AFON TYWI
SITE OF SPECIAL SCIENTIFIC INTEREST

YOUR SPECIAL SITE AND ITS FUTURE

‘Your Special Site and its Future’ is part of our commitment to improve the way we work with SSSI owners and occupiers. In it, we try to explain what is special about the wildlife on your site, and what care is needed to look after its wildlife into the future.

All SSSIs are considered to be of national importance and we recognise the crucial role that owners and occupiers play in their management and protection. We will look to your views and knowledge to help safeguard this important site.

We hope that you will find ‘Your Special Site and its Future’ interesting and helpful. Please contact us if there is anything about the site and its management that you would like to discuss.

What is 'special' about the wildlife at Afon Tywi SSSI?

Afon Tywi has 8 special features.

- Saltmarsh
- Allis shad
- Twaite shad
- Otter
- Little ringed plover
- Sand martin
- Club-tailed dragonfly
- A community of beetles, flies and other invertebrates inhabiting the river shingle banks.

Saltmarsh covers approximately 150 hectares of riverside land below Carmarthen. It has a characteristically diverse range of plant communities and is an important habitat for many estuarine birds. In recent decades, land drainage and land reclamation have been partially responsible for the loss of this type of habitat in many parts of Britain.

Twaite shad and the much rarer Allis shad are fish that spend most of their time in coastal waters but migrate up into river systems to spawn. Following a dramatic decline in numbers over recent years, Twaite shad are now considered endangered while Allis shad are critically endangered. Both are now protected under British and European legislation. The Afon Tywi is thought to be one of only four rivers in England and Wales in which the Twaite shad spawns.

Otters are protected under European legislation because, until recently, their numbers had decreased dramatically throughout Britain and the rest of Europe. Populations are now starting to increase again slowly in areas that provide suitable habitat. Otters are widespread throughout the Tywi catchment area and are reported to be breeding successfully, making the Afon Tywi one of the most successful sites in Wales for this species.

Two notable bird species are summer visitors to the site. The Afon Tywi is the most important river in the UK for the little ringed plover, with more pairs nesting on the shingle banks on this site than on any other river in Wales. Over 80% of the number that return to Wales each year nest on the Afon Tywi and this represents a significant part of the whole UK population. At many locations along the river the actively eroding channel banks provide nesting sites for sand martins. More than 75% of sand martins breeding in Wales are nesting along this river during the summer months, making the Afon Tywi the most important site in Wales for this species.

Club tailed dragonfly © Tristan Hatton-Ellis

The club-tailed dragonfly breeds in moderate to slow-flowing river systems, usually on meanders where there is a build-up of silt deposit. Populations tend to be extremely localised in Wales and the Afon Tywi is one of only five sites in Wales where this dragonfly has been recorded.

The assemblage of beetles, flies and other invertebrates that inhabit the shingle banks and water's edge includes over twenty species that are nationally scarce and a further 5 that are listed as rare or endangered in the Red Data book (a list of the most threatened plant and animal species). The high number of rare invertebrate species found here makes the Afon Tywi probably the most important site for shingle invertebrates in Britain.

As well as the features listed above, the Afon Tywi has other habitats that greatly contribute to the special wildlife interest. The mobile, shifting river creates shingle banks, pools, slow flowing reaches and faster flowing riffles. Together with the mosaic of scrub, broad leaved woodland, tall ruderals (pioneer weed species), swamp, marshy grassland and semi-improved grassland along the river banks, this diversity of habitats is important for many other birds and mammals, such as kingfishers, dippers and water voles, as well as contributing towards excellent conditions for healthy fish populations of salmon, sea trout, lamprey and bullhead. The site also contains intertidal habitats that contribute to the special wildlife interest of the site. Except where it is specified below, management of this site should aim to look after these habitats and species as well as those listed above.

What do we want Afon Tywi SSSI to look like?

The following is a description of how we would like to see the features at Afon Tywi SSSI.

Saltmarsh habitat covers at least 150 hectares of intertidal land, below Carmarthen but with some fluctuation in area due to the natural processes of erosion and accretion that are characteristic of the dynamic environment of estuaries. The lower marsh zones consist of pioneer species including common cord-grass, common glasswort and annual sea-blite, while the mid and upper zones are characterised by species such as sea purslane, sea aster, common saltmarsh grass and red fescue, with some variation in vegetation height and structure.

Above Carmarthen the river moves freely within the present-day floodplain, continually eroding the channel banks and depositing silt and stones to form mobile,

shifting shingle banks and other natural channel features such as gravel beds, pools, meanders, ox-bows and backwaters. Bankside vegetation is varied throughout the site, consisting of areas of scrub, broad-leaved trees and grassland, while the shingle banks contain some scattered pioneer species of plants. Japanese knotweed is not present on the site and there is no Himalayan balsam.

Allis shad and Twaite shad migrate freely from the sea, upstream to suitable spawning habitats. There are no artificial barriers to migration and there is sufficiently good quality habitat throughout the site to allow these fish populations to increase to reach their natural limits. The river is free from the effects of acidification, sheep dip chemicals, heavy metals, diffuse pollution, low dissolved oxygen and excessive sedimentation. The river has flows as near to natural as constraints will allow.

Otters are present throughout the site and the diversity of bankside cover offers suitable habitat for breeding, resting and feeding sites. Little ringed plovers and sand martins return to the site each year to breed and populations are stable or increasing in size. The club-tailed dragonfly is present in key areas and there is sufficient suitable habitat for populations to increase to their natural limits. The community of shingle invertebrates as a whole is present in areas of suitable habitat throughout the site and their populations are stable or increasing in size.

What management is needed on Afon Tywi SSSI and why?

Although Afon Tywi is an excellent place for wildlife it will only remain so if the necessary management continues. CCW's priority is to work with you to ensure that this management is carried out.

What does this mean in practice?

There are a number of different factors that could damage the special features at Afon Tywi SSSI if they are not properly managed. These are the ones we regard as most important:

River management should continue to be sympathetic, allowing natural river processes to operate and the river channel to freely migrate across the present day floodplain.

Within the tidal reach, areas of saltmarsh should continue to be periodically inundated by sea water and there should be no attempt to drain these areas or construct artificial barriers to this natural process.

Throughout the rest of the site, above the tidal reach, the shingle invertebrates, club-tailed dragonfly, sand martins and little ringed plover all rely on a dynamic habitat, with river movement and flooding constantly shifting and renewing areas of silt and shingle deposit and eroding channel banks. Any alteration of natural meanders could in turn alter the rates of erosion and deposition of in-river materials, resulting in loss of shingle bank habitat, slow flowing backwaters and cut-off channels, and bankside habitats.

River movement across the floodplain is already affected by the railway line and main roads, several pumping stations and gabions, groynes and other artificial structures. The erection of any further flood defence and bank protection structures should be avoided where possible, as this could alter erosion and deposition within the river. In addition, bank protection works can result in loss of natural features within the river channel. Spawning sites used by shad and other migratory fish need to offer a variety of natural features such as deep pools and overhanging banks for rest and shelter before and after spawning, suitable gravel over which to spawn, and slow flowing nursery areas for juveniles after hatching. Otters also use a variety of natural features along the river banks, for shelter, feeding, resting and breeding. Permanent alterations to the channel and banks are likely to have a detrimental effect on the wildlife and particularly on the feature species. Such works may also cause problems to neighbouring landowners as they can result in altered rates of erosion and deposition, both upstream and downstream.

Water Quality directly and indirectly affects all the plants and animals that use the river. The eggs and juveniles of shad are especially sensitive to temperature, raised levels of nutrients (especially soluble reactive phosphorus and nitrates) and increased sediment levels in the water. Additionally, the eggs and larvae of many of the rare beetles, flies and dragonflies live in the water and rely on clean water for their survival.

Water quality can be affected by nutrient enrichment from both consented and unconsented discharges, agricultural run-off (including chemicals) and sedimentation from excessive riverbank erosion. CCW will work closely with the Environment Agency, landowners and occupiers to minimise the risk of any pollution incidents in the future. Current consents for discharges entering, or likely to impact upon the site will continue to be reviewed.

Water levels in the river influence a range of factors including current velocity, dissolved oxygen levels, concentrations of pollutants and available habitat for associated plants and animals. During peak migration periods, shad and other migratory fish need sufficient flow to reach all of their spawning areas. Juvenile fish can also be affected by low flows if this results in the amount of dissolved oxygen available to them being reduced. However, excessively high flows in the summer may cause juvenile shad to be washed out of the river prematurely. Many insect larvae fix themselves to underwater stones or live in silt beds and will be unable to survive if these areas are exposed and dried out.

The natural flow rate of the river is already affected by several water abstraction and discharge points throughout the catchment and by Llyn Brianne dam upstream from Llandovery. Flow rates are regulated by releases of water from the dam, however, during the nesting period for little ringed plovers (May – August) flow rate should not be increased excessively so as to inundate shingle banks causing loss of eggs and chicks. The shingle invertebrate populations could also suffer catastrophic loss through unnatural flooding events during the summer months. CCW will continue to work in partnership with the Environment Agency, other stakeholders and interested groups to assess existing and proposed abstractions and discharges for their impact on the flow regime of the river and to ensure that there is sufficient flow at all times to support all the river habitats.

Little ringed plover © Neil Donaghue; http://www.glamorganbirds.org.uk/neildonaghy16.html

Riparian vegetation should consist of a variety of vegetation types. Tussocky vegetation or scrub (e.g. gorse) is needed adjacent to the shingle banks as a place of refuge for invertebrates during winter or floods while a scattering of plants on the shingle itself, give additional places of shelter. However, some invertebrates rely on un-shaded shingle bars for their survival. The retention of some areas of gravel shoal with very little or no tree cover is also essential for the little ringed plover, whose predators use trees as look-outs.

Where there are slow flowing meanders and backwaters, tall native broadleaved trees provide essential cover for club-tailed dragonfly adults, especially when freshly emerged. Large mature trees along the river bank also provide shaded spots where fish may conceal themselves from predators. Tree roots also provide resting and feeding places for otters and other smaller mammals. In addition, it is desirable to maintain some areas of shrubby growth and tall ruderals along the banks to provide cover for birds and mammals.

There are few areas on the Afon Tywi where the canopy is considered dense and coppicing should not take place unless the aim is to secure trees that might otherwise

topple into the river, leaving significant gaps without cover and destabilizing the channel bank. As alder is a common species throughout the site, alder disease is potentially damaging to the otter and fish populations, as well as to other mammal species and birds, as bankside cover and resting areas could be lost. In addition, leaves and invertebrates falling from trees into the water provide a source of nutrients and food. Management of riverside vegetation should aim to maintain the variety of different vegetation types. Where tree and shrub cover has been lost due to river erosion, or to alder disease, consideration should be given to planting new areas with a mixture of native trees of local stock to mitigate for these losses.

Agricultural practices on land adjacent to the river have the potential to affect any or all of the special features within the site. On saltmarsh in the lower reaches of the river, light grazing will help to maintain the special mixture of zoned vegetation types that are characteristic of saltmarsh habitat. However, overgrazing can result in the loss of some vegetation species and destabilization of soil, which may then be susceptible to increased erosion during inundation. This can seriously reduce the available feeding areas for many estuarine birds and invertebrates.

Further up river, above the tidal limit at Whitemill, the Tywi valley consists mainly of improved or semi-improved grazing for cattle and sheep, with relatively little arable land. Overgrazing and repeated ploughing both lead to loosening of the soil substrate, which may then be eroded during floods. Excessive trampling of banks by livestock often results in localised slipping of bank materials, causing raised sediment levels in the river channel. CCW will work with riparian landowners to improve bankside habitat and reduce excessive erosion through the creation of buffer zones, fenced off areas (streamside corridors) and through tree planting.

The use and disposal of sheep dip containing synthetic pyrethroids, near to the water course, poses a significant danger to all wildlife species and efforts must be made to keep sheep away from the river, shingle banks and backwaters for at least two weeks after dipping.

Fertilizer application to land close to rivers and tributaries may result in nutrient run-off and enrichment of the river in a way that will have a detrimental impact on aquatic plant life, invertebrate and fish species. The creation of buffer zones will help to reduce or prevent this occurring.

Invasive alien species such as Japanese knotweed and Himalayan balsam can form dense clumps, displacing native plants and reducing wildlife interest, as they provide a poor habitat for insects, birds and most mammals. The roots do not stabilize banks effectively and bank erosion may be increased, particularly during winter months when these plants partially die back. Control and removal of alien species from the site would be preferable, however Japanese knotweed and Himalayan balsam are particularly difficult to control. They tend to establish most easily in disturbed habitats and so special care needs to be taken when road works, bank protection works or similar operations that disturb the soil are taking place, as this is a common way for alien species to be introduced and spread. CCW will work with the Environment Agency, Local Authorities, landowners and fishery managers to control invasive alien species within the site, where this will not harm the special features of the SSSI.

Engineering works such as highways maintenance, bridge repairs, flood defense works and maintenance of abstraction and outfall points, have the potential to cause significant damage to the spawning grounds and juvenile habitat of shad, salmon and lamprey. These operations may also cause damage to bankside habitats and cause sediment, chemical and noise pollution, create obstructions and introduce or spread invasive weeds. The effects are worsened if heavy machinery is used in the river itself. The incorporation of soft engineering techniques, including the use of willow, is likely to be viewed more favourably than pure hard engineering. In-river works will usually be limited to a period between 15 July and 15th October in order to protect eggs and juveniles of migratory and other fish. In addition, certain conditions may be imposed to ensure that these operations do not cause excessive disturbance of sediments or damage to channel banks.

Obstructions to migration such as weirs, culverted bridges, high sediment loads, vibration, noise and low water flow can present a significant impediment to all migratory fish, particularly where more than one, or a series of these factors is present. The statutory agencies should ensure that proposed structures do not impact upon the features of interest on the site. Existing obstructions should be re-evaluated, with consideration given to the removal of artificial obstructions. Essential repairs to existing structures such as bridges should be timed to avoid critical fish migration periods.

Gravel extraction has traditionally been carried out on a small scale by many individual landowners along the Afon Tywi, for their private use. The removal of too much gravel from the river could seriously limit the amount of habitat available for shingle invertebrates and nesting little ringed plovers. It could also lead to the loss of suitable spawning sites for shad and other migratory fish and the process itself is invasive, causing disturbance to wildlife. Removal of gravel will be monitored to ensure that excessive amounts are not removed, that cannot be replaced by the natural processes within the river. Extraction operations will usually only be consented between 1st September and 15th October to avoid any danger of direct damage to little ringed plover eggs or chicks, damage to eggs and juveniles of migratory fish or unnecessary disturbance of shingle invertebrate populations.

Fishery Management must be sympathetic to the requirements of the fish and other special features of the SSSI. Habitat improvements for many of the SSSI features will also benefit the fishery. Continued close liaison with the Environment Agency and fishery managers should ensure that the impact of management for fishing, such as the management of bankside and channel features for anglers, or removal of non-target species that are SSSI features is minimized. Fish introductions (other than those agreed with CCW and EAW as mitigation in respect of Llyn Brianne dam), should be avoided because of the risk of, disease and competition. Longer term solutions should be sought to deal with the decline of salmon and sea trout stocks in rivers, so that artificial augmentation of populations becomes unnecessary.

Finally

Our understanding and knowledge of wildlife is continually improving. It is possible that new issues may arise in the future, whilst other issues may disappear. This statement is written with the best information we have now, but may have to change

in the future as our understanding improves. Any information you can provide on the wildlife of your site and its conservation would be much appreciated.

If you would like to discuss any aspect of your SSSI, or have any concerns about your SSSI, please contact your local CCW office.

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