

NEW FOREST WATERNEWS

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 and coastal habitats of the New Forest. This newsletter showcases our work and aims to raise awareness of the importance and unique nature of these environments.

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ARE INSECTICIDES USED IN FLEA TREATMENTS FOR DOGS NEGATIVELY IMPACTING NEW FOREST WATERBODIES?

THE FIRST RESULTS OF AN INVESTIGATION

There is growing concern about the potential environmental impact of powerful insecticides that are routinely applied in spot-on flea treatments for dogs. Washing dogs and their bedding at home can result in these chemicals being flushed into rivers, while dogs swimming in ponds, rivers and lakes are another potential source of contamination.

Most UK studies have focussed on measuring concentrations of these insecticides in rivers, and relatively few have assessed their impact on aquatic species. However, concerns about their environmental impact have already seen the most harmful chemicals banned from agricultural use, for example Professor Dave Goulson at University of Sussex has estimated that one flea treatment of a medium-sized dog with imidacloprid contains enough insecticide to kill 60 million bees.

The New Forest National Park contains an

abundance of small ponds, valley mires and headwater streams that support an impressive array of protected and rare aquatic species; it is also a popular recreational space with more than 15 million day-visitors annually, with the most popular activity being dog-walking.

The aim of this pilot project was to sample a series of static and slow-moving waterbodies on the open forest, with Forestry England permission, and test for harmful insecticides that are still commonly used in popular flea treatments for dogs (primarily fipronil, fipronil metabolites, and imidacloprid). Paired water samples were taken from ten target sites where 'dog-dipping' was known to occur regularly; a further four sites with limited access and low potential for dog-dipping were sampled as control sites. Other parameters such as turbidity were also collected at each site.



Dog in a New Forest stream



A total of 25 samples were collected in October 2023 at a time of relatively high-water levels and low recreational activity and were sent to ALS Laboratories for chemical analysis. Imidacloprid was detected at four of the ten target sites, with a spike at one valley mire location at Dibden Bottom (notably the only location where dogs entered the water while samples were being collected). The imidacloprid value at this location of 19 ng/l was nearly double the agreed international toxicity threshold for chronic long-term exposure to aquatic invertebrates (8-10 ng/l). The samples collected from Cadmans Pool, Green Pond, and Janesmoor Pond also contained imidacloprid, with the values of 6 ng/l at Janesmoor Pond being just below the toxicity threshold.



Dibden Bottom bridge over a valley mire being crossed a family with a dog entering the water . This site had a spike in Imidacloprid.

To summarise, this pilot study has confirmed the presence of imidacloprid in several static and slow-moving waterbodies in the New Forest. Given we can exclude most other potential chemical sources at these sites (e.g. agricultural run-off, combined sewer overflows) and they are known to be popular locations for dog-walkers to access, it is reasonable to assume that the imidacloprid detected at these sites is derived from veterinary products applied as spot-on treatments for dogs.

Although this is only a pilot study, the results are consistent with recent studies conducted elsewhere in the UK and internationally - we are therefore working with partners including New Forest Dog Owners Group and forest management bodies to inform the local community about the potential negative impacts of chemical flea treatments on aquatic life in the New Forest, and providing information on alternative treatments that do not harm the environment. Media coverage to date includes BBC News (TV, radio, and online) and local outlets.

Finally, we are grateful to Friends of the New Forest, who provided a grant for £6000 to cover the sample analysis costs of this pilot study.

There was no detectable signal of imidacloprid at any of the control sites. In addition, fipronil or fipronil metabolites were not detected at any of the sample sites, which is perhaps surprising given that recent studies in English rivers have shown a strong correlation between imidacloprid and fipronil concentrations - however, the chemicals at these riverine sites arrived via wastewater treatment works, and so probably represented a much wider source population of treated animals.



Prof Russell Wynn collecting a water sample to be tested for insecticides commonly used in flea treatments.

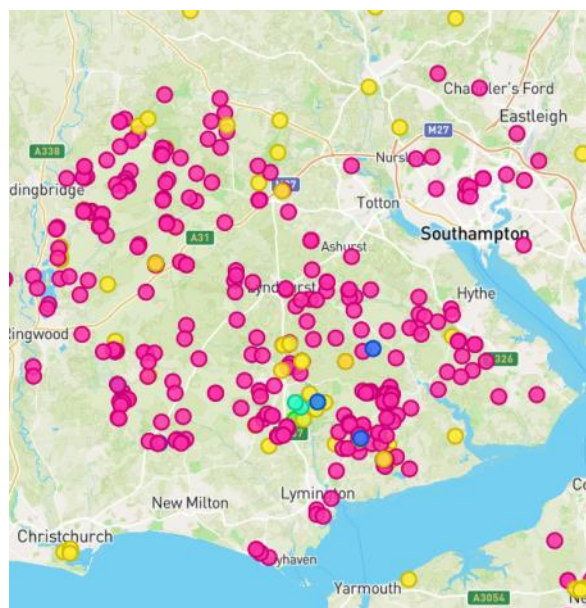
DOGS IN PONDS

AN OVERALL LOOK AT THE IMPACT OF DOGS IN PONDS

Freshwater Habitats Trust (FHT) is the UK's leading charity working to protect all freshwaters, from rivers and lakes to ponds and puddles. Through conducting scientific research, carrying out practical conservation work and policy advocacy, we're dedicated to reversing the dramatic decline in freshwater biodiversity. With over 30 years of experience in protecting, creating and restoring freshwater habitats, we recognise and advocate for the importance of small waterbodies. Small waters, such as wetlands and ponds, support more biodiversity than larger waterbodies, with two thirds (2/3) of all freshwater species being found in ponds. Temporary ponds, otherwise known as ephemeral ponds, can be particularly rich in plant and animal life and provide vital habitats for a wide range of invertebrate species.

The 2007 Countryside Survey of ponds across Great Britain found that two-thirds (66%) of high-quality ponds have lost plant species over a 24 year period, and in Southern England this figure rose to 71% of sites. Freshwater is undeniably in crisis, with extinction rates for freshwater species 4 to 6 times higher than their terrestrial or marine counterparts; it is clear that immediate action and a greater consideration to these environments is needed.

Small waterbodies with high conservation value now have some legal protection as a Habitat of Principal Importance. At FHT, we continue to work with Natural England after helping to secure this protection for ponds by identifying those that support important freshwater species or rare species communities. These waterbodies are known as Priority Ponds. In many cases, these ponds provide a last refuge for freshwater plants and animals that are now lost from surrounding areas and provide an opportunity for species to spread across the landscape. This designation means



Priority ponds mapped in the New Forest. The colours indicate the criterion that led to the designation of the pond. Full map and details can be found on the Freshwater Habitats Trust website.



A dog swimming in a New Forest pond which has become very turbid and has less aquatic vegetation than the other ponds nearby.

that statutory and other agencies need to consider these ponds in decision making and management plans; however ponds can still be adversely impacted by other factors, such as recreation.

While working with numerous landowners to identify the best ponds in Britain, we noticed patterns in the condition of ponds frequently accessed by dogs. These ponds had higher turbidity (the measurement of sediments in the water) with very little aquatic vegetation or invertebrate species. Ponds that are accessible to people and dogs may be subject to both physical and chemical impacts. Entering a pond leads to disturbance of the sediment on the bottom of the pond, increasing turbidity and preventing the penetration of light.



The pictures above show two ponds at Farnham Park, Surrey, the pond on the left is provided for dog walkers, the pond on the right is fenced to prevent dogs from entering the water. The difference in water clarity and in the diversity and abundance of wetland plants is very noticeable. It's important to point out that Farnham Park is not a SSSI like the New Forest, however the ponds still have the potential for wildlife value.

When dogs enter the water, any chemicals present on their fur, clothes or skin, from vet treatments or shampoos and laundry detergent, can leach into the water. There is potential for some of these (e.g. Fipronil in flea treatment) to have long term and long lasting damaging effects on wildlife. Ponds can be uniquely vulnerable to chemical pollution and turbidity for the same reason they can be refuges for wildlife; the area that a pond receives water from is relatively small. This small catchment area means that ponds are more likely to be isolated away from pollution inputs, unlike streams or rivers. However, if pollutants are introduced to these waterbodies, then these are likely to increase in concentration over time in these more static environments with less dilution.

To ensure the very best protection for these Priority Habitats, FHT has been working with landowners and local people to explore better management strategies in areas with multiple user groups, such as directing walking routes away from ponds and introducing a barrier to separate wildlife and recreational areas. When creating a wildlife pond we advise that wildlife and biodiversity must be the priority; activities such as regular use by dogs, duck feeding or the stocking of fish are all strongly advised against if the aim is to maximise biodiversity, due to their adverse impacts.

When protecting waterbodies while balancing wildlife conservation and recreational access, interpretation and engagement play a vital role. With this in mind, FHT have created educational resources for landowners and communities, including Buster and Molly's Guide to Ponds, a leaflet offering guidance on protecting ponds whilst walking your dog.



A panel from the Buster and Molly's guide to ponds.

The key messages in the leaflet are:

- Keep dogs out of ponds to prevent making the water turbid (muddy), which prevents aquatic plants from growing.
- Pick up dog waste (to prevent chemical pollution).
- Keep dogs under control to avoid disturbing wildlife hidden in reeds.
- Stay back from the edge (to prevent edge erosion).
- Treat wildlife with respect to protect it for the future.

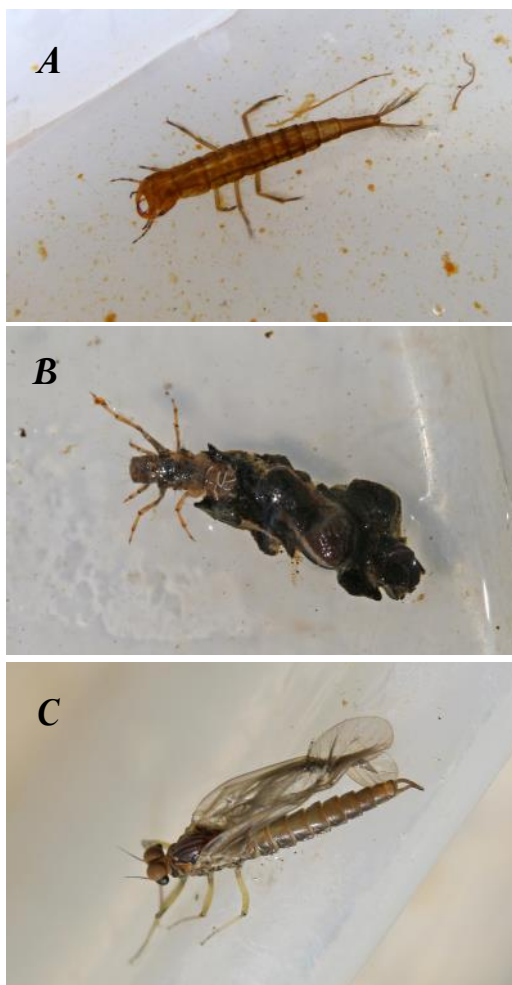
RIVERFLY MONITORING

AN UPDATE FROM A FORESTRY ENGLAND VOLUNTEER

Riverfly monitoring was offered as an additional task for Forestry England volunteers in 2016, organised by the Higher Level Stewardship (HLS) team. Initially, we surveyed Harvestslade and Cowleys Heath and later Avon Water in the Wootton Riverine system. Other teams surveyed more areas in the New Forest. The surveys took place once a month from March to October with the intent of checking what effect, if any, the stream restoration program had on the invertebrate riverfly populations. In conjunction with the invertebrate surveys, we also carried out chemical checks to ascertain the water quality and pollution levels of the streams.

Since 2016, our main survey took place in the Avon Water. Initially, we were surveying for 8 species, caddisflies (cased and caseless), mayflies (including olives), stoneflies and freshwater shrimps. In 2019, we began monitoring under the extended riverfly scheme which added another 25 species such as leeches, worms, bivalves, dragonflies and damselflies as well as specific species of riverflies.

Over the last 9 years Forestry England have been using the Riverfly Monitoring Scheme to explore the abundance and diversity of aquatic invertebrate species across the New Forest, and how these are impacted by the river restoration work they are undertaking. The latest public update looks at the case study of Wootton Riverine Woodland where a stretch of the Avon Water was restored. The watercourse was straightened in around 1860, leading to increased erosive energy and channel incision. This led to a deep channel with steep banks and spoil embankments, preventing water from interacting with the floodplain during high flows. River restoration typically involves restoring the natural meander of the river and reconnecting it to the surrounding floodplain. Research indicates that naturally functioning rivers contain more variable habitats (e.g., areas of different flow type/ bed material), and, thus, support greater species diversity. While interpreting relationships between aquatic invertebrates and river restoration is complex due to various influencing factors (e.g., climate variability), the increased habitat diversity at Wootton Riverine Woodland appears to have encouraged a wider variety of species to colonise the area.



Some of the riverfly species that the volunteers have recorded while surveying.

*A - Greater Diving Beetle larva
B - Cased Caddisfly
C - Emerging fly*

The results to date show that the invertebrate abundance is similar to that before the restoration work took place.

This is an enjoyable task, carried out with like minded friends and provides an opportunity to help understand the biodiversity of the New Forest streams and increase our knowledge of what lives in them.

Trevor Bumfrey — Forestry England Volunteer

Photos © Trevor Bumfrey

WATERBLITZ RESULTS

A LANDSCAPE SCALE CITIZEN SCIENCE STUDY OF WATER QUALITY IN THE NEW FOREST

The New Forest has a unique assemblage of irreplaceable habitats and species. The landscape is dominated by semi-natural habitats, with small urban settlements and some areas of intensive agriculture and other rural land management activities. The vast tracts of traditionally managed habitats are much richer in species diversity than most other areas in lowland England, supporting over 400 freshwater macroinvertebrate species (excluding Diptera) and over 300 wetland plant species. The areas of ancient habitat have resulted in the New Forest National Park having the highest proportion of land designated for conservation of all the UK National Parks. These habitats are ancient, fragile and irreplaceable with a wide variety of connected environments.

WHAT IS CLEAN WATER?

The thriving freshwater biodiversity within the New Forest landscape is a result of a clean, unpolluted water and the traditional practice of livestock grazing by commoners. Clean water has a chemistry or biology which would be normal for a given area in the absence of human disturbance. This is commonly referred to as the reference condition; minimally impaired water quality or natural background levels. The clean water threshold is determined by historical data sets or from paleolimnological studies (see our Clean Water for Wildlife [technical report](#)), where nutrients were historically present but in



A clean water sample taken from a New Forest pool

very low levels. In the absence of people, most freshwaters would naturally have low nutrient concentrations, and since freshwater plants and animals have evolved over millions of years in these conditions, the majority of species require these naturally low nutrient environments to flourish. The nutrient levels are found to be linked to the biodiversity potential of a waterbody. A small amount of nutrient pollution can half the number of different plant and animal species expected to be present. Due to the unique biodiversity of the New Forest and the significant populations of rare species present here, monitoring levels of pollution at the landscape scale is crucial to informing our understanding of the health of local freshwater habitats.

BACKGROUND

The WaterBlitz is a citizen science survey aimed to raise awareness of the true extent of clean water habitats in the New Forest, with the ultimate aim of helping to protect freshwater biodiversity. Volunteer involvement maximised the number of sites tested and raised public awareness of clean water. The investigation used rapid water quality testing kits to assess the level of nitrate and phosphate within the water sampled.

RESULTS

The sites were classified as clean water sites if phosphate levels were less than 0.05mg/l and nitrate levels were less than 0.5mg/l. If either nutrient is above these background levels the site would be considered as showing evidence of nutrient pollution. For more information regarding clean water thresholds, please refer to our [technical report](#).

	No. of sites	% of total
Pond	275	33%
Stream	361	44%
Ditch	113	14%
River	46	6%
Lake	12	1%
Other	21	3%
Total	828	

New Forest Water quality 2023

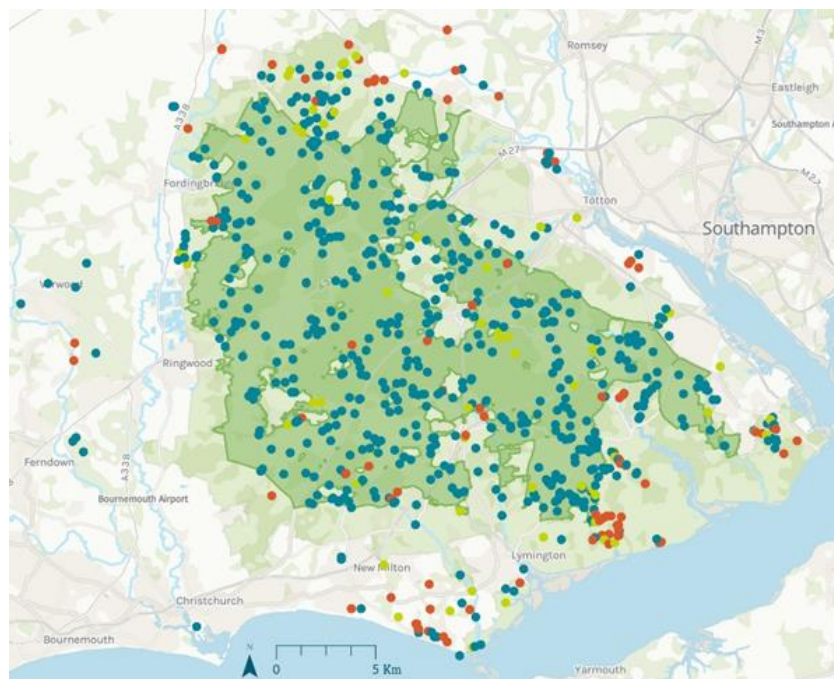


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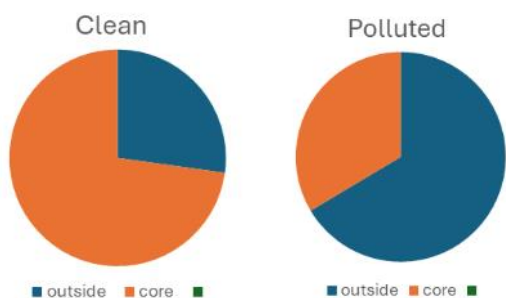
WaterBlitz results 2023. 81% of sites contained clean water.

CORE VS EDGE

To understand these results in the context of the New Forest landscape, we divided the sites tested by those within the New Forest core area designated for nature conservation (SAC) and those outside. The map on the right shows the Special Area of Conservation (SAC) at the core of the New Forest in the darker green, the coastal areas and areas along the Avon have been excluded to focus on the central Forest. The open Forest hosted 73% (487/669) of the clean water samples, while areas outside of this hosted 70% (112/159) of the polluted water samples.



A map of waterbodies tested with the colour corresponding to the results of the rapid nutrient testing kits (blue = clean, yellow = some pollution, orange = high pollution). The darker green area highlights the SAC in the centre of the New Forest National Park.



Pie charts representing clean and polluted samples, separated by whether these waterbodies were located inside or outside of the core SAC.

The core of the landscape is dominated by semi-natural habitats (heathland, woodland, grassland, mire, streams and ponds) these have remained relatively unchanged and have few human connections. In contrast, the non-designated periphery areas are a mix of urban, intensive agriculture and modified habitat land use. Pollution from urbanization and intensive agriculture has some of the worst impacts on freshwaters. The polluted sites identified are likely to be affected from a mix of diffuse and point sources, with no single universal cause. The contrast between the core and periphery highlights the impact of land use on water quality and the isolation to designated areas that many species face.

Our work aims to reverse the decline of freshwater biodiversity by establishing a new national Freshwater Network, comprised of healthy, unpolluted and interconnected freshwater landscapes. The isolation of species affects their expected long-term survival due to a reduction in genetic diversity within populations and lack of opportunity to relocate if their current habitat changes (for example, due to pollution or climate change). The condition of the

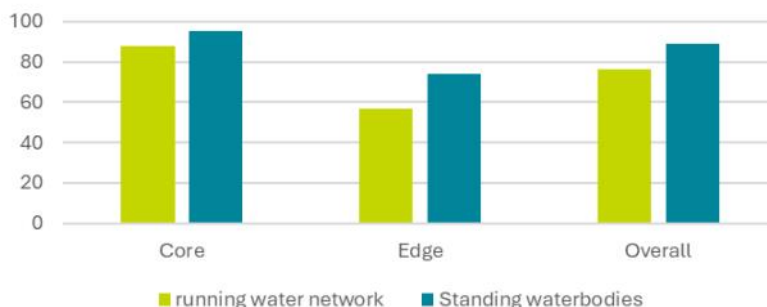
peripheral areas of the New Forest is of particular concern as these are the opportunity areas to focus nature recovery targets and build out from the best examples of freshwater habitats and create new clean water habitats for species to colonise. Water quality issues at the edge are likely to impact the core as water flows over boundaries, carrying pollutants into other habitats. Given the high biodiversity of the Forest, maintaining a higher standard of water pollution management across the entire New Forest landscape is essential to ensure a resilient future.

WATERBODY ANALYSIS

For analysis, the waterbodies have been divided into the running water network (ditches, streams and rivers), standing waterbodies (ponds and lakes), and the small and large waterbodies. Grouping the waterbodies aims to limit the potential inconsistencies from waterbody identification and draw out clearer conclusions.

The majority of standing waterbodies sampled were found to contain clean water (89% [256/287]), this was similar for the running water network, however to a lesser extent (76% [393/520]). Across both the core and periphery, standing waterbodies more consistently contained clean water.

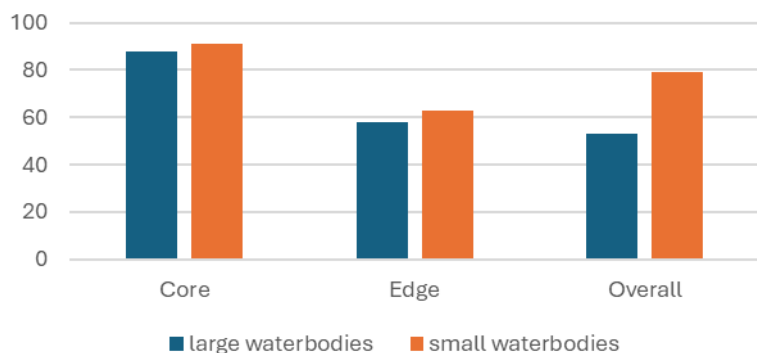
% of waterbodies that were found to contain clean water in 2022/23



A comparison of the running water network and standing waterbodies

These findings are consistent with similar studies; waterbody type analysis in a London 2016 study, conducted using the same testing kits, found ponds and lakes had less nutrient pollution in comparison to rivers and streams ([Full study here](#)). The extensive length and connected nature of the running water network exposes it to a wide range of inputs, including nutrients, and upstream inputs build up downstream, making it more vulnerable to pollution. Ponds draw water from a relatively small area, the size of which depends on the size of the pond. Ponds are still vulnerable to pollution as they are directly connected to the adjacent terrestrial environments, but they can be isolated away from inputs. Ponds support an extraordinary two thirds of all freshwater species, and in the New Forest ponds have been recorded to hold 470 more species than the New Forest streams. The contrast in nutrient

% of waterbodies that were found to contain clean water in 2022/23

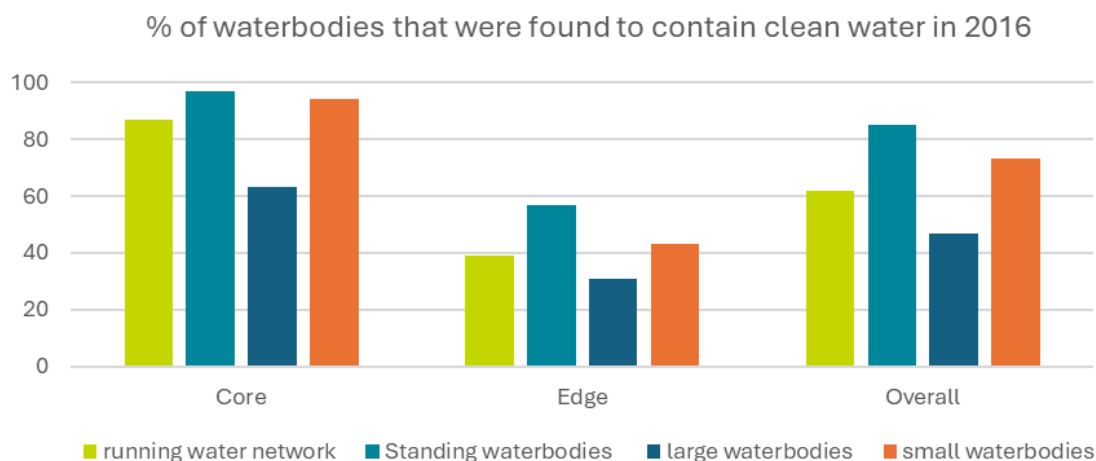


A comparison of the large and small waterbodies tested

pollution between waterbody types highlights the opportunity that ponds can provide for freshwater nature recovery and the need for their inclusion within landscape management. A comparison between the pollution level of large and small waterbodies showed that small waterbodies were more likely to hold clean water, with 79% (608/770) of small waterbodies holding clean water compared to 53% (31/58) of larger waterbodies. Over the last 35 years, Freshwater Habitats Trust has researched small waters and found them to be a critically important part of the landscape (See our [research library](#)). Small waterbodies make up the majority of the water environment and support a higher biodiversity, often representing the best remaining examples of intact freshwater habitats. This data supports the wider findings of our organisation and underpins the need for the protection of small waters, in addition to integration into catchment management.

2016 DATA COMPARISON

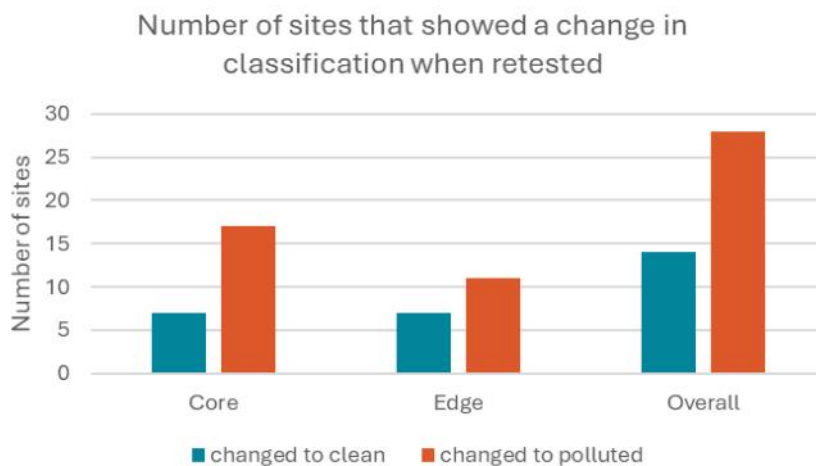
In 2016, 675 water samples were collected by staff and over 80 volunteers between March and June. These samples were taken from 314 ponds, 13 lakes, 277 streams, 19 rivers and 35 ditches. In total, 74% of sites showed no evidence of nutrient pollution. The open Forest hosted 75% (372/497) of the clean water samples, while outside of that area hosted 84% (149/178) of the polluted water samples. The running water network held less clean water sites than the standing waterbodies (62% in comparison to 85%) and the smaller waterbodies were overall cleaner than the larger waterbodies, (73% in comparison to 47%).



A comparison of the different clean waterbody types tested in 2016 divided by location

The 2016 data showed the same trends as the 2022/23 data, with more extreme differences between the core and periphery, running and standing water, and small and large waterbodies. These changes may be a result of the smaller sample size in 2016 and the shift in focus from ponds, which were previously most tested, to streams. Nevertheless, the consistency between datasets supports that small waterbodies, especially ponds, need to be considered and protected in the landscape.

To consider if a change to the overall water quality of the New Forest landscape has taken place, only the number of sites that were directly re-tested in the early phases of the WaterBlitz can be analysed. 245 sites were directly re-tested (36% of 2016 sites); 140 of these sites showed some change, however many of these changes did not affect the classification of the site as clean or polluted.



A comparison of data by location and overall

Overall, 42 sites changed classification with the majority of the change negative as sites now show evidence of nutrient pollution. There are many possible causes for this observed pollution, from poorly maintained septic tanks and small wastewater treatment works to recreation management and runoff from rural land management activities. Any change observed is likely to be the result of multiple changing factors. The dataset highlights change across both the core and periphery, showing an overall greater deterioration in water quality by 1% than the surrounding, more urbanised and intensively farmed area (Core: 6% 10/173, Edge: 5% 4/79).

CONCLUSION

The New Forest WaterBlitz results have shown a net 6% deterioration in water quality over the past 8 years, while the Catchment Partnership has been actively implementing nutrient pollution controls with landowners and raising awareness of nutrient pollution issues, this data highlights the need for greater efforts in the protection of the New Forest freshwater environments. The exceptional quality of the New Forest and other protected landscapes require a higher standard of safeguarding, as the unique assemblages of species found have significantly declines across the rest of lowland England.

Thea Margetts and Gemma Stride — Freshwater Habitats Trust

Photos © Freshwater Habitats Trust

STRATEGIES TO SAFEGUARD NATURE

HOW RANGERS FROM THE NEW FOREST NATIONAL PARK ENGAGE WITH TOURISTS TO MITIGATE THE POTENTIAL IMPACTS OF RECREATION.

Much like fluctuations in freshwater flow, the New Forest receives seasonal influxes of tourists whose levels of understanding and awareness for this protected landscape can be as diverse as the species it supports. With over 100 camping, glamping and touring sites located in and around the New Forest, visitors are enticed by the promise of a truly back to nature experience with seclusion and solitude. Whilst visitors experiences and their contribution to the local economy is important, so too is their potential impact on this fragile landscape.

Engaging with holiday makers is one way to reduce the potential impact of the National Park's 15 million visitors a year. However, the diversity of visitors' experiences and expectations from a holiday in green space, combined with their dispersal across 219 square miles can make this challenging. So how do mitigation rangers from the National Park Authority engage with the seasonal influx of visitors?

CONNECT

Camping in the New Forest (CitNF), which is fully owned and operated by the New Forest Agricultural Show Society, manages the 10 Forestry England campsites dotted around the National Park, hosting 257,780 visitors in the summer holidays. CitNF funded the New Forest National Park Authority ranger team to provide campers with a programme of events to increase visitors understanding of the New Forest's habitats and species, promote safe and responsible behaviour, create enjoyable experiences and enhance connection to natural surroundings. Four popular sites were selected (Ashurst, Hollands Wood, Roundhill and Holmsley) that provide family-friendly facilities. Across the busy tea-time period, we positioned the National Park Authority's mobile education unit near washroom facilities to run 24 Forest Fun sessions with information, advice, games, activities, arts, crafts and guided walks.



The mobile unit at a campsite creating an opportunity for people to learn about New Forest's habitats and species, safe and responsible behaviour, and enhance people's connections to the environment through positive experiences.

Visitors were attracted to the Unit (often in false hope of an ice-cream or coffee!) where we could discover their reasons for visiting, personal experiences, knowledge, expectations or questions. As well as leaflets, maps and literature we displayed multisensory resources as a foundation for conversation. Numerous visitors, on seeing models of an adder and grass snake, exclaimed ‘We don’t have snakes in this country do we?’ Some, on hearing the cuckoo, shared disappointment at not hearing one this spring, whilst others felt what it was like to wear a pony collar. Not forgetting the ‘sense’ of humour, kids were drawn to poo like a magnet when we used hats and model dog poo to make connections with dog owners.

Over 80% of young people are concerned about the environment and want to do more to look after it. 87% feel that being in nature makes them very happy (Children’s People and Nature Survey 2022). Connecting children to nature is imperative so we designed our provision to attract children of all ages and react to the interests of individuals on the day, whether they were into invertebrates, reptiles, amphibians, mammals, birds, fungi or even slime mould! We also tailored sessions to reflect features of each site such as butterflies at Ashurst, once famed by Victorian butterfly hunters. Armed with games, books, competitions, word games and crafts using paper plates, lolly sticks and loo rolls, we captured their attention and made connections.

COACH

Connecting with people meant they felt more receptive to learning about the special qualities of the Forest.

Close proximity of each site to ponds, streams or mires meant that the ‘design your own dragonfly’ activity was one of the most popular. Whilst children cut, coloured and moulded their dragonflies, they were eager to hear how, long before the dinosaurs, colossal dragonflies ruled the skies. Rangers prompted them to consider where their dragonfly would lay its eggs, how and where it would fly, hunt or what predators it would dodge. Supported by pictures and books, children and adults were astonished to learn about the monstrous mask of the nymphal stage. Quests to discover discarded moults (shed skins) soon became part of holiday plans!

Campers learnt about the more elusive forest creatures on the mobile unit as they stroked animal hides, tried antlers for size, met ground nesting birds from protected wetland habitats, such as lapwing and curlew, or read about rare species such as sundews and Southern damselflies. We live in an era of

eco-anxiety and parents welcomed snippets of conservation success, such as Forestry England’s wetland restoration programme or the ground nesting bird campaign. For those not seeking nature, the open top bus was welcomed as fun but sustainable transport, and the benefits shared of buying from the New Forest Marque.

Ranger Rambles were the best way to connect people with nature; tailored on the day to suit the interests of the group but designed to showcase a range of habitats and species. They could employ all their senses: feel the trees, hear the chirping of wood crickets, admire the purple haze across heathland, smell the aroma of water mint or bog myrtle and taste the peppery heat of marshpepper knotweed. Even the tech-savvy got excited when our smartphone was turned into a state-of-the-art bat detector or could magically identify mystery bird calls. Watching wood ants



Some of the crafts created at the mobile unit. The ladybird says ‘the animals are important to our world, but some are in danger’ showing what the child learnt with the rangers.

drew attention to the smallest woodland inhabitants that would have gone unnoticed by most. Anxieties and fears were overcome whilst engrossed watching ant motorways. Observation led to inquisitiveness about this keystone species and its fascinating behaviour carrying its dead back to the colony graveyard. The group's new, emotional investment was revealed when oncoming cyclists were warned 'don't ride over the ants!' - proof that people are motivated to protect what they care about and are more likely to care about what they have experienced.

COLLABORATE

Once people felt invested in the Forest, they were more motivated to protect it - but did they know how? Our message was simple - work with us to meet the New Forest Code nine key behaviours.

Campers teamed up for our New Forest code memory game, competed at New Forest code snakes and ladders, foraged for forest art with New Forest code scavenger bags and quizzed each other with our New Forest code flick-flack. Sensory games, like 'natural or not' and 'love it or lethal' encouraged leaving no trace and respect for livestock.

The New Forest is the perfect location for dog owners to explore and holiday with their pets. Whilst most campsites welcome and provide facilities for dogs, not all dog owners are fully aware of the potential impact that their canine might have on wildlife. A large part of our role was to promote responsible use of the Forest by people exercising their dogs.



The New Forest Code features nine behaviours, encouraging responsible access. A large part of the ranger engagement is to promote responsible use of the Forest by people exercising their dogs.

Stick and flickers were converted to bag and banners when we gave away compostable bags and revealed the lesser-known hazards of dog poo including:

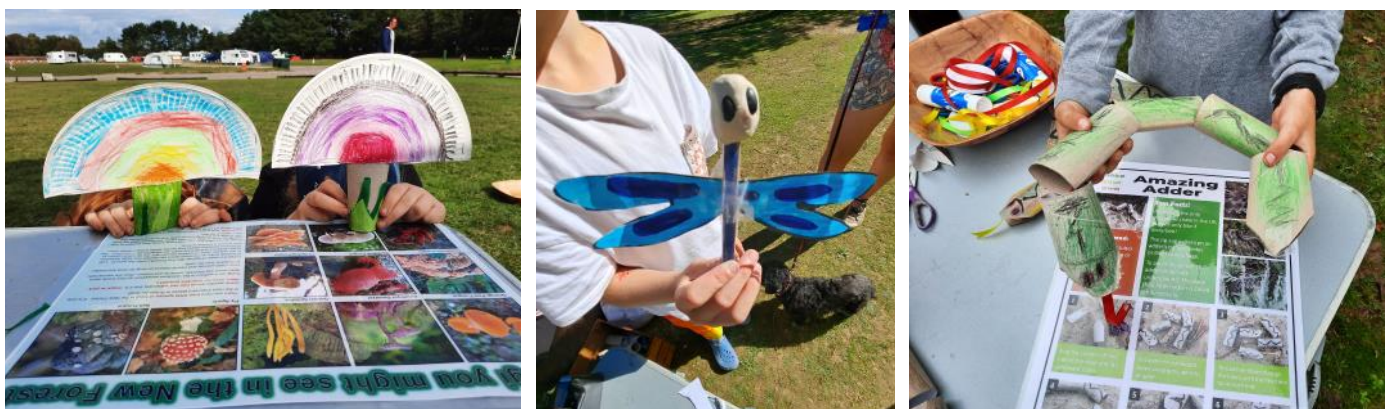
- Unlike livestock that recycle nutrients, dog wee and poo fertilises plants that outcompete rare, low nutrient species.
- Medications impact soil and water quality which impacts on micro fauna and invertebrates with knock on effects up the food chain.
- It harbours pathogens fatal to livestock and children.
- It can take a year to degrade.
- Foxes, supplemented by rubbish as well as dog poo, pose a significant threat to ground nesting birds.
- Provision of stock-proof bin facilities are neither economic or effective.

Walking and cycling are two of the most popular activities that visitors enjoy in the Forest, but these seemingly harmless activities can have significant impact on habitats and wildlife. We joined forces with people, sharing routes, apps and maps to promote permitted cycle and walking tracks, reduce the impact on sensitive habitats and give wildlife the quiet space it needs to feed and breed.

CELEBRATE

Positive reinforcement is a powerful tool for behaviour modification. A simple “thank you” can validate and motivate wanted behaviours. We thanked visitors who followed the New Forest code; who picked up after their dogs, gave ponies a wide berth and stuck to the tracks. However, reasons to congratulate people went far beyond compliance with the code. Some are listed below:

- Breakdown of barriers that previously prevented access to nature.
- Better understanding of the global, European and national importance of habitats and species in the New Forest.
- Recognition of the significance that history and culture has on the Forest today.
- Conscious modifications to behaviour from better knowledge and understanding.
- Awareness of wildlife that would otherwise go unnoticed.
- Dispelled misconceptions.
- Renewed confidence and inspiration for parents to encourage children to be in nature.
- Power of nature for mental health - benefits of stopping, mindfulness, peace, quiet and solitude.
- Increased confidence to explore green space whilst understanding how to protect it.
- Overcoming fears and reframing of risks.
- Appreciation and understanding for the needs of conservation initiatives.
- Sense of optimism for the future.
- A fresh intention to seek out nature in local communities.
- An eagerness to get involved with conservation or volunteer.
- Power of apps to self-educate and contribute to national records.
- Advantages of social media to showcase children’s achievements in nature.
- Strong influence that young people can have on the actions and attitudes of adults.



Crafts of new mushrooms species, dragonfly species and a cardboard adder. Conversations are tailored each day to suit the interests of the group and location of the mobile unit. The rangers celebrate the actions people take to positively reinforce the behaviour and guide people towards having a harmonious coexistence with nature.

The partnership initiative celebrated diversity of habitats and species in the New Forest whilst educating visitors on how to responsibly interact with nature, not only mitigating potential impacts of recreation but helping them form long term reconnections with nature - as water can be diverted and influenced so too can people be guided toward a more harmonious coexistence with nature.

Naomi Addleton — National Park Authority

Photos © National Park Authority

SPECIES PROFILE: MARSH LOUSEWORT

A PRETTY PINK PARASITE THAT INCREASES THE BIODIVERSITY OF THE WETLANDS IT INHABITATS.



Marsh Lousewort found in the wet margins on a New Forest mire, with a bright pink flower and fern-like leaves.

This plant needs to connect to the roots of other plants to survive as it draws water, organic carbon compounds and mineral nutrients from its 'host' plant. Many host plants of Marsh Lousewort have been recorded, but it seems to prefer to parasitise the roots of sedges (*Carex* spp.) and rushes (*Juncus* spp.). Marsh Lousewort is only a partial parasite, as it does have green leaves that make foods such as sugar and starch by photosynthesis. It is considered to be an ecosystem engineer due to the way the roots use resources from other plants. The growth of the host plant is stunted, creating space for less dominate plants.

This plant is an excellent example of how plants adapt to compete in a low nutrient environment and how plants are part of a community. Sadly, there is a declining population across the country and Marsh Lousewort is on the Rare Plants Register. Like many other rare species the New Forest is a strong hold for this plant. To ensure its survival, we need to protect the wonderful low nutrient wetlands of the New Forest.

Marsh Lousewort (*Pedicularis palustris*) can be found across the wetland habitats of the New Forest. Here in the New Forest, the pink-flowers bloom from May to October and look similar to Yellow Rattle flowers, but pink. These flowers are part of a mutual relationship with bumble bees and other invertebrates, as nectar is exchanged for pollination.

Marsh Lousewort can grow up to 60 cm tall and has a straight stem that is slightly hairy. The grazing in the New Forest means that species rarely grow very tall. The leaves are deeply lobed and have a fern-like appearance and are a way to identify the plant in any season. In early botanical texts written by Gerard (1633) the plant was referred to as 'Red Rattle' and said 'it groweth in moist and moorish medowes' referring to the wetland habitats it can be found in. Historically, the plant had many traditional uses, including traditional medicine and dyeing textiles.



A plant adapted to a low nutrient environment and considered an ecosystem engineer due to the way the roots use resources from other plant, creating space for less dominate plants.

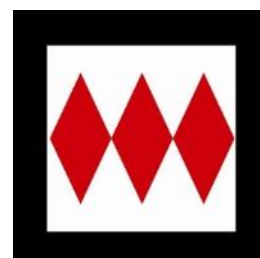
THE NEW FOREST CATCHMENT PARTNERSHIP

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

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