

National Parks and Wildlife Service

Conservation Objectives Series

Knocksink Wood SAC 000725



An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

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Introduction

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest. These habitats and species are listed in the Habitats and Birds Directives and Special Areas of Conservation and Special Protection Areas are designated to afford protection to the most vulnerable of them. These two designations are collectively known as the Natura 2000 network.

European and national legislation places a collective obligation on Ireland and its citizens to maintain habitats and species in the Natura 2000 network at favourable conservation condition. The Government and its agencies are responsible for the implementation and enforcement of regulations that will ensure the ecological integrity of these sites.

A site-specific conservation objective aims to define favourable conservation condition for a particular habitat or species at that site.

The maintenance of habitats and species within Natura 2000 sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Favourable conservation status of a habitat is achieved when:

- its natural range, and area 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.

The favourable conservation status of a species is achieved 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 populations on a long-term basis.

Notes/Guidelines:

1. The targets given in these conservation objectives are based on best available information at the time of writing. As more information becomes available, targets for attributes may change. These will be updated periodically, as necessary.
2. An appropriate assessment based on these conservation objectives will remain valid even if the targets are subsequently updated, providing they were the most recent objectives available when the assessment was carried out. It is essential that the date and version are included when objectives are cited.
3. Assessments cannot consider an attribute in isolation from the others listed for that habitat or species, or for other habitats and species listed for that site. A plan or project with an apparently small impact on one attribute may have a significant impact on another.
4. Please note that the maps included in this document do not necessarily show the entire extent of the habitats and species for which the site is listed. This should be borne in mind when appropriate assessments are being carried out.
5. When using these objectives, it is essential that the relevant backing/supporting documents are consulted, particularly where instructed in the targets or notes for a particular attribute.

Qualifying Interests

* indicates a priority habitat under the Habitats Directive

000725 Knocksink Wood SAC

7220 Petrifying springs with tufa formation (Cratoneurion)*

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion
incanae, Salicion albae)*

Supporting documents, relevant reports & publications

Supporting documents, NPWS reports and publications are available for download from: www.npws.ie/Publications

NPWS Documents

Year :	2008
Title :	National survey of native woodlands 2003-2008
Author :	Perrin, P.M.; Martin, J.; Barron, S.; O'Neill, F.H.; McNutt, K.E.; Delaney, A.
Series :	Unpublished report to NPWS
Year :	2009
Title :	Ireland Red List No. 2: Non-marine molluscs
Author :	Byrne, A.; Moorkens, E.A.; Anderson, R.; Killeen, I.J.; Regan, E.C.
Series :	Ireland Red List series, NPWS
Year :	2010
Title :	A provisional inventory of ancient and long-established woodland in Ireland
Author :	Perrin, P.M.; Daly, O.H.
Series :	Irish Wildlife Manuals, No. 46
Year :	2010
Title :	Ireland Red List No. 4: Butterflies
Author :	Regan, E.C.; Nelson, B.; Aldwell, B.; Bertrand, C.; Bond, K.; Harding, J.; Nash, D.; Nixon, D.; Wilson, C.J.
Series :	Ireland Red List series, NPWS
Year :	2012
Title :	Ireland Red List No. 8: Bryophytes
Author :	Lockhart, N.; Hodgetts, N.; Holyoak, D.
Series :	Ireland Red List series, NPWS
Year :	2013
Title :	Conservation status assessment for petrifying springs
Author :	Lyons, M.D.; Kelly, D.L.
Series :	Unpublished report to NPWS
Year :	2013
Title :	Results of a monitoring survey of old sessile oak woods and alluvial forests
Author :	O'Neill, F.H.; Barron, S.J.
Series :	Irish Wildlife Manuals, No. 71
Year :	2016
Title :	Monitoring guidelines for the assessment of petrifying springs in Ireland
Author :	Lyons, M.D.; Kelly, D.L.
Series :	Irish Wildlife Manuals, No. 94
Year :	2016
Title :	Ireland Red List No. 10: Vascular Plants
Author :	Wyse Jackson, M.; FitzPatrick, Ú.; Cole, E.; Jebb, M.; McFerran, D.; Sheehy Skeffington, M.; Wright, M.
Series :	Ireland Red Lists series, NPWS
Year :	2019
Title :	Checklists Protected and Threatened Species in Ireland 2019
Author :	Nelson, B.; Cummins, S.; Fay, L.; Jeffrey, R.; Kelly, S.; Kingston, N.; Lockhart, N.; Marnell, F.; Tierney, D.; Wyse Jackson, M.
Series :	Irish Wildlife Manuals, No. 116

Year : 2021
Title : Checklists Protected and Threatened Species in Ireland. Version 2.1. 3 December 2021
Author : Nelson, B.; Cummins, S.; Fay, L.; Jeffrey, R.; Kelly, S.; Kingston, N.; Lockhart, N.; Marnell, F.; Tierney, D.; Wyse Jackson, M.
Series : Irish Wildlife Manuals, No. 116

Year : in prep.
Title : The monitoring and assessment of four EU Habitats Directive Annex I woodland habitats
Author : Daly, O.H.; O'Neill, F.H.; Barron, S.J.
Series : Irish Wildlife Manuals

Other References

Year : 1997
Title : Irish wetland woods: the plant communities and their ecology
Author : Kelly, D.L; Iremonger, S.F.
Series : Biology and Environment: Proceedings of the Royal Irish Academy, 97B: 1-32

Year : 2002
Title : Reversing the habitat fragmentation of British woodlands
Author : Peterken, G.
Series : WWF-UK, London

Year : 2011
Title : The Fen Management Handbook
Author : McBride, A.; Diack, I.; Droy, N.; Hamill, B.; Jones, P.; Schutten, J.; Skinner, A.; Street, M. (eds.)
Series : Scottish Natural Heritage, Perth

Year : 2015
Title : The flora and conservation status of petrifying springs in Ireland
Author : Lyons, M.D.
Series : Unpublished Ph.D. thesis, Trinity College Dublin

Year : 2016
Title : Irish Vegetation Classification: Technical Progress Report No. 2
Author : Perrin, P.
Series : Report submitted to National Biodiversity Data Centre

Spatial data sources

Year :	2016
Title :	Point file associated with Lyons (2015)
GIS Operations :	Dataset created from spatial references; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	7220 (map 2)
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Year :	Revision 2010
Title :	National Survey of Native Woodlands 2003-2008. Version 1
GIS Operations :	QIs selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	91A0 (map 3)
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Year :	2009
Title :	Internal NPWS dataset
GIS Operations :	QI selected; clipped to SAC boundary. Expert opinion used as necessary to resolve any issues arising
Used For :	91E0 (map 3)
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Conservation Objectives for : Knocksink Wood SAC [000725]

7220 Petrifying springs with tufa formation (Cratoneurion)*

To restore the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion)* in Knocksink Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Square metres	Area stable or increasing, subject to natural processes	A number of springs and seepage areas are found on the wooded slopes within Knocksink Wood SAC. A total of c.1,350m ² (c.0.135ha) of Petrifying springs with tufa formation (Cratoneurion)* was recorded by Lyons (2015) at Knocksink Wood (site code PS002) at three 3 sub-sites: PS002a (c.1,200m ²), PS002b (c.100m ²), and PS002c (c.50m ²). See map 2 for the point locations of the sub-sites surveyed by Lyons (2015). A short survey was carried out by Lyons (2015) at PS002b and full surveys at PS002a and PS002c. This is a dynamic habitat and one which is likely to be significantly impacted by any reduction in water supply. Tufa sites may also decrease naturally due to natural blockages of upwelling springs. See Lyons (2015) and Lyons and Kelly (2016) for further details on this and all attributes. It is important to note that further unsurveyed areas may be present in the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 2	See map 2 for the point locations of the sub-sites in Knocksink Wood SAC surveyed by Lyons (2015). It is important to note that further unsurveyed areas may be present in the SAC
Hydrological regime: height of water table; water flow	Metres; metres per second	Maintain appropriate hydrological regimes	Petrifying springs rely on permanent irrigation, usually from upwelling groundwater sources or seepage sources (Lyons and Kelly, 2013). In karst areas, water tends to flow away rapidly over bare rock surfaces, even on fairly flat ground (Lyons and Kelly, 2013). Water flow should not be altered anthropogenically. See Lyons and Kelly (2016) for further details. At PS002a, Lyons (2015) noted a minor alteration to water flow due to an historic modification where water is piped beneath the road causing a minor impact on the flush below the springs
Physical structure: tufa formations	Seepage rate to the spring and groundwater quality (saturated calcium carbonate, pH, temperature and alkalinity conditions)	Maintain appropriate levels of tufa formation	Petrifying springs are springs that typically form small calcareous or 'tufa' deposits. On contact with the atmosphere at the spring head, carbon dioxide is lost from calcium saturated water to the atmosphere or is depleted by the photosynthetic activities of plants. This results in the precipitation of a calcium carbonate marl or tufa. Seepage flow rates are crucial for the development of tufa. In this SAC, the sub-site PS002a is described by Lyons (2015) as a woodland springhead giving rise to an extensive tufa-forming flush (main tufa types: tufa cascade, oncoids/ooids), PS002b is a heavily petrified, but sparsely vegetated, stream (main tufa types: stream crust, oncoids/ooids), and PS002c is described as a substantial tufa cascade predominantly colonised by bryophytes (main tufa type: tufa cascade)
Ecosystem function: water quality - nitrate level	mg/l	Maintain nitrate level at less than 10mg/l	Attribute and target based on Lyons and Kelly (2016). Nitrate levels of 7.98mg/l and 5.26mg/l were recorded by Lyons (2015) at PS002a and PS002c respectively
Ecosystem function: water quality - phosphate level	µg/l	Restore phosphate level to less than 15µg/l	Attribute and target based on Lyons and Kelly (2016). Phosphate levels of 51µg/l and 27µg/l were recorded by Lyons (2015) at PS002a and PS002c respectively, thus both failed the attribute target

Vegetation composition: community diversity	Variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes	Lyons and Kelly (2016) describe eight plant communities of petrifying springs in Ireland based on relevé data. At PS002a in Knocksink Wood SAC, the main community recorded by Lyons (2015) was <i>Palustriella commutata</i> - <i>Geranium robertianum</i> springheads. At PS002c, the main community recorded by Lyons (2015) was <i>Brachythecium rivulare</i> - <i>Platyhypnidium riparioides</i> tufaceous streams and flushes. Further information on the vegetation communities associated with this habitat is presented in Lyons and Kelly (2016)
Vegetation composition: positive indicator species	Number per spring	At least three positive/high quality indicator species as listed in Lyons and Kelly (2016) and no loss from baseline number	Attribute and target based on Lyons and Kelly (2016), where lists of positive and high quality indicator species are presented. Lyons (2015) recorded 7 positive indicator species at PS002a and 5 at PS002c, including the bryophytes <i>Palustriella commutata</i> and <i>Pellia endiviifolia</i> and also great horsetail (<i>Equisetum telmateia</i>) at both sub-sites. The positive indicators remote sedge (<i>Carex remota</i>), opposite-leaved saxifrage (<i>Chrysosplenium oppositifolium</i>), marsh hawk's-beard (<i>Crepis paludosa</i>) and yellow pimpernel (<i>Lysimachia nemorum</i>) were recorded at PS002a, and long-stalked yellow-sedge (<i>Carex lepidocarpa</i>) and the moss <i>Didymodon tophaeus</i> were recorded at PS002c by Lyons (2015). Great horsetail (<i>Equisetum telmateia</i>) was the only positive indicator recorded at PS002b (short survey) by Lyons (2015)
Vegetation composition: negative indicator species	Cover (DAFOR scale)	Potentially negative indicator species should not be Dominant or Abundant; potentially negative woody species should be absent in unwooded springs; invasive species should be absent	Attribute and target based on Lyons and Kelly (2016), where the lists of potentially negative herbaceous, bryophyte, algal and woody species are presented. See Lyons and Kelly (2016) also for details on potentially invasive species. If two or more potentially negative bryophyte/alga species are present, and if at least two are Frequent, or at least one is Abundant, then this attribute fails. See Lyons and Kelly (2016) for further details. Lyons (2015) recorded the potentially negative herbaceous species hemp-agrimony (<i>Eupatorium cannabinum</i>) at PS002a and PS002b, the potentially negative bryophytes <i>Brachythecium rivulare</i> at PS002a and <i>Cratoneuron filicinum</i> at PS002c, all of which were Occasional; however, the potentially negative alga <i>Vaucheria</i> sp. was recorded as Abundant at PS002a
Vegetation composition: algal cover	Percentage cover at, and in local vicinity of, a representative number of monitoring stops	Cover of algae less than 2%	Algal cover is indicative of nutrient enrichment from multiple sources (McBride et al., 2011)
Vegetation structure: sward height	Centimetres	Field layer height between 10cm and 50cm (except for bryophyte-dominated ground <10cm)	Attribute and target based on Lyons and Kelly (2016). See Lyons (2015) for further details
Physical structure: trampling/dung	Cover (DAFOR scale)	Cover should not be Dominant or Abundant	Attribute and target based on Lyons and Kelly (2016). See Lyons (2015) for further details
Indicators of local distinctiveness	Occurrence and population size	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes	This includes species on the Flora (Protection) Order, 2015 and/or Red Lists (Byrne et al., 2009; Regan et al., 2010; Lockhart et al., 2012; Wyse Jackson et al., 2016, etc.; see Nelson et al., 2019, 2021)

Conservation Objectives for : Knocksink Wood SAC [000725]

91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles

To restore the favourable conservation condition of Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles in Knocksink Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes. See map 3	Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles is present at Knocksink Wood SAC. Knocksink Wood is predominantly state-owned and protected as a Nature Reserve. It is situated in a valley on the Glencullen River. As part of the National Survey of Native Woodlands (NSNW), Knocksink (NSNW site code 789) was partly surveyed by Perrin et al. (2008); its conservation assessment score was ranked as joint first in County Wicklow and joint fifth nationally. Map 3 shows the minimum area of old sessile oak woodland within the SAC, which is estimated to be 9.66ha (Perrin et al., 2008). It is important to note that further unsurveyed areas may be present within the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes. The woodland area is shown on map 3	Distribution is based on Perrin et al. (2008). It is important to note that further unsurveyed areas may be present within the SAC
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The target areas for individual woodlands aim to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). In some cases, topographical constraints may restrict expansion
Woodland structure: cover and height	Percentage; metres; centimetres	Total canopy cover at least 30%; median canopy height at least 11m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20 cm; bryophyte cover at least 4%	The target aims for a diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer and ground layer. Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013). The canopy of the old sessile oak woods habitat at Knocksink Wood SAC exhibits adequate height and cover but the shrub layer is relatively sparse (NPWS internal files)
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See also the Irish Vegetation Classification (Perrin, 2016; www.biodiversityireland.ie/projects/ivc-classification-explorer)
Woodland structure: natural regeneration	Seedling: sapling: pole ratio	Seedlings, saplings and pole age-classes of target species for 91A0 woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy	The target species for 91A0 are sessile oak (<i>Quercus petraea</i>) and the hybrid oak <i>Quercus x rosacea</i> . Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013). The canopy structure of the old sessile oak woods habitat at Knocksink Wood SAC is relatively even-aged and regeneration of sessile oak is absent (NPWS internal files)
Woodland structure: dead wood	Number per hectare	At least 19 stems/ha of dead wood of at least 20cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem. Dead wood comprises old senescent trees, standing dead trees, fallen dead wood (including large branches) and rotten stumps of any species. Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)
Woodland structure: veteran trees	Number per hectare	No decline	Veteran trees are important habitats for bryophytes, lichens, saproxylic organisms, and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources

Woodland structure: indicators of local distinctiveness	Occurrence; population size	No decline in distribution and, in the case of red listed and other rare or localised species, population size	Includes ancient or long-established woodlands (see Perrin and Daly, 2010), archaeological and geological features as well as red listed and other rare or localised species. The majority of the old sessile oak woods habitat at Knocksink Wood SAC has been categorised as Possible Ancient Woodland (Perrin and Daly, 2010). The Endangered bryophyte <i>Fissidens rufulus</i> (Lockhart et al., 2012), which is listed on the Flora (Protection) Order, 2015 occurs beside the Glencullen River in a ravine at the base of the wooded valley (NPWS internal files). Rare plant species have been recorded from Knocksink Wood SAC, including yellow archangel (<i>Lamiastrum galeobdolon</i>), blue fleabane (<i>Erigeron acris</i>) and the Near Threatened (Wyse Jackson et al., 2016) ivy-leaved bellflower (<i>Wahlenbergia hederacea</i>). The SAC has one of the most diverse woodland invertebrate faunas in Ireland (NPWS internal files). See also the conservation objectives for habitats 7220* and 91E0*
Woodland structure: indicators of overgrazing	Occurrence	All four indicators of overgrazing absent	There are four indicators of overgrazing within 91A0: topiary effect on shrubs and young trees, browse line on mature trees, abundant dung, and severe recent bark stripping (Daly et al., in prep.; O'Neill and Barron, 2013)
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover at least 90% of canopy; target species cover at least 50% of canopy	The target species for 91A0 are sessile oak (<i>Quercus petraea</i>) and the hybrid oak <i>Quercus x rosacea</i> (Daly et al., in prep.; O'Neill and Barron, 2013)
Vegetation composition: typical species	Occurrence	At least 1 target species for 91A0 woodlands present; at least 6 positive indicator species for 91A0 woodlands present	A variety of typical native species should be present, depending on woodland type. The target species for 91A0 are sessile oak (<i>Quercus petraea</i>) and the hybrid oak <i>Quercus x rosacea</i> . Positive indicator species for 91A0 are listed in Daly et al. (in prep.) and O'Neill and Barron (2013)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent	Negative indicator species (i.e. any non-native species, including herbaceous species such as montbretia (<i>Crocsmia x crocosmiiflora</i>) should be absent or under control. Some mature beech (<i>Fagus sylvatica</i>) is present within the old sessile oak woods habitat at Knocksink Wood SAC. Some regeneration of beech and non-native conifers is occurring. The non-native climber traveller's-joy (<i>Clematis vitalba</i>) is present in low numbers (NPWS internal files)

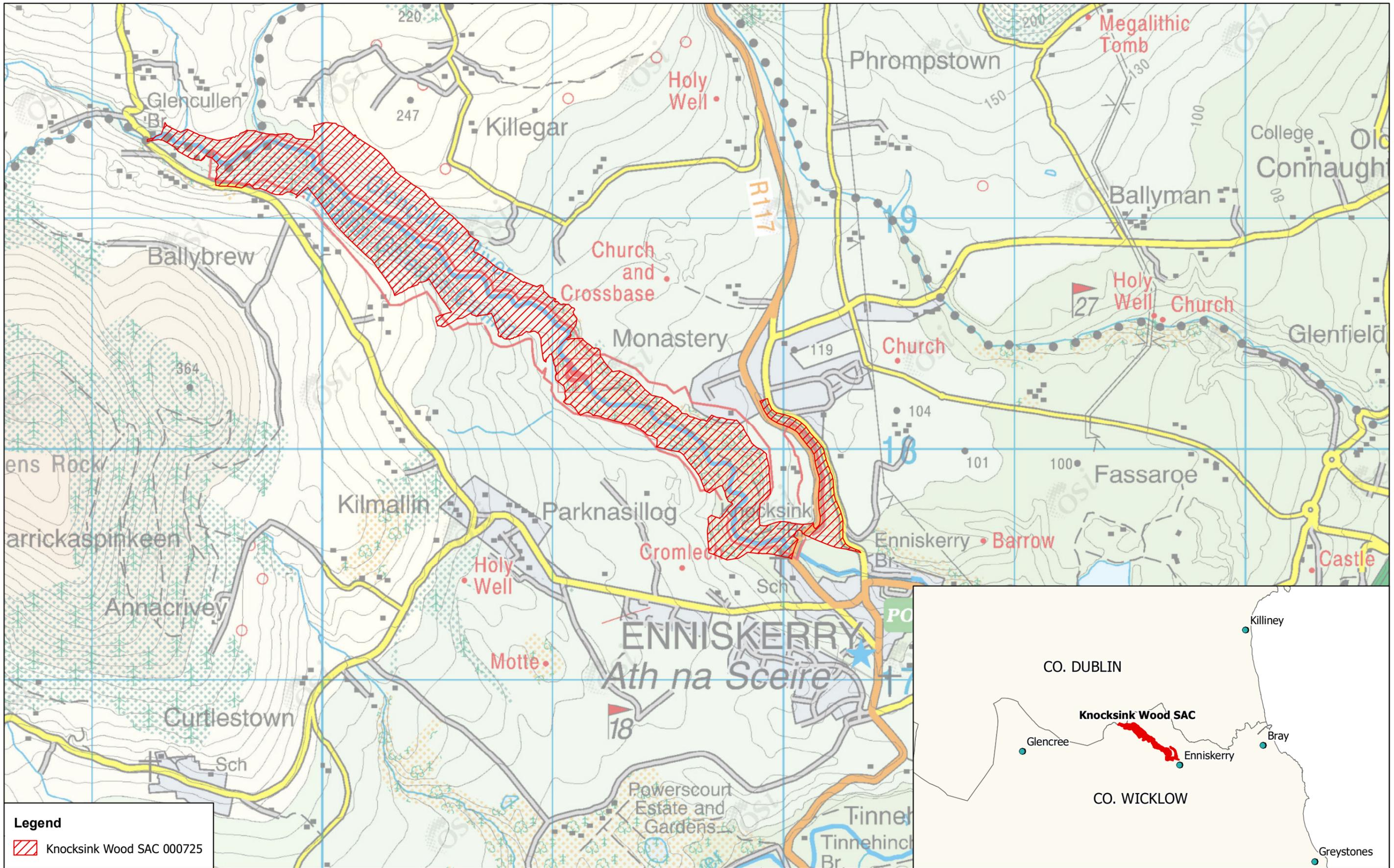
Conservation Objectives for : Knocksink Wood SAC [000725]

91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)*

To maintain the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)* in Knocksink Wood SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Habitat area	Hectares	Area stable or increasing, subject to natural processes. See map 3	Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)* is present within Knocksink Wood SAC. The habitat occurs within the floodplain of the Glencullen River. It is also associated with petrifying springs and streams on the slopes above the Glencullen River, and with a stream in the easternmost section of the SAC (NPWS internal files). Knocksink Wood SAC is predominantly state-owned and protected as a Nature Reserve. As part of the National Survey of Native Woodlands (NSNW), Knocksink (NSNW site code 789) was partly surveyed by Perrin et al. (2008); its conservation assessment score was ranked as joint first in County Wicklow and joint fifth nationally. Map 3 shows the minimum area of alluvial forests within the SAC, which is estimated to be 12.11ha (NPWS internal files). It is important to note that further unsurveyed areas may be present within the SAC
Habitat distribution	Occurrence	No decline, subject to natural processes. The woodland area is shown on map 3	Distribution is based on NPWS internal files. It is important to note that further unsurveyed areas may be present within the SAC
Woodland size	Hectares	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	The target areas for individual woodlands aim to reduce habitat fragmentation and benefit those species requiring 'deep' woodland conditions (Peterken, 2002). In some cases, topographical constraints may restrict expansion
Woodland structure: cover and height	Percentage; metres; centimetres	Total canopy cover at least 30%; median canopy height at least 7m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20cm; bryophyte cover at least 4%	The target aims for a diverse structure with a canopy containing mature trees, shrub layer with semi-mature trees and shrubs, and well-developed field layer (herbs, graminoids and dwarf shrubs) and ground layer (bryophytes). Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)
Woodland structure: community diversity and extent	Hectares	Maintain diversity and extent of community types	Described in Perrin et al. (2008). See also the Irish Vegetation Classification (Perrin, 2016; www.biodiversityireland.ie/projects/ivc-classification-explorer). The alluvial forests habitat in spring-fed flushes on slopes at Knocksink Wood SAC is a good example of the Carici remotae-Fraxinetum vegetation type, as defined by Kelly and Iremonger (1997)
Woodland structure: natural regeneration	Seedling:sapling:pole ratio	Seedlings, saplings and pole age-classes of target species for 91E0* woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy	The target species for 91E0* are alder (<i>Alnus glutinosa</i>), ash (<i>Fraxinus excelsior</i>) and willows (<i>Salix</i> spp.). Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)

Hydrological regime: flooding depth/height of water table	Metres	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	Periodic flooding is essential to maintain alluvial woodlands along river and lake floodplains, but not for woodland around springs/seepage areas. At Knocksink Wood SAC, the alluvial forests habitat is found along the river, and on slopes in spring-fed flushes which are subject to waterlogging but not flooding (NPWS internal files)
Woodland structure: dead wood	Number per hectare	At least 19 stems/ha of dead wood of at least 20cm diameter	Dead wood is a valuable resource and an integral part of a healthy, functioning woodland ecosystem. Dead wood comprises old senescent trees, standing dead trees, fallen dead wood (including large branches) and rotten stumps of any tree species. Assessment criteria are described in Daly et al. (in prep.) and O'Neill and Barron (2013)
Woodland structure: veteran trees	Number per hectare	No decline	Veteran trees are important habitats for bryophytes, lichens, saproxylic organisms and some bird species. Their retention is important to ensure continuity of habitats/niches and propagule sources
Woodland structure: indicators of local distinctiveness	Occurrence; population size	No decline in distribution and, in the case of red listed and other rare or localised species, population size	Includes ancient or long-established woodlands (see Perrin and Daly, 2010), archaeological and geological features as well as red listed and other rare or localised species. A substantial area of Possible Ancient Woodland, which includes the 91E0* habitat, has been identified in the southern part of this SAC (Perrin and Daly, 2010). Rare plant species have been recorded in this SAC, including yellow archangel (<i>Lamiastrum galeobdolon</i>), blue fleabane (<i>Erigeron acris</i>) and the Near Threatened (Wyse Jackson et al., 2016) ivy-leaved bellflower (<i>Wahlenbergia hederacea</i>). The Endangered bryophyte <i>Fissidens rufulus</i> (Lockhart et al., 2012), which is listed on the Flora (Protection) Order 2015, occurs beside the Glencullen River in a ravine at the base of the wooded valley (NPWS internal files). The SAC has one of the most diverse woodland invertebrate faunas in Ireland (NPWS internal files). See also the conservation objectives for 7220* and 91A0 in this volume
Woodland structure: indicators of overgrazing	Occurrence	All five indicators of overgrazing absent	There are five indicators of overgrazing within 91E0*: topiary effect on shrubs and young trees, browse line on mature trees, abundant dung, severe recent bark stripping, and trampling (Daly et al., in prep.)
Vegetation composition: native tree cover	Percentage	No decline. Native tree cover at least 90% of canopy; target species cover at least 50% of canopy	The target species for 91E0* are alder (<i>Alnus glutinosa</i>), ash (<i>Fraxinus excelsior</i>) and willows (<i>Salix</i> spp.) (Daly et al., in prep.; O'Neill and Barron, 2013)
Vegetation composition: typical species	Occurrence	At least 1 target species for 91E0* woodlands present; at least 6 positive indicator species for 91E0* woodlands present	A variety of typical native species should be present, depending on woodland type. The target species for 91E0* are alder (<i>Alnus glutinosa</i>), ash (<i>Fraxinus excelsior</i>) and willows (<i>Salix</i> spp.). Positive indicator species for 91E0* are listed in Daly et al. (in prep.) and O'Neill and Barron (2013)
Vegetation composition: negative indicator species	Occurrence	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent	Negative indicator species (i.e. any non-native species, including herbaceous species) should be absent or under control. Sycamore (<i>Acer pseudoplatanus</i>) and beech (<i>Fagus sylvatica</i>) are present in the canopy of the alluvial forests habitat at Knocksink Wood SAC (NPWS internal files)
Vegetation composition: problematic native species	Percentage	Cover of common nettle (<i>Urtica dioica</i>) less than 75%	Common nettle (<i>Urtica dioica</i>) is a positive indicator species for 91E0* but, in some cases, it may become excessively dominant. Increased light and nutrient enrichment are factors which favour proliferation of common nettle (Daly et al., in prep.)



Legend

 Knocksink Wood SAC 000725

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**MAP 1:
 KNOCKSINK WOOD SAC
 CONSERVATION OBJECTIVES
 SAC DESIGNATION**

Map to be read in conjunction with the NPWS Conservation Objectives Document

**SITE CODE:
 SAC 000725; version 3.01.
 COs. WICKLOW, DUBLIN**

0 125 250 500 Metres



The mapped boundaries are of an indicative and general nature only. Boundaries of designated areas are subject to revision.
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Níl sna teorainneacha ar na léarscáileanna ach nod garshuíomhach ginearálta. Féadfar athbheithnithe a déanamh ar theorainneacha na gceantar comharthaite. Suirbhéaracha Ordoanáis na hÉireann Ceadúnas Uimh OSI-NMA-014. © Suirbhéaracha Ordoanáis na hÉireann Rialtas na hÉireann

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Date: December 2021



Legend

-  *Petrifying springs with tufa formation (*Cratoneurion*)
-  Knocksink Wood SAC 000725

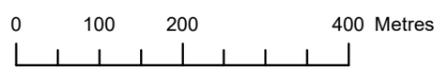
Ordnance Survey Ireland

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Rialtais Áitiúil agus Oidhreachta**
Department of Housing,
Local Government and Heritage

**MAP 2:
KNOCKSINK WOOD SAC
CONSERVATION OBJECTIVES
PETRIFYING SPRINGS**

Map to be read in conjunction with the NPWS Conservation Objectives Document

**SITE CODE:
SAC 000725; version 3.01.
COs. WICKLOW, DUBLIN**

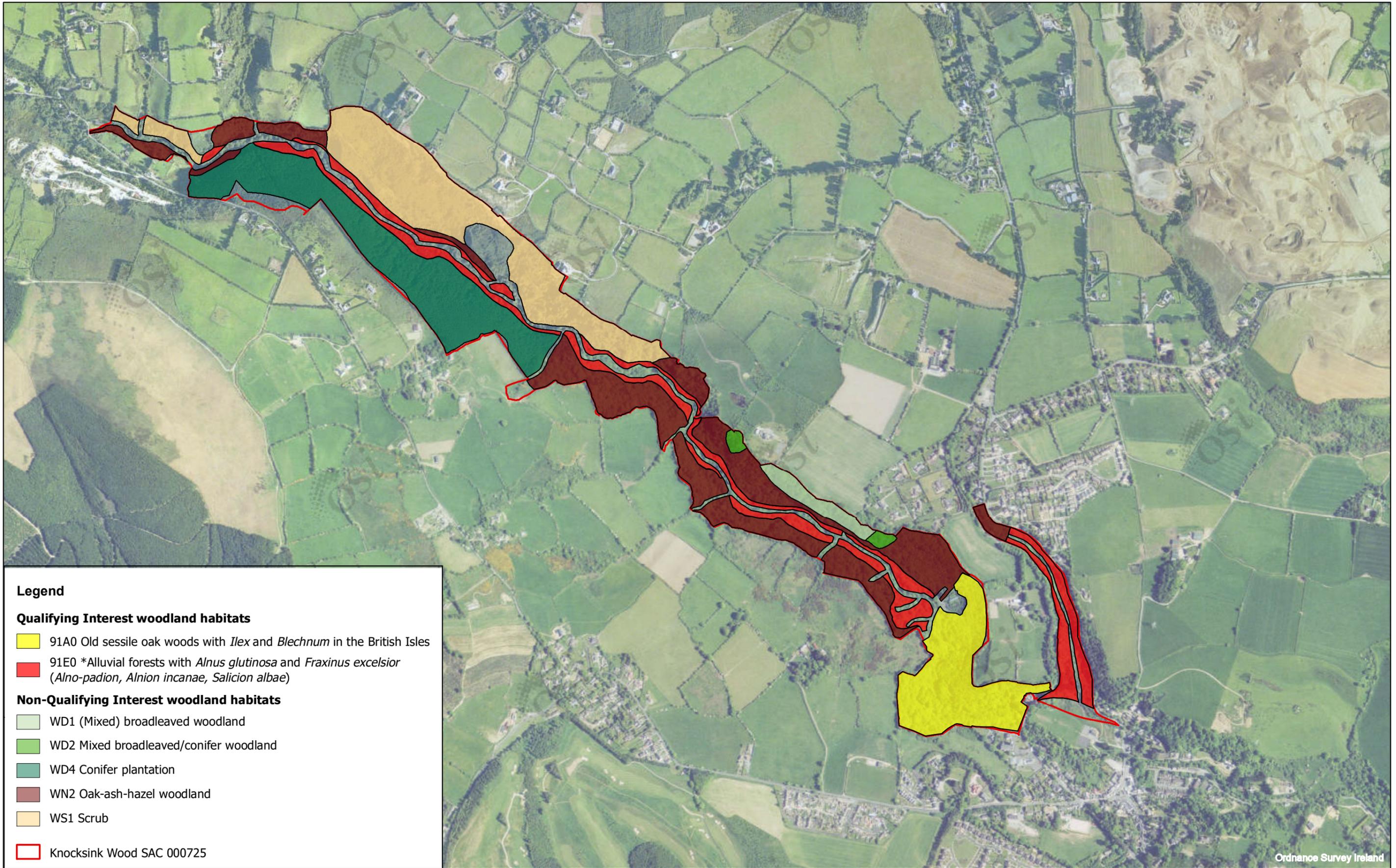


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Date: December 2021



Legend

Qualifying Interest woodland habitats

- 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles
- 91E0 *Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion*, *Alnion incanae*, *Salicion albae*)

Non-Qualifying Interest woodland habitats

- WD1 (Mixed) broadleaved woodland
- WD2 Mixed broadleaved/conifer woodland
- WD4 Conifer plantation
- WN2 Oak-ash-hazel woodland
- WS1 Scrub

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