Fossorial Water Voles in Glasgow's East End- summary text for talk

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Introduction and background

Water vole in traditional wetland habitat

Water voles are traditionally associated with wetland habitat. They are the largest vole in the UK. They have become famous through the character Ratty in wind in the Willows as Ratty was in fact a water vole.

There has been a historic long term decline since 1900 caused by habitat loss and degradation, mainly due to agricultural intensification. This resulted in fragmentation and isolation of the remaining water vole populations. This isolation makes water voles more vulnerable to extinction on a local level. A recent additional threat is the release and spread of American Mink, a predator. National Surveys are carried out across the whole of the UK (by the Vincent Wildlife Trust) due to the concern about the declining population. During the 1980's and 1990's there was a further period of accelerated loss with an estimated 88% decline in a short period (Strachan, 2004).

Water voles have undergone one of the most serious declines of any wild mammal in the UK in the 20th century.

Water vole wetland habitat in Glasgow

In Glasgow they were originally recorded along ditches and burns at the edge of the city and were then recorded in and around marshes.

Glasgow's Local Biodiversity Action Plan (LBAP)

Glasgow's Local Biodiversity Action Plan, which was produced a number of years ago, focussed on protecting the known populations in wetland through designated sites and habitat restoration/management projects.

Due to the dramatic decline of water voles, they are now legally protected. In Scotland is it primarily the habitat that is protected.

New Discovery 2008- Water vole population in non-aquatic habitat

In 2008, water voles were discovered by Glasgow City Council living approximately 1 km away from water. Scottish Natural Heritage were alerted to this unusual occurrence. GCC ecologists then widened the scope of water vole surveys to include non-wetland sites and more and more locations were discovered.

Masters of Research

Once it was realised that water voles living away from water was not uncommon in the east end of Glasgow, a partnership project was set up with the University of Glasgow, Glasgow Natural History Society and Scottish Natural Heritage to carry out vital scientific research to understand more. All of the current literature on ecology and habitat management was based on wetland habitats so information was urgently required about water voles living in

grassland. Grant funding was successful (Glasgow City Council Sustainability Fund and Glasgow City Council Greening Fund) and a Masters of Research started in January 2014.

The Fossorial Water Vole

Fossorial means mole-like and refers to a more subterranean lifestyle. In mainland Europe this behaviour is common, but in the UK it is very rare. Water voles in mainland Europe display two different eco-types. There are populations living in wetlands and other populations living away from water, and the latter are actually often considered a pest of agricultural land.

The range of water voles in the UK is generally restricted to riparian margins along water courses and reed beds and they are considered to have strict habitat preferences, with very few examples of fossorial behaviour. The most documented example of fossorial water voles in the UK is from a population on islands off of Jura.

The aim of this study was to investigate the distribution and ecology of the fossorial water voles in the east end of Glasgow.

Field Signs

The field signs of fossorial water voles are the same as found in wetlands with the exception of the occurrence of tumuli or 'vole hills' which in wetlands may occur but are washed away. Field signs include feeding stations, latrines and burrows. The standard methodology for estimating water vole population size is not suitable for fossorial water voles because it involves linear surveys and fossorial water voles are not associated with linear features.

Mark-recapture

Mark-recapture (under licence) was carried out to study the population dynamics and estimate population size. The biometrics results showed a large variability in the east end populations, but in general animals were relatively small. Both brown and black individuals were recorded and an additional brindled colouration was noted. Population density was high in comparison to other studies in the UK. Density at one site was the highest density recorded in the UK.

Presence/Absence

Presence/absence of water voles was recorded from the survey area in the east end of Glasgow. The area was 35 km square and there were 65 sampling sites. Habitat preference was studied and it was discovered that certain grass species were strongly associated with water vole presence. *Holcus lanatus*, *H. mollis* and *Dactylis glomerata* were significantly present at occupied sites and provide dense cover and are a nutritious food source.

The results showed a strong correlation of water vole presence with road verges, parks/greenspace and vacant/derelict land.

Water Vole Project Summary

Key outcomes include the discovery that water voles are present in the highest density recorded in the UK to the best of our knowledge, and Scottish Natural Heritage consider the fossorial population to be exceptional and of national significance.

This is an on-going successful partnership project. The first phases of research were funded by Glasgow City Council and Glasgow Natural History Society with in kind support from the University of Glasgow. The current cost of the project to date is £13k from grants. Scottish Natural Heritage will be funding the next stage of community engagement.

The Masters of Research has provided the scientific basis to produce guidelines for land management, development and mitigation policies for local authorities and Scottish Natural Heritage.

The information is currently being used to update the Local Biodiversity Action Plan and provide information for the supplementary guidelines in the City Plan. Trigger maps are being produced for development planning to highlight the presence of water voles in non-textbook locations. This helps protect the water voles in their current locations which includes road verges, parks/greenspace and vacant/derelict land.

There is however still concern that fragmented populations are more vulnerable to extinction. The next step is to protect the water voles in the long-term which is where all this information becomes even more important, for planning for the future and developing green infrastructure.

Greater Easterhouse is a Strategic Priority for Green Network delivery and has also been identified as an area for significant new housing development. A greater Easterhouse Integrated Green Infrastructure (IGI) scoping study is currently under way to examine opportunities for new and enhanced IGI on existing greenspace and vacant and derelict land.

Green Infrastructure really is the key to protecting the long term viability of the east end water voles through site protection and reduction in fragmentation.

After all, the path networks that provide active travel routes to work and school also act as wildlife corridors.

Community Engagement

Most of this talk has focussed on urban biodiversity. For biodiversity projects to be truly successful the local community needs to be involved. Local residents have in general embraced the idea of a unique population of water voles, particularly after the understandable misconceptions have been addressed. Local schools have been involved and are active in their local area promoting water voles and enhancing habitat. This work is being carried out by a number of organisations including the Council's Countryside Ranger Service, RSPB Scotland, Sevens Loch Wetland Park and the University of Glasgow.

Media Interest

This good news story for urban biodiversity has caught the imagination of the local community and national press. Articles have been published in The Herald, The Scotsman, BBC Wildlife magazine and RSPB magazine, and this unusual population has also been filmed for the One Show.