially banks) trampled by livestock, sewage and industrial discharges.

Water quantity	Flow	Flow regime should be characteristic of the river. As a guideline, at least 90% of the naturalised daily mean flow should remain in the river throughout the year Existing flow criteria already laid down for salmon should also be complied with.	River flow affects a range of habitat factors of critical importance to designated interest features, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. The maintenance of both flushing flows and baseflows, based on natural hydrological processes, is vital. Detailed investigations of habitat-flow relationships may indicate that a more or less stringent threshold may be appropriate for a specified reach; however, a precautionary approach would need to be taken to the use of less stringent values. Naturalised flow is defined as the flow in the absence of abstractions and discharges. The availability and reliability of data is patchy - long-term gauged data can be used until adequate naturalised data become available, although the impact of abstractions on historical flow records should be considered.

*Water quality:	Biological class. Environment Protection's General Quality Assessment scheme. Assess every year.	'a'	Generally, water quality should not be injurious to any life stage. A wide range of water quality parameters can affect the status of interest features, but standard biological monitoring techniques provide a reasonable integrated picture in relation to many parameters. The river quality classifications used in all parts of the UK have a biological component. All classified reaches within the site that contain, or should contain, the interest feature under conditions of high environmental quality should comply with the targets given.
	Ecosystem Class. Environment Protection's General Quality Assessment scheme. Assess every years	"a"	The River Ecosystem Classification 1995 sets standards for dissolved oxygen, biochemical oxygen demand, total and un-ionised ammonia, pH, copper and zinc. It therefore covers a number of water quality parameters that can cause problems within river systems. All classified reaches within the site that should contain the interest feature under conditions of high environmental quality should comply with the targets given.

	Soluble Reactive Phosphorus	*Targets should be set in relation to river/reach type(s and should be near background levels)* Annual mean <0.02mg/l - upland watercourses, <0.06mg/l mid-altitude watercourses on hard substrates and <0.2mg/l interim target for lowland rivers on clay substrates and large alluvial rivers.	The target of 25mgL^{-1} is based on the EC Freshwater Fish Directive a more precautionary figure has been used for salmon to help protect substrates used for salmon spawning. The mg/l used here are indicative values for rivers in England, the equivalent for Northern Ireland will have to be defined
*Water quality:	Pollution	None	Pollutants such as silage or Sheep dip can cause extreme mortality
	Suspended solids	Annual mean <10mgL^{-1} (spawning & nursery grounds) Annual mean <25mg L-1 (migratory passage)	Elevated levels of suspended solids can clog the respiratory structures of salmon.

APPENDIX 3

Copy of Internal memo dated 13th February 2015 produced by NIEA

NIEA Northern Ireland Environment Agency
www.ni-environment.gov.uk

Internal Memo

From: **Terry A'Hearn**
Chief Executive

Your Ref: K/2013/0072/F

Date: **13th February 2015**

To: **Scott Symington**
Planning Service

DALRADIAN GOLD LTD PLANNING APPROVAL

I am writing to confirm that NIEA are content that conditions 25 and 26 can be removed from Planning Approval K/2013/0072/F. NIEA will protect the Owenkillew River through the regulation of the Water Order Discharge Consent.

The principle objective of conditions 25 and 26 of the Planning Approval, and that of the discharge consent, are the protection of the integrity of the Owenkillew SAC and to maintain favourable condition status of the Freshwater Pearl Mussel. The Natural Environment Division of NIEA recommended inclusion of conditions 25 and 26 in the Habitats Regulations Assessment (HRA) as a precaution in the absence of any other controls.

As part of the Water Order Consent application, Water Management Unit of NIEA carried out modelling to determine the potential impact of the proposed discharge on the suspended solids levels in the Owenkillew. The proposed discharge enters the Owenkillew via the Curraghinalt Burn. The discharge is therefore diluted firstly by the existing flow in the Curraghinalt Burn, then by that in the Owenkillew upon the confluence of the two waterways. The modelling indicated that compliance with the Water Order consent condition of 50mg/litre will protect the 10 mg/litre suspended solids objective in the Owenkillew, subject to the upstream concentrations in the Owenkillew not exceeding this level. The Water Order Consent is therefore considered to be appropriate mitigation to the risks identified in the HRA.

In line with the precautionary approach a number of other parameters relating to the Owenkillew River have been listed within condition 25 of the Planning Permission. These parameters are taken from Table 2.5 of the report "Proposals for Owenkillew Sub Basement Management Plan" and are designed to achieve favourable status for the Freshwater Pearl Mussel. Subsequent to drafting of the planning conditions, WMU of NIEA has carried out a detailed assessment as part of the Water Order Consent application process.

This assessment found that the proposed activities would not present a risk to the standards listed and as a result no additional conditions have been set within the consent.

[signed]

TERRY A'HEARN