

The Oxbow Diving Beetle *Hydroporus rufifrons* in Wales in 2026

NRW Evidence Report No. 1030

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Hydroporus rufifrons © Franz Hebauer

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Crynodeb gweithredol

Ym mis Mai 2026, cynhaliwyd arolwg o 39 o wlyptiroedd sydd hefyd yn orlifdiroedd, a llaciau twyni, yng Ngheredigion a Sir Gaerfyrddin, i chwilio am y Chwilen Blymio *Hydroporus rufifrons*. Canolbwyntiodd yr arolwg ar y tair ardal lle canfuwyd y chwilen yn 2012 – Dolau-gwyrddon-isaf, Gwaun Garthenor a Moor Wood, Highmead – yn ogystal â lleoliadau yng Ngwarchodfa Natur Genedlaethol Cors Caron a Gwarchodfa Natur Genedlaethol Dyfi. Mae'n ymddangos bod y chwilen wedi diflannu o ddwy o'r tair ardal lle cafodd ei chanfod ar orlifdir Afon Teifi yn 2012, o ganlyniad i golli cynefinoedd oherwydd dwysáu amaethyddol. Mae newidiadau ecolegol yn y safle sy'n weddill o 2012 (Gwaun Garthenor) wedi lleihau'r gynefin addas sydd ar gael a nifer yr *H. rufifrons* sydd yno, gyda dim ond un chwilen fenywaidd wedi'i chofnodi yn 2026.

Fodd bynnag, canfuwyd *H. rufifrons* ar Warchodfa Natur Genedlaethol Cors Caron am y tro cyntaf (pump oedolyn mewn tri lleoliad). Dylai'r tîm rheoli yma geisio gwneud yn siŵr bod twmpathau glaswellt ymylol o amgylch cyrff dŵr tymhorol yn cael eu cynnal a'u cadw. Yn ogystal, canfuwyd llawer o'r chwilod hyn mewn gwlyptiroedd llaciau twyni ar Dwyni Tywod Ynys-las yng Ngwarchodfa Natur Genedlaethol Dyfi (dros 100 o oedolion mewn pedwar lleoliad). Dyma'r unig achos hysbys o'r math hwn o gynefin yn cael ei ddefnyddio yn unrhyw le yn y byd. Yma, mae'r tîm rheoli yn hapus i ymdrechu i gynnal y poblogaeth. Cofnodwyd tri oedolyn yma ym mis Awst 2026 er gwaethaf amodau sychder ledled Cymru ym mis Gorffennaf ac Awst.

Felly, mae'r arolwg wedi tynnu sylw at y ffaith bod *H. rufifrons* wedi'i gyfyngu i dri safle yng Nghymru ar hyn o bryd, gyda'r poblogaeth yng Ngwaun Garthenor mewn perygl uniongyrchol o ddiflannu, yn ôl pob tebyg. Yma, mae angen rheoli'r coetir, lleihau ewtroffigedd ac adfer prosesau hydrolegol ar frys er mwyn atal dirywiad.

Mae poblogaethau yng Nghymru yn cynrychioli ffin ddeheuol dosbarthiad *H. rufifrons* ym Mhrydain o ystyried colledion hanesyddol yn ne Lloegr, gyda'r poblogaethau agosaf sydd wedi goroesi yn bodoli yn ne Ardal y Llynnoedd. Felly, mae'n hanfodol sicrhau bod y chwilod hyn yn parhau i oroesi ym mhob un o'r safleoedd yng Nghymru, er mwyn cynnal ystod bresennol y chwilen blymio.

Caiff cyfanswm o 459 cofnod o 64 rhywogaeth o chwilen ddŵr a gafodd eu canfod yn ystod yr arolwg eu cyflwyno hefyd, gyda darganfyddiadau nodedig yn cynnwys y chwilen blymio *Nartus grapii* yng Nghors Caron a Chors Fochno, a'r *Hydaticus seminiger* yng Nghors Fochno. Cofnodwyd carabid prin y gwlyptir *Blethisa multipunctata* yng Ngwaun Garthenor.

Executive summary

A survey of 39 floodplain wetlands and dune slacks in Ceredigion and Caerfyrddin (Carmarthenshire) for Oxbow Diving Beetle *Hydroporus rufifrons* was undertaken in May 2026. The survey focused on the three areas where the beetle was found in 2012 – Dolau-gwyrddon-isaf, Gwaun Garthenor and Moor Wood, Highmead - as well as locations in the Cors Caron and Dyfi NNRs. It has apparently become extinct at two of the three areas it was found in on the Teifi floodplain in 2012, owing to habitat loss resulting from agricultural intensification. Ecological changes at the remaining 2012 site (Gwaun Garthenor) have reduced the extent of occurrence of both suitable habitat and the *H. rufifrons* there, with just a single female recorded in 2026.

H. rufifrons was, however, found on Cors Caron NNR for the first time (five adults at three locations), where management should aim to ensure the maintenance of marginal tussocks around seasonal waterbodies. The beetle was also discovered to be abundant in dune slack wetlands on Ynyslas Dunes in Dyfi NNR (over 100 adults at four locations), the only known case of this habitat type being used anywhere in the world. Here, management is sympathetic to maintaining the population. Three adults were recorded here in August 2026 despite drought conditions across Wales in July and August.

The survey has thus highlighted that *H. rufifrons* is currently restricted to three sites in Wales, with the population at Gwaun Garthenor apparently at immediate risk of extinction. Here, scrub management, the reduction of eutrophication and restoration of hydrological processes are required urgently to arrest declines.

Welsh populations represent the southern limit of the British distribution of *H. rufifrons* given historic losses in southern England, with the nearest extant populations in the southern Lake District. It is therefore imperative to ensure continued occupancy of all Welsh sites to maintain the current range of the diving beetle.

A total of 459 records of 64 species of water beetle found during the survey is also presented, notable finds being the diving beetles *Nartus grapii* at Cors Caron and Cors Fochno, and *Hydaticus seminiger* at Cors Fochno. The scarce wetland carabid *Blethisa multipunctata* was recorded at Gwaun Garthenor.

1. Introduction

The Oxbow Diving Beetle *Hydroporus rufifrons* (Müller) is, as its name suggests, mainly associated with river floodplain wetlands, where it largely inhabits seasonal and fluctuating waterbodies with clean water and mossy edges with tussock vegetation. One of the rarest UK diving beetles, the species declined dramatically over the 20th and 21st centuries, and is now restricted to the west of Britain, in a limited number of English, Welsh and Scottish sites (Figure 1). Foster *et al.* (2008) stated that these localities were in two remaining regions; south-western Scotland and the English Lake District. Discoveries in Wales in 2012 (Foster & Bilton, 2013) added a number of sites on the Afon Teifi floodplain, including some with very strong colonies. *H. rufifrons* can still be found in a few localities in the south of the Lake District and south-west Scotland, but has otherwise disappeared from what was formerly a widespread range, including areas of both eastern and western Britain. The species is restricted to fluctuating and temporary water bodies, particularly those that have developed in former oxbow systems (Foster *et al.*, 2008, 2016) and shows a pattern of decline associated with land use changes, having first been lost from (sub)urbanised areas around London and then from localities in eastern England, presumably in association with agricultural intensification.

H. rufifrons would appear to show a classic 'core-satellite' metapopulation structure in most regions, being rare in the majority of discovered localities and only abundant in a subset of occupied sites, these mostly being situated on floodplains (Bilton, 2023). This pattern is seen in the UK and in other areas of the species' range (e.g. Hess & Heckes, 2004). Flight tests with *H. rufifrons* have always proved negative and dissected individuals show weak flight muscle development (Bilton, 2023). Whilst the species may disperse in flood water, the occurrence of specimens in isolated hillside ponds demonstrates that *H. rufifrons* must fly on occasion. It is worth noting that the majority of these isolated individual finds are females, which may occasionally fly after mating, such dispersal events sometimes resulting in new colony establishment.

H. rufifrons is classified as Endangered in Britain using IUCN criteria and was included on the UK Biodiversity Action Plan and the Section 7 list of Species of Principal Importance for Conservation of Biological Diversity in Wales.

1.1. *Hydroporus rufifrons* in Britain

Subsequent to the publication of the atlas (Foster *et al.*, 2016) more sites have been discovered in the south of the Lake District and in southwest Scotland, although all sites in eastern Britain, with the exception of the Lincolnshire reintroduction (Foster *et al.*, 2016), are now certainly lost. The distribution map (Figure 1) demonstrates this loss of range in the east and the separation of population centres in Wales, the southern Lake District and Scotland. It should be noted that many records in Scotland and the English Lake District are for single individuals (see above); the number of strong colonies being much fewer.

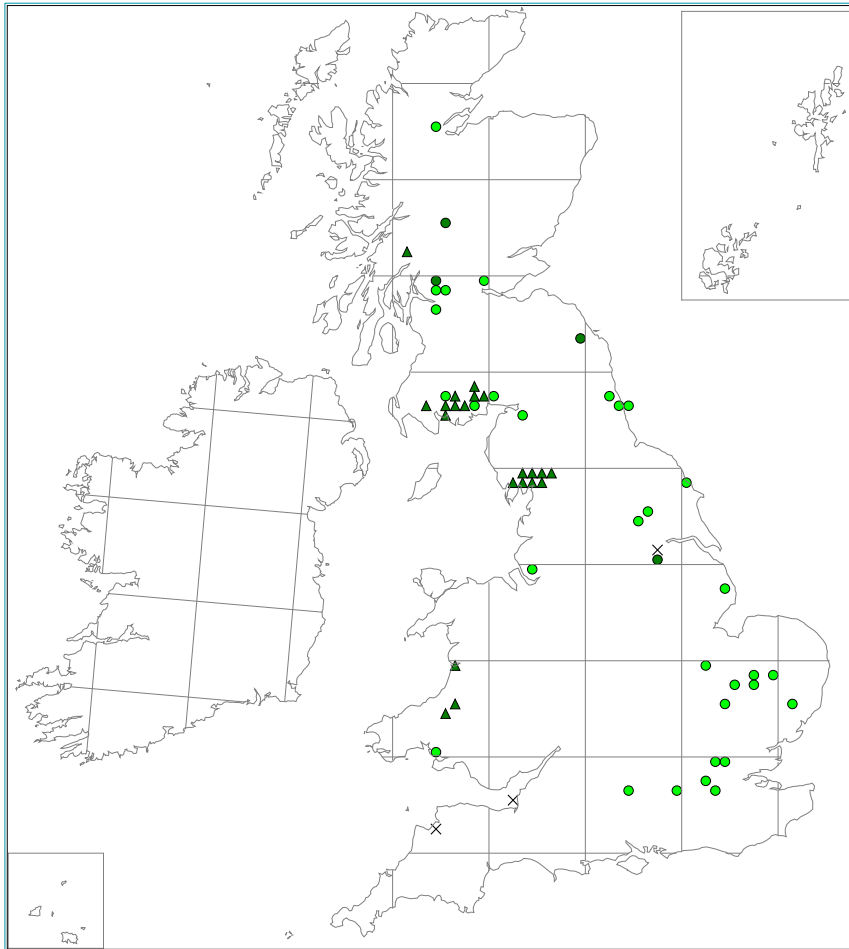


Figure 1. Distribution of *Hydroporus rufifrons* in Britain, 2026. Triangles are for records from 2000 onwards; dark circles are for records from 1980 to 1999; light circles historical records pre-1980; crosses subfossil sites.

1.2 *Hydroporus rufifrons* in Wales

Arthur Price reported *H. rufifrons* in Kidwelly Castle Moat (SN4006, Caerfyrddin) in August 1958 (Price, 1959), and the beetle was found here two years later. More recent attempts to find it at Kidwelly have proved negative however, and the species is almost certainly long extinct there, the last definitive record being from 1960 (Foster & Bilton, 2013).

One specimen of *H. rufifrons* was found in a pitfall trap operated by P.F. Holmes up to 26th June 1987 at Gwaun Garthenor (SN6355, Ceredigion) as part of the Welsh Peatland Invertebrate Survey (Holmes *et al.*, 1991). A number of visits by Garth Foster and Mick Eyre failed to find the species here subsequently, although neither of them sampled at the correct location of the pitfall until DTB resurveyed the area on 2nd April 2011, and found one specimen of *H. rufifrons* at SN638559. This prompted the 2012 survey which discovered the species in 16 locations across three sites on the Teifi floodplain (Dolau-gwyrddon-isaf, Gwaun Garthenor and Moor Wood, Highmead), including some very strong

colonies (Foster & Bilton, 2013). Following this work, John Bratton found a single specimen in siftings from the margins of a dry dune slack at Ynyslas, Dyfi NNR, on 3rd October 2013. The work detailed here revisits the sites discovered to support *H. rufifrons* in 2012, together with a selection of others, including areas of the Cors Caron NNR floodplain inaccessible due to high water levels in 2012 and the area at Ynyslas where the beetle was found in 2013.

2. Methodology

2.1 Study area and site locations

Survey work was concentrated on the Teifi floodplain, resurveying all populations discovered during the 2012 survey. Potentially suitable areas on Cors Caron NNR were located *a priori* from Google™ Earth imagery, by looking for areas of apparent floodplain pools, fen or areas of rush pasture and by walking the site. Potentially suitable areas of transition fen on Cors Fochno were located with the assistance of the NRW site manager, Justin Lyons.

2.2 Survey methodology

Sites were sampled using a standard D-framed pond net (1 mm mesh). Individual sites were worked until no further taxa were discovered; sampling time at locations varying as a result. After *H. rufifrons* was detected at a site, netting was sometimes minimised so as to avoid excessive habitat disturbance if the suitable area was small. Most water beetles were identified in the field, with the exception of members of a number of critical genera/species complexes, which were retained for further examination.

2.3 Survey sites

Thirty-nine samples were taken in 12 areas:

- the Teifi floodplain at Cors Caron (1-10);
- the area around Gwaun Garthenor (11-12);
- an oxbow at Dolau-gwyrddon-isaf (13-14);
- locations on the Dolau Uchaf oxbow (15-19);
- oxbows at Moor Wood, Highmead (20-21);
- an oxbow system at Pentrecagal (22-24);
- a permanent floodplain pool at Abermachnog (25);
- an oxbow on the Cothi floodplain near its confluence with Afon Marlais (26-27);
- oxbows on the Teifi floodplain near Pont Carfan (28-29);
- a permanent pool near Abercoed (30);
- wetland habitats on the margins of Cors Fochno (31-35);

- dune slacks at Ynyslas (36-39).

In addition, the Teifi floodplain SW of Lampeter was visited, but no water was available to sample. Sites sampled are listed in Table 1 below.

3. Results & discussion

Results are summarized in Table 1 and as site inventories in Appendix 1, which includes all water beetle species recorded and photos of selected habitats.

Table 1. Sites surveyed for *Hydroporus rufifrons* in Wales in 2026. * indicates sites where the species was found in 2012.

Site	Samples	Grid Reference	Date	<i>H. rufifrons</i>
Cors Caron	1-10	SN6761	07-08/05/2026	Present
*Gwaun Garthenor	11-12	SN6456	08-09/05/2026	Present
*Dolau-gwyrddon-isaf	13-14	SN561464	09/05/2026	Extinct?
Dolau Uchaf oxbow	15-19	SN5143	09/05/2026	Absent
*Moor Wood, Highmead	20-21	SN503430	08/05/2026	Extinct?
Pentrecagel	22-24	SN3440	09/05/2026	Absent
Abermachnog	25	SN375403	09/05/2026	Absent
Afon Marlais confluence	26-27	SN644368	09/05/2026	Absent
Pont Carfan	28-29	SN6657	10/05/2026	Absent
Abercoed	30	SN672583	10/05/2026	Absent
Cors Fochno environs	31-35	SN69	11/05/2026	Absent
Ynyslas dunes	36-39	SN6193	11/05/2026	Abundant

3.1 Cors Caron

A total of 10 locations were sampled for water beetles at Cors Caron NNR on 7th and 8th May 2026 (Figures 2-5). Sites 1-9 are on the Teifi floodplain between the raised bog domes, areas grazed by horses and cattle. All sites in this area are likely to have developed in old river channels before the river was canalized, or in the remains of former drainage structures. ***H. rufifrons* was found in three locations (1, 4 & 9), although only in location 4 were multiple individuals (3) found.** The other significant find here is the diving beetle *Nartus grapii*, which occurred commonly in *Menyanthes* fen at locality 10, one of the few known Welsh sites for this fen species.

The area of the NNR covered by locations 1-9, and the area immediately to the south of location 1, contain a large area of potentially suitable habitat for *H. rufifrons*, although at the time of visit many seasonal pools were already dry. It is highly likely that the species is relatively widespread in this area of Cors Caron and further investigation during a wetter year may be useful.

Whilst the discovery of the species in the NNR is welcome and significant, particularly given apparent losses elsewhere along the Teifi (see below), it is important that future management of the site is conducted appropriately. During the survey, it was apparent that a number of seasonal pools had had their marginal *Juncus* tussocks cut in recent years (e.g. Figure 6). Unfortunately, this is precisely the kind of habitat structure required by *H.*

rufifrons, which is always associated with areas with marginal vegetation, usually tussocks of *Juncus* and *Carex*. Although we lack direct experimental evidence, it is likely that such vegetation is required for pupation and/or aestivation of adults during dry phases.



Figure 2. Google™ Earth image of Teifi floodplain at Cors Caron NNR, showing locations 1-5 sampled for water beetles. Samples taken at approx. the centre of each number.

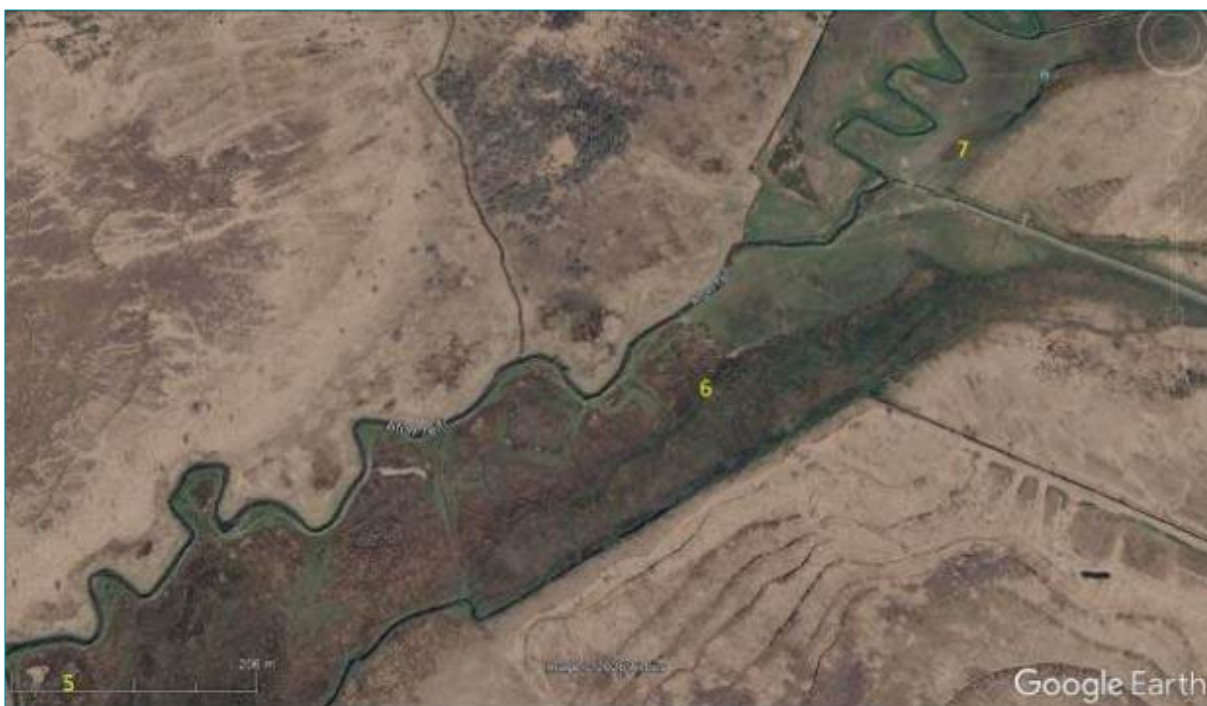


Figure 3. Google™ Earth image of Teifi floodplain at Cors Caron NNR, showing locations 5-7 sampled for water beetles. Samples taken at approx. the centre of each number.

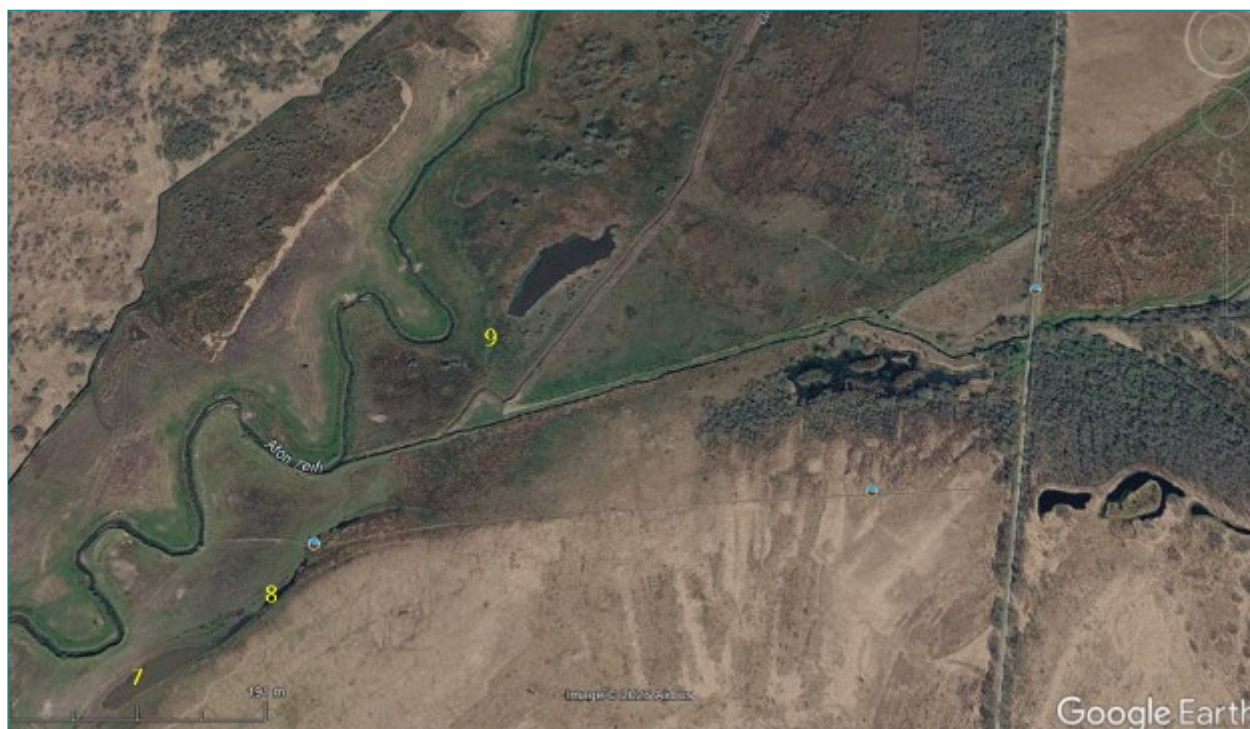


Figure 4. Google™ Earth image of Teifi floodplain at Cors Caron NNR, showing locations 7-9 sampled for water beetles. Samples taken at approx. the centre of each number.

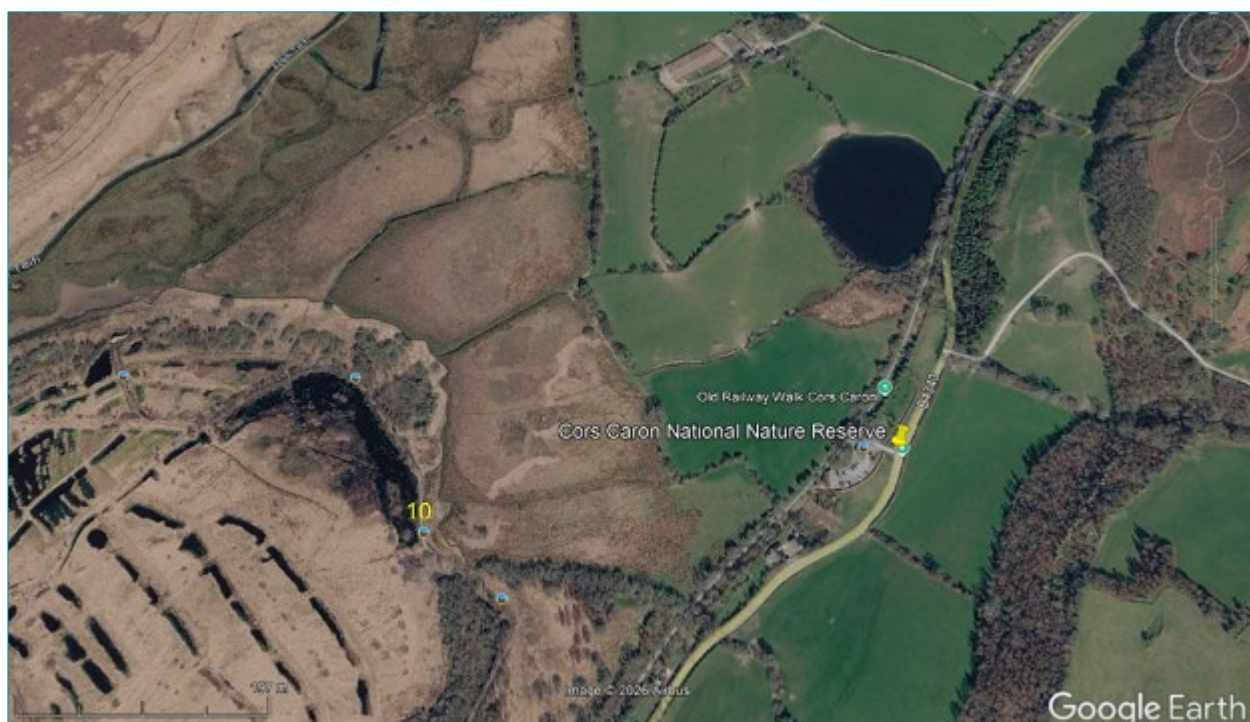


Figure 5. Google™ Earth image of Teifi floodplain at Cors Caron NNR, showing location 10 sampled for water beetles. Sample taken at approx. the centre of number.



Figure 6. Location 3 at Cors Caron NNR. A) margin of pool with cut bases of *Juncus* tussocks; B) opposite margin of same pool with remaining tussock structure – here *Hydroporus rufifrons* was found at *Juncus* bases.

Management Recommendation: Avoid further tussock removal from areas at the margins of reliable seasonal pools on Cors Caron NNR. As well as the direct destruction of *H. rufifrons* habitat, the encouragement of greater numbers of waterfowl such as Canada Geese can lead to localised eutrophication, which is also detrimental to the survival of this species.

3.2 Gwaun Garthenor

In the 2012 survey, this area was found to support one of the strongest concentrations of *Hydroporus rufifrons* remaining in the UK, if not western Europe (Foster & Bilton, 2013). Locations sampled during the 2012 survey are shown in Figure 7 below. Of these, 12 (1, 2, 4, 7 and 9-16) supported *H. rufifrons*, with the beetle being very abundant as adults and larvae in the seasonal pools 9-16, situated in an area of unimproved riverside pasture grazed by Llamas.

The area was revisited on 8th and 9th May 2026 and (despite being in the same management) was found to have changed considerably. The area covered by locations 1-8 from the 2012 survey was significantly drier and showed considerably more scrub invasion, particularly by *Salix*, some of which are relatively large now. During 2012 and prior, this area retained considerable wet habitat even during dry periods of the year (DTB, pers. obs.). What was an area of seasonally fluctuating, but permanently damp fen in 2012

is now very much drier, it being hard to find any water at all. This ecological change is clearly visible when comparing contemporary and historical Google™ Earth imagery (Figure 8). Whether this change is down to climatic factors or changes to surrounding drainage networks is unclear, but it would appear that this section of the site has passed an ecological ‘tipping point’ and will continue to develop into *Salix* carr, leading to the continued loss of its specialist biota.



Figure 7. Google™ Earth image of Teifi floodplain at Gwaun Garthenor showing locations sampled for water beetles in the 2012 survey. Samples taken at approx. the centre of each number. *Hydroporus rufifrons* was found at locations 1, 2, 4, 7 and 9-16.

Locations 9-16 from the 2012 survey were all completely dry at the time of visit in May 2026. Whilst there had been no apparent change in management, the vegetation at these locations suggested that they wet less frequently than they did around 2012. Considerable areas of *Urtica* invasion, for example, were not present in 2012 and point to this. *Urtica* also indicates eutrophication, perhaps resulting from increased nutrient loading in the Teifi? A return visit when these seasonal pools contain water is planned, however, since *H. rufifrons* may still be present.

Despite considerable time spent walking this site, water was only found in two areas (other than deep, sheer-sided drains, entirely unsuitable for *H. rufifrons* so not sampled). Locations 11-12 in Figure 9 below show the location of these sites, **a single female *H. rufifrons* being found at location 11**. Site 12 supported the scarce wetland carabid *Blethisa multipunctata*.

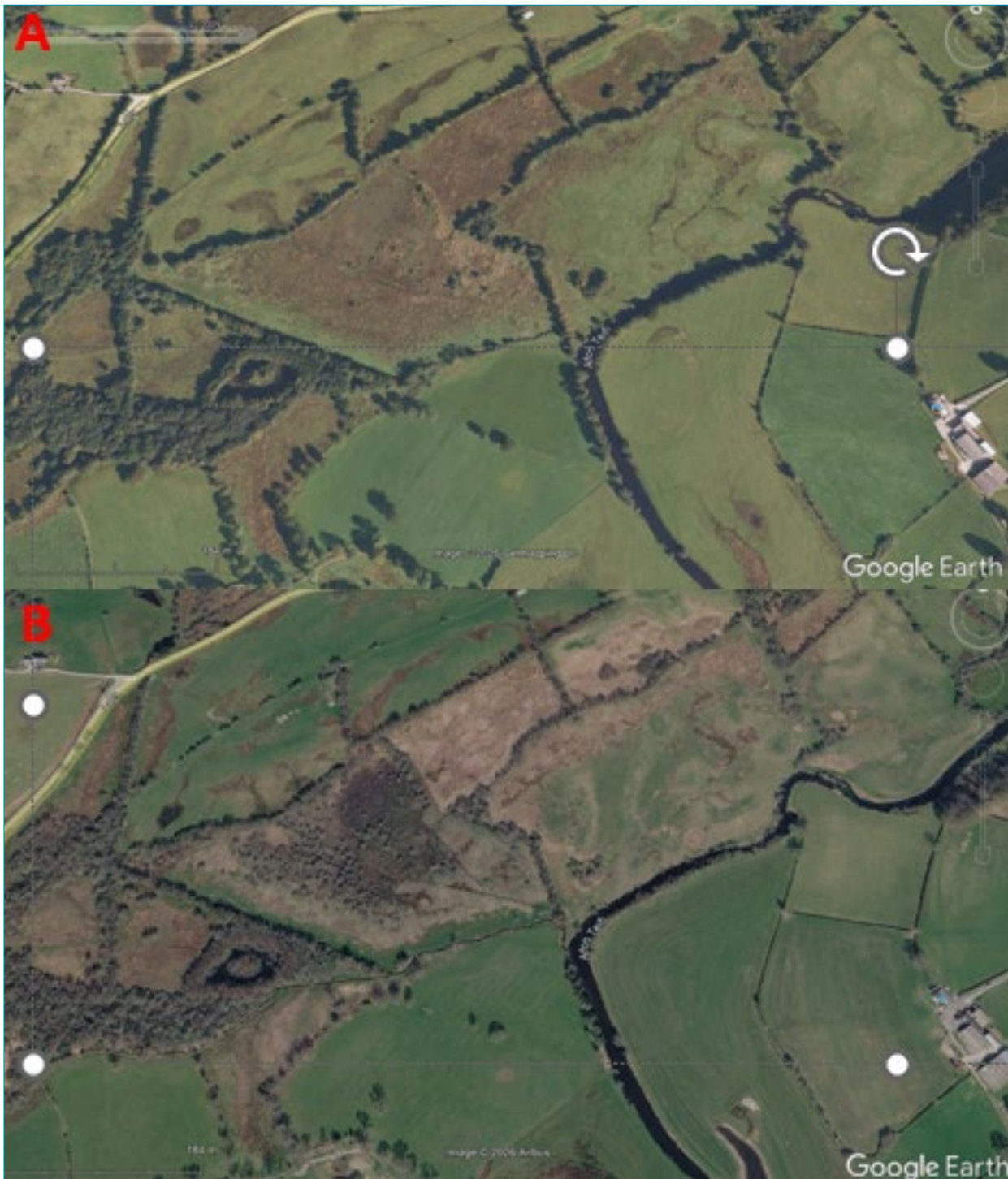


Figure 8. Google™ Earth image of Teifi floodplain at Gwaun Garthenor showing changes in vegetation including scrub cover. A) imagery from 2009, reflecting the condition of the site in 2012; B) imagery from 2026. Note the substantial scrub encroachment in the core area of fen (locations 1-8 of 2012 survey in Figure 8). Whilst this area was very wet in 2012 and prior, it was almost completely dry in 2026.



Figure 9. Google™ Earth image of Teifi floodplain at Gwaun Garthenor, showing locations 11-12 sampled for water beetles. Samples taken at approx. the centre of numbers.

Management recommendation: Clear scrub, prevent further eutrophication and restore hydrology to provide suitable conditions for *H. rufifrons* and re-establish a robust population.

3.3 Dolau-gwyrddon-isaf

This site was visited on 9th May 2026 where samples were taken from two locations as shown in Figure 10. As with Gwaun Garthenor, it has deteriorated significantly since the last survey in 2012, this time clearly a result of agricultural activity. The main oxbow that formerly supported a diverse sward of seasonal fen vegetation with many tussocks and moss, is now a highly eutrophicated muddy wallow, almost devoid of vegetation and entirely unsuitable for *H. rufifrons* which was not found and is almost certainly now extinct at the site. Figure 11 below shows almost exactly the same area and aspect of this site during the two surveys – note the considerable deterioration in habitat quality evident.



Figure 10. Google™ Earth image of Teifi floodplain at Dolau-gwyrddon-isaf, showing locations 13-14 sampled for water beetles. Samples taken at approx. the centre of numbers.



Figure 11. Oxbow at Dolau-gwyrddon-isaf showing changes in habitat and vegetation between 2012 and 2026. A) photo from August 2012 – note abundant aquatic vegetation and tussocks; B) photo from May 2026 – note the large areas of cattle trampled eutrophic mud, lack of vegetation and loss of tussocks. The large *Salix* is the same bush, top centre left in A), top right in B).

3.4 Dolau Uchaf Oxbow

Five locations (15-19) were sampled on this large oxbow south of Llanybydder on 9th May 2026 (Figure 12). All supported eutrophic fen communities, unlikely to support *H. rufifrons*, which was not reported at the site.



Figure 12. Google™ Earth image of Teifi floodplain at Dolau Uchaf oxbow, showing locations 15-19 sampled for water beetles. Samples taken at approx. the centre of numbers.

3.5 Moor Wood, Highmead

Another location where *H. rufifrons* was discovered in the 2012 survey, and another which has changed in character considerably in the intervening years. Locations sampled in 2012 are shown in Figure 13 below, *H. rufifrons* being found at locations 37 and 39. In 2012, it was also noted that a significant area of the site, from locations 36 to 40, appeared potentially suitable for the species.

The site was revisited on 9th May 2026 and, as with others, has deteriorated since 2012. Overall, the site shows signs of being much drier and being more heavily grazed, having lost much of its vegetation structure – tussocks in particular being infrequent, some apparently having been recently removed by cutting. There are also signs of significant eutrophication, including the spread of *Urtica* into the oxbows themselves.

Of the locations sampled in 2012, 36 was dry and invaded by *Urtica*, 37 was sampled but much more eutrophic than in 2012 and lacking tussocks, 38 was dry, heavily grazed and entirely lacking tussocks, 39 was dry and 40 was again eutrophicated with muddy margins.

No *H. rufifrons* were found in 2026 and it seems likely the species is now extinct at the site. Sites where beetles were sampled are indicated in Figure 15 below, primary numbers being those allotted in 2026. The loss of vegetation structure is evident, for example, in Figure 14 and at a larger scale if one compares Figure 13 (2009 imagery) with Figure 15 (2026 imagery).



Figure 13. Google™ Earth image of Teifi floodplain at Moor Wood, Highmead in 2012, showing locations sampled for water beetles. Samples taken at approx. the centre of numbers.



Figure 14. Moor Wood, Highmead, showing location 38 from the 2012 survey. A) August 2012; B) May 2026. Note the complete loss of habitat structure here.



Figure 15. Google™ Earth image of Teifi floodplain at Moor Wood, Highmead, showing locations 20-21 sampled for water beetles. Numbers in parenthesis are those from 2012 survey. Samples taken at approx. the centre of primary numbers.

3.6 Pentrecagal

Three locations were sampled on 9th May 2026 on this oxbow system on the Teifi floodplain near Pentrecagal (22-24), see Figure 16. None was likely to support *H. rufifrons*.



Figure 16. Google™ Earth image of Teifi floodplain near Pentrecagal, showing locations 22-24 sampled for water beetles. Samples taken at approx. the centre of numbers.

3.7 Abermachnog

Flooded vegetation in the margins of a permanent oxbow pool (Figure 17) was sampled on 9th May 2026. It was not likely to be suitable for *H. rufifrons*.



Figure 17. Google™ Earth image of Teifi floodplain near Abermachnog, showing location 25 sampled for water beetles. Sample taken at approx. the centre of number.

3.8 Cothi floodplain near confluence with Afon Marlais

Two locations were sampled on 9th May 2026 in an oxbow complex (Figure 18). Seasonally fluctuating but silty and eutrophic and unlikely to support *H. rufifrons*, which was not found here.



Figure 18. Google™ Earth image of Cothi floodplain near Afon Marlais confluence, showing locations 26-27 sampled for water beetles. Samples taken at approx. the centre of numbers.

3.9 Teifi floodplain near Pont Carfan

Eight locations were sampled here during the 2012 survey, although *H. rufifrons* was not found in any. The area was revisited on 10th May 2026, when only two of these were wet. Areas sampled are shown on Figure 19 below. *H. rufifrons* was again not found and it seems unlikely this area supports the species.

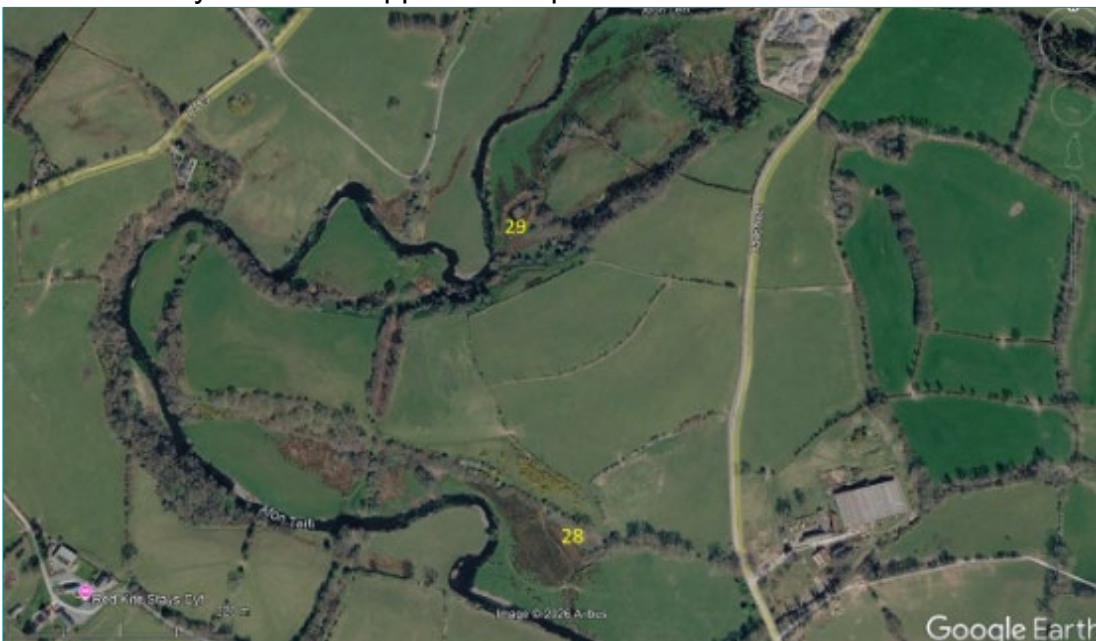


Figure 19. Google™ Earth image of Teifi floodplain near Pont Carfan, showing locations 28-29 sampled for water beetles. Samples taken at approx. the centre of numbers.

3.10 Permanent pool near Abercoed

A permanent pool with invasive *Crassula helmsii* beside road. Some *Juncus* tussocks etc., but as in 2012, no *H. rufifrons* were found when this pool was sampled on 10th May 2026. For location sampled see Figure 20.



Figure 20. Google™ Earth image of Teifi floodplain near Abercoed, showing location 30 sampled for water beetles. Sample taken at approx. the centre of number.

3.11 Teifi floodplain SW of Lampeter

Figure 21 shows locations sampled here for *H. rufifrons* in 2012. This section of the floodplain was revisited on 10th May 2026. The entire area was dry, including all previously sampled areas. Given that this is intensively grazed pasture, and the species was not found when sites were wet in 2012, it seems unlikely that the area supports *H. rufifrons*.



Figure 21. Google™ Earth image of Teifi floodplain SW of Lampeter, showing locations sampled for water beetles in the 2012 survey. All were dry when visited in 2026.

3.12 Cors Fochno environs

Five locations were sampled around the margins of Cors Fochno on 11th May 2026. These were selected after liaising with the NRW site manager, Justin Lyons, to represent areas with transition fen, which may support the target species. Although *H. rufifrons* was not found, this work resulted in a number of additional water beetle records, including *Nartus grapii* and *Hydaticus seminiger*. *Nartus* is known otherwise only from Cors Caron in mid-west Wales. The only previous records of the Nationally Scarce *H. seminiger* in Wales are from Flintshire and Denbighshire on the edge of the Cheshire Plain (Foster *et al.*, 2016; Garth Foster, pers. comm.), the discovery at Cors Fochno representing a significant range extension for this large diving beetle.

Locations sampled are indicated in Figure 22.



Figure 22. Google™ Earth image of Cors Fochno environs, showing locations 31-35 sampled for water beetles. Samples taken at approx. the centre of numbers.

3.13 Ynyslas Dunes

As noted above, a single specimen of *H. rufifrons* was sifted from moss at the edge of a dry dune slack pool at Ynyslas by John Bratton in 2013. DTB has opportunistically visited this area a number of times since, the site typically being either bone dry or too heavily inundated to sample. This slack has been invaded by *Crassula helmsii*, which is being controlled by sequential application of plastic sheeting to the stonecrop beds. Water levels during the visit on 11th May 2026 were perfect, however. **In addition to being abundant in the pool where it was discovered by John Bratton, *H. rufifrons* was also found to be common in two other nearby slacks, and an adjacent ditch which had been**

colonized by the same mossy swamp vegetation present in the slacks. There are areas adjacent to those sampled around locations 36 and 37 which support suitable habitat, dry at the time of visit. Ynyslas clearly supports a very strong, healthy colony of the species, particularly important in a Welsh context, given observations on the Teifi in 2026. Locations sampled at Ynyslas are shown in Figure 23.

Current management of slacks at Ynyslas seems to be working very well for *Hydroporus rufifrons*, including the sequential smothering of *Crassula helmsii*, which has not negatively affected the population in the original slack.

Three adults were found under the plastic sheeting on 11th August 2026 despite drought conditions across Wales in July and August.

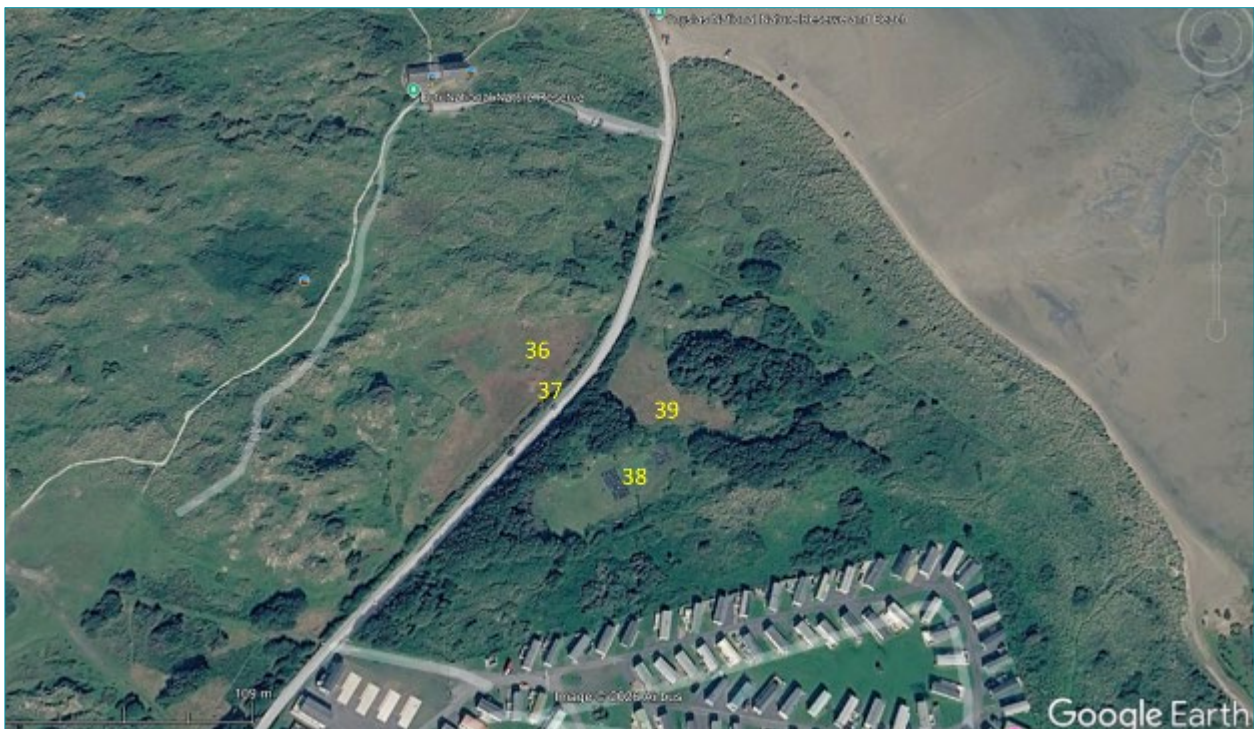


Figure 23. Google™ Earth image of Ynyslas dunes, showing locations 36-39 sampled for water beetles. Samples taken at approx. the centre of numbers. Note black plastic sheeting for *Crassula* control visible in location 38 – the slack where a single specimen of *H. rufifrons* was sifted in 2013.

4. Conclusions

H. rufifrons was found at three sites during the current survey – Cors Caron, Gwaun Garthenor and Ynyslas Dunes – and these represent the only known Welsh localities. At Cors Caron, five adults were recorded at three locations (Sites 1, 4 & 9), with just a single female recorded at Gwaun Garthenor (Site 11). The beetle was abundant in dune slacks on Ynyslas Dunes with over 100 adults recorded at Sites 36, 37, 38 & 39. Previously occupied habitat at Dolau-gwyrddon-isaf and Moor Wood, Highmead has been lost to agricultural, and perhaps hydrological, changes and the loss of tussocky vegetation and *H. rufifrons* is considered extinct at these sites.

More sympathetic management of occupied pools on Cors Caron is required to safeguard populations, and significant habitat restoration is required urgently at Gwaun Garthenor to prevent the extirpation of the beetle. This includes scrub clearance, the prevention of further eutrophication and the restoration of suitable hydrological conditions.

Welsh populations represent the southern limit of the British distribution of *H. rufifrons* given historic losses in southern England, with the nearest extant populations in the southern Lake District. It is therefore imperative to ensure continued occupancy of all Welsh sites to maintain current range.

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Appendix 1. Site inventories and photos

Site 1. 7th May 2026. Cors Caron, Teifi floodplain SN688635. Seasonally flooded margin of permanent pool on floodplain.

Hydroporus incognitus
Helophorus aequalis
H. memnonius castaneus
H. flavipes
H. palustris
Hydrobius subrotundus
H. pubescens
Helochares punctatus
***H. rufifrons* – 1 adult**
Anacaena globulus
Agabus bipustulatus
A. lutescens
Agabus sturmii
Dryops luridus
Ilybius guttiger



Site 2. 7th May 2026. Cors Caron, Teifi floodplain SN688635. Old channel with deep water core and seasonally fluctuating vegetated margins.

Hydroporus angustatus

Ilybius guttiger

H. palustris

Hydrobius subrotundus

H. pubescens

Anacaena globulus

Agabus sturmii

A. lutescens



Site 3. 7th May 2026. Cors Caron, Teifi floodplain SN688635. Another deep former channel, samples taken from silty vegetation in seasonal flooded margins.

Noterus clavicornis

Hydroporus incognitus

Agabus bipustulatus

A. sturmii

Ilybius ater

Helophorus flavipes

Helochares punctatus

Anacaena lutescens



Site 4. 8th May 2026. Cors Caron, Teifi floodplain SN689638. Seasonal pool on floodplain with some mosses and marginal *Juncus* tussocks – some of these cut down (see report above).

Noterus clavicornis

Hydroporus angustatus

H. erythrocephalus

H. incognitus

H. nigrita

H. memnonius castaneus

H. palustris

H. pubescens

***H. rufifrons* – 3 adults**

Agabus bipustulatus

A. sturmii

Ilybius ater

I. fuliginosus

I. guttiger

Colymbetes fuscus

Helophorus aequalis

H. flavipes

Hydrobius subrotundus

Anacaena lutescens



Site 5. 8th May 2026. Cors Caron, Teifi floodplain SN689638. Seasonal pool with mud and algae – no tussocks remaining – all cut down.

Hydroporus pubescens

H. tessellatus

Laccobius minutus



Site 6. 8th May 2026. Cors Caron, Teifi floodplain SN695642. Vegetated ditch at edge of raised bog dome.

Hydroporus incognitus

H. tessellatus

A. bipustulatus

A. sturmii

Ilybius ater

Helophorus flavipes

Enochrus affinis

Hydrobius subrotundus

Anacaena lutescens

Coelostoma orbiculare



Site 7. 8th May 2026. Cors Caron, Teifi floodplain SN695642. Open, silty pool with limited vegetation and heavy Canada Goose presence/usage.

Noterus clavicornis

Hydroporus nigrita

H. tessellatus

Agabus sturmii

Ilybius ater

Hydrobius subrotundus

Helochares punctatus



Site 8. 8th May 2026 Cors Caron, Teifi floodplain SN695642. Old river channel with rich vegetation in margins.

Gyrinus caspius

G. substriatus

Noterus clavicornis

Agabus bipustulatus

A. sturmii

Ilybius ater

Anacaena globulus

Hydrobius subrotundus

Enochrus affinis

Hydraena britteni



Site 9. 8th May 2026. Cors Caron, Teifi floodplain SN696644. Old channel with rich vegetation and seasonally flooded margins.

Haliphus lineatocollis

Hydroporus incognitus

H. memnonius castaneus

H. nigrita

H. palustris

H. pubescens

***H. rufifrons* – 1 adult**

Agabus bipustulatus

A. sturmii

Ilybius fuliginosus

Colymbetes fuscus

Dytiscus semisulcatus

Helophorus aequalis

H. flavipes

Hydrobius subrotundus

Helochares punctatus

Anacaena globulus

A. lutescens

Coelostoma orbiculare

Cercyon ustulatus



Site 10. 8th May 2026. Cors Caron, SN688625. Mossy *Menyanthes* swamp with marginal *Carex* tussocks and *Salix* beside boardwalk.

Hydroporus gyllenhalii

H. incognitus

H. palustris

H. pubescens

Agabus bipustulatus

A. sturmii

Ilybius ater

I. fuliginosus

I. quadriguttatus

Nartus grapii

Colymbetes fuscus

Anacaena globulus

A. lutescens

Enochrus affinis

Hydraena britteni

Dryops luridus



Site 11. 8th May 2026. Gwaun Garthenor SN637557. Seasonally fluctuating richly vegetated fen with *Carex* and *Juncus* tussocks and some mosses.

Hydroporus erythrocephalus

H. gyllenhalii

H. memnonius castaneus

H. palustris

H. pubescens

***H. rufifrons* – 1 female**

Agabus affinis

A. bipustulatus

A. sturmii

Ilybius fuliginosus

Helophorus aequalis

H. obscurus

Hydrobius subrotundus

Enochrus fuscipennis

Hydraena britteni

Dryops luridus



Site 12. 8th May 2012. Gwaun Garthenor SN638557. Shallow ditch margins with *Glyceria*.

Hydroporus angustatus

H. memnonius castaneus

H. nigrita

H. palustris

H. planus

H. pubescens

H. tessellatus

Agabus bipustulatus

A. sturmii

Ilybus ater

I. fuliginosus

I. guttiger

Rhantus exsoletus

Colymbetes fuscus – larva

Dytiscus semisulcatus – larva

Helophorus aequalis

H. brevipalpis

H. grandis

H. obscurus

Enochrus coarctatus

Hydrobius subrotundus

Dryops luridus

Blethisa multipunctata



Site 13. 9th May 2026. Dolau-gwyrddon-isaf oxbow 1 SN561464. Muddy remnant oxbow pool with heavy cattle trampling, deep eutrophic silt and limited vegetation.

Hydroporus pubescens

H. tessellatus

Agabus bipustulatus



Site 14. 9th May 2026. Dolau-gwyrddon-isaf oxbow 1 SN561464. Muddy remnant oxbow pool with heavy cattle trampling, deep eutrophic silt and limited vegetation.

Laccophilus minutus
Hydroporus pubescens
H. palustris
H. tessellatus
Agabus bipustulatus
Dytiscus marginalis – larvae
Helophorus aequalis
Anacaena lutescens



Site 15. 9th May 2026. Dolau Uchaf oxbow 1 SN5143. *Carex* sedge swamp with fen and leaf litter on soft deep silt in partial shade.

Hydroporus memnonius castaneus

Hydroporus palustris

H. pubescens

H. tessellatus

Agabus bipustulatus

Ilybius ater

Dytiscus marginalis

Helophorus aequalis

H. obscurus

Anacaena lutescens



Site 16. 9th May 2026. Dolau Uchaf oxbow 2 SN5143. *Glyceria maxima*-dominated swamp with fen and leaf litter on soft deep silt in partial shade.

Hydroporus palustris

H. planus

H. pubescens

H. tessellatus

Agabus bipustulatus

A. sturmii

Anacaena globulus

A. lutescens

Hydraena riparia



Site 17. 9th May 2026. Dolau Uchaf oxbow 3 SN5143. *Carex*-dominated swamp with fen and leaf litter on soft deep silt in partial shade.

Hydroporus palustris

H. planus

H. pubescens

H. tessellatus

Agabus bipustulatus

A. sturmii

Ilybius ater

Anacaena globulus



Site 18. 9th May 2026. Dolau Uchaf oxbow 4 SN5143. Deep, permanent pool with *Carex* in margins and *Potamogeton*.

Hydroporus palustris

H. tessellatus

Agabus bipustulatus

A. sturmii

Ilybius ater

Dytiscus marginalis

Helophorus grandis

H. minutus



Site 19. 9th May 2026. Dolau Uchaf oxbow 5 SN5143. *Glyceria maxima*, algae and *Myriophyllum* in open water at end of more permanent section.

Hydroporus tessellatus
Colymbetes fuscus
Dytiscus marginalis
Helophorus aequalis
H. minutus



Site 20. 9th May 2026. Moor Wood, Highmead 1 SN503430. *Glyceria*, *Juncus* and algae over fine mud at edges of *Salix* thicket.

Hydroporus memnonius castaneus

H. nigrita

H. palustris

H. planus

H. pubescens

H. tessellatus

Agabus bipustulatus

Helophorus aequalis

H. grandis

Hydrobius fuscipes

Anacaena lutescens



Site 21. 9th May 2026. Moor Wood, Highmead 2 SN503430. Permanent pool with *Glyceria* and *Juncus* spp., with muddy edges at edges of *Salix* thicket.

Haliphus lineatocollis

Hydroporus pubescens

H. tessellatus

Agabus bipustulatus

Ilybius ater

Dytiscus marginalis – larvae

Helophorus brevipalpis

H. obscurus

Anacaena lutescens



Site 22. 9th May 2026. Teifi floodplain near Pentrecagal 1 SN3440. *Juncus*, *Glyceria* and *Persicaria* over silt in drying remnant oxbow.

Hydroporus planus
H. pubescens
H. tessellatus
Agabus bipustulatus
Ilybius fuliginosus
Dytiscus marginalis – larvae
Helophorus aequalis
H. brevipalpis
H. grandis
H. obscurus
Hydrobius fuscipes
Anacaena lutescens



Site 23. 9th May 2026. Teifi floodplain near Pentrecagal 2 SN3440. *Glyceria maxima*, *Phalaris* and algae below *Salix* on edge of main pond.

Hydroporus incognitus
H. memnonius castaneus
H. pubescens
Agabus bipustulatus
Ilybius ater
I. fuliginosus
Colymbetes fuscus larva
Helophorus aequalis
H. brevipalpis
H. grandis
Anacaena globulus
Dryops luridus



Site 24. 9th May 2026. Teifi floodplain near Pentrecagal 3 SN3440. Silt with *Eleocharis*, *Carex*, *Pericaria* and *Glyceria* with much algae.

Hydroporus palustris

H. planus

H. pubescens

H. tessellatus

Rhantus exsoletus

Helophorus brevipalpis

H. obscurus

Anacaena lutescens

Hydrobius fuscipes



Site 25. 9th May 2026. Oxbow at Abermachnag SN375403. Permanent pool margins with *Phalaris*, *Eleocharis*, *Glyceria*, *Equisetum* etc. over silt.

Haliphus ruficollis

Laccophilus minutus

Hygrotus inaequalis

Hydroporus palustris

H. pubescens

Agabus bipustulatus

A. sturmii

Ilybius fuliginosus

Colymbetes fuscus

Helophorus aequalis

H. brevipalpis

H. grandis

H. minutus

H. obscurus

Hydrobius fuscipes

Anacaena globulus

A. limbata

Dryops luridus



Site 26. 9th May 2026 Oxbow at Afon Marlais confluence 1 SN644368. *Phalaris*, *Juncus* and *Glyceria* over silt and plant debris.

Laccophilus minutus

Hydroporus memnonius castaneus

H. palustris

H. pubescens

H. tessellatus

Agabus bipustulatus

A. sturmii

Ilybius ater

Helophorus aequalis

H. brevipalpis

H. obscurus

Hydrobius fuscipes

Anacaena lutescens

Dryops luridus



Site 27. 9th May 2026 Oxbow at Afon Marlais confluence 2 SN644368. Dense vegetation dominated by *Juncus* and *Glyceria* over silt and plant debris.

Laccophilus minutus

Hydroporus memnonius castaneus

H. palustris

H. pubescens

H. tessellatus

Agabus bipustulatus

A. sturmii

Ilybius ater

Helophorus aequalis

H. brevipalpis

H. obscurus

Hydrobius fuscipes

Anacaena lutescens

Dryops luridus



Site 28. 10th May 2026 Teifi floodplain at Pont Carfan 1 SN6657. Residual water in drainage ditch cut through old oxbow, with *Callitriche*, *Apium* and algae over silt.

Haliphus ruficollis
Hygrotus inaequalis
Agabus bipustulatus
A. sturmii
Dytiscus semisulcatus
Helophorus aequalis
H. grandis



Site 29. 10th May 2026. Teifi floodplain at Pont Carfan 2 SN6657. Permanent pond with *Juncus* and *Glyceria* in margins.

Haliplus ruficollis

Hydroporus memnonius castaneus

H. nigrita

H. palustris

H. pubescens

Agabus bipustulatus

A. sturmii

Ilybius ater

Colymbetes fuscus larva

Helophorus grandis

Anacaena lutescens

Hydrobius fuscipes



Site 30. 10th May 2026. Permanent pool near Abercoed SN672583. Permanent pool with marginal *Crassula helmsii*, *Juncus*, *Glyceria* etc. over silt and dead leaves.

Gyrinus substriatus
Haliphus ruficollis
Hygrotus inaequalis
Hydroporus palustris
H. pubescens
Agabus bipustulatus
A. sturmii
Colymbetes fuscus larva
Helophorus aequalis
H. grandis
Hydrobius fuscipes



Site 31. 11th May 2026. Cors Fochno environs 1 SN6191. Linear pool dug ca. 40 years previously, with *Sparganium*, *Chara*, *Potamogeton* and *Juncus*.

Noterus clavicornis
Hydroporus gyllenhalii
H. pubescens
H. tessellatus
Liopterus haemorrhoidalis
Agabus bipustulatus
A. sturmii
Ilybius ater
I. montanus
Nartus grapii
Colymbetes fuscus larva
Enochrus affinis
Helochares punctatus
Hydrobius fuscipes
Cymbiodyta marginella



Site 32. 11th May 2026. Cors Fochno environs 2 SN6191. Linear pool dug ca. 40 years previously, with reeds, *Sparganium*, *Chara*, *Potamogeton* and *Juncus*.

Noterus clavicornis
Hydroporus gyllenhalii
H. pubescens
H. tessellatus
H. umbrosus
Liopterus haemorrhoidalis
Agabus bipustulatus
A. sturmii
Ilybius ater
I. montanus
Nartus grapii
Colymbetes fuscus larva
Enochrus affinis
Helochares punctatus
Hydrobius fuscipes



Site 33. 11th May 2026. Cors Fochno environs 3 SN6191. Part of linear pool complex dug ca. 40 years previously, with reeds, *Sparganium*, *Chara*, *Potamogeton* and *Juncus*.

Noterus clavicornis
Hydroporus erythrocephalus
H. gyllenhali
H. pubescens
H. tessellatus
H. umbrosus
Liopterus haemorrhoidalis
Agabus bipustulatus
A. sturmii
Ilybius ater
I. montanus
Nartus grapii
Colymbetes fuscus
Helophorus flavipes
Enochrus affinis
Helochares punctatus
Hydrobius fuscipes



Site 34. 11th May 2026. Cors Fochno environs 4 SN6191. Permanent ditch with reedswamp.

Graptodytes pictus
Hygrotus inaequalis
Hydroporus erythrocephalus
Ilybius ater
I. fuliginosus
Nartus grapii
Enochrus ochropterus
Chaetarthria similima



Site 35. 11th May 2026. Cors Fochno environs 5 SN6392. Deep permanent ditch on bog edge with dense marginal vegetation of *Iris*, *Juncus* etc.

Haliphus ruficollis
Noterus clavicornis
Laccophilus minutus
Hyphydrus ovatus
Hygrotus inaequalis
Hydroporus planus
H. pubescens
H. tessellatus
Agabus bipustulatus
A. congener
A. sturmii
Ilybius ater
I. montanus
Hydaticus seminiger
Helophorus brevipalpis
Enochrus affinis



Site 36. 11th May 2026. Ynyslas dunes slack 1 SN609940. Mossy, densely vegetated dune slack, mowed in summer. Diverse sward including *Carex*, *Juncus* etc. Almost dry, water revealed by trampling.

Hydroporus planus

H. pubescens

***H. rufifrons* – abundant (> 20)**

H. striola

Agabus bipustulatus

Ilybius montanus

Helophorus aequalis

H. flavipes

Anacaena lutescens



Site 37. 11th May 2026 Ynyslas dunes 2 SN609940. Mossy ditch beside with *Scirpus* and detritus beside dune slack.

Hydroporus erythrocephalus

H. planus

H. pubescens

***H. rufifrons* – abundant (> 20)**

H. striola

Helophorus aequalis

H. flavipes

H. grandis

Anacaena lutescens

Helochares punctatus



Site 38. 11th May 2026. Ynyslas dunes slack 2 SN610938. Densely vegetated mossy slack with *Crassula helmsii* (managed with plastic sheeting). Site from which specimen was sifted by John Bratton in 2013.

Hygrotus impressopunctatus

Hydroporus palustris

H. planus

H. pubescens

***H. rufifrons* – abundant (> 30)**

H. tessellatus

Agabus bipustulatus

A. nebulosus

A. sturmii

Ilybius montanus

Colymbetes fuscus

Dytiscus marginalis – larvae

Helophorus aequalis

H. brevipalpis

H. grandis

H. flavipes

Enochrus fuscipennis

Anacaena lutescens

Helochares punctatus

Hydrobius subrotundus

Dryops luridus



Site 39. 11th May 2026. Ynyslas dunes slack 3 SN610938. Densely vegetated mossy slack immediately adjacent to last location. No photo taken, but habitat very similar in appearance.

Hydroporus palustris

Helophorus aequalis

H. planus

H. brevipalpis

H. pubescens

H. grandis

***H. rufifrons* – abundant (> 30)**

Anacaena lutescens

Agabus bipustulatus

Helochares punctatus

Ilybius montanus

Hydrobius subrotundus

Colymbetes fuscus

Dryops luridus

Data Archive Appendix

The data archive contains:

[A] The final report in Microsoft Word and Adobe PDF formats.

~~[B] A full set of maps produced in JPEG format.~~

~~[C] A series of GIS layers on which the maps in the report are based with a series of word documents detailing the data processing and structure of the GIS layers.~~

~~[D] A set of raster files in ESRI and ASCII grid formats.~~

~~[E] A database named [name] in Microsoft Access 2000 format with metadata described in a Microsoft Word document [name.doc].~~

~~[F] A full set of images produced in [jpg/tiff] format.~~

[G] Species records are held in the Welsh Invertebrate Database (WID).

Metadata for this project is publicly accessible through Natural Resources Wales' Library Catalogue <https://libcat.naturalresources.wales> (English Version) and <https://catllyfr.cyfoethnaturiol.cymru> (Welsh Version) by searching 'Dataset Titles'. The metadata is held as record no. **NRW_DS161635**.

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