



**Managing
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The increasing threat of invasive non-native species, particularly in the aquatic environment, is very worrying for us, because they can prevent some of our operational processes working as they should. An invasive, non-native species (INNS) is any non-native animal or plant that has the ability to grow and spread causing damage to the environment, the economy and our health.

Water industry impacts.

INNS have a wide range of implications for water companies, including:

- Fouling, eroding or blocking assets like water pipes and filters.
- Altering water quality and how we can measure it.
- Damaging the status of native species and protected sites.
- Increasing the need for herbicide use within our river catchments.
- Interfering with recreation like angling and sailing.

Preventing the spread.

By law, it's an offence to allow invasive species to escape or spread in the wild. We need to make sure that all activity at our sites is closely controlled to reduce the risk of spreading invasive non-native species. So we've adopted the nationwide 'Check, Clean, Dry' process on our recreational sites and nature reserves:

- **Check** equipment and clothing for live plants or animals, particularly in areas that are hard to inspect.
- **Clean** all equipment, footwear and clothing by washing it thoroughly, and leave any plants or animals at the place where they were found.
- **Dry** all equipment and clothing, as some species can live for many days in moist conditions, and make sure not to transfer water elsewhere.

- **It costs us around £4 million a year to remove invasive mussels.**
- **We've removed the equivalent of over four Olympic-sized swimming pools of mussels from our pipes since 2006.**

Thousands of zebra mussels found inside a connection tunnel.



Although we try to prevent the spread of invasive non-native species as a result of recreational activities on our property, we do unfortunately sometimes find them on our sites or in our infrastructure, and have to remove them.

Invasive mussel species

Last year, thousands of zebra mussels (*Dreissena polymorpha*) were found clinging to the inside of a connection tunnel at Walthamstow Reservoir, in north-east London, by our operational staff carrying out routine inspections. Since 2006, it has cost us around £4 million a year to remove the equivalent of over four Olympic swimming pools of mussels from our untreated water pipes.

Removing the zebra mussels from the tunnel had to be done by hand. This meant that we had to take the tunnel out of use, which put a strain on our water treatment works. The dying mussels release hazardous gases, such as ammonia and methane, which makes clearing them a health and safety risk for our people.

The quagga mussel (*Dreissena rostriformis bugensis*), is a highly invasive aquatic species that threatens native wildlife and creates an expensive biofouling nuisance for the water industry. Its first ever recorded appearance in the UK was in September 2014 in the Wraysbury River, a tributary of the River Thames in west London, but it then spread quickly to four of our West London reservoirs.

North American Nuttall's waterweed.

The New River is threatened by North American Nuttall's waterweed, which required a huge clean-up operation after it rapidly covered the river's surface.

This weed was first recorded in Oxfordshire over 50 years ago, but it's now widespread throughout southern England. It prefers nutrient rich lakes and ponds, but can also survive in flowing water.

Last year, our Hampton water works experienced a major issue, with engineers cutting back and removing tonnes of the weed by hand on a daily basis.

The weed clogs waterways and disrupts infrastructure, such as inlet screens, which traditionally filter debris from entering water treatment works.

The New River is an artificial waterway that was opened in 1613 to supply the capital with fresh drinking water taken from the River Lea. If left unchecked, the invasive Nuttall's waterweed threatens to limit the volume of water that we can take out of the river to supply our customers.



Nuttall's waterweed clogging up the New River.



Pigmyweed removal at Kempton.

New Zealand Pigmyweed.

Kempton Nature Reserve is part of our Kempton Park water treatment works in south west London, and it's also a Site of Special Scientific Interest (SSSI) which is designated for its internationally important populations of overwintering waterfowl.

However, in the past 10 years it has suffered from severe and widespread infestations of New Zealand Pigmyweed (*Crassula helmsii*), which we've removed as shown in the image above. The aggressive dominance of this invasive non-native plant has already diminished the botanical diversity of this SSSI, and has severely limited the foraging opportunities for overwintering birds.

"If Nuttall's waterweed is left unchecked, it would drastically reduce the amount of water we could abstract, meaning there would be less water being put into supply throughout the summer at a time when demand is typically higher."

- Claudia Innes, Thames Water Biodiversity Manager.