

CRAYFISH PLAGUE OUTBREAKS UPDATE OCTOBER 2017

Information note issued by National Parks and Wildlife Service and Marine Institute.

The purpose of this is to provide an update on the Crayfish Plague Outbreaks and associated information. This is the first and others will be produced as, and when, significant new information is available. For more detailed information on the outbreak and advice on biosecurity, please refer to the pages on Crayfish Plague on the National Biodiversity Data Centre (NBDC) web site <http://www.biodiversityireland.ie/projects/invasive-species/crayfish-plague/>. If you have any other questions please contact Brian Nelson in NPWS. Brian.nelson@chg.gov.ie

This note contains

- 1 an update on the known outbreaks
- 2 information from the genotyping of the disease strains
- 3 NPWS recommendations on operation of the voluntary ban

1. Update on the known outbreaks

There are five outbreaks currently with no additional ones reported since the summer. Maps of the location and extent of the outbreaks are provided on the NBDC. These will be updated when and if there is more information.

Please note these are based on the information available to NPWS. NPWS commissioned three small surveys in September 2017 to cover the three outbreaks on the Bruskey, Deel and Lorrha rivers. An existing survey contract to Galway/Mayo Institute of Technology covering all the SACs has been in place since late 2016. This has covered the Suir and the Barrow/Nore with fieldwork delayed until late summer in response to the outbreaks. Briefly the position on each of the rivers is as follows:

RIVER SUIR. GMIT have sampled over 20 sites within the SAC. Crayfish were found in sites on the Anner and on the main Suir above Ardfinnan. Sites on the lower Suir below Ardfinnan were negative. (see map below).

RIVER BARROW: 12 sites were covered on the Barrow and live crayfish were found on the Lower Barrow at Graiguenamanagh, the Fushoge and Lerr tributaries, and then at all sample points upstream of Tankardstown (see map below).

BRUSKEY/ERNE/L. GOWNA: most sites visited were negative for crayfish. The river conditions during the survey period were difficult and more work will be needed to confirm these results and to determine if the outbreak has ended.



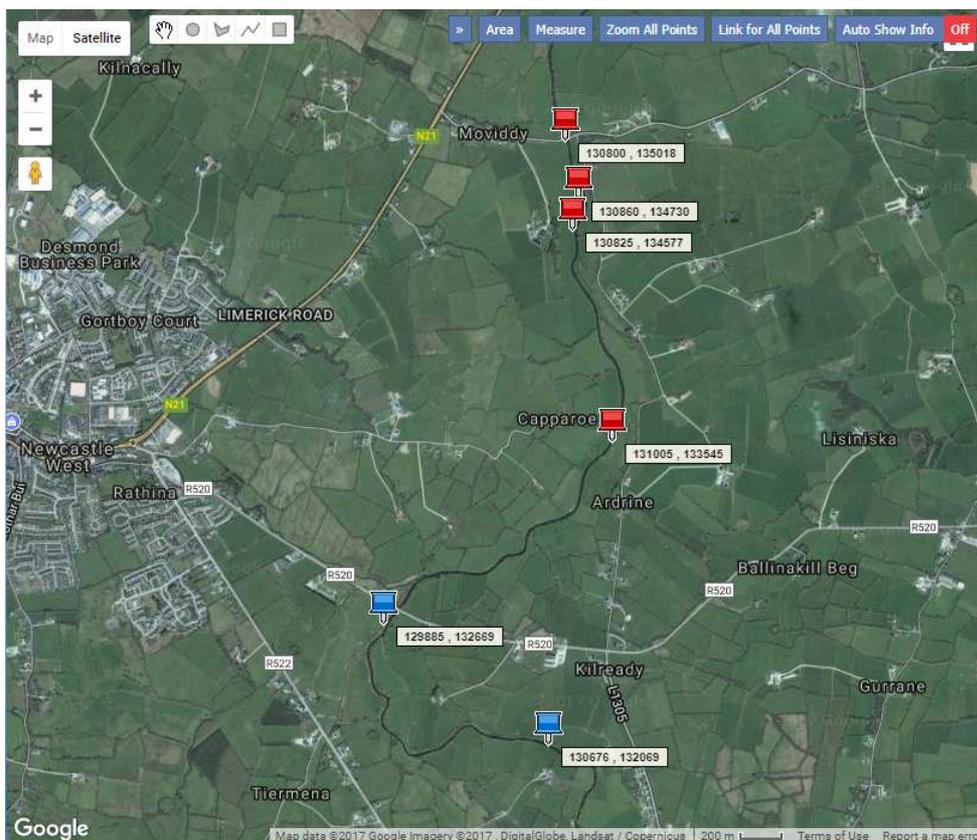
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LORRHA/NORTH LOUGH DERG CATCHMENTS: as with the Bruskey, conditions during the survey period were challenging. Live crayfish were still present on the upper part of the Lorrha. No crayfish were found in other streams that flowed into the east side of Lough Derg. The reasons for these negative results need to be investigated further.

DEEL: the outbreak on the Deel has spread upstream significantly. Previously the outbreak had reached Rathkeale but it has now moved to cover at least 1.5km of river upstream of Grange Bridge. The map below shows the affected section with red symbols indicating where dead/dying crayfish were found and blue where healthy individuals were present. This is based on work between 3rd and 14th October (see map below).



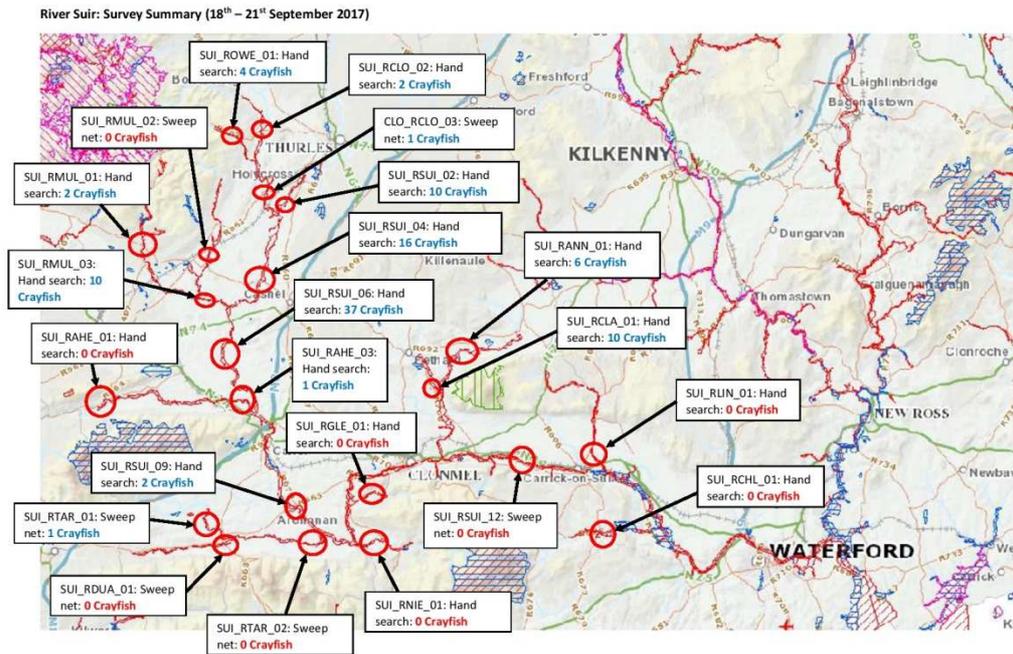
Map of the Deel outbreak. Red symbols show points where dead and symptomatic crayfish were found between 4 and 14 October 2017 and blue symbols where healthy specimens only were found.



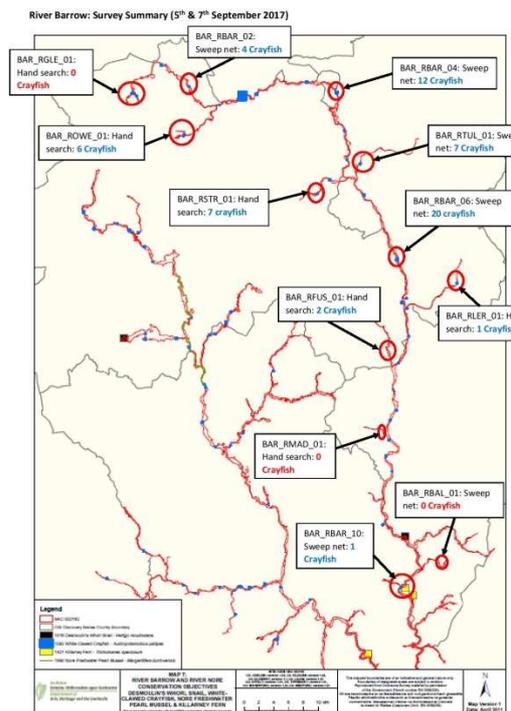
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Preliminary results from the GMIT sampling of the Lower River Suir (SAC 2137) in September 2017.



Preliminary results from the GMIT sampling of the River Barrow (part of the River Barrow and River Nore SAC (002162)) in September 2017.



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2. Genotyping results

Four genotype groups of *Aphanomyces astaci*, have been described by Huang et al., 1994 and Dieguez-Uribeondo et al., 1995:

- **Group A** – originally isolated from *Astacus astacus* (Noble crayfish) and *Astacus leptodactylus* (Turkish crayfish) comprises of a number of strains thought to have been related to the early introductions of *A. astaci* into Europe in the 19th century.
- **Group B** – includes strains isolated from Noble crayfish, originally detected in Sweden, and *Pacifastacus leniusculus* (Signal crayfish), originally detected in Lake Tahoe USA. It is thought that Signal crayfish may have introduced *A. astaci* into Europe and infected the Noble crayfish.
- **Group C** – consists of strains originally isolated from Signal crayfish in Pitt Lake, Canada.
- **Group D** – originally isolated from *Procambarus clarkii* (red swamp crayfish) in Spain, this strain is generally associated with higher optimum temperatures compared to isolates from northern Europe (Dieguez-Uribeondo et al. 1995)
- **Group E** – isolated from *O. limosus* (Kozubíková et al., 2011a).

Genotyping results to date as confirmed by the OIE Reference Laboratories in the UK & Finland:

- **1. River Bruskey** – (S/94/15 - 11B & 11D) - Genotyping has indicated that this isolate is 'closely related' to Genotype C. Further sequencing work is being carried out to elucidate the closeness of the relationship.
- **2. River Lorrha** – (S/63/17 – 12) – Genotyping has indicated that this isolate is Genotype A.
- **3. River Deel** – Genotyping results are expected within the next 10 days.
- **4. River Barrow** – (S/74/17 – 2) – Genotyping has indicated that this isolate is Genotype D.
- **5. River Suir** – (S/21/17 – 3) - Genotyping has indicated that this isolate is Genotype D.

Huang, T. S., Cerenius, L., & Söderhäll, K. (1994). Analysis of genetic diversity in the crayfish plague fungus, *Aphanomyces astaci*, by random amplification of polymorphic DNA. *Aquaculture*, 126(1-2), 1-9.

Diéguez-Uribeondo, J., Huang, T. S., Cerenius, L., & Söderhäll, K. (1995). Physiological adaptation of an *Aphanomyces astaci* strain isolated from the freshwater crayfish *Procambarus clarkii*. *Mycological Research*, 99(5), 574-578.

Kozubíková E., Viljamaa-Dirks S., Heinikainen S. and Petrussek A., 2011a. Spiny-cheek crayfish *Orconectes limosus* carry a novel genotype of the crayfish plague pathogen *Aphanomyces astaci*. *J. Invertebr. Pathol.*, 108, 214–216.



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3 NPWS recommendations on operation of the voluntary ban

It is now six months since the voluntary ban recommendation was put into place. It was reviewed in late September with the recommendation of all agencies that it remains in place until 31 January 2018. Based on the current information it is clear that the outbreaks are still active and this is especially evident on the Deel. The negative results from additional catchments are concerning. They may indicate undetected plague outbreaks and this will have to be investigated.

The genotyping results, as described above, indicate that the outbreaks on the Bruskey, Lorrha and Barrow/Suir involve different strains so these rivers must have been inoculated separately and independently. What is not known is the route of infection. As the Barrow/Suir outbreaks involve the same strain it is reasonable to assume there has been transfer of the disease from one river to the other, but separate inoculations of these cannot be ruled out.

The genotyping evidence suggests that plague has arrived from outside Ireland at least three times and that there may have been at least one transfer between catchments in Ireland.

It is therefore our view that the voluntary ban should remain in place until the next review. However, we would like to stress that the most important aspect of the voluntary ban is the absolute need for biosecurity. It is our strong recommendation that people limit themselves both to the stretch of river they normally operate within and also to keep transfers from infected rivers to the absolute minimum i.e. such movements should only occur where absolutely necessary and then, only after rigorous adherence to the cleaning and disinfection protocols.

Excellent advice on the cleaning of equipment is available on the NBDC site.



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