

NEW FOREST WATER NEWS

New Forest Catchment Partnership Newsletter

The New Forest Catchment Partnership is coordinated by the New Forest National Park Authority and Freshwater Habitats Trust who are working alongside other organisations and communities to protect and improve the special freshwater habitats of the New Forest. This newsletter showcases the work of those who are committed to improving the freshwater environment of the New Forest

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WHAT LIES BENEATH

DISCOVERING THE HIDDEN TREASURES OF THE NEW FOREST'S FRESHWATERS

Globally, 10% of all species on earth are found in freshwaters; which in its entirety only occupies 2-3% of the lands surface. Current estimates suggest that this is equivalent to the same number of species found in the World's oceans, which occupy 70% of The Earth. We have a duty of care to manage and protect these species rich freshwaters in their own right, but we also rely on freshwaters for our survival; for food, for power and for an endless list of other resources too numerous to list here. It would be nice to think that this is reflected in the amount of time and effort spent on monitoring the health of freshwaters, but sadly not.

In fact, even in the UK which has some of the oldest and most well established species monitoring programmes in the world; only the larger streams and rivers are part of a regular monitoring programme. Small waters; the ponds, small lakes and headwater streams, which make up nearly 99% of the freshwater resource, are rarely surveyed, if at all, and remain outside of formal monitoring programmes.



Bartley Water

As many of you know, the New Forest is one of the UK's most important freshwater landscapes. Alongside our bigger rivers, the Beaulieu and Lymington, there is a complex network of smaller streams and trickles which flow down from the bogs and mires, through wet woodlands and over heathlands to the coast. Driving through the Forest at this time of year, it's easy to appreciate the number of small and large ponds, pools and small lakes that are part of the fabric of this place. Together, the freshwater habitats of the New Forest support more than two thirds of all of the UK's freshwater species and more than a third of the UK's rarest plants and invertebrates – species which have been identified as declining significantly to a level of conservation concern in the last 50 years. But, even here, there are limited resources available to regularly assess the status of these habitats and the species they support.



WHAT LIES BENEATH CONTINUED.....

The Victorian Taxonomist

Traditional detailed surveys to assess the condition of freshwater habitats and species typically require skilled surveyors. This is especially true where these habitats are of very high quality or where they support rare species. More general, less technical surveys, may be able to place a habitat into broad quality categories, e.g. poor, moderate, good, high status – but if the habitat always falls into the highest category, then the question is really about detecting change within the category before it deteriorates to the next level. This is likely to require identification of all the plants, invertebrates and animals to species levels. If a rare species has exacting habitat requirements, specific to a habitat found only in the New Forest, then more general, national surveys may fail to take account of local conditions. As above, this could require species specific surveys including environmental information, to fully understand status and change.

Through the New Forest HLS scheme and the Environment Agency's national river monitoring survey programme, we are beginning to collect this detailed level of information for some rivers and for some species in the New Forest. But, if we want to collect vital data from more places and for all the New Forest's important species, using traditional survey techniques, we would need many more hours and a large team of professional surveyors. The tools and techniques used by these professionals today would not be unfamiliar to the Victorian gentlemen and women who named many of these species over 100 years ago – nets, collection pots, microscopes and species identification guides.

A Survey Revolution

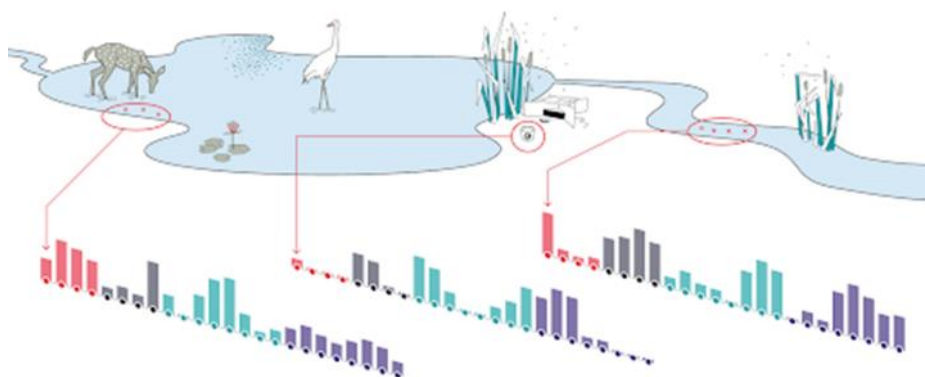
Exciting new developments may be about to revolutionise the way we undertake surveys for freshwater species and in the New Forest we are at the forefront of trialling this new approach.

eDNA or environmental DNA, is "... nuclear or mitochondrial DNA released by an organism into its environment ...". This DNA comes from shed skin, faeces, mucus, gametes, hair, and decaying matter. The use of eDNA kits enables us to detect species regardless of their life stage or gender, and regardless of the skill level of the surveyor.

We can, for the first time, produce a list of species living in a pond, stream or river by collecting a single sample of water.

At the moment we can reliably detect all freshwater vertebrates, including amphibians, fish, water birds and mammals.

There have also been significant



steps towards developing single species qPCR eDNA to find a specific target species, such as Great Crested Newts and the elusive Tadpole Shrimp *Triops cancriformis*; and multispecies meta-barcoding for taxonomic groups like freshwater mussels. In standing waterbodies, ponds and lakes, which are closed systems, we have successfully related this to the actual populations of fish and amphibians living there. For other vertebrates, the birds and mammals, we are still undertaking research to understand how this relates to the animals living in the pond versus animals which are just passing through; whether flying over the pond or visiting the pond to drink for example. In running waters, we are also still in the process of understanding what an eDNA result is telling us about the community. Does a list of fish species relate to the population at the point of survey, or the whole population upstream from the sample site? With these caveats in mind, we have undertaken two provisional surveys using eDNA metabarcoding for vertebrates in the New Forest. In this issue of Water News we'll present our lake results; next issue (in March), we'll present the results of the stream surveys.

EDNA SURVEY AT HATCHET POND

Hatchet Pond is a 6.7ha shallow lake located within the New Forest National Park. It is one of the highest quality standing water habitats in the country, supporting an outstanding assemblage of freshwater plants and animals, with a suite of endangered and protected species. It is also a popular tourist spot and coarse fishery. Historically, nine species of fish have been recorded from Hatchet Pond: Northern Pike *Esox lucius*, European Perch *Perca fluvi-*



Hatchet Pond

atilis, Common Roach *Rutilus rutilus*, Eurasian Ruffe *Gymnocephalus cernua*, Common Bream *Abramis brama*, Rudd *Scardinius erythrophthalmus*, Tench *Tinca tinca*, Common Carp *Cyprinus carpio*, Mirror Carp *Cyprinus carpio carpio* and Common Eel *Anguilla anguilla*.

Surveys using eDNA were completed on Hatchet Pond (5 kits evenly spaced around the lake margin) and Hatchet Little Pond (1 kit) on Saturday 26th January 2019. We sent the kits to Nature Metrics, an environmental DNA specialist based in Surrey.

A total of 35 taxa were detected across the 6 samples. A total of 10 unique fish, 3 amphibians, 17 birds and 10 mammals. The average species richness per sample was 24 and ranged from 21 species (Sample 5 Hatchet Pond) to 28 species (Sample 3 Hatchet Pond).

All the species of fish which had previously been recorded were confirmed as present, along with small quantities of Dace DNA. Roach DNA was most abundant in the samples, followed by Perch. The DNA of all 10 species of fish were present in Hatchet Pond samples 3 and 4, and were also all found in Hatchet Little Pond. Dace, Pike, Roach, Bream, Rudd and Eel were present in all the Hatchet Pond samples. Tench and Carp were only absent from sample point 2. This is good confirmation that eDNA samples from small lakes can record the composition of the fish community, and we will come back to Hatchet Pond over the next couple of years to undertake fish surveys as part of a regular monitoring programme.

EDNA SURVEYS AT HATCHET POND CONTINUED....

The same eDNA samples also gave us good results for amphibians using the pond at this time of year. Three species were recorded, Common Toad *Bufo bufo*, Common Frog *Rana temporaria* and Palmate Newt *Lissotriton helveticus*. We know from previous surveys using traditional techniques, that Smooth Newt *Lissotriton vulgaris* and Great Crested Newt *Triturus cristatus* are also using the pond. We assume they were absent from this survey because of the time of year. January is outside of the breeding window for these amphibians and we would recommend that, if they are the focus for survey, sampling should follow the protocol of collecting an eDNA sample in May. We also

had some interesting results about the other vertebrates using Hatchet Pond. The most abundant eDNA in the sample was from Mallard; which any family who regularly visits the pond would probably have guessed! Less obvious species picked up by the test included Goosander, Lapwing and Snipe. Also found in various quantities were



Teal, Widgeon, Swan, Gulls, Coot, Moorhen, Corvids, Thrush species, Starling, Grey Heron, and Cormorants. This is an interesting, but certainly not an exhaustive list of the bird species recorded from the pond.

The eDNA also gave us a glimpse of some of the mammals visiting the pond, including Roe, Sika and Fallow deer, Red fox and Field vole, along with the human, dog, horse, donkey, and cow DNA, that you might expect to find in any New Forest waterbody.

The eDNA samples were easy to collect, required no previous experience, and because we had a team of volunteers thanks to the local fishermen, we were able to survey the whole pond in under an hour! A traditional survey to collect data on fish and amphibians would have taken several days (and nights) for a team of at least four specialists.

So, we can conclude, that this eDNA technique has the potential to tell us more about the species using the New Forest’s ponds and lakes, and we are currently preparing a funding bid which will give us the budget to arm a larger team of volunteers with eDNA kits.

The streams data has been just as interesting, including evidence of otter DNA in the very heart of the Forest – but more about that in the next issue ...

| Species | Hatchet Little Pond | Hatchet Pond 1 | Hatchet Pond 2 | Hatchet Pond 3 | Hatchet Pond 4 | Hatchet Pond 5 |
|-------------------------|---------------------|----------------|----------------|----------------|----------------|----------------|
| European eel | ★ | ★ | ★ | ★ | ★ | ★ |
| Common bream | ★ | ★ | ★ | ★ | ★ | ★ |
| Carp | ★ | ★ | ★ | ★ | ★ | ★ |
| Dace | ★ | ★ | ★ | ★ | ★ | ★ |
| Roach | ★ | ★ | ★ | ★ | ★ | ★ |
| Rudd | ★ | ★ | ★ | ★ | ★ | ★ |
| Tench | ★ | ★ | ★ | ★ | ★ | ★ |
| Northern pike | ★ | ★ | ★ | ★ | ★ | ★ |
| Ruffe | ★ | ★ | ★ | ★ | ★ | ★ |
| Perch | ★ | ★ | ★ | ★ | ★ | ★ |
| Common toad | ★ | ★ | ★ | ★ | ★ | ★ |
| Common frog | ★ | ★ | ★ | ★ | ★ | ★ |
| Palmate newt | ★ | ★ | ★ | ★ | ★ | ★ |
| Eurasian teal | ★ | ★ | ★ | ★ | ★ | ★ |
| Mallard/Common shelduck | ★ | ★ | ★ | ★ | ★ | ★ |
| Widgeon spp. | ★ | ★ | ★ | ★ | ★ | ★ |
| Swan/goose spp. | ★ | ★ | ★ | ★ | ★ | ★ |
| Goosander | | | | | ★ | |
| Lapwing | | | | | | |
| Gull spp. | ★ | ★ | | ★ | ★ | ★ |
| Snipe spp. | ★ | | ★ | ★ | ★ | |
| Jack snipe | | | ★ | ★ | ★ | |
| Dove spp. | ★ | ★ | ★ | | | |
| Coot | ★ | ★ | ★ | ★ | | ★ |
| Common moorhen | ★ | ★ | ★ | ★ | ★ | ★ |
| Corvid | ★ | | | | ★ | |
| Common starling | | | ★ | | | |
| Thrush spp. | | ★ | | ★ | | |
| Grey heron | | ★ | | | | |
| Great cormorant | ★ | ★ | ★ | | ★ | ★ |
| Roe deer | ★ | | | | | |
| Sika deer | ★ | | | | | |
| Fallow deer | ★ | ★ | ★ | ★ | | ★ |
| Red fox | | | | | | |
| Field vole | | | | | | |

The map indicates the sampling locations.
The table indicates DNA detected, marked by a star for present, blank for absent.

RIVER BASIN MANAGEMENT PLAN - CHALLENGES AND CHOICES CONSULTATION

NO ONE ASKED ME.....!

How many time have you seen plans published or things happen and felt frustrated that your individual or organisational views have not been taken into account? Organisations are often accused of not consulting or doing so in a way that doesn't promote engagement. Fortunately, the planning around our water environment is more transparent and after reviewing the Environment Agency's current 'Challenges and Choices' consultation we can definitely recommend it to everyone who cares about the New Forest's water environment.

'Challenges and Choices' is the latest step in the process of producing an updated River Basin Management Plan for the south-east and which is due to be published by December 2021. River Basin planning provides an overarching framework for managing the water environment. River Basin management plans are led by the Environment Agency and include legally binding objectives to protect and improve rivers, lakes, groundwater and coastal waters, and a summary of the measures needed to achieve those objectives.

The Agency is inviting organisations and individuals to give their views on: the challenges that limit the benefits society obtains from the water environment in the river basin districts in England (the challenges); the best way to address these issues (the choices). You can review the consultation via tradi-

Why it matters for organisations

Water and land are intrinsically linked so River Basin Plans inform decisions on land use planning alongside other strategies, such as flood risk management plans. Public bodies (e.g. local councils, Forestry England and Commission, National Parks, Environment Agency) have legal duties to have regard to River Basin Management Plans. The Plans play an important part in setting priorities for action and the allocation of time and financial resources. In particular they inform the work of the Environment Agency and can influence approaches and resources for stakeholders in Catchment Partnerships.

tional online documents [here](#) and make your own free-form written responses. The Agency has also sought to take the pain out of consultations by providing an online package of resources including short video clips, background to the challenges and guiding questions (click [here](#) for guided questions) so that the whole process can be completed easily and quickly online. We have found the resources engaging and would recommend them to everyone.

The consultation is open until 24th April. We would encourage partner and stakeholders to find out how their organisation is responding, promote engagement, and where possible highlight the importance of the New Forest's water dependent habitats including standing water bodies. Similarly, individuals can also help and get involved.

Examples of questions posed by the River Basin Management Plan consultation that are of importance in the New Forest

- ◆ What can we do to address this biodiversity crisis and meet the 25 Year Environment Plan targets for wetlands, freshwater and coastal habitats and wildlife?
- ◆ What can be done to address pollution from agriculture and rural areas?
- ◆ How can we support the farming sector to excel at innovative solutions which benefit both productivity and the environment? What should these solutions look like?
- ◆ How can sustainable drainage systems and green infrastructure be most effectively used to tackle pollution from urban areas? What challenges are there to using them?
- ◆ What can be done to address pollution from water industry wastewater?
- ◆ What opportunities exist for water companies to collaborate with other sectors and organisations on measures to improve the water environment?
- ◆ How can local partnerships become more inclusive and representative of all of the stakeholders within their catchments?

FISH AND FISHING THROUGH THE CENTURIES AT BEAULIEU

HISTORIC BEAULIEU

Any estate situated as Beaulieu is, where a tidal river meets the sea, will undoubtedly have used the rich resources both habitats have to offer. Similarly, the well-watered hinterlands offer further opportunities for fish related enterprises; it is these that are considered in the following article.

Prior to the foundation of Beaulieu Abbey, in 1205, but records are silent on the subject, however, the copious records of Abbey provide much detail as to how the Cistercians managed their fisheries. By 1270 the monks had constructed a large dam at Sowley, thereby forming the pond there, the main use of which was to breed fish. The species stocked at that time would certainly have included bream and may also have included pike, perch, roach, rudd and chub – carp had not yet been introduced to England. From this pond, fish would have been netted and transferred to ‘stew’ ponds near the Abbey where they could be more easily caught when required. The Abbey’s medieval stew pond still exists near the church car park at Beaulieu; by the 16th century it was called ‘*le Paile Pond*’. Ponds associated with the Abbey fulling mill, likely doubled up as stew ponds, being not far from the Abbey.

Freshwater fish were highly prized delicacies at the time and not commonly eaten by the lower ranks, certain species such as pike, then known as *lupi aquatica* or ‘water wolves’ often being of particularly high status. Generally the monks ate sea fish, mainly herring, caught in large numbers by fishermen on the Abbey Estate at Northtown in Norfolk, and shipped to Beaulieu. Of course, netting the Beaulieu River would easily provide a certain quantity of bass, mullet and trout, and it is possible some sea fishing was undertaken locally. It is also likely that the mill would contain eel traps in the race. Eels were regularly taken in large numbers and were therefore considered as lower status despite being taken in freshwater.

Surviving records from the time of the Dissolution of the Abbey, 1538, show how things had moved on, though fish were still considered a high status gift. In 1535, the Abbot sent a pike to Thomas Cromwell no doubt to curry favour and obtain a favourable surrender of the Abbey lands. Most of the estate was now let to tenants and the terms of their respective leases generally record ponds indicating their continued value. Before the Dissolution, Sowley Pond was subject to a right of the tenant of Lodge Farm and Ginns to fish there with a net one day and one night a week. After the Dissolution, that right was reserved to the lord, Thomas Wriothesley, Earl of Southampton, though the reference to nets was dropped and a *Fish Howse* is noted, perhaps indicating recreational angling in addition to the taking of fish for the Lord’s use. Angling was then in its infancy and popular amongst the landed classes, the earliest English essay on the subject was contained in the 1496 edition of the *Boke of St. Albans*, entitled *a Treatyse of Fysshynge wyth an Angle*.

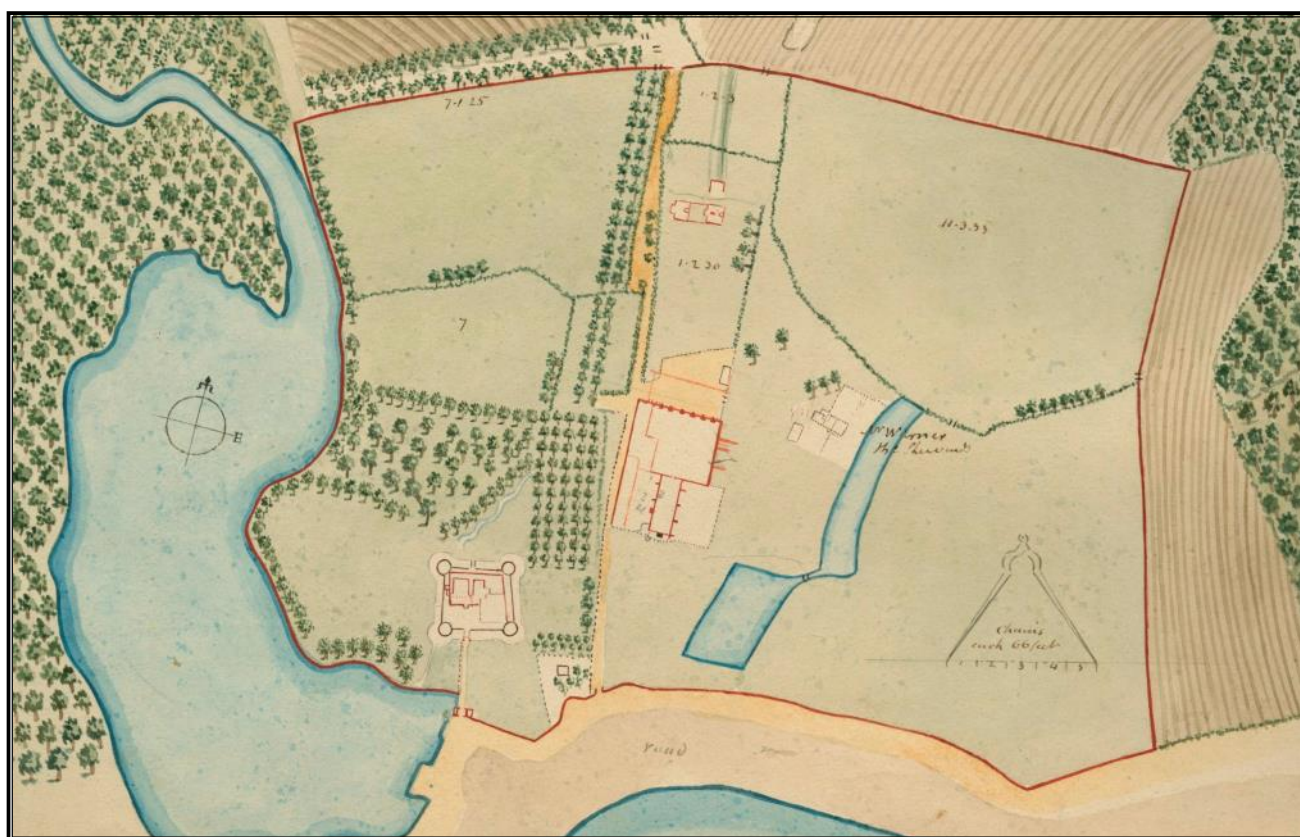


Frontispiece for the ‘*Treatyse of Fysshynge wyth an Angle*’ from the *Boke of St. Albans*.

As well as Beaulieu, the Earl of Southampton also had Titchfield at the Dissolution and orders were soon made to supply 1400 live bream, pike, tench and perch from Sowley Pond to stock the ponds at Titchfield. The value of Sowley Pond in this regard was noted by John Craiford in a letter to the Earl, dated the 12th April 1538, in which he says: *'Fail not to purchase Southlee pond, the storer and foundation of your stews at Leonard's and Titchfelde ...'* The Earl was soon to stock his ponds at Titchfield with carp supplied by the Bailiff of Guernsey and no doubt the ponds at Beaulieu derived its own stock from that introduction soon after.

Records relating to fish during the next 300 years are rather sparse. Some smaller ponds were drained and, in the early 18th century, Boarmans Pond was derived of part of its inflow when the Hartford Stream was diverted to provide headwater for an ornamental cascade and canal. By 1867 Boarmans had also been drained.

However, by May the following year the pond had been restored. There were then no fish in the pond and the keepers had been instructed not to place pike in it. This was fortunate as the pond did not last long. Ordnance Survey maps of 1895 and 1907 show only marshy ground. Finally, the map of 1931 shows the pond restored, perhaps by the Royal Engineers who frequently encamped in the nearby parkland during the interwar years and provides an explanation for the dam being known as Engineers Bank. Soon after the restoration Colonel George Pollitt, tenant of The House in the Wood, leased the fishing there for £10 a year, and in 1934, letters confirm that the pond was then well stocked with trout. From that date the pond appears to have been maintained and stocked for fishing, though, since 1972, it has been managed as a course fishery by the local angling club.



1802 Plan of the environs of Palace House showing the medieval stew pond with the later 18th century pond above and connected to it.

In 1884, an oyster fishery on the Beaulieu River, which had formed part of the large Newtown (Isle of Wight) Fisheries, came into the hands of Lord Montagu on the failure of the parent company. Rather than abandon the enterprise, Lord Montagu set up his own fishery, called the Beaulieu Fisheries, farming oysters on the same site as the failed enterprise on the lower reaches of the Beaulieu River. Soon after taking this over, Lord Montagu's

FISH AND FISHING THROUGH THE CENTURIES AT BEAULIEU CONTINUED.....

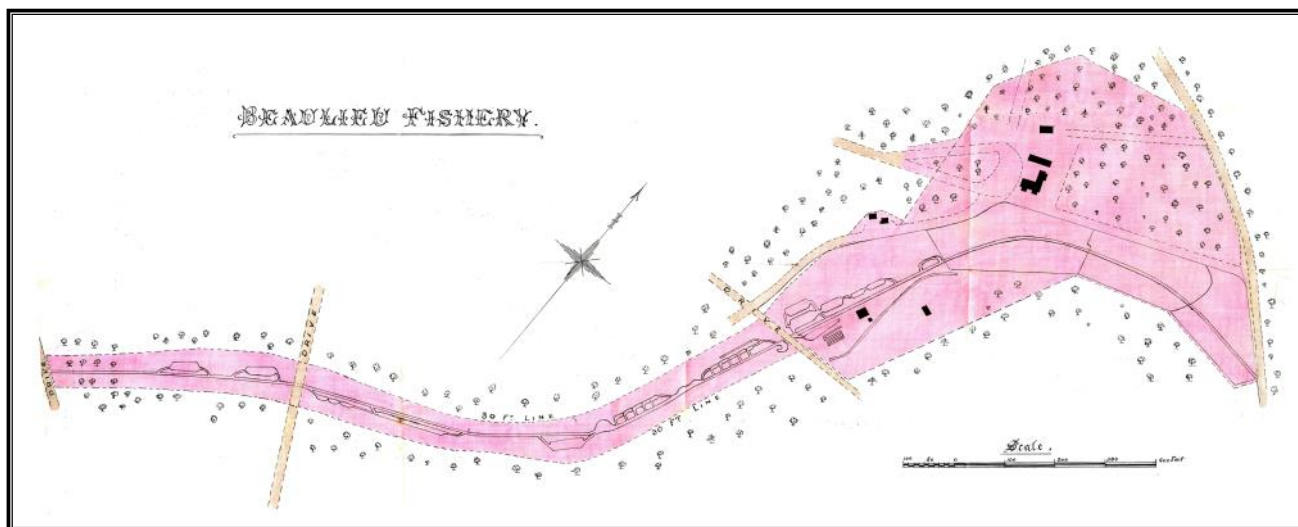
HISTORIC BEAULIEU

attention turned to the potential of Sowley Pond, with discussion from September 1886 as to its stocking with black bass. By 1890, trout became the name of the game, and, in 1901, Ethelbert Collins was manager of the 'Trout and Oyster Fisheries'. The following year advertisements appeared for the Beaulieu Fisheries from which trout ova, fry and young stock could be had. In 1906, Lord Montagu soon dropped that part of the fisheries breeding trout and this was put out on a lease for 21 years to Gibbs brothers from south-west London. The fishery included Hartford Heath Cottage and consisted of a large number of holding ponds.



John, Lord Montagu, (centre) overseeing seine netting on the Beaulieu River, circa 1900.

Many of the ponds can still be seen today, being concrete lined ponds with vertical sides up to 2 metres in depth. That the enterprise was a going concern is confirmed by the list of stock appended to the lease, which included: 56,000 brown trout, and 25,000 Loch Leven brown trout, fry of 3 weeks old; with almost 5,000 other brown and rainbow up to 7 inches in length. During their tenure they restocked the Serpentine in Hyde Park with fish bred at Beaulieu. The fishery passed through a number of hands until March 1919 when Sir Julian Orde took it over but suffered great disappointment and considerable financial loss during his early years on restocking the fishery. Sir Julian obtained a supply of live fish from a hatchery at Hungerford, in Berkshire, but unfortunately 'the fish which had been used to a chalk water were tipped without ceremony into the Beaulieu Water, which is of a totally different character being heavily charged with iron' rather than being slowly introduced to the new water source by stages. The next morning when Sir Julian paid his first visit, he found 90% of his trout floating upside down.' Whether Sir Julian renewed his attempt at restocking the fishery is unclear, but in 1929, when Colonel Pollitt took on The House in the Wood he wished to improve the supply of water. As such a hydraulic ram and purpose built pond were installed on the Hartford Stream; the pond being so sited that it flooded a number of the Hartford fishery ponds, thus indicating the probable and at least partial abandonment of the fishery by that time.



Plan of the Fishery at Hartford Heath in 1915.

Downstream of the Hartford fishery within the old Abbey precincts a new pond was created at the close of the 19th century, this was provided with a set of small fry ponds and may have been an extension of the Hartford Fishery and was certainly leased with it in 1915. This pond had however silted up by the 1950s and was later drained. A similar venture was set up around the same time beside the outflow of Sowley Pond, the idea was to stock the Pond with trout. However, circumstances arose which prevented the original projector, Charles Braun, to attain his goal, but his successor Cedric Scott later took up the challenge and provided the Loch Leven, Brown and Rainbow Trout with which the Pond was stocked following its draining and restoration in 1907.

Today the remaining fisheries are sporting enterprises, the medieval fish production being long consigned to the past, though seine netting of the Beaulieu River which continued regularly up into the 20th century has since been revived, thus keeping the tradition alive. In 1983, the Countryside Education Trust cleaned out the old Hartford fishery, but nature has once more reclaimed them, perhaps their smaller scale pond dipping activities at Middle Pond are easier to maintain.



Boarmans Pond, Beaulieu Estate, summer 2018



Stew Pond, Beaulieu Estate, summer 2018

SPECIES PROFILE: MARSH CLUBMOSS

Imagine a time when dragonflies were the size of seagulls and vast lowland swamp forests were dominated by giant club mosses, tree ferns, and horsetails.

Today, the New Forest in some ways reminds us of this prehistoric time. Clean unpolluted and seasonally fluctuating water table, primitive species, dragonflies, lampreys, ferns and an interesting species that here in the New Forest still exists very similar to its evolutionary ancestors. This plant *Lycopodiella inundata*, or marsh clubmoss as commonly known, is not a true moss but a primitive non-flowering plant, more closely related to ferns. The clubmosses form part of a group of plants that remain virtually unchanged since they first evolved over 400 million years ago,

The morphology of this plant is similar to young crossed leaved heath shoots or the tips of a spruce tree, with a characteristic striking lime green colour. It has creeping horizontal stems that grow to between 5-20cm in length. The plant sub-divides growing into a v-shaped. The strobili form at the junction of the v and grows vertical, sometimes to 10cm high. In late summer to autumn the strobili develop pale brown spore cases at the tips.



Marsh clubmoss, stood tall and bright amongst its vibrant friends

Clubmosses have a fascinating life cycle, like a moss, which follows alternating generations (known as a gametophyte), it happens in association with a symbiotic fungus. Once the gametophyte has grown it either produces sperm or eggs (and fertilisation occurs when the sperm swims towards the eggs in the wet habitats in which it lives). They can also reproduce asexually, when an extra horizontal stem grows and produces its own strobilus, which eventually breaks off to become its own plant.

For me, a somewhat bleak wetland or heathland habitat is in fact on par with a tropical rainforest and this plant is just one among many that offer such interest, vibrancy and wonder to the onlooker. Alongside its plant allies, marsh clubmoss certainly stands out from the crowd in terms of its rarity here in the British Isles, nevertheless its friendly plant companions stand together and tell us an important story of the space they occupy.

The vast tracts of uncultivated wetland and traditional grazing allow opportunistic colonisation of non-competitive specialist plants thriving in areas of clean unpolluted seasonally saturated ground. This and the intricate mix of grazing and the depressions left by ungulate animals prevent the growth of competitive grasses and rushes creating the perfect home for some of our rarest plant species.



At first glance the pines capture your eye, but upon closer inspection this landscape holds many very rare and endangered plants and animals.

Marsh clubmoss is an endangered species, protected by law in the UK under schedule 8 of the Wildlife and Countryside Act 1981.

In the New Forest, the Dorset Heaths and Thames Basin Heaths, Marsh Clubmoss has just about managed to maintain a presence. The rest of its distribution across the UK is a bleak situation. Historically Marsh clubmoss has been recorded in 220 10km squares but since 1987 it has only been found in 53 squares representing a decline of 76% from its former range. For further information click [here](#) for Marsh clubmoss Dossier.

The loss of this species is a sign that the whole ecosystem is under pressure and struggling for survival. Each species that is lost triggers another and so on in a domino effect. These habitats and species deserve our highest regard and the highest levels of protection. We know they purify our water environment and contribute to clean air, but what else do they offer? What else have we yet to learn.

The Species Recovery Trust in partnership with the Freshwater Habitats Trust and other land management and conservation bodies in the New Forest are committed to long term monitoring of this species. The presence and abundance of this species is an indication of the quality of the habitat. Monitoring over a sustained period of time can help us to understand how these rare habitats are changing. There will be influential factors out of our control; there will be factors we can control and this data can help inform our future land management decisions.

One of the things we know about marsh clubmoss in the New Forest is its fondness for tracks and pathways, due to its requirement for bare ground free from the competing pressures of larger vascular plants. At times, this relationship with lightly disturbed soils can put it very much in harm's way, and we assisted with a project this year to match our data with data on visitor numbers, to see if changing patterns of track use in the Forest might have a detrimental effect.



Marsh clubmoss (indicated by red pegs) growing on the exposed vertical slopes along rutted trackway created by grazing animals

SPECIES PROFILE: MARSH CLUBMOSS CONTINUED....

Surveys have also led to the discovery of new populations deep within the blanket bogs, away from any disturbance. In these cases the pristine quality of the bogs, combined with permanent waterlogging, has created a unique environment where the marsh clubmoss can grow on top of the sphagnum mosses, using them as a hydroponic mat.

We have a superb bunch of volunteers who monitor most of the populations across the forest each year (we're always keen for more people!) and this is also allowing us to track the change in population across time. One of the most interesting discoveries this has led to allowed us to track the impacts of the unusually harsh winter of 2017-2018 (remember all that snow!). At the time we were worried about the Clubmoss, as so many populations had sat under the snow and seemed to disappear after the melt, and then just two months later they re-emerged with an average of four times more plants. For a species that grows up into the arctic circle, it had maybe been waiting for a winter like this to trigger this massive regeneration.

Sadly, like financial investments, numbers can go down as well as go up, and over the last four years we have seen many populations vanish. So far, they've been largely replaced by new finds, but as the world grows hotter and summer droughts become more intense, we will continue to keep a close eye on this ancient treasure.

Marsh clubmoss has survived the ravages of a changing world since the early carboniferous period, surviving at least 2 mass extinction events, and we will continue to work tirelessly to prevent the sixth mass extinction event we are now witnessing being the end for this and other rare species.



Marsh clubmoss (on the right) growing on sphagnum bog amongst other specialist plant species, oblonged-leaved sundew and bog asphodel.



Monitoring volunteer recording marsh clubmoss which has colonised a site recently restored to open habitat.



Marsh clubmoss growing prolifically on grazed, poughed ground, taking advantage of recently created bare ground.

NEW FOREST WATER FORUM—WILDER FOR WATER

29TH JANUARY 2020—EVENT FOCUSING ON THE NEW FOREST WATER ENVIRONMENT

The New Forest Water Forum - Wilder for Water: working with nature to support nature

The Water Forum is a New Forest focused event to raise awareness and promote the great work of the New Forest Catchment Partnership. Just as important, it's also an opportunity for networking and extending our links with others passionate about the water environment.

The essence of our next event is 'Wilder for Water' and we have a wonderful line up of guest speakers who will inspire you with their knowledge and passion for the freshwater habitats and wildlife in the New Forest.

Local and national experts will be talking about:

A Wilder Future • current New Forest freshwater projects • positive changes and the importance of the 'blue corridor' • working with nature to support nature • a focus on specialist species including curlew, frogs and toads, triops and the coastal stingray.

Join us for our fourth Water Forum with an opportunity to network prior to the event from 10.30 - 11.30 and catch up with familiar and new faces. Lunch and refreshments will be provided again another opportunity to network.

When: Wednesday 29th January 2020 (1030 – 1500)

Where: Brockenhurst Village Hall. This year we have hired the main hall for an extra bit of space.

Last year's Water Forum was themed around 'achieving and aspiring together.' We had fantastic presentation from New Forest specialists talking about some of our most rare species. You can find these presentations on the Freshwater Habitats Trust webpage under New Forest Catchment Partnership, or [click here](#)

There is also a dedicated web page for our next Water Forum, which can be found by [clicking here](#).

[Click here to book a place](#)



Dr Naomi Ewald sharing results from volunteer monitoring networks

PROFILE: MANUEL HINGE

SCIENTIST AND WILDLIFE CAMERAMAN

Born, bred and still living in the same house in Lyndhurst for almost sixty years is a modern day novelty, but it has given a great insight into how the New Forest functions and the changes therein.

A childhood passion to photograph the creatures in the Forest didn't satisfy me, and the need to film them in action soon took precedence with all the field craft and technique to make movies learnt from around the age of twelve. No media courses in those days, just trial and error and attempting to emulate those wildlife documentary film makers on the telly.

Never academically very studious, but climbing the academic tree I fell out of the top with a Ph.D for an ecological study in mammology, Red and Roe deer to be precise in commercial forestry. After which a self-imposed four year challenge to get into the dream career of wildlife documentary film making succeeded in year three. Working as an indie at the BBC NHU in Bristol culminated in the making of a BBC2 'Natural World' on the New Forest in that third year, thereafter I didn't really look back producing and filming many more NHU productions since the early 1990's.

The career developed often working with those I tried to emulate in my teens (no name dropping here...some being household names), and when starting to actually produce, direct, and film the documentaries under my own flag, the scientific training helped tremendously. A scientific hat worn together with a media hat allows me to view both perspectives when making science based documentaries that have to make sense to the eventual viewers. Making science interesting without dumbing it down can at times be challenging, stripping out jargon being the biggest offender, but there's great satisfaction when you get it right.

The making of 'wildlife' films is still fun, it brings you into contact with many knowledgeable people that have particular insights and expertise into the subjects you may be researching, and finding those people is an art in itself. Good research is everything, whether science or media and luckily some of the expertise rubs off, giving me additional knowledge on a vast spectrum.

This rubbing off has been the case with many individuals passionately involved with the Water Partnership. Not a science I knew much about until starting a mega film where I had to research the various issues in the New Forest and Solent. The



passion for the subject by many is infectious and has a momentum of its own. Whether non-native plants, Elver passes at Beaulieu, fish electro surveys on Forest streams, stream restoration, ephemeral ponds, nitrate and phosphate testing, they all have been fascinating to be involved with through the filming opportunities and telling the stories of some very passionate people.

The media, love it or hate it, has a part to play in today's outreach. The traditional media and now social media has become an integral part in keeping the public aware with how their money, or time as a volunteer is being spent on the great environmental passions in vogue, conservation and research projects out there in the great outdoors. The New Forest has many fantastic stories to be told and I just have to keep both hats in place.....

Manuel Hinge's New Forest work:

[New Forest Life Partnership—Wetland Restoration](#)

[Higher Level Stewardship—Restorations](#)

THE NEW FOREST CATCHMENT PARTNERSHIP

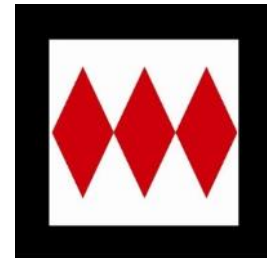
THE PARTNERSHIP IS A GROUP OF ORGANISATIONS THAT ARE WORKING WITH LOCAL COMMUNITIES TO PROTECT AND IMPROVE THE OUTSTANDING FRESHWATER ENVIRONMENT OF THE NEW FOREST.

W: FRESHWATERHABITATS.ORG.UK/PROJECTS/CATCHMENT-PROJECTS

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KEY PARTNERS INCLUDE:

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