Domestic mosquitoes in the Neston area of Cheshire, UK


Mosquito Magnet trap

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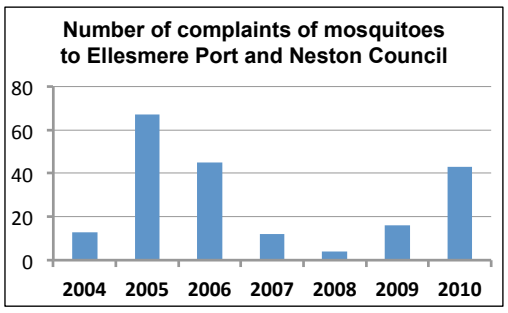
Oc. detritus female

Introduction

Mosquitoes are often the subject of complaints to the Local Authority in the Neston area of Cheshire, especially in September. Some years are much worse than others.

A long-term survey of adult mosquitoes caught in domestic areas and immature stages of *Ochlerotatus detritus* on the Dee estuary marshlands around Neston, Cheshire, was conducted between 2007 and 2014.

This area is a UK Site of Special Scientific Interest (SSSI) and an EU Special Area of Conservation which imposes conditions on possible control methods. Habitat alteration by deepening pools has been done but only permitted in extremely restricted areas.



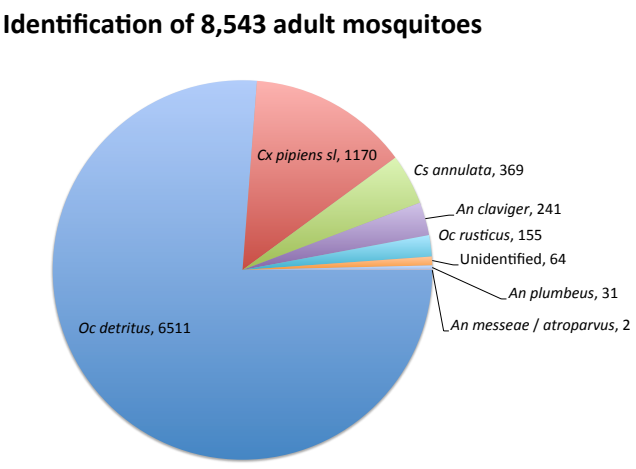
Adults

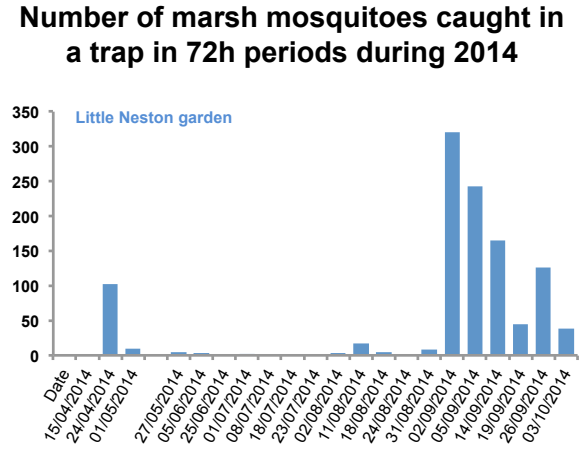
A survey of adult mosquitoes found close to residential properties was carried out from 2007-2014 by placing Mosquito Magnet traps in private gardens and school fields. All traps were placed within 25m of houses and, consequently, the sampled mosquitoes were likely to represent those species causing the greatest nuisance to residents.

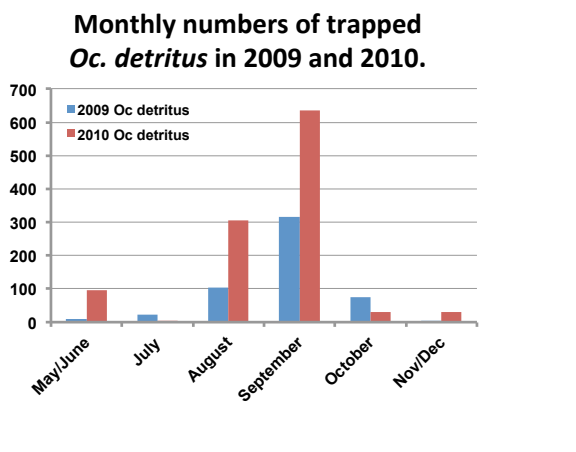
A total of 8,543 mosquitoes were trapped and examined. The most common species identified were *Ochlerotatus detritus* (76.2%), *Culex pipiens sl* (13.7%) and *Culiseta annulata* (4.3%). A small number of other species were also identified.

Numbers vary seasonally in each year with peaks usually in spring and autumn and there are marked differences between years, showing, for example, that 2010 was much worse than 2009. The distribution of numbers was similar to the number of complaints received.

Mosquitoes were found over the whole of the Neston area and across the Wirral Peninsula, up to a distance of at least 8km.

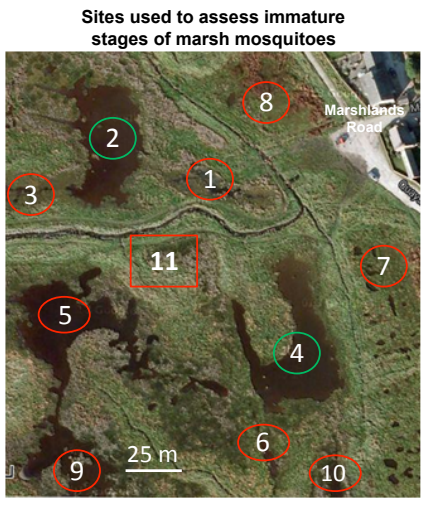


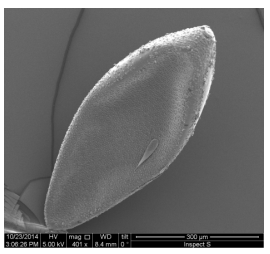


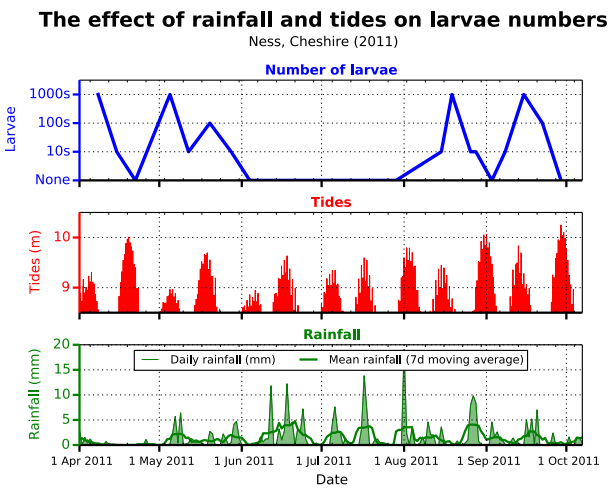


Immature stages

A number of identifiable sites on the Dee estuary were examined weekly for the immature stages of *Oc. detritus* from March to October 2011-14. Pools were sampled and the numbers of larvae and pupae were scored. Tide levels recorded at Gladstone Dock, Liverpool were obtained from the British Oceanographic Data Centre (www.bodc.ac.uk) and rainfall data collected at Ness Gardens and submitted to the Met Office Integrated Data Archive System (MIDAS) database were retrieved from the British Atmospheric Data Centre (www.badc.ac.uk). Example plots showing the relationship between larval numbers, tides and rainfall are shown. Peaks of immature stages usually occur in spring and autumn, similar to the appearance of adults.




Oc. detritus egg



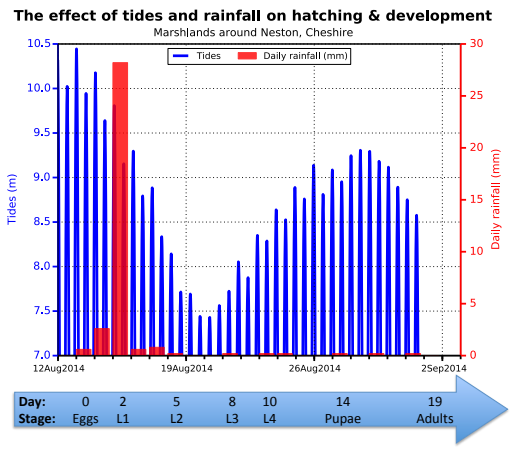
Eggs

It appears that eggs containing larvae hatch in the spring following a rise in temperature and a high tide which gives rise to the spring population of adults. These lay eggs widely which do not hatch until a high tide in autumn. The conditions in August and September 2014 produced enormous numbers of adults and resulted in many complaints from residents.

Conclusions

Large numbers of mosquitoes which develop from the marsh area of the Dee Estuary cause a significant nuisance to residents over a large area of the Wirral Peninsula. However, options for control are limited due to the large area involved and due to economic, environmental and scientific considerations.

Oc. detritus females lay their eggs on the soil and never on water. A first instar larvae develop inside the eggs but successive immersions with water are needed for the eggs to hatch. The eggs can overwinter and may remain viable for months or even years. Data from this study suggests that a high tide initiates egg-hatching and, when followed by sufficient rainfall, allows development of aquatic stages in very large numbers. This model could allow the Local Authority to forecast times when large numbers of mosquitoes are likely to be present thereby providing local residents with the information necessary to minimise nuisance effects.



Proposed model to forecast the appearance of large numbers of adult mosquitoes

Acknowledgements

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