Water Vole Habitat Management

Herts and Middlesex

Protecting **Wildlife** for the Future

Water vole image on front cover and mink image on page 18 by Dave Kjaer.
Water vole images on p3 and p4 by David Chapman.
Water vole images on p8 by Gary Last.
Water vole image on p21 by Russell Spencer.

Water Vole Habitat Management

1. Introduction

The water vole *(Arvicola amphibius)* was once a common sight along our waterways but is now Britain's fastest declining mammal. In places, populations have fallen by over 90% in the last century and as a result, the water vole is now vulnerable to extinction and needs protection nationwide.

Water voles are still present in Hertfordshire, but in small numbers. Populations are known to be present on the rivers Mimram, Purwell, Rhee, Chess and in the Lee Valley, whilst small colonies may exist in other areas. It is vital that we protect our remaining water voles to ensure their future survival and population growth throughout the county.

a) What water voles look like

Of the three vole species found in Britain, water voles are the largest. Adults weigh between 150-300g+ so are roughly the same size as a brown rat, meaning they are often mistaken for rats (see section 6 for information on telling water voles from rats). Water voles generally have chestnut coloured fur. They have round bodies, blunt noses and small brown ears, hidden in their fur.

b) What water voles want

Water voles live in and around watercourses and wetlands. Tall grasses, sedges and reeds provide essential food and cover.

They are excellent swimmers and use the water to escape from terrestrial predators. When disturbed at the water's edge they will jump into the water, making a loud 'plop' that acts as a warning to other nearby voles. They can dive and will kick up sediment from the bed of the watercourse to create a 'cloud' that hides them from predators whilst they escape into one of their many burrow entrances. The best habitat provides year-round water at a fairly stable level. Although water voles can survive periods of drought, they become more vulnerable to terrestrial predators, such as stoats and foxes. In watercourses where fluctuations in water level are not unusual, water voles may have a network of burrows away from the water's edge that they use during periods of high water. However, floods can displace or kill water voles, particularly where there is no safe refuge such as higher ground with grassy vegetation.

Nests are made in their burrows at the water's edge or in tussocks of vegetation in wetlands which lack a defined edge. Therefore they require either banks that can hold burrow systems or tussocky vegetation, such as reeds, sedges and some grasses.

Although they do not hibernate, water voles are at their most active during the breeding season, from April to October. They are highly territorial and show a high fidelity to their territory even when it is disturbed. Each female will have a well-marked territory in which she will not tolerate other females.

Water vole droppings

Water vole nest attached to a fence

c) Signs/survey

Droppings Water voles mark their territories with heaps of droppings, known as latrines. These are usually placed at the water's edge on objects such as pieces of wood or stones or on patches of bare soil near where the water voles enter and leave the water. Droppings are capsule shaped, about 8-12mm long and as they consist of mainly vegetation they have little odour and a putty-like or slightly fibrous texture. Droppings are the best field sign for proving water vole presence. Rat droppings are larger, darker, not deliberately placed in piles and foul smelling.

Nests Grasses and reeds are used for bedding material and to make nests, roughly the size of a rugby ball. The nests may be created in burrow systems or, where vegetation cover is dense and the water table high, nests can be found above ground, often woven into the bases of tussocky grasses, rushes, sedges or reeds.

Feeding signs It has been shown that over 200 species of plant make up a water vole's diet, from grasses to willow bark. Where they eat vegetation at the water's edge they leave piles of cut leaves or stems that are known as feeding stations. Each length of cut leaf or stem is usually about 8-10cm long with a clear 45 degree angle at each cut end. Field voles also

leave feeding stations, but the lengths of each section are usually shorter. However, there is some overlap and this sign alone can not necessarily confirm the presence of water voles.

Runs Water voles create well-hidden runs through the vegetation along the water's edge, with occasional entrances onto the water. The runs are about 4-8cm wide and if followed may lead to sites of latrines or feeding signs.

Burrows They have complex networks of burrows in suitable banks of watercourses. A series of burrow entrances may be seen at the water's edge with some found below the water level on steep banks and others away from the water. The entrances are usually 40-50mm wide and do not usually have a spoil heap from excavation. Rat burrows are usually more heavily used, frequently with spoil thrown out of the holes and obvious muddy runs between entrances.

Lawns They may also graze around their burrow entrances, creating 'lawns' of short vegetation.

Tracks These show five toes on the hind foot and four on the front. These are easily confused with rat tracks although the rat is heavier and larger.

Lawn created by a water vole

Water vole feeding signs

Water vole burrow entrance

2. Vegetation Management

Water voles rely on the in-channel and bank vegetation for food and cover. A dense fringe of sedges, rushes, reeds or grasses at the water's edge and a bank with a variety of tall grasses and flowering plants is ideal. Water voles can also be seen sitting and feeding on floating mats of grasses and aquatic plants, such as water-crowfoot.

Unmanaged banks that become encroached by scrub and trees will be unattractive to water voles as increased shading reduces the lush growth of grass and other plants at the water's edge and branches provide perches for predators such as herons and birds of prey.

a) In-channel and bankside vegetation

Vegetation management is a key factor for balancing flood risk and the provision of wildlife habitat in waterbodies. As a general rule, the more diverse the structure of a river channel is (for example, riffles, pools, wet shelves and marginal vegetation) the wider the range of animals and plants will be able to use it.

Where it is necessary to cut bankside and in-channel vegetation there are a few points that will benefit water voles:

- When cutting bankside vegetation, set cutting blades high (15cm) to promote grass re-growth in late summer and provide cover for water voles and a range of invertebrates.
- Cut alternate banks in alternate years and delay cutting until late summer to reduce the impact on water voles

Carrying out works on one bank only leaves habitat for water voles

during their breeding season. Late cuts will also reduce the rate of re-growth.

- Retain 25-50% of in-channel vegetation in areas of low or medium flood risk. Retain 20% of vegetation as a small margin in high flood risk areas.
- Manage watercourses on a rolling programme over 3-5 years in preference to a 'blitz' every few years.
- Avoid dumping cuttings on retained buffer strips or margins. However, cut in-channel vegetation should be temporarily left on the top of the bank to allow aquatic invertebrates to crawl back to the water.
- When de-silting, only remove silt from the central channel and do not scrape the banks.
- When using heavy machinery, work from one bank only, taking care to keep the machine as far back from the bank edge as possible to prevent crushing of vegetation and burrow systems in the bank.

b) Buffer strips and margins

The creation of buffer strips or field margins along the banks of watercourses can protect watercourses from farm operations and disturbance and provide a safe habitat for water voles and other wildlife. Water vole burrow systems are commonly up to 2m from the water's edge, but may be further from the water on some sites.

Ideally buffer strips or margins should be greater than 2m wide and contain a variety of grasses and flowering plants. They can be created through natural regeneration or sowing. Although natural regeneration is preferable, particularly where rare arable species are likely to be

Buffer strips provide safe refuges for water voles.

present, sowing may be more appropriate where there is a weed burden. If sowing, try to incorporate a wildflower mix of local provenance.

Once established, field margins should be cut or grazed on a 3-4 year rotation to produce a thick grass sward but prevent scrub encroachment.

c) Trees and hedgerow

Tree and scrub management is best undertaken in the winter. Prior to felling, pollarding or coppicing mature trees check for crevices or holes that may provide roost sites for bats. Seek advice from Natural England if in doubt. Tree felling may also require a licence from the Forestry Commission.

Do not plant hedgerows or trees directly adjacent to watercourses as this will cause shading over time. Where hedgerows exist alongside waterbodies, they should be managed routinely to prevent growth over the water. Water voles will eat hedgerow fruit, but where hedges shade the water and banks they will deter water vole presence.

Pollarding trees along a watercourse reduces shading allowing more vegetation to grow

3. Habitat Creation

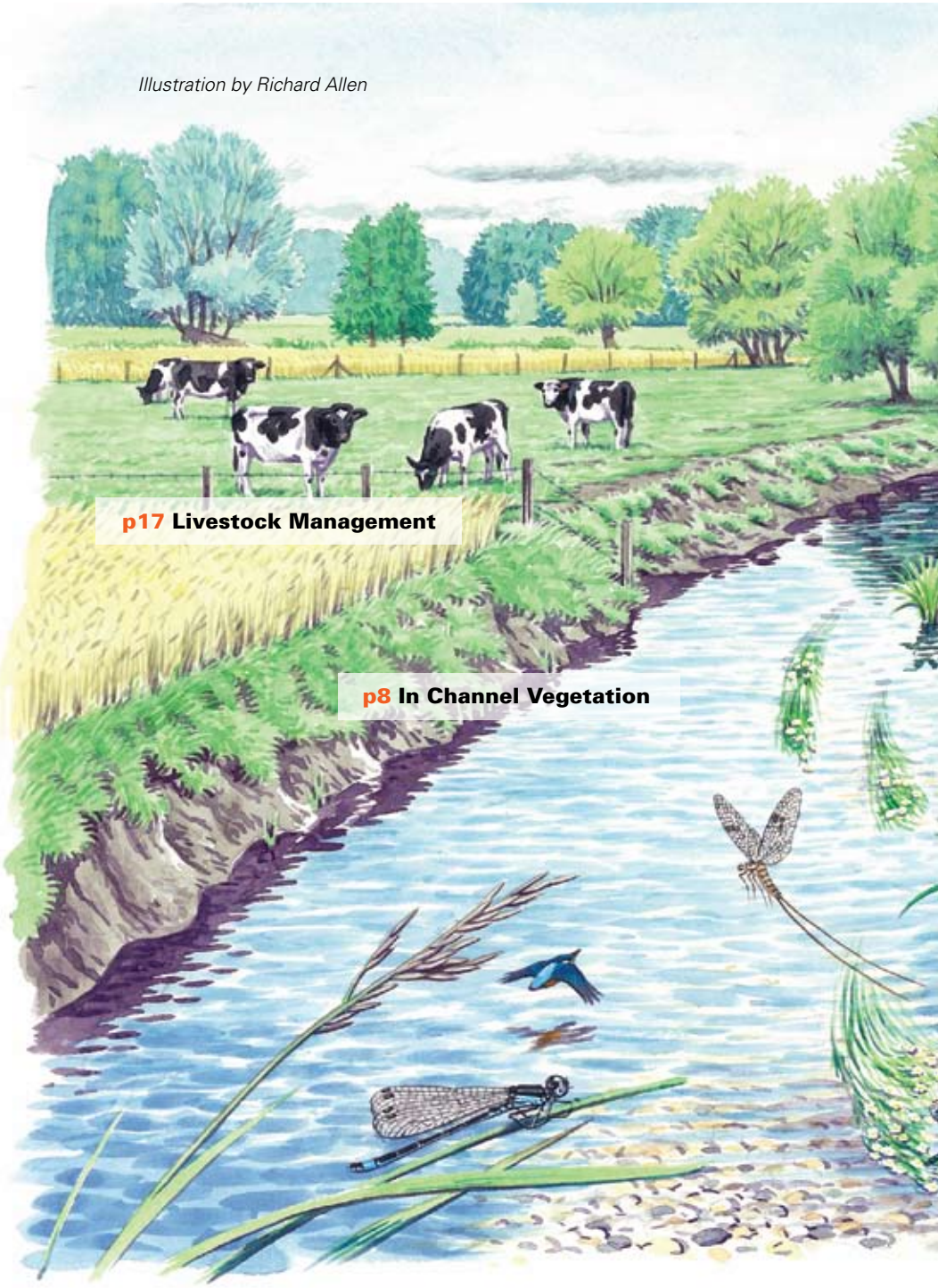
a) Before you start

Habitat creation or restoration schemes may require planning permission or licensing or consent from statutory bodies, depending on the particular site.

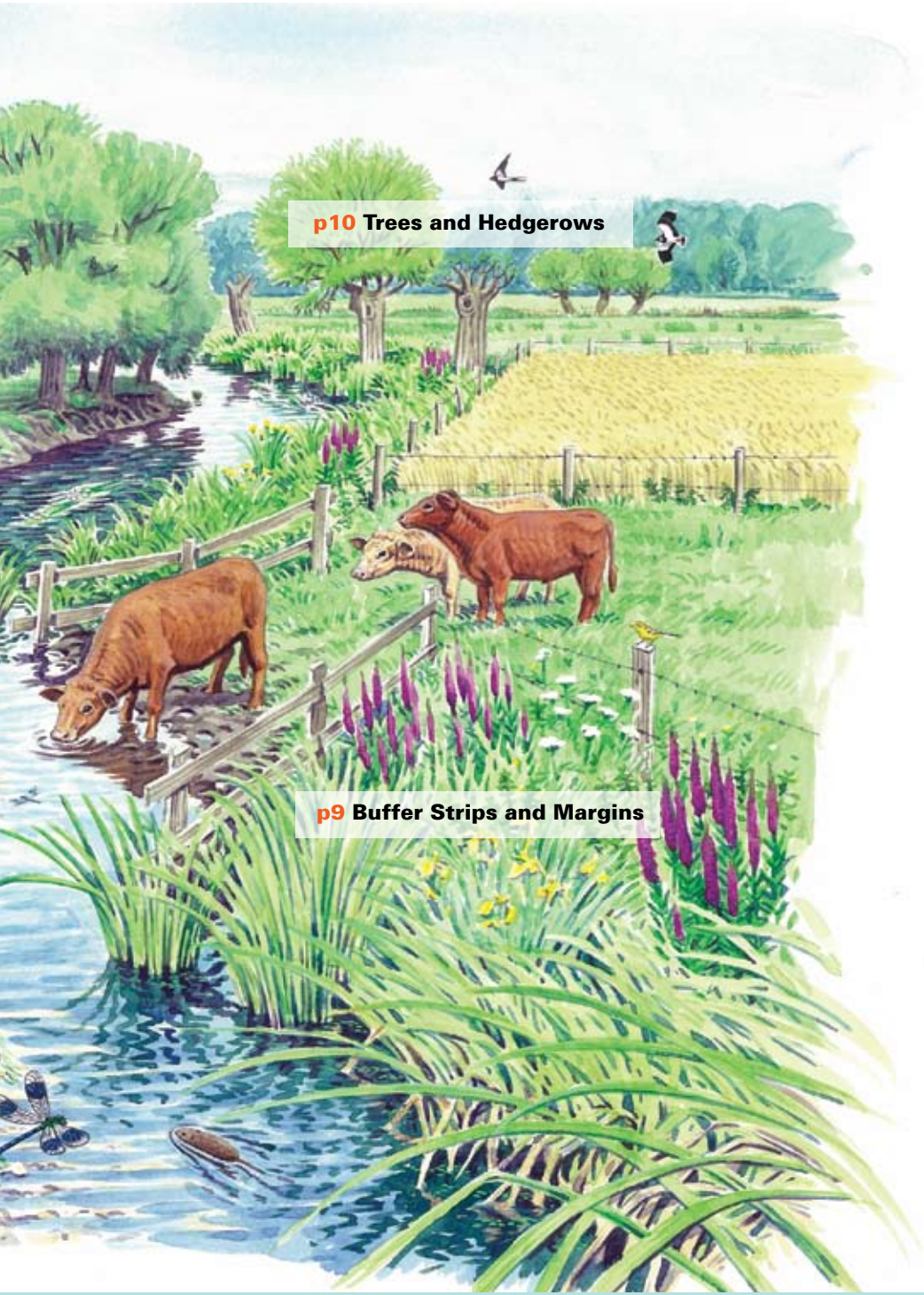
A checklist for site works may include:

Organisation	Issue
Environment Agency	Flood Defence Consent (needed for nearly all works in, over, under or adjacent to main rivers) Abstraction Licence
Natural England	Protected species (including water voles) Site of Special Scientific Interest
Local Authority	Planning Permission Archaeological interest County Wildlife Site Change of use of land
Forestry Commission	Felling licence

Illustration by Richard Allen



The bank on the left is not managed sympathetically for water voles.



The bank on the right is managed sympathetically for water voles.
For more details, please see the relevant sections in the text.

b) Ponds

Ponds can be excellent habitat for water voles, whether in a garden or on farmland. When creating a pond for water voles there are a few points to consider:

- Do not line the pond. Water voles have burrow entrances above and below the water level that enable them to escape predators on land or in the water. Soft-lined ponds are likely to be damaged by water voles and hard-lined ponds will reduce its suitability for voles.
- Create a varied shoreline. Shallow edges will allow a dense fringe of marginal vegetation to grow to provide food and cover for water voles. Steeper banks will provide burrowing opportunities. Creating spits, bays and islands will increase the length of bank edge, thereby maximising the area that water voles can use.
- Ponds should be no shallower than 1m deep to ensure year-round water and to limit the encroachment of bankside vegetation.

Pond creation can provide valuable additional habitat for water voles.

c) Reedbeds

Reedbeds were once an extensive habitat throughout Britain but are becoming increasingly rare as sites dry out and become isolated. They provide excellent habitat for water voles and a wide range of other wetland species.

When creating reedbeds for water voles consider:

- Reedbeds need a constant and reliable source of water to prevent them drying out and becoming encroached by scrub.
- Small reedbeds can be created by transplanting rhizomes of common reed (*Phragmites australis)* in winter to a shallow pond or scrape. Once established the reeds will spread to water up to 1m deep at a rate of 1.5m per year.
- Larger reedbeds can be created on land that is taken out of arable production. Creating a network of ditches and scrapes of varied depths will produce a diverse reedbed and may attract rare species such as bittern.
- Reedbeds in deep water need no management, but in most cases the reed will need cutting as a management tool.
- Grazing of larger reedbeds can also be used to prevent scrub encroachment and will create a varied structure that will benefit biodiversity.

Hard engineering of river banks creates unsuitable water vole habitat.

Planted coir rolls can provide vegetation along banks.

d) Bank reinforcement

Hard engineering of river banks, such as sheet piling, rock gabions and masonry, creates unsuitable habitat for water voles and other riparian wildlife. However, where banks of watercourses have eroded or are unstable and require support there are a number of 'soft' engineering options that can be employed that will help water voles.

- Pre-planted coir fibre rolls fixed at the base of shallow banks can prevent slumping, or behind hard engineering options can provide bank vegetation
- Faggots made of bundles of willow or hazel canes held in place by poles can protect eroding edges and be used to create vegetation shelves
- Hazel wattle hurdles staked to eroding banks allow re-growth of vegetation through the panels

The provision of vegetation shelves along stretches of watercourses with existing hard engineering can allow water voles to move safely between sites.

4. Livestock Management

Water voles rely on tall grassy vegetation at the water's edge for food and cover from predators. Without this vegetation they become vulnerable to predation and can disappear from a site. Banks that are heavily grazed by livestock will lack the necessary vegetation cover for sustaining water voles, whilst poaching destroys burrow systems and compacts the ground making it harder for new burrows to be created.

Simply fencing a bank to prevent livestock access can quickly and very effectively remedy this situation by allowing vegetation to regenerate naturally. Where livestock need access to the water drinking areas can be left unfenced or drinking pens can be installed.

In the longer-term, the vegetation may need managing to prevent scrub and woodland developing.

Grazing animals along watercourses trample the banks, reducing vegetation and habitat for water voles

5. Mink Control

It is now widely accepted that American mink *(Neovison vison)* have contributed towards the decline of water vole populations across Britain. It is quite possible that water voles will become extinct in Britain if mink numbers are not reduced or eliminated in some areas.

Mink have been recorded on every river in Hertfordshire, threatening the survival of water voles in our county. Mink control schemes have been implemented on rivers in Hertfordshire where we know water vole populations still exist. Control schemes are coordinated by the Wildlife Trust and carried out by volunteers. Ideally these schemes are river-based, with mink rafts or traps placed at strategic points along the watercourse. In this way, no person is working to control mink numbers on their land in isolation. Where mink control is carried out in isolation it is unlikely that mink numbers will decrease. However, a river-wide effort can have remarkable results.

Mink raft

Mink tracks on clay pad

The mink control schemes in Hertfordshire rely on the use of mink monitoring rafts. These are platforms made of plywood and polystyrene with a wooden tunnel on top that sit on a waterbody close to the bank. Inside the tunnel is a clay pad that records tracks of any animals that pass through – this is called the monitoring phase. When mink tracks are recorded on the raft, the clay pad is replaced with a live capture trap and left set until the animal is caught – the trapping phase. Once a mink is caught and dispatched the clay pad can be returned to the raft and the trap removed. During the monitoring phase the raft should be checked weekly or more often if it is easy to do so. During the trapping phase it is important to check the trap at least once a day to be humane and comply with the law.

Mink monitoring rafts have proven to be very effective at catching mink, relying on their curiosity to visit the raft instead of baiting. They require less trapping effort than conventional bank traps as they need daily checking only when traps are in use.

More information on mink control is available from the Wildlife Trust.

6. Rat Control

The interaction between rats and water voles is not fully understood, but it is clear that where rats move into an area used by water voles, the water vole numbers decline and may disappear. The cause of this is thought to be a combination of rats preying on the water voles, especially the young and the spread of diseases.

Brown rat (Rattus norvegicus)

Rat droppings

Rats and water voles are similar in appearance and are easily confused. The main distinguishing characteristics of a rat are a pointed muzzle, large ears and a scaly tail. Water voles have a blunt muzzle, ears that are hidden in their dense fur and a slightly hairy tail.

Where rats and water voles are present it is best practice to control rats in a way that will not harm water voles. The Wildlife Trust is able to provide free advice on appropriate control methods and can help to identify water vole sites.

Water voles have full legal protection under the Wildlife & Countryside Act 1981, Schedule 5, Section 9. It is an offence to:

- intentionally kill, injure or take (capture) a water vole;
- possess or control a live or dead water vole, or any part of a water vole;
- intentionally or recklessly damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection or disturb water voles while they are using such a place;
- sell, offer for sale or advertise for live or dead water voles.

Blocking water vole burrows is illegal. Placing traps or bait boxes into or in the way of water vole burrows could lead to prosecution. Offences carry a maximum penalty of £5,000, imprisonment for up to six months, or both. In addition, the courts may order the forfeiture of any vehicle or other thing that was used to commit the offence.

If in doubt, contact the Wildlife Trust. More information on rat control is available from the Wildlife Trust.

Water vole (Arvicola amphibius)

Water vole droppings

Wetlands for Water Voles & People Project

The Heritage Lottery-funded Wetlands for Water Voles and People Project is a three-year project, formed of a partnership of the Wildlife Trust, the Environment Agency, Lee Valley Regional Park Authority, British Waterways and the Herts Biological Records Centre. The project aims to conserve and enhance water vole populations in Hertfordshire, increase participation of individuals and community groups in water vole recovery and wetland protection and increase awareness, understanding and appreciation of and access to wetlands and water vole conservation.

For more information contact:

Wetlands for Water Voles & People Project

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