



# River Otter catchment overview

**September 2019**

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## River Otter catchment overview

### 1. Overview of physical geography

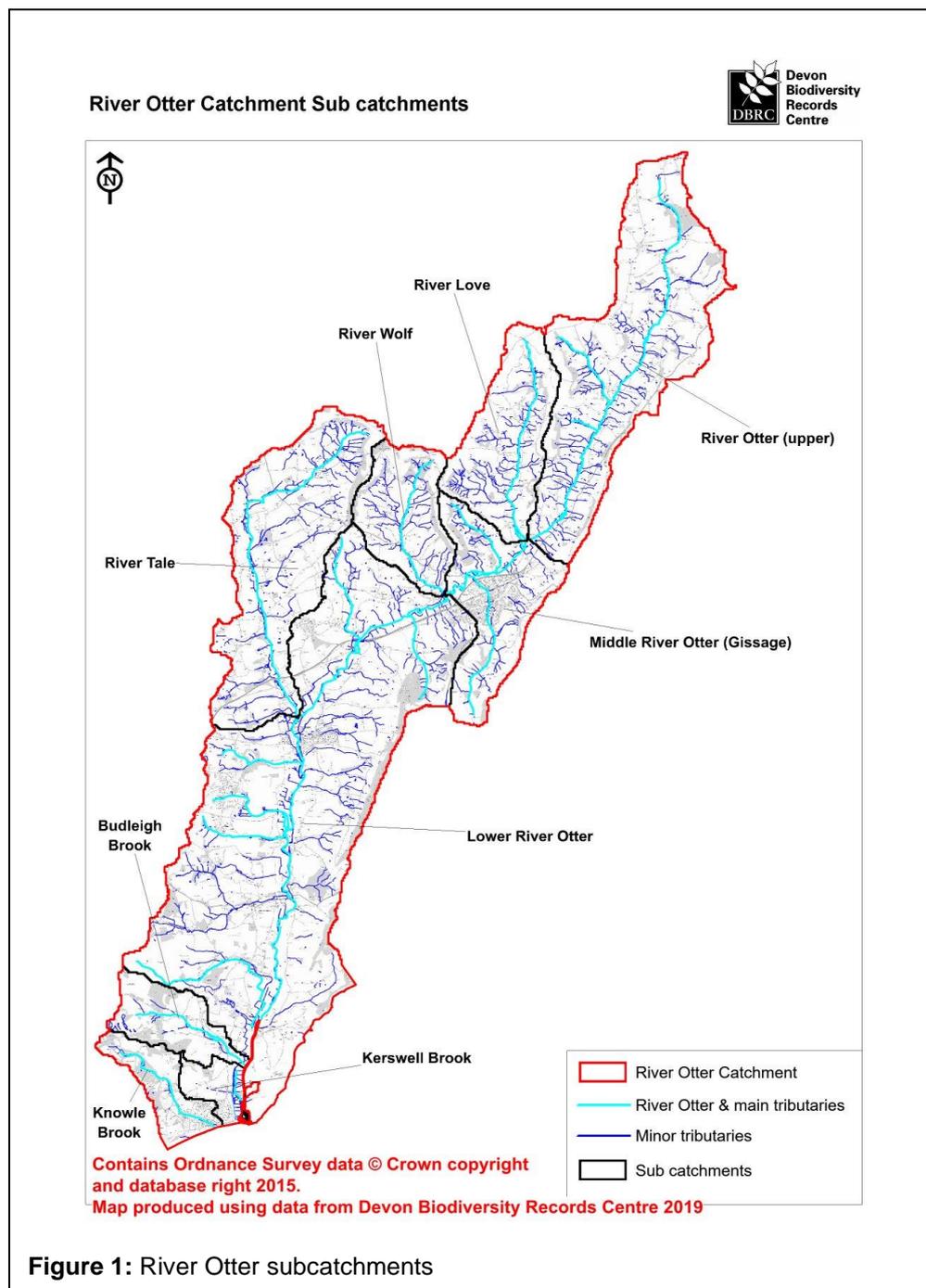
The River Otter rises in the Blackdown Hills, from a Cretaceous Upper Greensand scarp that rises to 275m, which defines the eastern edge of the catchment as far south as Sidmouth. The western boundary is formed by a ridge of Permian Sandstone; between these two ridges lies an area of Triassic Mercia Mudstone which runs to Ottery St Mary. East and south of Ottery St Mary the geology changes to Otter Sandstone. The bedrock is overlain by alluvium and river terrace deposits, with fine sandy and silty soils.

The Otter Catchment is a predominately rural catchment, with small, dispersed settlements. The main towns are Honiton, Ottery St Mary and Budleigh Salterton. The northern part of the catchment is characterised by rolling hills with small field systems enclosed by hedgerows, whereas more intensive agricultural practices dominate the southern part. There are several coniferous and broadleaved plantations on the greensand ridge that runs along the northern and eastern side of the catchment, with more conifer plantations around the East Devon Pebblebed Heaths to the southwest.

The Otter Catchment is divided into nine subcatchments, with the rivers Tale, Wolf and Love rising from the Upper Greensand scarp, along with the Upper Otter. The Middle Otter (Gissage) rises from the Permian Sandstone, while the Lower Otter is mostly on the Otter Sandstone, along with the Budleigh Brook, Knowle Brook and Kerswell Brook in the south of the catchment.

Sub catchment	Length of Main River (km)	Length of Tributaries (km)
River Otter (Upper & Lower combined)	65.15	282.47
River Love	8.77	44.35
River Wolf	6.23	32.05
River Tale	14.04	70.87
Middle River Otter (Gissage)	15.36	35.80
Budleigh Brook	5.19	5.32
Knowle Brook	5.02	1.03
Kerswell Brook	0.76	0.00

**Table 1:** River Otter subcatchments

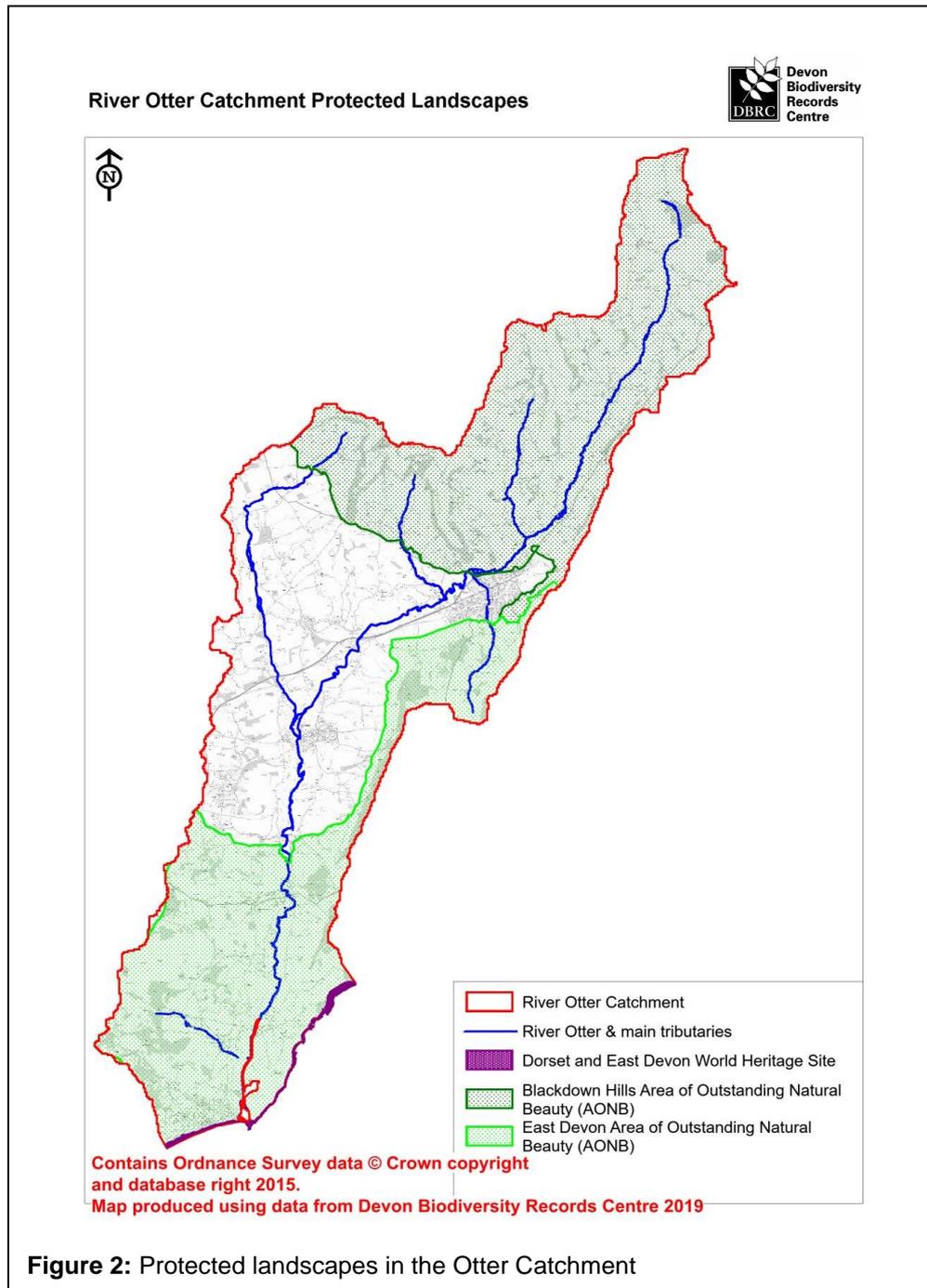


## 2. Overview of the ecology and importance of the River Otter catchment

The Otter catchment is located within two landscapes of national importance recognised as Areas of Outstanding Natural Beauty (East Devon AONB and the Blackdown Hills AONB). The Blackdown Hills AONB covers the north upper reaches of the catchment, north of Honiton, while the area south of Ottery St Mary is covered by the East Devon AONB. The coastal strip is part of the Dorset and East Devon World Heritage Site, also known as the Jurassic Coast. This international designation

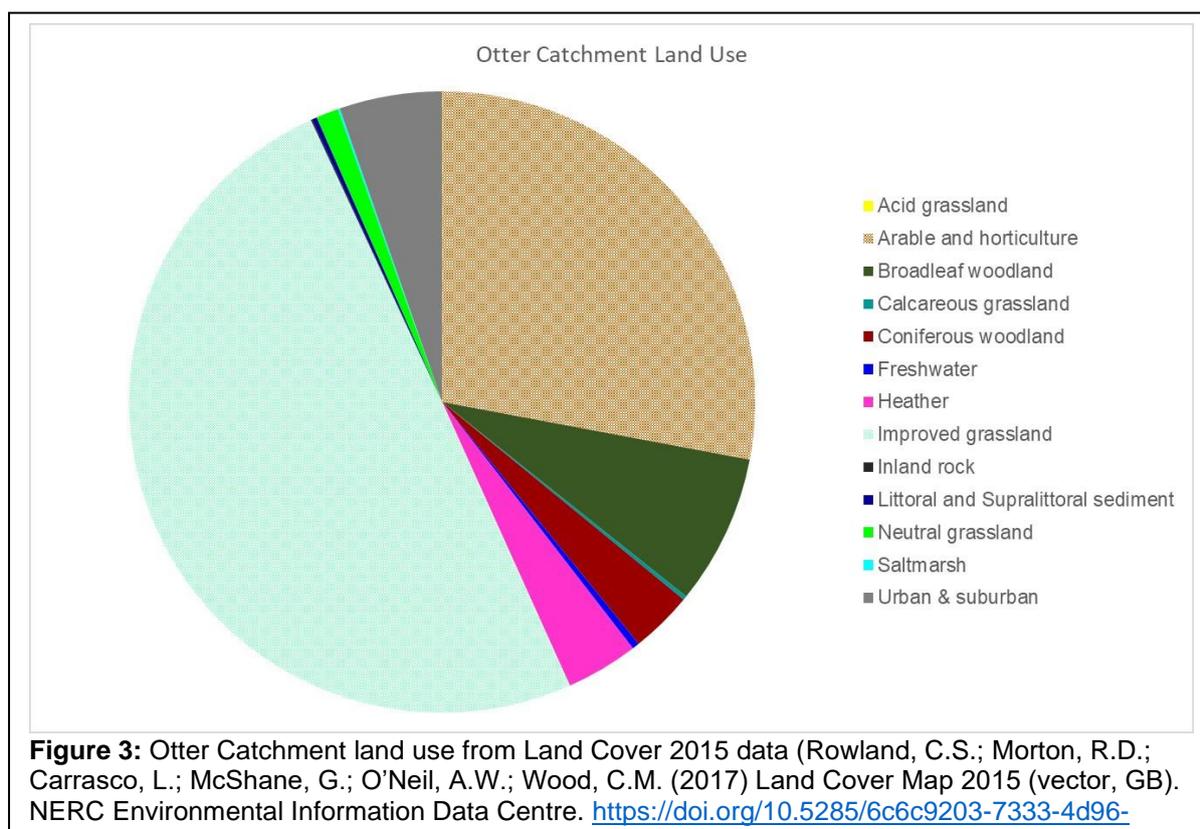
recognises the importance of this landscape with its globally significant geological and geomorphological features that cover the Triassic, Jurassic and Cretaceous periods.

The East Devon Pebblebed Heaths are internationally important both for their wet and dry heathland habitats, and for the wide range of birds and invertebrates that they support. The Otter Estuary is another important site for birds, supporting significant populations of overwintering wildfowl and waders.

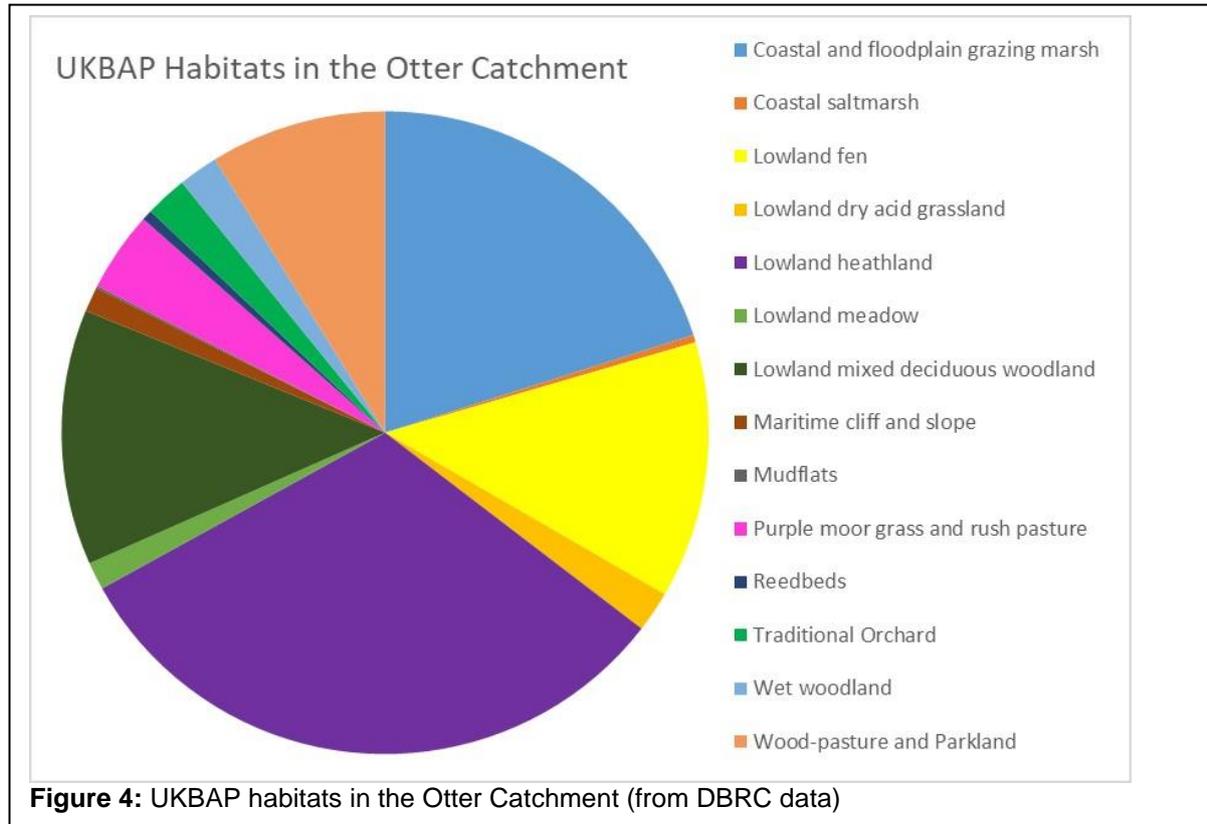


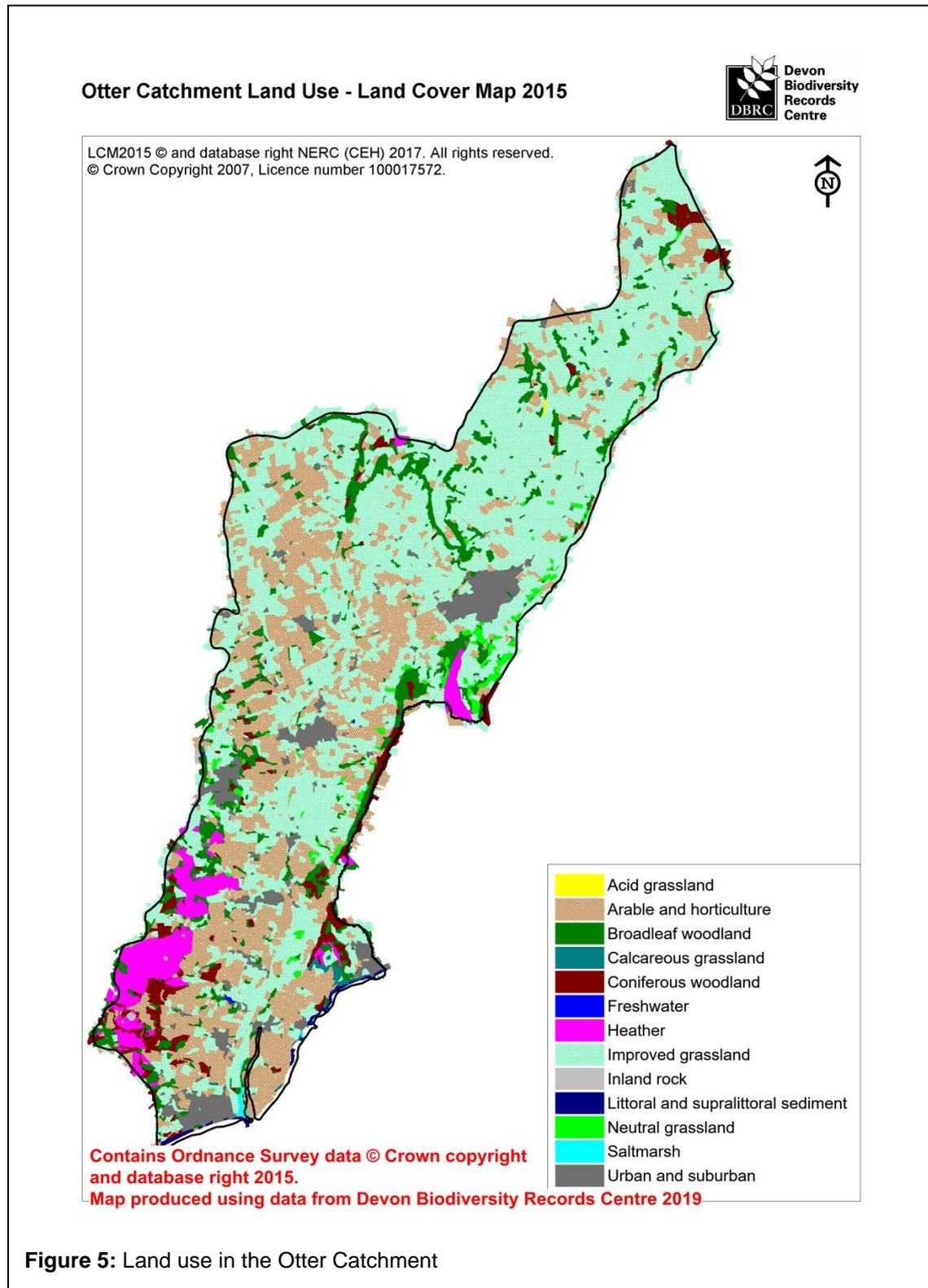
### 3. Breakdown of land-use into habitat types

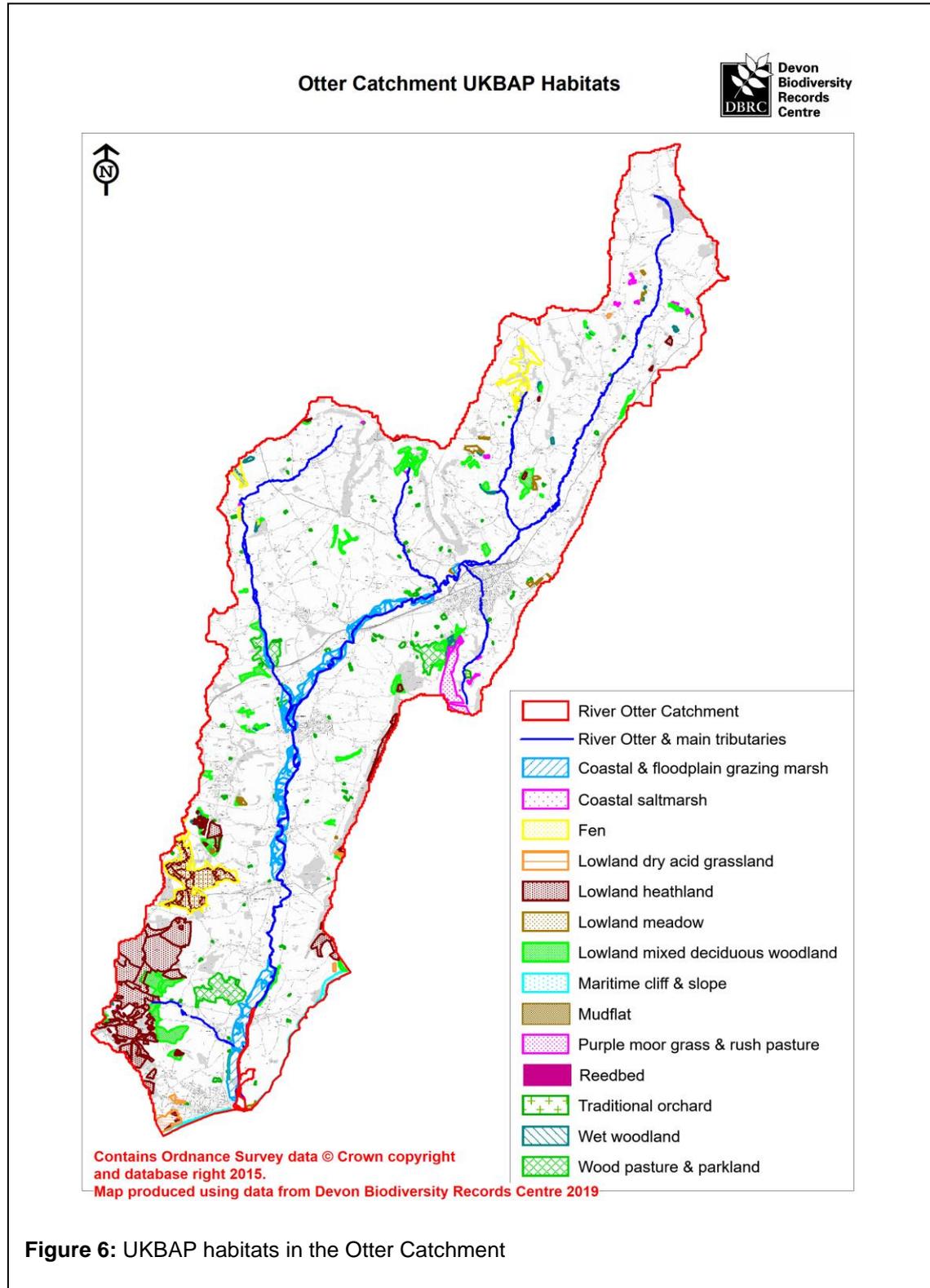
The Otter Catchment covers 25,010 ha, which the Land Cover 2015 data shows as being 50% improved grassland, 28% arable and horticulture and 5% urban and suburban (Figures 2 & 4). The remaining 17% covers woodland, other grasslands, heathland, freshwater, saltmarsh, littoral sediment, and supra-littoral sediment. DBRC's UKBAP priority habitat data shows that 12% of the catchment is covered by UKBAP habitats (Figures 3 & 5).



Lowland heathland covers the largest area (32% of mapped habitat) mainly in the southwest (the East Devon Pebblebed Heaths) but there are also smaller heaths to the north and east. Coastal and floodplain grazing marsh is the second most abundant habitat (20% of mapped habitat) covering most of the land alongside the main River Otter from Honiton to Budleigh Salterton. Lowland fen and lowland mixed deciduous woodland are next, covering 13% of mapped habitat each. However, the figure for lowland fen is an overestimate, as a large area of the East Devon Pebblebed Heaths has been mapped as lowland heath and lowland fen. This was done when it was not possible to accurately map the boundary of the habitat, so a larger area was mapped and it was marked as 'present but not mappable.'







### 4. Designated sites and features of interest

The Otter Catchment contains over 90 statutory and non-statutory sites, especially in the northern and eastern parts of the catchment:

#### Statutory Sites:

##### Sites of Special Scientific Interest (SSSI)

The East Devon Pebblebed Heaths were designated as a SSSI as a 'nationally important representative of the inland Atlantic-climate, lowland heathlands of Britain and north-west Europe.' It is the largest block of lowland heath in Devon (1,133 ha) with a diverse range of heathland communities. It supports a wide range of birds and invertebrates, with 24 species of dragonfly and damselfly, including the southern damselfly (*Coenagrion mercurial*) and small red damselfly (*Ceriagrion tenellum*) rare butterflies such as the pearl-bordered fritillary (*Boloria euphrosyne*) and silver-studded blue (*Plebejus argus*) and heathland birds such as the nightjar (*Caprimulgus europaeus*) and Dartford warbler (*Sylvia undata*) and the hobby (*Falco subbuteo*). The site was assessed by Natural England in 2012 and 2017; its condition was recorded as being mainly Unfavourable-Recovering (68%) with the rest being Favourable (28%) or Unfavourable-No Change (4%).

The East Devon Pebblebed Heaths were also designated as a Special Protection Area, as they support populations of European importance of Dartford warblers and nightjars, and as a Special Area of Conservation (SAC) for the northern Atlantic wet heaths, European dry heaths, and southern damselfly population.

There are five other SSSIs in the Otter Catchment (all in the Devon part of the catchment), including two geological SSSIs:

- Hense Moor SSSI contains some of the best remaining examples of lowland mixed valley bog in Devon, with a mosaic of different habitats. It supports a rich invertebrate fauna, including the raft spider (*Dolomedes fimbriatus*). Its condition was assessed in 2011 as Unfavourable-Recovering
- Hense Moor Meadows SSSI is adjacent to Hense Moor and consists of herb-rich meadows with unimproved neutral grassland and fen communities. It was assessed in 2011 as Favourable
- Otter Estuary SSSI contains a wide range of saltmarsh communities which together with additional areas of tall herb and scrub, supports significant populations of overwintering wildfowl and waders, including redshank (*Tringa totanus*) common sandpiper (*Actitis hypoleucos*) curlew (*Numenius arquata*) and red-breasted merganser (*Mergus serrator*). Reed warbler (*Acrocephalus scirpaceus*) sedge warbler (*Acrocephalus schoenobaenus*) and reed bunting (*Emberiza schoeniclus*) breed on the site, and Otterton Point is an important location for vertebrate palaeontology. Its condition was assessed in 2009-2010 as mostly Favourable (4% Unfavourable-No Change).
- Budleigh Salterton Cliffs gSSSI is a coastal section exposing the full thickness of the Lower Triassic Budleigh Salterton Pebble Beds. Its condition was assessed in 2007-2010 as Favourable

- Ladram Bay to Sidmouth gSSSI is an important site for coastal geomorphology, with a series of well-developed cliffs, stacks and shore platforms cut in the red sandstones of the Keuper representing one of very few assemblages of such forms in southern Britain. Its condition was assessed in 2007-2010 as Favourable

### **Local Nature Reserve (LNR):**

- Fire Beacon Hill LNR is a lowland heathland site, supporting heathland birds such as the yellowhammer (*Emberiza citronella*) Dartford warbler and nightjar.
- Otterhead Lakes LNR consists of two lakes of the former landscaped gardens of Otterhead House, with surrounding wet and dry woodland, grassland, and freshwater streams and ditches

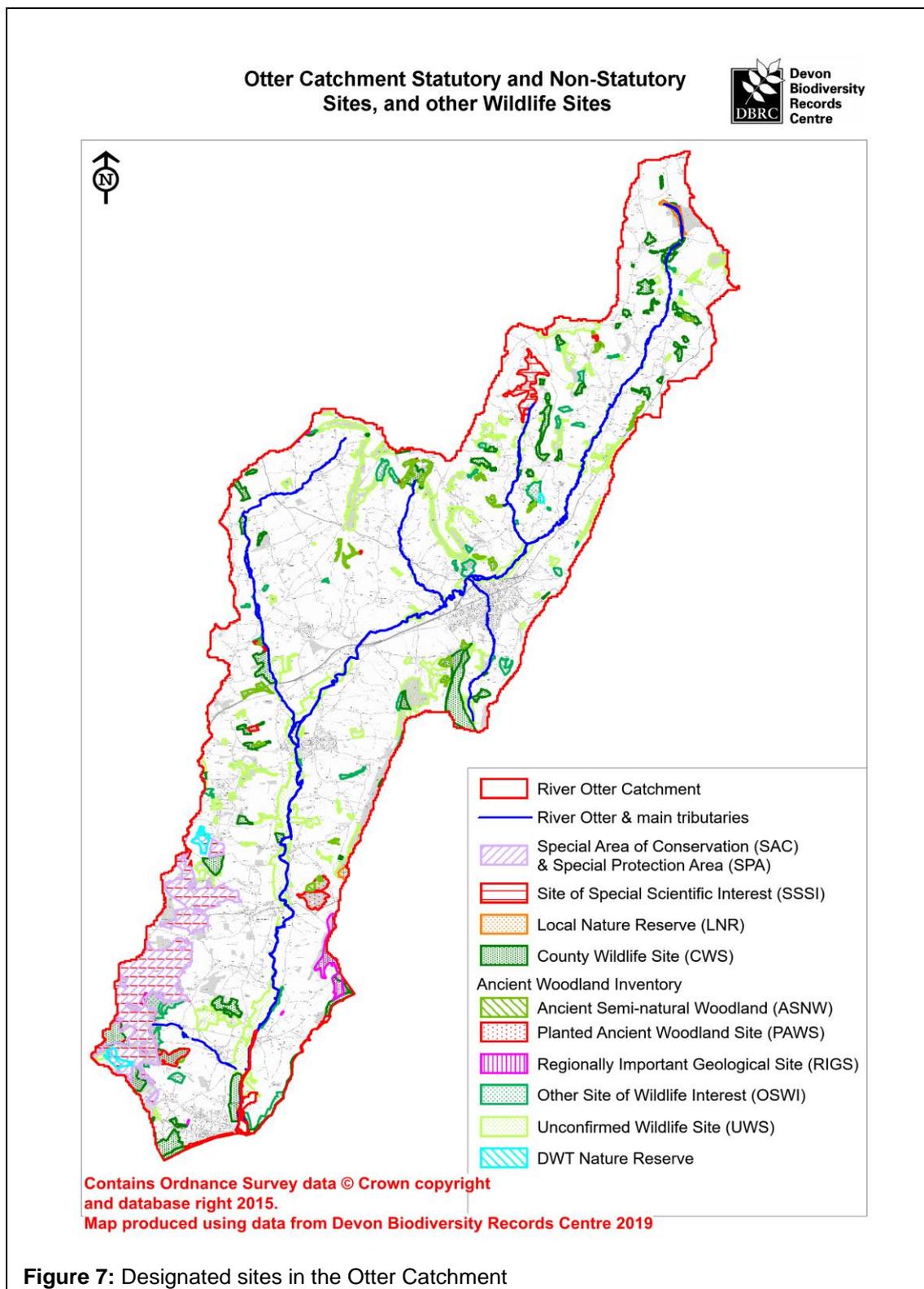
### **Non-statutory Sites:**

#### **County Wildlife Sites (CWS):**

County Wildlife Sites are sites of county importance for wildlife, designated on the basis of the habitat or the known presence of particular species. The Otter Catchment has 90 County Wildlife Sites, covering 1,131 ha. Eighty of these are in Devon (1,074 ha) and 10 are in Somerset (57ha). Most of the Devon sites were originally surveyed in the 1990s, though many of the sites have been resurveyed since. Over half of these sites have been surveyed or resurveyed within the last 10 years. It is not known when the Somerset sites were surveyed

The sites range in size from a pond with amphibian interest that is less than 0.1 ha to Gittisham Hill, a 137 ha site with purple moor grass and rush pasture, wet heath, and wet woodland. The habitats include wet and dry woodland, unimproved neutral and acid grassland, springline mire, wet and dry heath, and parkland. Half of the sites contain wet or dry woodland, and many of these are found on the streams and tributaries, rather than the main river. Key sites include the Otterhead Lakes Reserve at the top of the catchment, which covers a 1.5km stretch of riverbank and contains a complex of habitats including wet woodland and marshy grassland. This links to a set of four County Wildlife Sites just downstream that also contain wet woodland and marshy grassland, providing nearly 3km of semi-natural habitat along the river.

Other key sites include Wolford Loge, a large area of springline mire and semi-improved neutral grassland at the top of the Wolf catchment, with woodland County Wildlife Sites either side; and Clyst William Cross, an area of fen and unimproved marshy grassland on the River Tale. At the south end of the Otter catchment, Otter Meadows is an area of coastal saltmarsh, floodplain grazing marsh and reedbeds that supports good populations of wetland birds.





### **Ancient Woodland Inventory (AWI):**

Ancient Woodland have existed from at least Medieval times to the present day without ever having been cleared for uses other than wood or timber production. There are 24 ancient woodland sites in the Otter Catchment, covering 244 ha, most of which are also County Wildlife Sites. Just over half (56%) of the sites are Ancient Semi-natural Woodlands (ASNW) where the wood consists of native species that are not obviously planted. The rest of the sites are Plantations on Ancient Woodland Sites (PAWS) where coniferous or broadleaved plantations have replaced former native tree cover. There are no ancient woodlands in the Somerset part of the catchment.

### **Regionally Important Geological Sites (RIGS):**

RIGS are earth science sites that are of regional or local importance. There are seven RIGS within the Otter catchment (six in Devon and one in Somerset). They are mostly small (less than 1 ha) rock exposures. The largest site is Peak Hill and Mutters Moor (85 ha) which contains Peak Hill gravel and Mutters Moor gravel, and is also a County Wildlife Site.

### **Other Wildlife Sites:**

#### **Other Sites of Wildlife Interest (OSWI):**

OSWIs are sites of significant wildlife interest within a local context that have been surveyed but do not reach the criteria for County Wildlife Sites. There are 43 OSWIs within the Otter Catchment, covering 342 ha. The habitats include semi-improved neutral grassland, secondary broadleaved woodland, and remnant heathland. This designation is only used in Devon, so there are no OSWIs in the Somerset part of the catchment.

#### **Unconfirmed Wildlife Sites (UWS):**

Unconfirmed Wildlife Sites are sites identified as having possible interest but have not been surveyed. There are 130 UWS within the Otter Catchment, covering 1,954 ha. They have been identified from old Phase 1 survey maps and aerial photos. This designation is only used in Devon, so there are no UWS in the Somerset part of the catchment.

#### **Devon Wildlife Trust Nature Reserves:**

Devon Wildlife Trust manages three nature reserves within the Otter Catchment; Bystock and Venn Ottery, which are heathland sites within the East Devon Pebblebeds Heath SSSI, and The Rough, which contains unimproved neutral and marshy grassland, and is also a CWS. There are no Somerset Wildlife Trust reserves in the Otter Catchment.

## **5. Key species present**

This information is based on records held on the Devon Biodiversity Records Centre database, and on the NBN Atlas (<https://nbnatlas.org/>). The records are not necessarily from surveys; some are ad-hoc records, so the distribution of a particular species may represent the recording effort, rather than the actual distribution. There

may be a bias towards recording on protected sites or nature reserves, and a lack of records does not mean that a species is not present. See Appendix 1 for a list of data providers

### Mammals:

- European otter (*Lutra lutra*) – there is good survey data for the main River Otter and the River Tale. There are fewer records for the other subcatchments, though otters are present on all of them. Devon is a stronghold for otters, but the Otter catchment was one of the last to be recolonised by otters; the first signs found in the 2<sup>nd</sup> National Otter survey of England (1984-86) and numbers were low until the 4<sup>th</sup> National Otter survey of England (2000-02)
- European water vole (*Arvicola amphibius*) – water voles were reintroduced to the Tale catchment in 2005/2006, and are still present in 2019. There is one isolated record for the main otter at Gittisham (2016) & one unconfirmed record via the NBN for 2014 south of Newton Poppleford

### Crayfish:

- American signal crayfish (*Pacifastacus leniusculus*) – there is one old (1986) record for the Honiton area on the NBN Atlas, but no new records. It is not known if there has been any survey
- White-clawed Freshwater crayfish (*Austropotamobius pallipes*) – there are old (pre 1999) records from the main River Otter, but it is no longer present in the catchment

### Dragonflies and damselflies:

- Southern damselfly (*Coenagrion mercurial*) – southern damselflies are now only found on the East Devon Pebblebed Heaths SSSI, although there are old records from the 1960s for Hense Moor SSSI. The populations on the East Devon Pebblebed Heaths SSSI are of National importance.
- Small red damselfly (*Ceragrion tenellum*) – small red damselflies are only found on the East Devon Pebblebed Heaths SSSI. These populations are of National importance, and appear to have been increasing in recent years.
- Downy emerald (*Cordulia aenea*) and red-eyed damselfly (*Erythromma najas*) – these two species are only found in the southwestern part of the catchment, with recent records only at Bystock nature reserve and Squabmoor Reservoir
- Hairy dragonfly (*Brachytron pratense*) and ruddy darter (*Sympetrum sanguineum*) – these two species are only found in the southern part of the catchment, on the East Devon Pebblebed Heaths SSSI and around the Otter Estuary. The ruddy darter records are at least 10 years old
- Keeled skimmer (*Orthetrum coerulescens*) – there are a few recent records from the Love catchment, including Hense Moor SSSI, otherwise keeled skimmers are only found on the East Devon Pebblebed Heaths SSSI
- White-legged damselfly (*Platycnemis pennipes*) – there are a few records along the main River Otter and on Aylesbeare Common, though they are at least 10 years old, if not much older

### Amphibians:

- Common frog (*Rana temporaria*) – common frogs are found throughout the catchment, though most records are from gardens
- Common toad (*Bufo bufo*) – there are scattered records from the southern part of the catchment, but none for the Upper Otter, Love or Wolf catchments
- Great Crested Newt (*Triturus cristatus*) – there are recent records near Sidmouth, Ottery St Mary, Upottery and on Woodbury common
- Palmate newt (*Lissotriton helveticus*) and smooth newt (*Lissotriton vulgaris*) – there are very few records of these two species. Palmate newts are present around Ottery St Mary and Honiton, while there are only old records of smooth newts around Whimble and Otterton. It is not known if there has been targeted survey for either of these species

### Bats:

- Western Barbastelle (*Barbastella barbastellus*) – a few records from Newton Poppleford and Bystock nature reserve
- Daubenton's Bat (*Myotis daubentonii*) - a few records from Bystock nature reserve, Ottery St Mary and Honiton
- Lesser Noctule (*Nyctalus leisleri*) – only recorded from West Hill and Luppitt
- Nathusius's Pipistrelle (*Pipistrellus nathusii*) - a few records from Bystock nature reserve, Ottery St Mary and East Budleigh
- Grey Long-eared Bat (*Plecotus austriacus*) – a few records from Upottery, Newton Poppleford area and Bystock nature reserve
- Whiskered Bat (*Myotis mystacinus*), Noctule (*Nyctalus noctula*) and Greater Horseshoe Bat (*Rhinolophus ferrumequinum*) all have scattered records in the southern half of the catchment only
- Serotine (*Eptesicus serotinus*), Brown Long-eared Bat (*Plecotus auritus*), Common Pipistrelle (*Pipistrellus pipistrellus*) and Lesser Horseshoe Bat (*Rhinolophus hipposideros*) are common throughout the catchment. Natterer's Bat (*Myotis nattereri*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*) are also found throughout the catchment, though there are fewer records

### Wetland birds:

- The Otter Estuary supports a wide variety of breeding and overwintering birds, with sizeable flocks of wigeon, teal, black-headed gulls and golden plover recorded over the winter. Goosander also overwinter on the estuary and the River Otter.

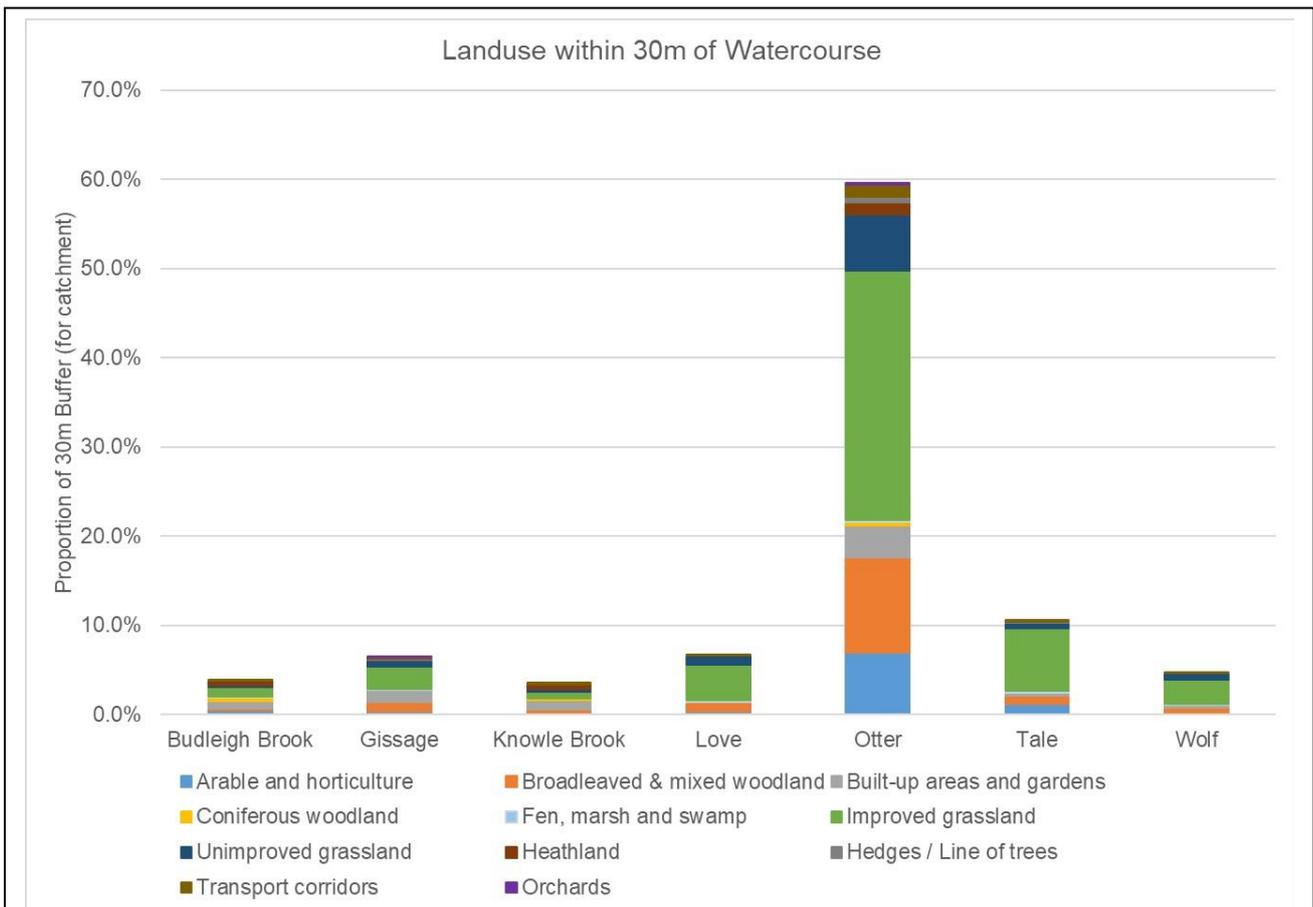
## 6. Riverside land-use

The land use within 30m of the main river channels was mapped using the 2010 aerial photos and the MasterMap data. This showed that the main land use was improved grassland, making up 46% of the area, with woodland and scrub covering 17%, unimproved grassland 10% and arable land covering 9%. The Land Cover 2015 dataset shows a similar figure for improved grassland across the whole Otter



Catchment (50%) but has more arable land (28%) and less woodland (11%). However, arable land rarely continues right up to the water's edge, so there is usually a buffer of scrub or grassland, which has been mapped separately. Also, riverbanks are often lined with trees; again, these are not usually mapped separately on the Land Cover 2015 data, but are sometimes mapped separately in the MasterMap dataset.

Figure 8 shows the land use within 30m of each main river channel, expressed as a percentage of the total area of the buffer. Improved grassland is the most abundant habitat in all the subcatchments, except the Knowle Brook, which runs through Budleigh Salterton, so has a higher proportion of built up areas and gardens. The Tale, Love and Wolf only have small villages or hamlets, so have a very small amount of built up land and gardens. The arable land is found mainly in the Tale and Otter subcatchments, while the heathland (and associated conifer plantations) are found in the Knowle and Budleigh Brooks, and the Lower Otter. All subcatchments have plenty of woodland, along with small amounts of other semi-natural habitats, such as unimproved grassland and fen, marsh, and swamp.



**Figure 8:** Land use within 30m of the river

An earlier analysis looked at the percentage of orchards, plantation (broadleaved and coniferous) and arable land in each subcatchment, using the 2007 aerial photos (this

means that the proportion of arable land is different to that shown in Figure 8). There are very few orchards close to the rivers in the Otter Catchment, and they are mainly found in the upper and lower Otter, and the Gissage subcatchments. Plantations are mainly coniferous plantations on the heathlands in the west of the catchment, although some broadleaved plantations were identified on the Tale.

Watercourse within Otter catchment	Length of River (km)	Area of 30m buffer (ha)	Length of PRow (km)	Area of Orchard (ha)	% of total buffer	Area of Plantation (ha)	% of total buffer	Area of Arable (ha)	% of total buffer
Budleigh Brook	5.19	30.50	0.16	0.00	0.0%	3.05	0.4%	3.84	0.5%
Knowle Brook	5.02	30.07	0.59	0.19	0.0%	2.26	0.3%	0.79	0.1%
Love	8.77	51.81	0.96	0.08	0.0%	0.00	0.0%	6.62	0.9%
Otter (upper & lower)	65.15	414.50	8.55	1.68	0.2%	8.01	1.1%	70.46	9.6%
Otter (Gissage)	15.36	85.60	0.32	1.20	0.2%	0.00	0%	8.25	1.1%
Tale	14.04	83.29	0.77	0.10	0.0%	0.13	0%	22.30	3.0%
Wolf	6.23	37.02	0.11	0.00	0.0%	0.00	0%	3.01	0.4%
<b>Total Main Rivers</b>	<b>119.76</b>	<b>733.87</b>	<b>11.84</b>	<b>3.31</b>	<b>0.5%</b>	<b>13.45</b>	<b>1.8%</b>	<b>118.17</b>	<b>16.1%</b>
<b>Ordinary Watercourses</b>	<b>470.46</b>	<b>2645.00</b>	<b>34.37</b>	<b>15.98</b>	<b>0.6%</b>	<b>68.72</b>	<b>2.6%</b>	<b>621.83</b>	<b>23.5%</b>
<b>Total (all watercourses)</b>	<b>594.42</b>	<b>3377.85</b>	<b>45.89</b>	<b>18.23</b>	<b>0.5%</b>	<b>82.17</b>	<b>2.4%</b>	<b>736.46</b>	<b>21.8%</b>

**Table 2:** Orchards, plantations, and arable land within 30m of the main rivers and of all watercourses

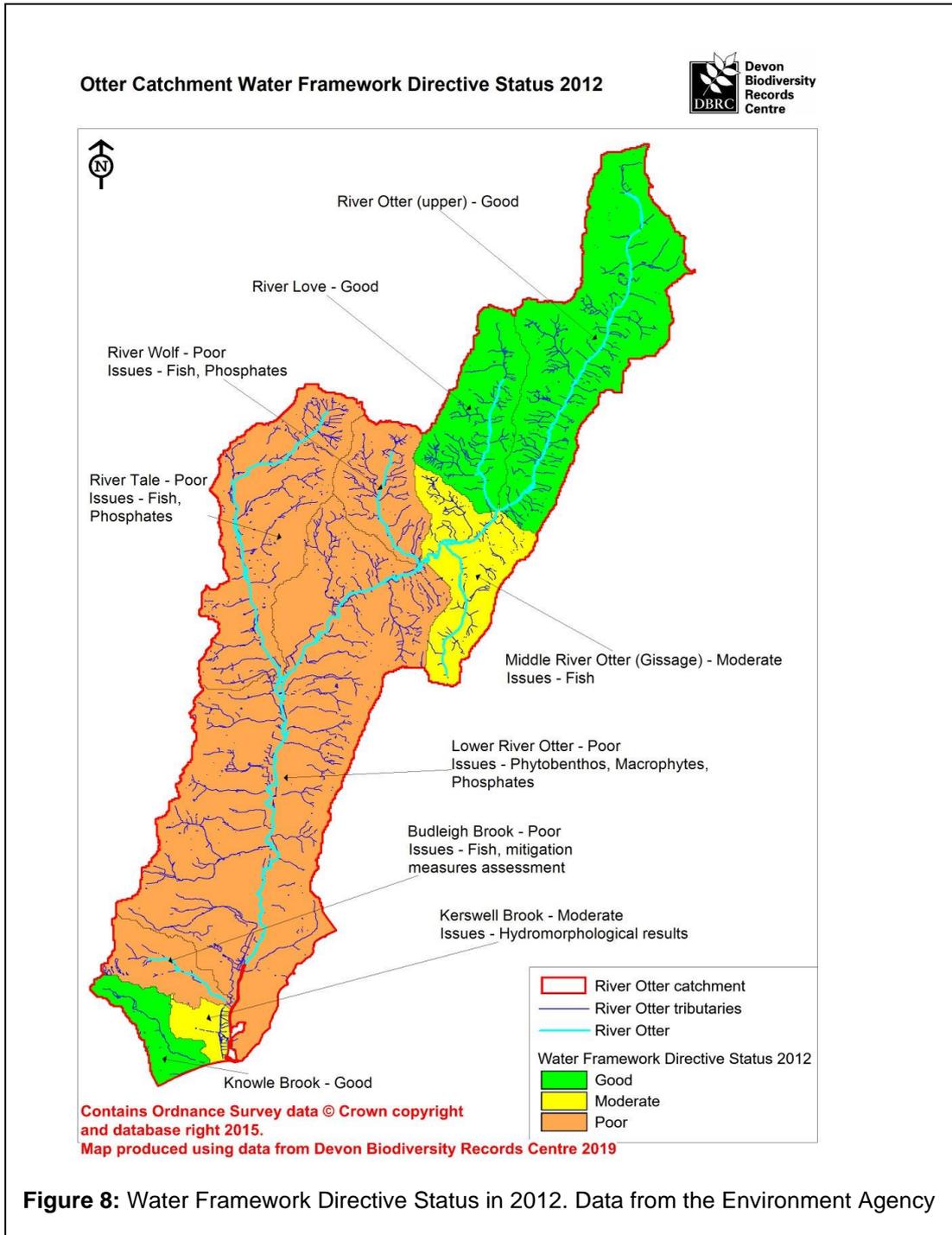
## 7. Riverside wood, scrub, and trees

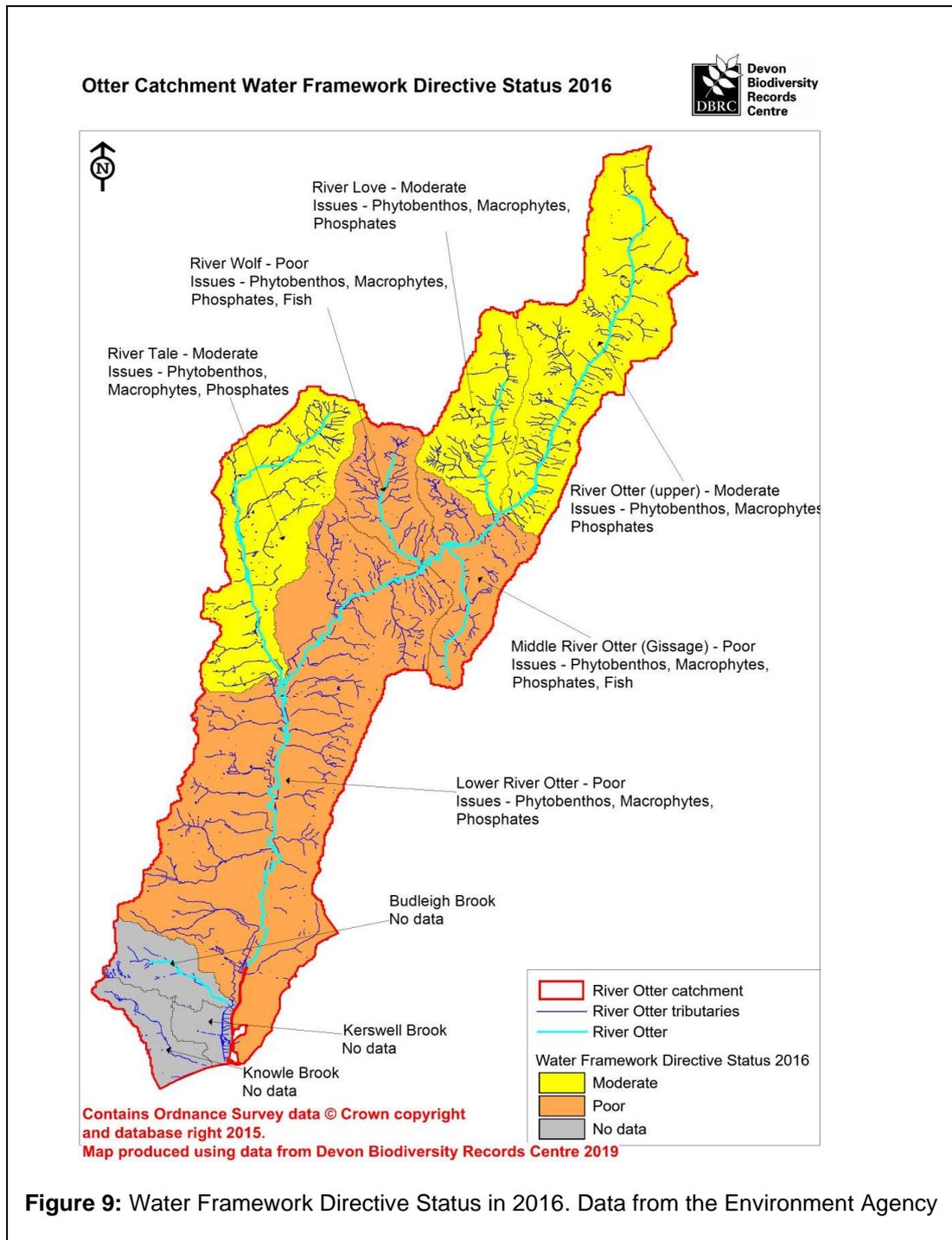
Riverside wood, scrub, and trees are an important habitat; especially areas of willow scrub, but it has not been possible to map this separately. Woodland datasets, such as the National Forest Inventory do not include lines of trees growing on riverbanks or areas of scrub at the edge of fields. The MasterMap dataset sometimes maps these areas as separate polygons, but not consistently. It would be possible to map these areas from aerial photographs, but that was outside the scope of this report.

## 8. WFD status of watercourses

The Otter catchment is a predominately rural catchment, dominated by livestock and arable farming, especially in the lower reaches, below Honiton. The steep and rolling terrain means that heavy rain often runs-off rapidly into the river system, and can carry large amounts of soil and nutrients. This is reflected in the Water Framework Directive (WFD) ecological status of the sub-catchments; the Lower Otter and Wolf were both classified as Poor in 2012, and had not changed in 2016 (the latest publicly available data). The Middle Otter has deteriorated from Moderate to Poor, while the Tale has improved from Poor to Moderate. The River Love and the Upper Otter have also changed from Good to Moderate.

The main issues identified were elevated levels of phytobenthos, macrophytes and phosphates. These were mainly caused by poor soil management on arable farms, and poor nutrient management from livestock, though there was also sewage discharge from waste water treatment. The Middle Otter and River Wolf also had barriers to fish movement





**Figure 9:** Water Framework Directive Status in 2016. Data from the Environment Agency

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## Appendices:

### Appendix 1 – species data providers (accessed via the DBRC database or NBN atlas)

- Bat Conservation Trust
- Biological Records Centre
- British Dragonfly Society
- British Trust for Ornithology
- Devon Bat Group
- Devon Biodiversity Records Centre
- Devon Reptile and Amphibian Group
- Devon Water Vole Recovery Project
- Devon Wildlife Trust
- Environment Agency
- Joint Nature Conservation Committee
- Natural England
- People's Trust for Endangered Species
- The British Association for Shooting and Conservation
- The Mammal Society

### Appendix 2 – Land Cover 2015 data

DOI for LCM2015 Vector data for Great Britain:

Rowland, C.S.; Morton, R.D.; Carrasco, L.; McShane, G.; O'Neil, A.W.; Wood, C.M. (2017) Land Cover Map 2015 (vector, GB). NERC Environmental Information Data Centre. <https://doi.org/10.5285/6c6c9203-7333-4d96-88ab-78925e7a4e73>

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### Acknowledgements

The following datasets have been used in the derivation of LCM2015 Vector (GB):

- Landsat-8 satellite imagery. Data available from the U.S Geological Survey.
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