

**CYNGOR CEFN GWLAD CYMRU
COUNTRYSIDE COUNCIL FOR WALES**

SITE OF SPECIAL SCIENTIFIC INTEREST CITATION

PEMBROKESHIRE

**AFON CLEDDAU GORLLEWINOL/
WESTERN CLEDDAU RIVER**

Date of Notification: 2003

National Grid Reference: SM867308 to SM958153

O.S. Maps: 1:50 000 Sheet number: 157
1:10 000 Sheet number: SN 02 NW, SW
SN 03 SW, SM 82 SE
SM 83 SE, SM 91 NW, NE
SM 92 NW, NE, SW, SE
SM 93 SW, SE

Site Area: 371.7 ha

Description:

The Western Cleddau River is of special interest primarily for important populations of otter *Lutra lutra*, bullhead *Cottus gobio*, river lamprey *Lampetra fluviatilis* and brook lamprey *Lampetra planeri*. It is also of special interest for sea lamprey *Petromyzon marinus*; for its range of river habitats including beds of submerged aquatic plants often dominated by water-crowfoot *Ranunculus* spp., as well as a variety of associated riverside habitats. The tributaries included within this site are the Afon Cleddau, Nant-y-bugail, Afon Anghof, Nant-y-coy Brook, Spittal Brook, Rudbaxton Water, Camrose Brook and Cartlett Brook.

The Western Cleddau is a lowland river, one of the westernmost in Britain. The main channel stretches for 30km between its source at Mathry, which lies at an altitude of 112m, to the tidal limit of the Daugleddau Estuary at Haverfordwest, flowing over sands and gravels deposited as the ice sheets from the last glaciation retreated. A striking feature of this river is that in flowing southwards it cuts across the structural orientation in the underlying rocks, which are of Precambrian to Silurian age (650-395 million years ago). In contrast, its main tributaries follow the orientation of the rocks or are controlled by structural features such as faults and folds.

In its upper course the river flows over soft substrates, across a marshy valley, bounded by the extensive mire of Corsydd Llangloffan NNR/SSSI. As it enters the wooded valley of Priskilly Forest the gradient of the river increases, and this relatively rapid section continues to Wolf's Castle and through the gorges at Treffgarne. In its lower reaches the river meanders through a wide valley floodplain bordered by low bluffs, to its tidal limit at Haverfordwest, where the Western Cleddau River SSSI ends.

The catchment for the Western Cleddau is predominantly agricultural land with significant areas of permanent pasture, broadleaved woodland and other semi-natural vegetation. Most

of the soils are of clay-rich acidic brown earth type, developed under former and surviving woodland cover, although there are also peaty deposits and peaty soils in some areas.

Biology:

The river is dominated for much of its course by a plant community characteristic of smaller, predominantly lowland, medium nutrient status rivers flowing over sandstone, mudstones or hard limestones of southern Britain. On the Western Cleddau, typical plants for this type of river include stream water-crowfoot *Ranunculus penicillatus* ssp. *penicillatus*, intermediate water-starwort *Callitriche hamulata*, the liverworts endive peltia *Pellia endiviifolia* and great scented liverwort *Conocephalum conicum*, brook-side feather-moss *Amblystegium fluviatile* and greater water-moss *Fontinalis antipyretica*, and species fringing the river channel include fool's-water-cress *Apium nodiflorum*, water-cress *Rorippa nasturtium-aquaticum*, hemlock water-dropwort *Oenanthe crocata*, purple-loosetrife *Lythrum salicaria*, bittersweet *Solanum dulcamara* and remote sedge *Carex remota*.

In shady, steeper-gradient sections the vegetation is dominated by mosses such as the rusty feather-moss *Brachythecium plumosum*, water grimmia *Schistidium alpicola*, fox-tail feather-moss *Thamnobryum alopercurum*, *Racomitrium aciculare* and liverworts including water earwort *Scapania undulata* and overleaf peltia *Pellia epiphylla*, as well as intermediate water-starwort. These species are normally associated with moderately base-poor, low nutrient river systems.

Throughout the length of the river where emergent species fringe the river channel, yellow iris *Iris pseudacorus*, the branched and unbranched bur-reeds *Sparganium erectum* and *S. emersum*, reed canary-grass *Phalaris arundinacea* and floating sweet-grass *Glyceria fluitans* are also typical. The slower flowing headwaters also include water-pepper *Persicaria hydropiper*, and extensive beds of common reed *Phragmites australis*. In the lower reaches marsh foxtail *Alopecurus geniculatus*, brooklime *Veronica beccabunga* and water mint *Mentha aquatica* are common. Water horsetail *Equisetum fluviatile* occurs in less nutrient-rich, slow-flowing reaches. Further up the riverbanks marsh woundwort *Stachys palustris* and lady-fern *Athyrium filix-femina* commonly occur throughout.

A notable feature of the vegetation communities in the Western Cleddau is the unusual distribution of certain species normally considered typical of acidic, low nutrient conditions. These include bulbous rush *Juncus bulbosus*, water earwort *Scapania undulata*, intermediate water starwort and alternate water-milfoil *Myriophyllum alterniflorum*, all of which occur throughout the system, often growing in close proximity to species generally thought typical of base-rich/nutrient-rich conditions such as water-cress *Rorippa nasturtium-aquaticum*, fool's-water-cress *Apium nodiflorum*, great willowherb *Epilobium hirsutum*, blunt-fruited water-starwort *Callitriche obtusangula*, brooklime and bittersweet.

From the headwaters to its confluence with the Afon Cleddau tributary, the Western Cleddau River meanders slowly through a variety of valley mire habitats, parts of which are included within Corsydd Llangloffan NNR/SSSI. The Western Cleddau supports plant species typical of this medium nutrient status river, but also blunt fruited water-starwort, which is more typical of base-rich/nutrient-rich conditions. The Western Cleddau then flows through the densely wooded banks of the Priskilly Forest, which is a particularly good site for otters, as they are impenetrable and undisturbed. It is characterised by a wide and meandering valley and supports aquatic plants typical of this type of river with extensive stands of bur-reed

fringing the channel and it is a particularly good section for water crowfoot. From Wolf's Castle to below Treffgarne Gorge the river increases in gradient flowing over bedrock, boulders, cobbles and pebbles. The steep over-hanging earth banks, including some stretches with unstable bank cliffs, are shaded with broadleaved woodland. The steeper gradient and shading favours the low nutrient vegetation community described above; patches of water crowfoot, common and intermediate water-starwort, alternate-flowered and spiked water-milfoil occur where there is sufficient light. Two nationally rare lower plant species also occur here: the moss *Octodiceras fontanum* and the liverwort *Porella pinnata*.

The Afon Cleddau tributary, which flows from the raised bog at Esgyrn Bottom SSSI through a wide valley of marshy grassland, is an upland-type stream flowing over gravel and pebbles. The scarce slender green feather moss *Hamatocaulis vernicosus* is found in flushes at Puncheston.

The Afon Anghof tributary starts as an upland stream, running between steep peaty banks within a wide valley. The vegetation is typical of an acidic and nutrient poor valley mire with nearby flushes containing round-leaved sundew *Drosera rotundifolia*, bog asphodel *Narthecium ossifragum*, bogbean *Menyanthes trifoliata*, bog pondweed *Potamogeton polygonifolius*, marsh St John's-wort *Hypericum elodes*, marsh lousewort *Pedicularis palustris*, marsh cinquefoil *Potentilla palustris* and lesser skullcap *Scutellaria minor*. The lower reach is predominantly shaded and the aquatic vegetation is dominated by brook-side feather-moss and greater water-moss. It eventually joins the main river at Wolf's Castle.

The smaller tributaries such as the Spittal Brook, Nant y Bugail, Nant y Coy, Rudbaxton Water and Camrose Brook are predominantly shaded with a more impoverished flora. The sparse vegetation is dominated by occasional dense stands of hemlock water dropwort, with patches of common water-starwort *Callitriche stagnalis*, and mosses including brook-side feather-moss and long-beaked water feather-moss *Rhynchostegium riparioides*.

In the lower reaches, including the Cartlett Brook tributary, the river meanders slowly through wide valleys of predominantly pasture. The substrate consists of a mixture of pebbles, gravel, sand and silt, and riffles in particular support extensive beds of stream water crowfoot as well as other typical aquatic plants.

The riverside vegetation communities form a complex patchwork with extensive areas of woodland and scrub interspersed with smaller open areas of marshy grassland, swamp, fen and mire. Broadleaved semi-natural woodland and dense scrub is widespread along the banks of the upper and middle reaches of the river. The dominant species are alder *Alnus glutinosa*, ash *Fraxinus excelsior*, oak *Quercus* spp., sycamore *Acer pseudoplatanus*, willow *Salix* spp., birch *Betula pubescens* and hazel *Corylus avellana*. The rare black poplar *Populus nigra* has been recorded in the lower reach near Haverfordwest. The floodplain supports wet alder and willow woodland with the distinctive tussock sedge *Carex paniculata*, tufted hair-grass *Deschampsia cespitosa* and occasionally the uncommon royal fern *Osmunda regalis*. Where land adjacent to the river has been fenced to exclude grazing stock, the vegetation tends to be dominated by scrub and tall herbs including hawthorn *Crataegus monogyna*, blackthorn *Prunus spinosa* and gorse *Ulex europaeus* with bramble *Rubus fruticosus* and common nettle *Urtica dioica*. Wet areas protected from grazing stock support tall vegetation including wild angelica *Angelica sylvestris*, meadowsweet *Filipendula ulmaria*, common valerian *Valeriana officinalis* and marsh-marigold *Caltha palustris*. The wet pasture along the river is dominated by rushes Juncus spp., purple moor-grass *Molinia*

caerulea and sedges *Carex* spp. Soft rush *Juncus effusus*, toad rush *J. bufonius*, pendulous sedge *C. pendula*, and remote sedge occur throughout. The lower reaches are less shaded with narrow strips of scrub and woodland occurring intermittently along the steep, grassy-banks, which are dominated by Yorkshire fog *Holcus lanatus*, bent grasses *Agrostis* spp., cocksfoot *Dactylis glomerata* and nettle. Partially vegetated gravel bars occur throughout the river system. Two invasive alien species, Japanese knotweed *Fallopia japonica* and Himalayan balsam *Impatiens glandulifera* are present throughout the site.

The Western Cleddau is considered to be one of the best rivers in Britain for bullhead, brook lamprey and river lamprey and supports a significant population of sea lamprey. Bullhead are found throughout the Western Cleddau. The small tributaries with coarse substrates, shallow gradients and riffles provide particularly good habitat for these small fish. River and brook lamprey are widely, but less evenly distributed than the bullhead. Sea lamprey also occur on the river but are predominantly restricted to the lower reaches. Lamprey have similar spawning requirements to trout and salmon, namely clean gravels with a through-flow of water. After hatching the larvae drift downstream to suitable silt and sand beds where they live as blind, wormlike filter feeders for several years. They then metamorphose into eyed eel-like subadults. River and sea lampreys spend several years in the sea and estuarine waters before migrating back up the river to spawn. The brook lamprey is a wholly freshwater species, migrating upstream to the spawning grounds after metamorphosis from larvae to adult; they die soon after spawning.

Although not of special interest the Western Cleddau is also a locally important migratory salmonid river, the principal species being sea trout *Salmo trutta trutta* with a small but well distributed population of salmon *Salmo salar*. Non-migratory brown trout *Salmo trutta fario* are also common. Other fish present in the river include eel *Anguilla anguilla*, 3-spined stickleback *Gasterosteus aculeatus*, Minnow *Phoxinus phoxinus* and Stone Loach *Noemachilus barbatulus*.

The Western Cleddau is one of the best rivers in Britain for otter, which are found on all the tributaries within the site. The river is an essential source of the small fish (particularly salmonids and eels) that make up the bulk of the otters' diet. Amphibians found in the wet habitats by the river, are an important secondary food source in winter and spring. Dense riverside vegetation, especially woodland, scrub and tussocky vegetation is particularly important to the otter, providing safe, concealed breeding and resting sites known as couches, holts or dens. Where dense vegetation is not available otters may use the roots of bankside trees, stone filled gabions or piles of flood debris. A number of breeding sites have been identified in some of the more undisturbed parts of the river system.

Although not of special interest in their own right, the site supports a range of breeding birds including dipper *Cinclus cinclus*, grey heron *Ardea cinerea*, kingfisher *Alcedo atthis*, grey wagtail *Motacilla cinerea*, mallard *Anas platyrhynchos*, moorhen *Gallinula chloropus*, mute swan *Cygnus olor*, sedge warbler *Acrocephalus schoenobaenus* and grasshopper warbler *Locustella naevia*. Associated wetlands provide valuable feeding habitats for snipe *Gallinago gallinago*, curlew *Numenius arquata*, lapwing *Vanellus vanellus*, and barn owls *Tyto alba*. The river and associated habitat is also an important feeding corridor and resting site for an assemblage of bat species including the greater horseshoe bat *Rhinolophus ferrumequinum* and lesser horseshoe bat *Rhinolophus hipposideros* and the Pipistrelle bat *Pipistrellus pipistrellus*.

The Western Cleddau River SSSI also contains two rare invertebrates, the cased caddis *Ylodes simulans*, and an aging population of the nationally scarce freshwater pearl mussel *Margaritifera margaritifera*, which is recorded from only nine Welsh rivers.

Remarks:

This site is a component part of the Cleddau Rivers SAC.

The site supports the following habitats and species covered by the EC Habitats Directive (directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora):

Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation - Annex I
Slender green feather-moss – Annex II
Common Otter – Annex II and IV
Atlantic salmon – Annex II and VI
Bullhead – Annex II
River lamprey – Annex II and V
Brook lamprey – Annex II
Sea lamprey – Annex II
Bat species – Annex II & IV

The otter and bat species are also listed in Schedule 5 of the Wildlife and Countryside Act, 1981 (as amended).

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