Invasive Shrimp, *Dikerogammarus villosus.*

Briefing Note 3, 15th March 2011.

Introduction

The invasive non native shrimp, *Dikerogammarus villosus* ('killer shrimp'),was first reported in the UK on 3rd September in Grafham Water SSSI in Cambridgeshire, and was subsequently found on 25th November in Cardiff Bay, and on 26th November in Eglwys Nunydd reservoir (Port Talbot), in South Wales. Briefing notes 1 and 2 (11th October 2010; 22nd December 2010) provided information on the response to these discoveries. Both available at:
www.nonnativespecies.org/alerts/killershrimp

This briefing note provides a further update on developments.

D. villosus is an aggressive predator with a high rate of reproduction. It is an extremely successful invasive species with the potential to spread quickly and to cause harm to freshwater ecosystems. We predict that if it becomes widespread it will threaten a number of native species through predation and competition and will have knock-on effects for biodiversity and the wider functioning of freshwater ecosystems in the UK.

The shrimp has already colonised parts of Western Europe, killing and out-competing a range of aquatic species such as freshwater invertebrates, particularly native freshwater shrimps and even very young fish. It therefore can alter the ecology of the habitats it invades.

The potential impact of the invasive shrimp

D. villosus is thought to be one of the most damaging invasive species in Europe. The UK Technical Advisory Group for the Water Framework Directive (UKTAG) has included it on their list of high impact species and it is amongst the 'Top 100' invasive alien species in Europe (www.europe-aliens.org). It has the potential to significantly affect the ecology of our major rivers, canals and lakes as well as some brackish habitats.

D. villosus has spread rapidly across Europe following the opening of the Rhine-Main-Danube canal in 1992. This links its home waters (the region of the Caspian and Black Seas) to Western Europe, so the shrimp is now found in many countries including the Netherlands, Belgium, Germany and France.

Context to the response

The Non-native Species Secretariat has responsibility for helping to coordinate the overall approach to invasive non-native species issues in Great Britain. The Secretariat reports to the GB Non-native Species Programme Board which represents the relevant governments and agencies of England, Scotland and Wales. The approach to invasive non-native species is summarised in the Invasive Non-native Species Framework Strategy for Great Britain, which is intended to provide a strategic framework within which the actions of government departments, their related bodies and key stakeholders can be better co-ordinated. More information on the Non-native Species Secretariat can be found at: www.nonnativespecies.org

Given the potential impacts of *D. villosus* and the significant challenges we face in dealing with events as they develop, we need to keep current actions under review. Our current priorities are: contain it at known affected sites; investigate whether it is present elsewhere; identify and commission investigations and research on key aspects of its impact and effectiveness of biosecurity measures; and promote behaviour that will reduce the risks of spreading it from one place to another. We will be reviewing the effectives of current measures and advising Defra and WAG on current policy aims.

Managing the response

The response to this species in England and Wales is being led by a National Task Group comprising staff from Defra, WAG and expert advisers from the Environment Agency, Natural England and the Countryside Council for Wales. The Task Group is coordinating delivery of the response plan and key high level actions. There are several workstreams aimed at addressing the main issues and progress will be reported to the GB Non Native Species Programme Board.

Developments since Briefing note #2

Containment: site managers and users of the three known affected sites are continuing to implement bio-security good practice in recognition of the critical importance of preventing any spread from these sites. Basic bio-security advice is available at the GB Non Native Species Secretariat's website: www.nonnativespecies.org/alerts/killershrimp

Pilot studies were conducted in late January-early February in an unheated outbuilding. It was found that the shrimps could survive for up to 15 days on wet, folded waders and for up to 7 days on a folded, damp net. Therefore it remains vitally important that all equipment is thoroughly checked, washed and dried to avoid risk of introducing the shrimp to another water body. These measures are essential if we are to preserve as many options as possible for control measures in due course and the cooperation of all involved is greatly appreciated.

Surveillance and monitoring: no new discoveries have been made beyond the three known affected sites during winter surveillance. The Environment Agency is planning to deploy specially adapted traps in the coming months to enhance our ability to investigate whether the shrimp is present at any other sites. See the

Environment Agency press release of 3rd March at: http://www.environment-agency.gov.uk/news/127915.aspx

Nature conservation sites: Natural England and the Countryside Council for Wales are leading work to identify high risk nature conservation sites and planning work to implement relevant bio-security at those sites. This work is being done in liaison with the Environment Agency so that surveillance and monitoring effort is undertaken as strategically as possible. The nature conservation agencies are considering how best to involve the cooperation and assistance of stakeholders in planning this work and will be seeking their views shortly. For further information on this work please contact Genevieve Madgwick at Natural England: genevieve.madgwick@naturalengland.org.uk

Research: a scientific and technical advice group comprised of a range of experts is helping to identify and prioritise research needs. Research is being commissioned by Defra to investigate whether there are disinfectants suitable for practical use as part of the bio-security (decontamination) practices that would enhance their effectiveness by killing any shrimps present on equipment etc and further reducing any risks of translocation.

A Cambridge University led research programme, supported by the University of Leeds and Queen's University, Belfast, is underway, investigating the implications for biodiversity of invasion by *D.villosus.* This study includes: whether the predatory impact and prey range as observed in Europe is similar in the UK; whether the shrimp may be carrying parasites or is affected by parasites in the UK; the factors affecting its potential spread. Joint funders of this work include the Esmee Fairbairn Foundation.

Communications: a wide range of bodies have already been raising awareness of this issue amongst their memberships and this is greatly welcomed. Key personnel from within Government and its agencies as well as representatives of relevant landowners, water user groups and conservation interests are now coordinating efforts to improve the flow of information and advice to those who need to know.

A communications group has been established to coordinate communications activities across the relevant Government departments and agencies as well as other stakeholders and partners. A number of recreational bodies, environmental NGOs and other relevant/interested organisations are represented on this group, which also provides a forum for a broader exchange on issues and concerns about the species and the response measures being taken. If you wish to learn more about this group please contact: emma.kiddle@defra.gsi.gov.uk or caroline.deville@defra.gsi.gov.uk

An awareness campaign is being developed in conjunction with this wide range of stakeholders to reinforce some of the existing bio-security messages that many of these groups are already promoting. A unifying campaign 'brand' has been developed to highlight the "Check – Clean – Dry" bio-security best practice message, along with a branded campaign collateral for stakeholders to use if they do not have their own. A campaign website is also being developed.

What can your organisation do?

Bio-security advice is available from the central information point for the invasive shrimp at the GB Non Native Species Secretariat website: www.nonnativespecies.org/alerts/killershrimp

This includes information on shrimp identification and interim bio-security guidance for anglers and boaters. Keep up to date with this website as it will be periodically updated as new information and guidance becomes available.

It is important that anyone monitoring or surveying freshwaters is vigilant and reports suspected sighting*s* of the shrimp via the NNSS website. You should be particularly vigilant at water bodies with stony or artificial substrate, and those containing zebra mussels. Where *D.villosus* has been detected the bio-security advice for boating and angling should be applied to any equipment that has been in contact with the water.

It is always good practice to inspect, clean thoroughly and dry any equipment which has been in contact with the freshwater environment to minimise the risk of spreading non-native species. For *D.villosus* bio-security advice, please refer to the link above.

Further information
If you have any queries or would like further information about the shrimp and the actions taken to control its spread, or if you feel your organisation can help, please visit: www.nonnativespecies.org/alerts/killershrimp

You can contact the GB Secretariat at the above address or alternatively you can contact Mark Diamond of the Environment Agency at: mark.diamond@environment-agency.gov.uk