

National Parks and Wildlife Service

Conservation Objectives Series

Rye Water Valley/Carton SAC 001398



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*

001398	Rye Water Valley/Carton SAC
1014	Narrow-mouthed Whorl Snail <i>Vertigo angustior</i>
1016	Desmoulin's Whorl Snail <i>Vertigo moulinsiana</i>
7220	Petrifying springs with tufa formation (Cratoneurion)*

Supporting documents, relevant reports & publications

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

NPWS Documents

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 :	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 :	2011
Title :	Monitoring and condition assessment of populations of <i>Vertigo geyeri</i> , <i>Vertigo angustior</i> and <i>Vertigo moulinsiana</i> in Ireland
Author :	Moorkens, E.; Killeen, I.
Series :	Irish Wildlife Manuals, No. 55
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 :	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 :	Monitoring of sites and habitat for three Annex II species of whorl snail (<i>Vertigo</i>)
Author :	Long, M.P.; Brophy, J.T.
Series :	Irish Wildlife Manuals, No. 104
Year :	2019
Title :	Monitoring of sites and habitat for three Annex II species of whorl snail (<i>Vertigo</i>). Appendix IV. <i>Vertigo angustior</i> site reports
Author :	Brophy, J.T.; Long, M.P.
Series :	Irish Wildlife Manuals, No. 104
Year :	2019
Title :	Monitoring of sites and habitat for three Annex II species of whorl snail (<i>Vertigo</i>). Appendix VI. <i>Vertigo moulinsiana</i> site reports
Author :	Brophy, J.T.; Long, M.P.
Series :	Irish Wildlife Manuals, No. 104

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

Other References

Year : 2008
Title : Hydrological report for Leixlip Spa, Co. Kildare
Author : Kuczyńska, A.; Bartley, P.
Series : Unpublished report to Kildare County Council

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 : Tufa springs survey, Ryewater Valley/Cartron SAC, Leixlip, Co. Kildare. Tufa spring report. Version 1.1
Author : JBA
Series : Report by JBA Consulting, Limerick

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)
<hr/>	
Year :	2021
Title :	NPWS rare and threatened species database
GIS Operations :	Dataset created from spatial references in database records. Expert opinion used as necessary to resolve any issues arising
Used For :	1014, 1016 (map 3)
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Conservation Objectives for : Rye Water Valley/Carlton SAC [001398]

7220 Petrifying springs with tufa formation (Cratoneurion)*

To restore the favourable conservation condition of Petrifying springs with tufa formation (Cratoneurion)* in Rye Water Valley/Carlton 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	The habitat Petrifying springs with tufa formation (Cratoneurion)* was surveyed by Lyons (2015) at Louisa Bridge (sub-site code PS001) within Rye River Valley/Carlton SAC. The area of the habitat estimated by Lyons (2015) is c.1,250m ² . 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. See also JBA (2016)
Habitat distribution	Occurrence	No decline, subject to natural processes. See map 2	See map 2 for the point location of habitat 7220* surveyed by Lyons (2015) at Louisa Bridge (sub-site code PS001). It is important to note that further unsurveyed areas of the habitat may be present within 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). Water flow should not be altered anthropogenically. See Lyons and Kelly (2016) for further details. At Louisa Bridge (PS001), the hydrology was modified during the 19th century when the warm spring in the area was a popular visitor destination. PS001 is of hydrogeological importance as the spring and seepage complex is irrigated by two independent spring systems which differ in the chemical composition of the spring waters (Lyons, 2015; Lyons and Kelly, 2016). The separate water sources comprise a deeper, older and warmer artesian groundwater system with high concentrations of sodium and chloride, and a more recent, shallow, alkaline groundwater system (Kuczyńska and Bartley, 2008). The water from the two sources mixes as it trickles down the hillside towards the Rye Water River, creating a series of shallow pools and paludal habitats (Lyons, 2015)
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 surveyed sub-site (PS001) was described as containing a complex of tufa-forming springs, flushes and pools with paludal tufa, oncoids/ooids and marl (Lyons, 2015; Lyons and Kelly, 2016)
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). A nitrate level of 0.13mg/l was recorded at PS001 within Rye River Valley/Carlton SAC by Lyons (2015)
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). A phosphate level of 16µg/l was recorded at PS001 by Lyons (2015), just marginally failing 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 Louisa Bridge (PS001) in Rye River Valley/Carton SAC, the main community recorded by Lyons (2015) was <i>Carex lepidocarpa</i> small sedge springs. 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 23 positive indicator species at PS001; <i>Carex dioica</i> , <i>C. hostiana</i> , <i>C. lepidocarpa</i> , <i>C. panicea</i> , <i>Festuca rubra</i> , <i>Eleocharis quinqueflora</i> , <i>Anagallis tenella</i> , <i>Crepis paludosa</i> , <i>Neottia ovata</i> , <i>Parnassia palustris</i> , <i>Pinguicula vulgaris</i> , <i>Samolus valerandi</i> , <i>Triglochin palustris</i> , the cyanobacterium <i>Rivularia biasolettiana</i> and the bryophytes <i>Aneura pinguis</i> , <i>Bryum pseudotriquetrum</i> , <i>Campylium stellatum</i> , <i>Eucladium verticillatum</i> , <i>Fissidens adianthoides</i> , <i>Pellia endiviifolia</i> , <i>Palustriella commutata</i> , <i>P. falcata</i> and <i>Scorpidium cossonii</i>
Vegetation composition: negative indicator species	Cover (DAFOR scale)	Potentially negative indicator species should not be Dominant or Abundant; 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, and details on potentially invasive species are presented. 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 (Lyons and Kelly, 2016). The potentially negative herbaceous species <i>Eupatorium cannabinum</i> was recorded as Occasional at PS001 by Lyons (2015) and the potentially negative bryophyte <i>Cratoneuron filicinum</i> was Rare. The potentially negative woody species <i>Fraxinus excelsior</i> , <i>Salix cinerea</i> and <i>Hedera helix</i> were all recorded as Rare at PS001, an unwooded spring; however, the attribute was allowed pass on expert judgement (Lyons, 2015). It was noted that scrub encroachment poses a threat to the habitat, but has been kept under control by manual removal of seedlings in recent years (see Lyons, 2015)
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). Two species of <i>Vertigo</i> snail listed on Annex II of the Habitats Directive (<i>Vertigo angustior</i> and <i>V. moulinsiana</i>) have been reported in the SAC, each with different habitat requirements (Moorkens and Killeen, 2011; Long and Brophy, 2019). See the conservation objectives for the species 1014 and 1016 in this volume

Conservation Objectives for : Rye Water Valley/Carton SAC [001398]

1014 Narrow-mouthed Whorl Snail *Vertigo angustior*

To restore the favourable conservation condition of Narrow-mouthed Whorl Snail (*Vertigo angustior*) in Rye Water Valley/Carton SAC, which is defined by the following list of attributes and targets:

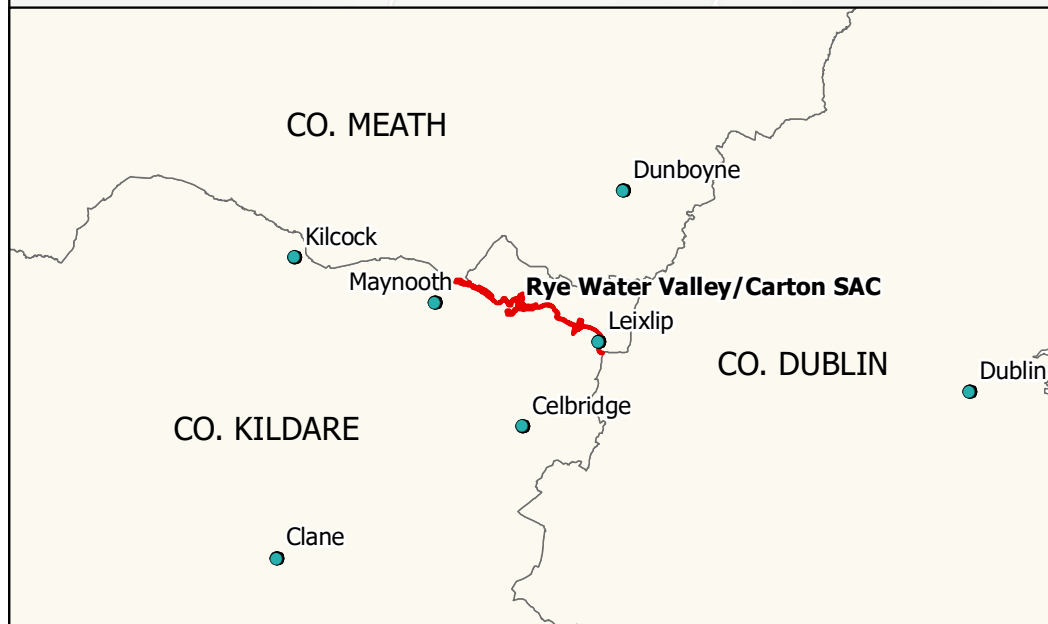
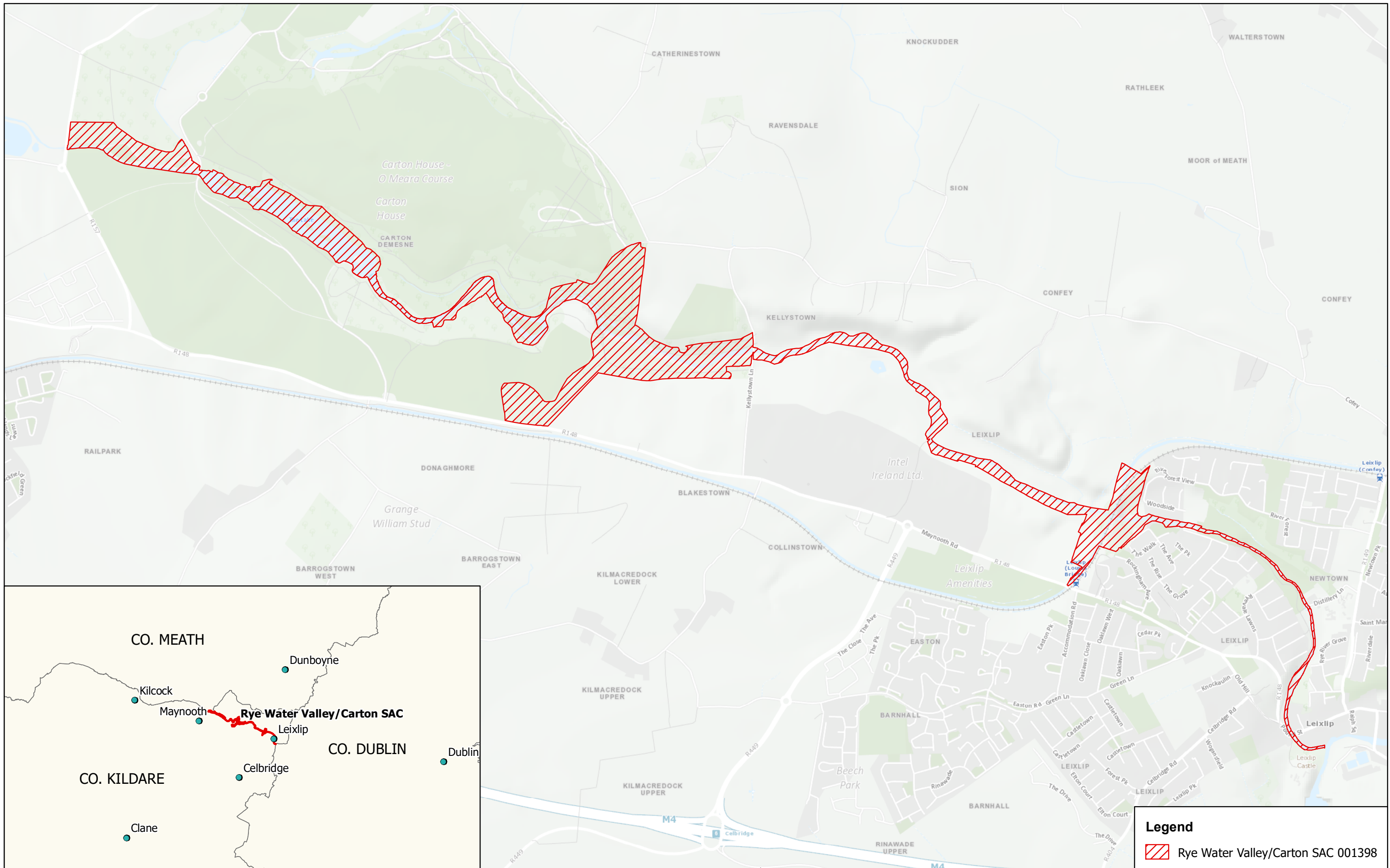
Attribute	Measure	Target	Notes
Distribution	Number of occupied 1km squares	Population restored to baseline. There is one recorded site for the species in the SAC within the 1km grid square N9936. See map 3	Narrow-mouthed whorl snail (<i>Vertigo angustior</i>) was last recorded in Rye Water Valley/Carton SAC in 1997 at one site within the 1km grid square N9936; the species was not found in 2006, 2010 or 2016. See details for the site Louisa Bridge (site code VaCAM19) in Moorkens and Killeen (2011), Long and Brophy (2019) and Brophy and Long (2019). Further work is required to definitively establish the status of the species in this SAC
Occurrence in suitable habitat	Percentage positive records in a representative number of samples	Restore to self-sustaining population	This attribute should be assessed following the methodology in Long and Brophy (2019) taking a representative number of samples in suitable habitat across the site in an appropriate time frame to detect successful reproduction. A self-sustaining population will be indicated by detection of both adults and juveniles
Habitat area	Hectares	Restore area of suitable habitat, subject to natural processes	The area that supported narrow-mouthed whorl snail (<i>Vertigo angustior</i>) within this SAC is the floodplain habitat at the base of the spring-fed slope along the banks of the Rye Water River. In 1997, the vegetation was defined as wet grassland vegetation dominated by yellow iris (<i>Iris pseudacorus</i>), low herbs and mosses up to 0.9m high growing on damp, friable soil covered with a layer of humid, open structured moss and litter. This vegetation occurred in a narrow zone between the riverside vegetation and the springs, and appears to have become increasingly rank and shaded by willows (<i>Salix</i> spp.) over time
Habitat quality: water levels	Hydrological regime	Restore suitable hydrological regime, subject to natural processes	The area that supported narrow-mouthed whorl snail (<i>Vertigo angustior</i>) was in a narrow zone between the saturated ground influenced by the tufaceous springs and the river floodplain. This delicate hydrology may have been negatively impacted by increased flooding or by changes to the springs

Conservation Objectives for : Rye Water Valley/Carton SAC [001398]


1016 Desmoulin's Whorl Snail *Vertigo moulinsiana*

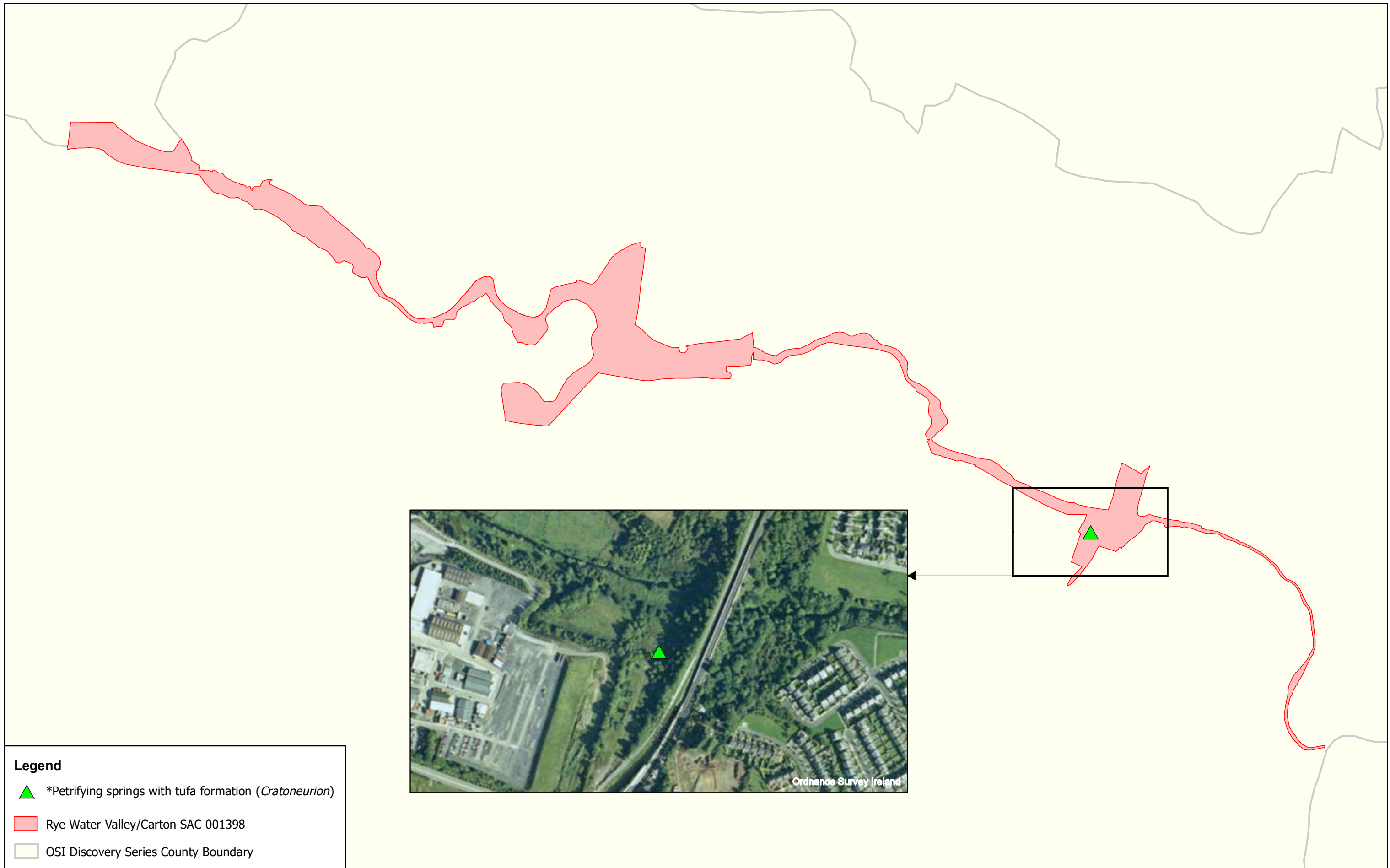
To maintain the favourable conservation condition of Desmoulin's Whorl Snail (*Vertigo moulinsiana*) in Rye Water Valley/Carton SAC, which is defined by the following list of attributes and targets:

Attribute	Measure	Target	Notes
Distribution	Number of occupied 1km squares	No decline, subject to natural processes. There is one known site for this species in the SAC within the 1km grid square N9936. See map 3	Desmoulin's whorl snail (<i>Vertigo moulinsiana</i>) is known from one site in Rye Water Valley/Carton SAC, at Louisa Bridge, within the 1km grid square N9936. See details for the site Louisa Bridge (site code VmCAM05) in Moorkens and Killeen (2011), Long and Brophy (2019) and Brophy and Long (2019)
Occurrence in suitable habitat	Percentage positive records in a representative number of samples	No decline, subject to natural processes. A baseline figure of 50% positive samples is set	Desmoulin's whorl snail (<i>Vertigo moulinsiana</i>) should be present in 50% of samples taken across the site. This attribute should be assessed following the methodology in Long and Brophy (2019) taking a representative number of samples in suitable habitat across the site
Density within habitat	Number of adults per sample	No decline, subject to natural processes; at least 25% of samples should have more than 10 individuals	At least 25% of samples should have at least 10 individuals of Desmoulin's whorl snail (<i>Vertigo moulinsiana</i>). This attribute should be assessed following the methodology in Long and Brophy (2019) taking a representative number of samples in suitable habitat across the site
Habitat area	Hectares	Area of suitable habitat stable or increasing, subject to natural processes; no less than 0.2ha of at least sub-optimal habitat	The baseline figure for the amount of habitat in at least sub-optimal condition for this site is 0.2ha. Optimal and sub-optimal habitat is defined in Moorkens and Killeen (2011) and given in Long and Brophy (2019) and Brophy and Long (2019)
Habitat quality: occupied patches in at least sub-optimal condition	Percentage	No decline, subject to natural processes. A baseline of 50% is set	Suitable habitat that is at least sub-optimal is patchy on the site. The baseline target is that at least 50% of the occupied habitat patches should be in at least sub-optimal condition. This is derived from Moorkens and Killeen (2011), Brophy and Long (2019) and Long and Brophy (2019) where optimal and sub-optimal habitat is also defined
Habitat quality: soil wetness	Soil wetness criteria	No decline, subject to natural processes	The baseline is that 50% of the site should meet the soil wetness criteria (classes 3-5) that is defined and assessed according to the definitions and methodology given in Moorkens and Killeen (2011), Brophy and Long (2019) and Long and Brophy (2019)



Legend

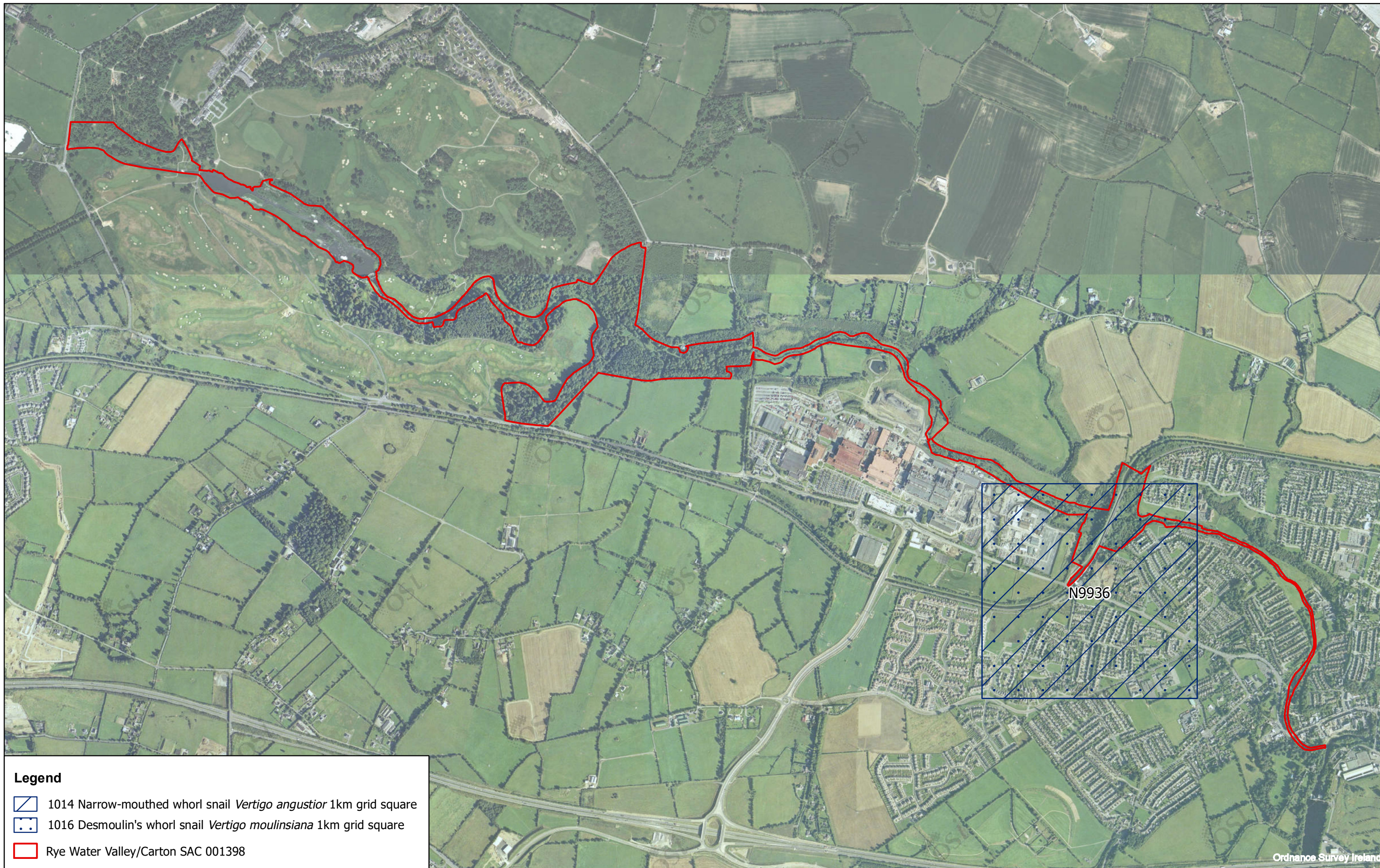
 Rye Water Valley/Carton SAC 001398






Legend

- ▲ *Petrifying springs with tufa formation (*Cratoneurion*)
- Rye Water Valley/Carton SAC 001398
- OSI Discovery Series County Boundary





Legend

-  1014 Narrow-mouthed whorl snail *Vertigo angustior* 1km grid square
-  1016 Desmoulin's whorl snail *Vertigo moulinsiana* 1km grid square
-  Rye Water Valley/Carton SAC 001398

Ordnance Survey Ireland

