



MosquitoNI



Mosquito-borne Disease Risk to Northern Ireland under Environmental Change

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Mosquitoes and Environmental Change

Climatic and land use changes are shifting risks from mosquito-borne diseases towards temperate zones, including the UK.

Currently, surveillance and research capacities differ enormously among UK regions. There is an almost complete lack of understanding of mosquito vectors, associated viruses, and potential pathogens in Northern Ireland.

These gaps weaken UK, all-Ireland, and international preparedness to address transboundary vector-borne disease challenges as environments change.

This threat is particularly acute owing to biological invasions by vectors and pathogens. For example:

- In England, Usutu virus was detected for the first time in wild birds in 2020¹, with an ongoing northward range expansion.
- In 2023, West Nile virus was detected for the first time in mosquitoes in England by UKHSA and APHA.
- Chikungunya, dengue and Zika viruses are increasingly widespread in Europe, spread by the tiger mosquito that is expanding its invaded range².

The MosquitoNI Project

MosquitoNI is a new 4-year £1.5 million project (2026-2030), funded by a UKRI-BBSRC New Investigator Award. It is led by Queen's University Belfast, University of Glasgow, and UK Centre for Ecology and Hydrology, integrating interdisciplinary expertise across ecology, virology, and modelling (Figure 1).

The project includes collaborators and partners spanning a range of academic and non-academic organisations, to help steer the work and disseminate its findings. We will engage with these stakeholders during networking events and workshops.

A website and public mosquito reporting system are being developed to allow citizen scientists to upload mosquito sightings and report nuisance biting in Northern Ireland. In turn, this will enable targeted outreach and reactive sampling around hotspots.

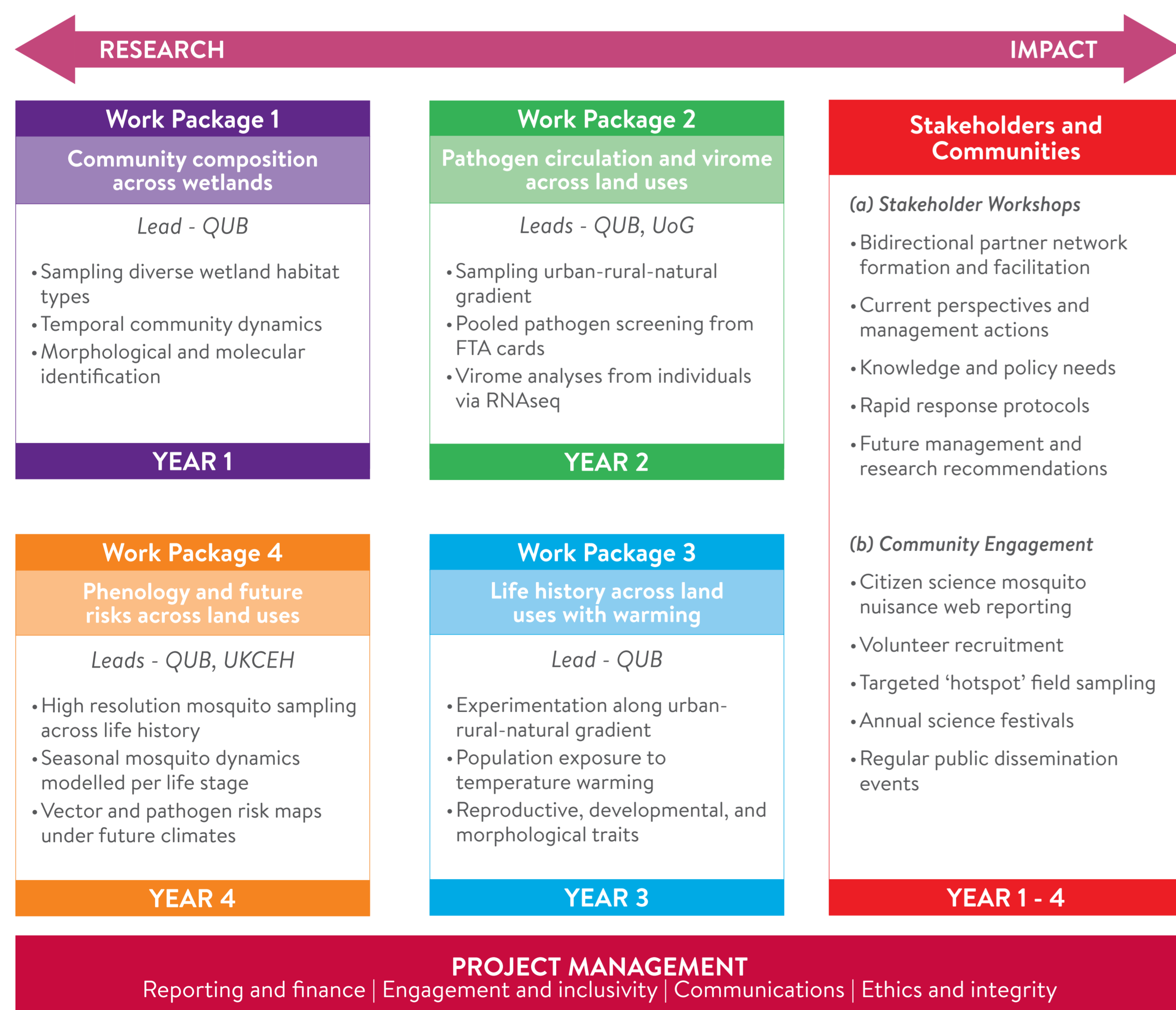


Figure 1. Proposed MosquitoNI work programme.

References

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What We Know So Far

Little is currently known about the diversity and distribution of mosquito species in Northern Ireland – Ireland as a whole has been traditionally data-poor concerning mosquitoes and their viruses.

Previous studies across the whole island have identified approximately 20 species (Table 1)^{3,4,5}. However, this diversity is likely underestimated given low sampling efforts across the variety of wetland habitats that mosquito taxa could occupy (Figure 2).

To date, pathogens of concern, such as West Nile and Usutu viruses, as well as invasive mosquitoes, have not been detected.

Preliminary field sampling in 2025 indicates a high abundance of native taxa, including *Culex*



Figure 2. Example aquatic mosquito habitats being sampled in Northern Ireland.

pipiens, *Culiseta annulata*, *Aedes detritus*, and other potential vectors, with abundances generally highest in the summer months (Figures 3, 4).

Table 1. Known mosquito species in Ireland.

<i>Aedes</i>	<i>Anopheles</i>	<i>Coquillettidia</i>	<i>Culex</i>	<i>Culiseta</i>
<i>Ae. cinereus</i>	<i>An. algeriensis</i>	<i>Cq. richiardii</i>	<i>Cx. pipiens</i>	<i>Cs. litorea</i>
<i>Ae. geminus</i>	<i>An. claviger s.s.</i>		<i>Cx. torrentium</i>	<i>Cs. morsitans</i>
<i>Ae. cantans</i>	<i>An. maculipennis s.l.</i>			<i>Cs. alaskaensis</i>
<i>Ae. caspius</i>	<i>An. daciae</i>			<i>Cs. annulata</i>
<i>Ae. detritus s.l.</i>	<i>An. plumbeus</i>			<i>Cs. subochrea</i>
<i>Ae. dorsalis</i>				<i>Cs. fumipennis</i>
<i>Ae. punctor</i>				
<i>Ae. rusticus</i>				

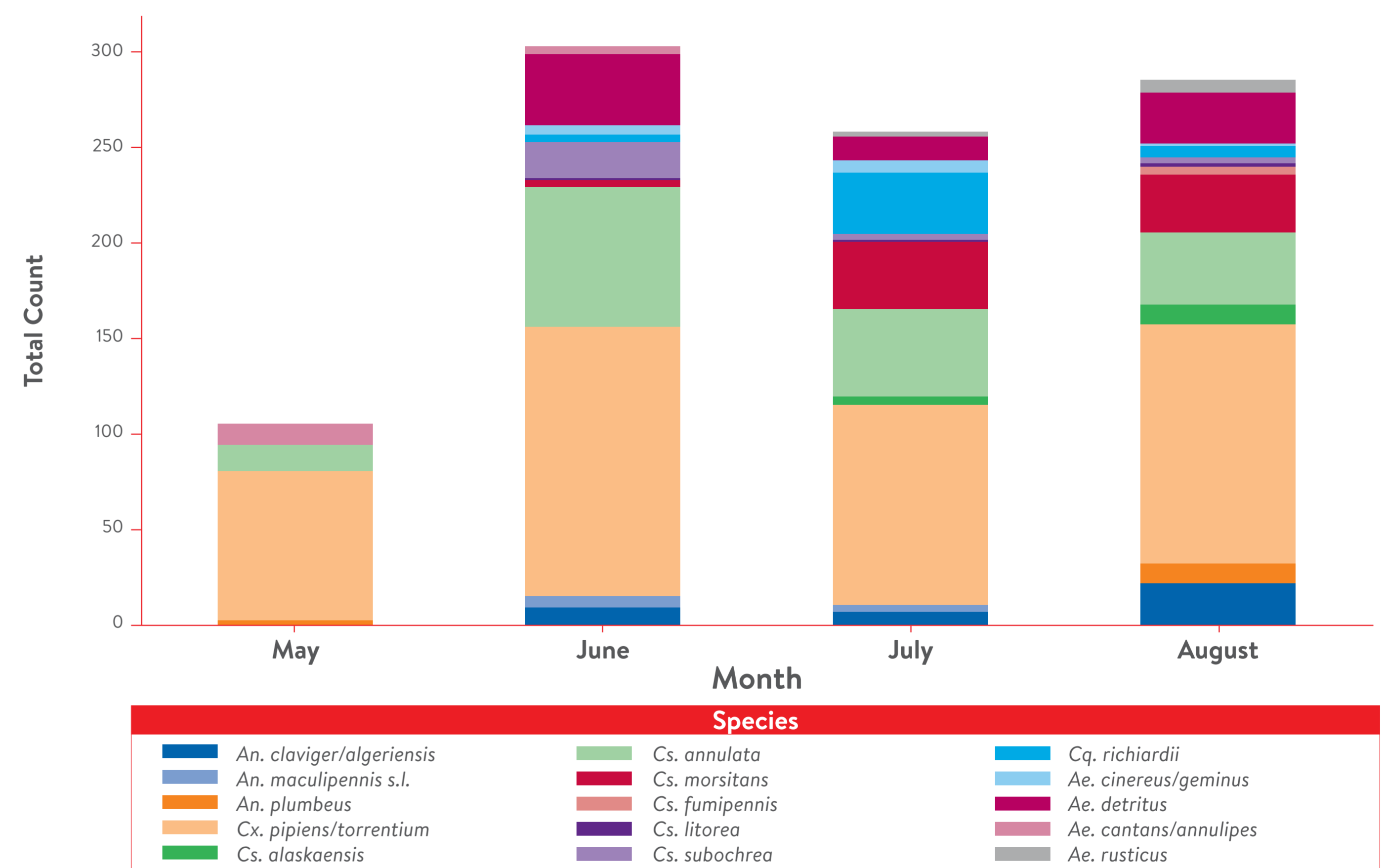


Figure 3. Preliminary 2025 field data (BG-Pro) recording mosquito abundances per month by taxon (Carmichael et al. in prep.). Total trap nights: 196.

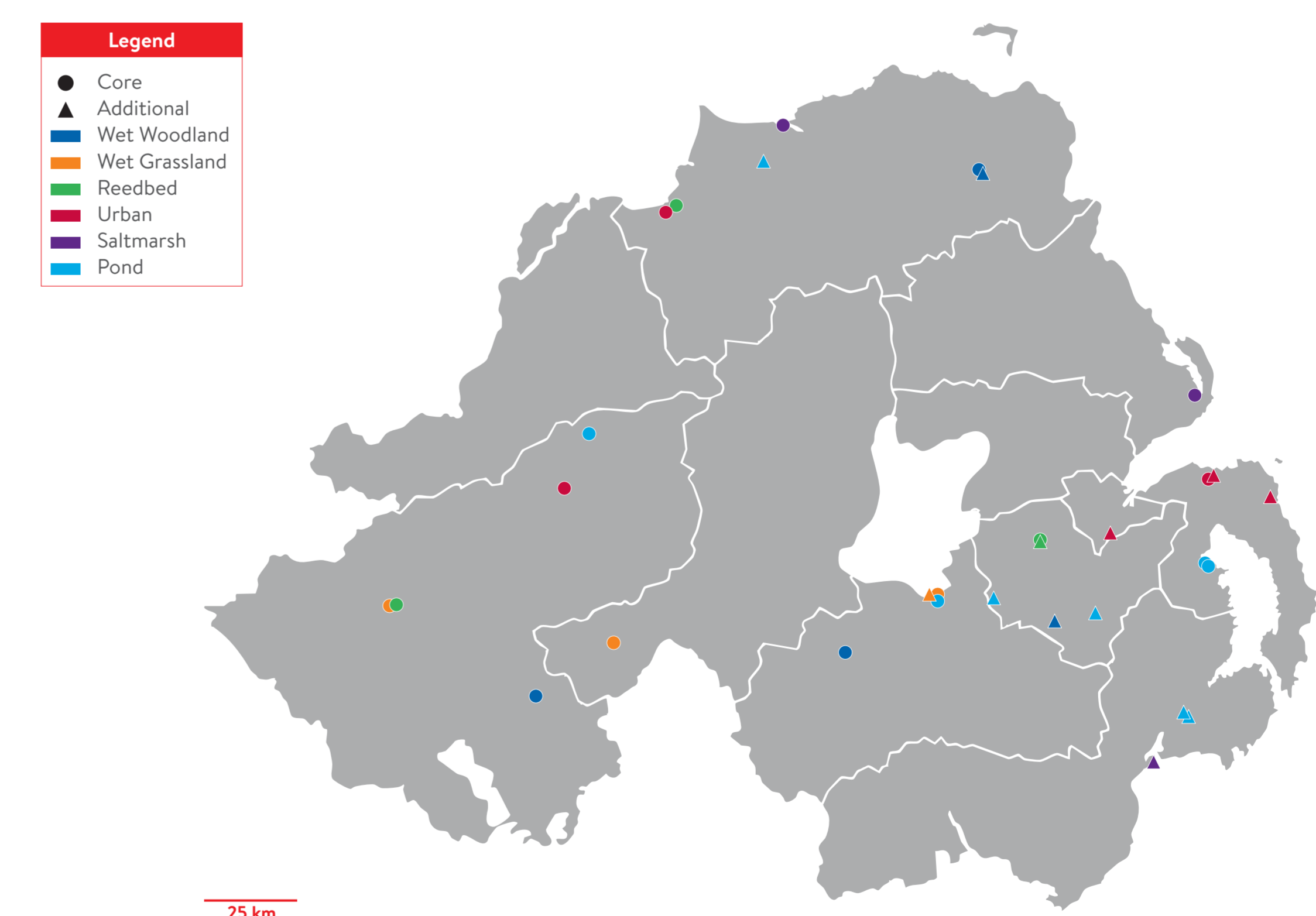


Figure 4. Wetland site classes surveyed in 2025 (Carmichael et al. in prep.).

Get In Touch

The MosquitoNI project is in its infancy. We are keen to build connections inside and outside of academia to develop collaborations and dissemination pathways.

If you are interested in the project and would like to get involved in future workshops and stakeholders events, please get in touch!

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