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Coláiste na Tríonóide, Baile Átha Cliath
The University of Dublin

Annual Meeting of the Irish Freshwater Sciences Association 2024

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Venue: M4 (Geology/Geography Lecture Room 4) on the ground floor
of the Museum Building
(<https://www.tcd.ie/Maps/map.php?b=54&i=b60>).

Book of Abstracts

(In order of speaker presentations)

TABLE OF CONTENTS

Session 1a (12 minute talks)	1
Cormac Mc Conigley – Local Authority Waters Programme	1
Darragh Murphy – University College Cork	2
Michelle McKeown - University College Cork	3
Pascal Sweeney – Sweeney Consultancy	4
Session 1b (12 minute talks)	5
Oisín Duffy -National Biodiversity Data Centre.....	5
Helen Barber-James – National Museums Northern Ireland.....	6
Elvira Deeyto – Marine Institute	7
Session 2 (7 minute talks)	8
Xavier Badham – Queens University Belfast.....	8
Oscar Flynn – University College Dublin	9
Simon Harrison – University College Cork	10
Aoife Walsh -Inland Fisheries Ireland	11
Sean Neville – University College Cork	12
Aideen Kane – Independent Researcher	13
Ronan Matson -Inland Fisheries Ireland	14
Catherine Dalton -University Limerick	15
Session 3 (2 minute elevator pitches)	16
*Michael Connell - University College Dublin.....	16
*Michael Officer -Trinity College Dublin	17
*Robert Moise – University College Dublin	18
*Georgia Miles – Queens University.....	19
Juiliette Ni Shúilleabháin - 2 nd yr. student, St Mary's Secondary School Mallow, Co. Cork.....	20
Ashenafi Battamo -University College Dublin	21
Emma Drohan – Inland Fisheries Ireland	22
Jan Robert Baars – University College Dublin	23
Siobhan Atkinson -RPS.....	24

*Talk entered into student competition

SESSION 1A (12 MINUTE TALKS)**Cormac Mc Conigley – Local Authority Waters Programme****LAWPRO – Expanding and Innovating to Deliver for Water Quality.**

Dr Cormac Mc Conigley¹

(¹Catchment Manager, Local Authority Waters Programme)

Ireland's River Basin Management Plan 2022-2027 is about to be published. The plan introduces new actions to allow Ireland to achieve our water quality objectives. The Areas for Action have been greatly expanded with almost half (43%) of waterbodies now in an Area for Action. The majority of these are in Prioritised Areas for Action where LAWPRO will be leading the work to improve water quality. The plan also introduces areas led by other organisations such as Local Authorities and the National Federation of Group Water Schemes amongst others. The expansion of the Areas for Action will require innovative approaches to be developed along with further collaboration between all stakeholders to ensure we can deliver. The draft plan also introduces Catchment Management Plans, proposing to have a plan for each hydrometric area. LAWPRO are tasked with developing a template for these and has begun this work using five pilot catchments. These topics will be discussed along with the approaches that are being developed to ensure we are successful.

Darragh Murphy – University College Cork

Nature-Based Solutions in Practice: The Impacts of an Offline Storage Area on Flood Peaks, Water Quality and Sward Health on an Irish Farm

Drainage of farmland and modification of stream channel morphology have been implicated in an increased downstream flood risk, generating more rapid and higher flood peaks. During flood events, high loadings of nutrients, sediments and agrochemicals can be mobilised from agricultural soils, hard standings and farm track-ways, putting downstream rivers, lakes and estuaries at risk of pollution. Additionally, high sediment loads derived from land drains and exposed soils may block gravel interstices, harming streambed macroinvertebrates and important fish spawning sites.

Nature-based Solutions are advocated to tackle multiple environmental challenges, but empirical evidence on their efficacy is lacking. This study presents evidence from a three-year study on the impacts of offline storage of stream-water on flood peaks, water quality and grassland productivity. Our results indicate that storage of water on agricultural grasslands can attenuate flood peaks, and potentially improve water quality, without impairing grassland productivity during the growing season. The study also highlighted important limitations of NbS which should be explored further.

Michelle McKeown - University College Cork

Climate Change Effects on Water Quality in Ireland: Emerging Challenges and Insights – A Review

McKeown M.M.*^{1,2}, Taylor K.³, O'Dwyer J.^{2,4}, Weatherill J.^{2,4}, Harrison S.^{2,4}, Jansen M.A.K.^{2,4}, Sullivan T.^{2,4,5}, Banning A.⁶.

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There is growing concern about the effects of climate change on water quality. Using Ireland as a case study, this review paper provides a synthesis of the current and likely future impacts of climate change and associated weather dynamics on ambient water quality in regions with a temperate maritime climate. Increases in water temperature and changes in rainfall distribution patterns with more frequent extreme events are likely to increase pressures on surface water quality and production of safe drinking water, over the coming decades. In addition to climate change, Ireland's water resources mounting pressures from population growth, and societal shifts (e.g., urbanisation, agricultural intensification), coupled with historic lack of investment in treatment infrastructure for drinking water. These compounding factors exacerbate existing challenges in protecting aquatic ecosystem function and human health. This paper advocates a holistic approach that marries climate adaptation efforts with water sector resilience, tackling the intertwined issues of climate change, anthropogenic pollution, ambient water quality. The goal is to inform and guide effective policy and adaptation strategies, ensuring the protection and sustainability of water resources for current and future needs.

Pascal Sweeney – Sweeney Consultancy

Oligochaete Identification for River Water Quality Assessments.

Many freshwater ecologists are not very confident in the identification of oligochaetes, even to the taxonomic level necessary for the assessment of river water quality. This presentation aims at simplifying the process of identification of the main groups. Recent changes to taxonomic classification are summarised, highlighting the Families/Sub-Families used for river water quality assessments. Features necessary for identification are described. A PDF with photographs for basic identification of the main groups has been made available on the IFSA website.

SESSION 1B (12 MINUTE TALKS)**Oisín Duffy -National Biodiversity Data Centre****An Introduction to the National Biodiversity Data Centre: Citizen Science and Mapping**

This talk will give an introduction to the function and work carried out by the National Biodiversity Data Centre. This will include highlighting the digital infrastructure for data capture, known as “Ireland’s Citizen Science Portal” and also the mapping portal, known as “Biodiversity Maps”. The Citizen Science Portal section will show how the recorder network engages with biological recording through various recording initiatives and how this data is submitted through the portal. The Biodiversity Maps section will show the features, functionality and uses of the mapping portal and how this data can be used by recorders and researchers alike.

Helen Barber-James – National Museums Northern Ireland

Diversity of Ephemeroptera, Plecoptera and Trichoptera (EPT) species in the Burren - Results of August 2023 Bioblitz

Helen M. Barber-James¹, Georgia Miles^{1,2}, David McGrath³

(¹National Museums Northern Ireland, Belfast, Northern Ireland

²Queens University, Belfast, Northern Ireland

³Private, Burren, Republic of Ireland)

The Burren offers a unique ecosystem in Ireland for exploring biodiversity, particularly for freshwater aquatic taxa. As a well-developed karst landscape, much of the drainage on the Burren uplands is underground, passing between sinks and resurgences, and there are very few surface streams or bodies of standing water, with most prone to drying up during droughts. On the adjacent Gort lowlands are more numerous groundwater-fed lakes and turloughs, the levels of which are controlled by groundwater and rainfall. The sites chosen for this project were largely areas where little to no survey or collecting work on aquatic invertebrates has been done before. On the Burren uplands, several springs were targeted in particular for investigation of their biota. Of 14 species of Ephemeroptera (mayflies) found, three are worthy of mention, one rare and two new records for the region. Only two species of Plecoptera (stoneflies) were found, possibly because it was late in the season for this group, which begin to fly very early in spring. The Trichoptera (caddisflies) were the most diverse, with 46 species recorded, including two new records for the Burren, and one possible new record for Ireland, which needs more material for confirmation.

Elvira Deeyto – Marine Institute

Maximising the Value of Long-term Data Collections through Collaboration

Elvira de Eyto¹

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Long term ecological research, and the datasets that such monitoring programs produce, are crucial to our understating of how multiple stressors are shaping ecosystems. However, such data collections are rare in a national and international context and are particularly sensitive to vagaries in funding and staffing. Here, we discuss the origins of a monitoring program comprising surveys of aquatic macroinvertebrates at 16 sites in the Burrishoole catchment which commenced in 2003. Whilst these data form an important part of the Marine Institute's monitoring of the catchment, they have also recently been integrated into several larger scale pan-European studies. Here, we present some outputs from the last 2 decades and demonstrate how additional value can be realised by being open to collaboration and data-sharing.

SESSION 2 (7 MINUTE TALKS)

Xavier Badham – Queens University Belfast

Ecological Stability of a River Community along a Gradient of Nutrient Stress

Xavier Richard Badham, Lesley Lancaster, Sarah Helyar, Mark Emmerson

Excess nutrients, including nitrates, phosphates, and ammonia, can lead to harmful algal blooms and can disrupt animal metabolic processes stressing individuals, populations, and communities. These stressors may in turn affect ecological stability and ecosystem responses to disturbance. Here we investigate the link between ecological stability and nutrient concentration. We use the Upper Bann River, in Northern Ireland, as a study area exhibiting a gradient of nutrient stress reflecting increasing agricultural land use downstream. We quantify community dynamics through invertebrate and algal trophic interactions, abundance, and biomass. Experimental disturbance of the streambed provides insight into stability, quantified through recovery, resistance, and variability metrics. Food web properties derived from a mixture of literature review and gut contents meta-barcoding analysis are explored. Initial findings highlight distinct community variations along the Upper Bann defying typical River Continuum Concept classifications. Unconventional community patterns suggest that ecosystem stability and functioning may be altered via experimental disturbance.

Keywords: Freshwater; Ecological stability; Nutrifcation; Macro-invertebrates; Algae; Press disturbance

Oscar Flynn – University College Dublin

Hydroacoustic Surveys used to Investigate the Distribution and Abundance of the Invasive Charophyte *Nitellopsis obtusa* in Loughs Ree and Derg

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² Lough Derg Science Group, Marina Village, Ballina, Killaloe, Co Clare)

Nitellopsis obtusa is a large invasive macroalgae of the family Characeae that forms extensive, dense, monotypic beds that alter habitat and impact littoral communities in lakes across North America. *N. obtusa* is native to Asia, the European continent and the UK. It was not discovered in Ireland until 2016, where it is considered cryptogenic and likely introduced. Recent signs of spread prompted a rapid hydroacoustic survey, assessing the distribution and abundance of *N. obtusa* across Loughs Ree and Derg with a view to inform its management. Beds of *N. obtusa* quantified within three bays in Lough Ree covered 254.4 hectares with a biovolume of ~2.7 million m³, indicating that *Nitellopsis obtusa* is one of the most aggressive macrophytes introduced to Ireland. There are currently no feasible methods of controlling such large beds of *N. obtusa* and therefore management measures should be implemented to limit its spread to other waterbodies. Hydroacoustic surveying proved to be a rapid and cost-effective method of assessing beds of *N. obtusa* and should be repeated in Lough Ree in future to discern whether *N. obtusa* continues to expand its range. Surveys are also required in Lough Derg in order to provide a baseline for future management.

Simon Harrison – University College Cork

The Impact of Pool Drying and Predation on Larvae of the Saltmarsh Mosquito *Ochlerotatus detritus* in Cork Harbour

(University College Cork, School of Biological, Earth & Environmental Sciences, Distillery Fields, North Mall, Cork, Ireland).

Climate change will bring many ecological changes to Ireland in coming decades. The geographical distribution of many species currently restricted to southern latitudes will likely expand northwards, including undesirable pest species such as mosquitoes, and vector-borne diseases. The common saltmarsh mosquito *Ochlerotatus detritus* is widespread around Irish coasts. Adults have a catholic feeding behaviour, commonly feeding on humans, birds and livestock, making it a biting nuisance in coastal areas, and also a potential vector for West Nile Virus – a dangerous disease of humans and horses and a notifiable disease in Ireland. Saltmarsh mosquitoes may be controlled by physical management of saltmarshes, so as to facilitate the movement of aquatic predators into isolated pools, by the use of pesticides, or less harmful biocides such as *Bacillus thuringiensis*. Knowledge of the distribution, biology and life cycle of mosquito larvae is vital for the cost-effectiveness of these control methods, yet there is little research ongoing in this area in Ireland. Here we report on investigations into the larval biology of *O. detritus*, which is common in saltmarshes in Cork City. We show that the mosquito larvae are vulnerable to key aquatic predators, but have remarkable resistance to desiccation of their saltmarsh pool habitat.

Aoife Walsh -Inland Fisheries Ireland

PASTA – Utilizing a Web-based Tool to Evaluate Stream Thermal Sensitivity within the IFI CCMRP/OPWCRP Catchment Monitoring Network.

Abstract The Paired Air and Stream Temperature Analysis (PASTA) tool provides a robust framework for assessing spatiotemporal patterns in stream thermal sensitivity, groundwater influence, and source depth effects, enabling the evaluation of dynamic relationships between air and stream temperatures and shedding light on climate change resilience. PASTA is an open access web tool that accepts user-uploaded stream and air temperature datasets, integrating advanced statistical methods to delineate spatial and temporal variations in stream thermal sensitivity. It also quantifies the relative groundwater influence on stream temperature dynamics, providing insights into hydrological interactions shaping thermal regimes. This tool was used on water temperature and gridded air temperature data (Met Eireann) from 12 index catchments in 2021 and 2022 to identify air-coupled and groundwater-fed sites. For each site selected variables that provide information on groundwater influence and thermal sensitivity were displayed over an underlying aquifer layer to pinpoint groundwater-fed streams and precipitation-fed streams. These results can be used to identify climate resilient fish habitat, that can be used to focus conservation efforts in areas that act as thermal sanctuaries during extremes events.

Sean Neville – University College Cork

Novel Underwater Video Methodology for Monitoring Freshwater Fish Population

Dr. Simon Harrison¹, Seán Neville¹.

(¹University College Cork, School of Biological, Earth & Environmental Sciences, Distillery Fields, North Mall, Cork, Ireland).

Although electrofishing is the dominant method to monitor riverine fish populations in Ireland, its use is limited in very shallow streams, in areas of dense overhanging vegetation and in streams containing the critically endangered freshwater pearl mussel. Furthermore, electrofishing can only be practised during summer months, because of the risk of damaging sensitive life stages. It is also costly in terms of equipment and manpower. The development of cheap, compact and waterproof action cameras (AC), such as the GoPro, offers new potential strategies for fisheries research. AC technology presents many potential advantages compared with electrofishing surveys, foremost of which is that their use does not harm fish and they can be deployed in very shallow streams - a key habitat of juvenile salmonids. AC can therefore be used to monitor delicate early life stages, including overwintering eggs and emerging alevins in redds. Additionally, ACs can be used to study small-scale fish habitat use and behaviour in streams, which hitherto could only be done by direct underwater observation or through the use of tagged fish. Here, we present preliminary findings on the use of AV technology to study stream fishes, demonstrating its potential use in fisheries ecology and management

Aideen Kane – Independent Researcher

Corixids of Co. Cork.

Aideen Kane and Pascal Sweeney

The distribution of species of Corixidae in Co. Cork has hitherto been poorly described in comparison to other parts of the country. This has, in part, been due to potentially suitable sites, particularly in East and North Cork, not being obvious on maps to visiting entomologists. With the advantage of local knowledge, the present study commenced in Summer 2023, with the aim of sampling a wide range of habitat types in at least 50% of the 10km squares in the county. In addition, conductivity measurements are taken, as there is evidence of a link between conductivity and species distribution. Ongoing sampling and identification have already yielded some interesting results.

Ronan Matson -Inland Fisheries Ireland

Aquatic Plants in Ireland a Photographic Guide

Joe Caffrey¹, Ronan Matson² & Rossa O'Briain²

(¹ *INVAS Biosecurity*

² *Inland Fisheries Ireland*)

Aquatic environments are particularly vulnerable to threats posed by biodiversity loss, climate change and the spread of invasive species. One of the most important ecological skills necessary for gathering baseline data and measuring impact, is reliable species identification. This newly published guide fills a genuine gap in the Irish literature and allows the specialist and non-specialist alike, to identify practically every aquatic plant species that grows in, or alongside, Ireland's freshwater habitats.

The book offers a wide breadth of cover and brings together the knowledge of some of Ireland's leading experts, including specialists in algae, bryophytes and sedges. To make it more intuitive, it deviates from the traditional taxonomic approach by arranging species based on where they are encountered within their natural habitat and reduces complicated jargon to make it more accessible.

The broad ecology of each plant is summarised, and each species profile includes useful identification tips to avoid confusion with similar species, as well as up-to-date maps illustrating national distribution. Over 1,200 colour photographs and diagrams are provided, along with a detailed glossary.

Catherine Dalton -University Limerick

Lakes in Ireland – Mirrors of Change

Catherine Dalton, Elvira de Eyto & Eleanor Jennings

A globally accessible Open Access e-book is planned for lakes in Ireland titled 'Lakes in Ireland: Mirrors of Change.' The book encompasses 22 chapters on the geography, science, and history of lakes in Ireland, contributed by academic scholars, as well as state agency experts. Chapters focus on important results from sentinel lake sites, as well as summarizing our current knowledge of water quality, fishery status, and the impacts of anthropogenic change (including global warming) on Ireland's lakes. This edited volume will fill a 25-year gap in terms of authoritative research publications on Irish lakes. The book is aimed at practitioners, undergraduates and postgraduates, ENGOs, academics, policy analysts, decision-makers, and the general public.

SESSION 3 (2 MINUTE ELEVATOR PITCHES)

***Michael Connell - University College Dublin**

HydroGen: Integration of DNA-based Assessment Tools into Water Quality and Biodiversity Monitoring with a Focus on Fish and Diatoms.

Connell, M., Kelly-Quinn, M., Carlsson, J.

This project will assess how environmental (e)DNA and other DNA based methods can supplement and support traditional monitoring methods for the Water Framework Directive (WFD) across a range of biological quality elements and for other regulatory targets related to biodiversity in rivers. Additionally, the research aims to showcase the added value which can be gained from utilising DNA-based (both DNA & eDNA) approaches including potential novel DNA metrics. Additionally, guidance for their integration into existing programmes will be developed. Traditional monitoring methods for assessing fish involve their direct capture usually through electrofishing, whilst diatoms require time-costly morphological identification. These traditional methods can be inadequate and provide subpar data resulting from issues with morphological identification, low detection probabilities, challenges of gear deployment and are often highly invasive. By incorporating DNA based strategies alongside traditional methods many of these pitfalls can be overcome. A total of 40 EPA monitoring river sites across Ireland representing a gradient of river health from poor to high status have been selected, where water as well as phytobenthos samples will be taken. Four sites will be sampled seasonally, with the remaining sampled yearly. The results from the traditional and DNA-based methods will be compared across spatial and temporal scales

*Talk entered into student competition

Michael Officer -Trinity College Dublin*Maternal Temperature does not Influence Offspring Disease Resistance during Transgenerational Temperature Shifts in *Daphnia magna*.**

Predicting the impact of global warming on host-parasite interactions is complicated by the complexity and high thermal dependency of these interactions. The speed of current global warming scenarios may also outpace the capacity of genetic adaptation to keep pace in host-parasite systems. Recent evidence suggests that transgenerational plasticity can help organisms respond to rapidly changing environments. Environmental stressors that coincide with high infection risk in the maternal environment may cue parental generations to produce offspring better equipped to cope with similar stressors and to resist infection. This study used the *Daphnia magna*-*Ordospora colligata* zooplankton-fungal parasite system to test whether maternal temperature (11, 14, 17, 20, 23, and 26°C) influenced offspring disease resistance during transgenerational temperature shifts. Maternal temperature did not affect offspring disease resistance; parasite infectivity and host spore burden did not change according to maternal temperature. However, mothers held at a higher temperature produced more fecund offspring. Maternal temperature-induced changes in fecundity may catalyse population age restructure, potentially altering disease exposure and outcomes across host-age classes. Altered population disease dynamics may affect up- and downstream trophic interactions. Offspring temperature influenced infectivity and spore burden; infectivity was highest at 20°C, the thermal optimum of *O. colligata*, and spore burden decreased at higher temperatures. Together, these results demonstrate the importance of considering multiple parasite and host fitness indicators when assessing the adaptive value of maternal effects in conferring offspring disease resistance under changing environments. Furthermore, the need to evaluate the interactions between multiple maternal stressors and transgenerational plasticity is highlighted.

*Talk entered into student competition

Robert Moise – University College Dublin*HydroGen: Integration of DNA-based Assessment Tools into Water Quality and Biodiversity Monitoring with a Focus on Macroinvertebrates and Microbes**

Moise R., Kelly-Quinn M., Carlsson, J.

The project aims to evaluate how DNA-based methods can supplement and support traditional monitoring methods for the Water Framework Directive across a range of biological quality elements and for regulatory targets related to biodiversity in rivers. Traditional surveys often provide inaccurate data due to issues such as morphological identification errors, low probability of detection, and intrusive approaches. This is one of two PhDs in the EPA-funded HydroGen project, under which forty freshwater sites across Ireland will be sampled over the course of four years. Sites cover a gradient from high to low ecological value and include both seasonal and annual sampling routines. In particular, four sites will be sampled seasonally and the remaining thirty-six annually. This comprehensive approach will allow to detect seasonal variations in the distribution of macroinvertebrates and microbes. The research will provide insights into the added value that can be achieved by using genetic tools, including potential new metrics based on DNA data. It is an opportunity to extend the scale and frequency of studies, thus supporting the efforts of monitoring bodies. The combined approach will improve our understanding of the diversity and distribution of species that inhabit Irish freshwaters.

Keyword: Water framework directive, eDNA, freshwater monitoring.

*Talk entered into student competition

Georgia Miles – Queens University*Mayfly Research in Ireland: Past, Present, and Future Directions: A Preliminary Overview.**

G. Miles¹ and H.M Barber-James²

(¹Queens University, Belfast, Northern Ireland

²Ulster Museum, National Museums Northern Ireland, Belfast, Northern Ireland)

The distribution and vulnerability of Ephemeroptera of Great Britain and the Republic of Ireland has been well assessed. However, information on mayfly species distribution in Northern Ireland is relatively sparse in comparison.

Over 137,000 species specific records for British and Irish Ephemeroptera, spanning 1850 to 2023, have been sourced from NBN atlas and NMNI collections; Northern Irish records account for just 0.72% of this number, and GIS work shows that the distribution of records and the efforts to acquire them has declined in recent years.

With specific focus on Irelands 10 most threatened or data deficient species, the possible influence of fundamental natural factors on species distributions, including geology and changing temperatures, is being assessed using QGIS analysis. Secondary effects such as anthropogenic increases in pollution will then also be considered, to help interpret how and why Ephemeroptera distributions in Ireland are changing. Recommendations will be made on where targeted surveys and mitigation efforts should be focused, to find potential refugia and future sources for ecosystem recovery, and to ensure the protection of Ireland's threatened species.

*Talk entered into student competition

**Juiliette Ni Shúilleabháin - 2nd yr. student, St Mary's Secondary School
Mallow, Co. Cork**

Assessing the Presence of White-Clawed Crayfish (*Austropotamobius pallipes*) in the Blackwater Catchment Area of Mallow using environmental DNA Analysis and the Identification of Possible Ark Sites.

This investigation provides insight into the possible use of eDNA for monitoring and conservation of this endangered species by evaluating eDNA samples taken from various waterbodies.

Ashenafi Battamo -University College Dublin

Impacts of Extreme Weather Events on Freshwater, Terrestrial and Marine Ecosystems

Battamo, A.Y ¹, Eichelmann, E. ¹, Naber, N. ¹, O'Sullivan, J.J. ², Salauddin, Md. ² & Kelly-Quinn, M. ^{1*}

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² UCD School of Civil Engineering and UCD Earth Institute, University College Dublin, Belfield, Dublin 4, Ireland)

Evidence is mounting of accelerating biodiversity loss across ecosystems, including protected habitats and species, from pollution and habitat degradation and fragmentation from a range of land-use and other anthropogenic drivers, including extreme weather and climatic events. The Extremes project is a 12-month desk study funded by the Environmental Protection Agency. Among its tasks is a systematic review and synthesis of the impacts of extreme climatic events on freshwater, terrestrial and marine ecosystems. The team is also seeking the input of stakeholders and experts on the perceived impact of extreme weather events on Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) and associated species in Ireland. This will be followed by an assessment of the vulnerability of selected SACs and SPAs to extreme climatic events.

Keywords: Extreme Weather Events; Extreme Climatic Events; Freshwater Ecosystems; Marine Ecosystems; Terrestrial Ecosystems.

Emma Drohan – Inland Fisheries Ireland

The RESTORE project - Detecting Change and Assessing the Effectiveness of Measures to Protect and Restore High Status Objective River Waterbodies

Project Members: Dr. Fiona Kelly, Dr. Mary Kelly-Quinn, Dr. Johnathan Turner, Dr. John O'Sullivan, Dr. Md Salauddin and Emma Drohan.

Deteriorating water quality from point and diffuse nutrient pollution, together with habitat degradation is reflected in Irish catchments through the decline of high-status objective (HSO) waterbodies from 31.6% to 18.4% in the periods from 1987-1990 and 2019-2021, respectively. Highlighting potential drivers of degradation, together with monitoring the impacts of pressures and associated stressors on aquatic systems remains critical for the management of river waterbodies. The EPA funded RESTORE project, which we introduce in this paper, aims to develop a bespoke multi-disciplinary monitoring programme to detect change and assess the effectiveness of measures to protect and restore HSO river waterbodies. In partnership with the Waters of Life Project and University College Dublin, this project will develop and test a monitoring programme across six demonstration catchments in Ireland. Utilising existing catchment and stream condition data, a desk-based assessment will initially be undertaken to provide context for subsequent field campaigns. The field campaigns will assess selected biological and supporting elements using novel high resolution spatial and temporal monitoring. The results will be used to inform a wider rollout of a national monitoring programme for HSO waterbodies in an effort to mitigate status decline and increase the number of HSO sites.

Jan Robert Baars – University College Dublin

Mayfly Distribution in Ireland – Records for the Red Listing

Baars, J-R., Feeley, H.B., Kelly-Quinn, M.

Mayflies (Ephemeroptera) are an important aquatic invertebrate group in freshwater ecosystems in Ireland. The species in this group have long been an integral part of the biological assessment of water quality. With the steady decline in water quality in Ireland the species sensitive to this degradation are likely being lost from rivers, small streams and lakes. The conservation status of mayflies was assessed in 2012 where 1 was Critically Rare, 2 were Endangered, 3 were Vulnerable and 2 were Near threatened. To repeat the Red Listing in the context of declining water quality the assessment requires up to date distribution records to detect a decline in distribution if any. Very few records have been submitted to NBDC and there are many gaps to fill, for even some of the most common species. There are also several recent taxonomic changes that are likely to impact the conservation assessment. This 2 year-long project aims to survey for species (including targeting gaps and early emerging species) and will engage with agencies and stakeholders like anglers to submit records for verification. This project is funded through the Local Biodiversity Action Fund (NPWS) supported by 30 county councils. This project is also funded by LAWPRO and will be supported by their staff.

Siobhan Atkinson -RPS

Guidance on Assessment and Construction Management in *Margaritifera* Catchments in Ireland

Siobhán Atkinson¹, Mark Magee², Evelyn Moorkens³, Margaret Heavey⁴

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⁴ The Law Library, The Four Courts Inns Quay Dublin 7)

The freshwater pearl mussel, *Margaritifera margaritifera*, is one of the most demanding species for water and river habitat quality in the world. Effective conservation of *Margaritifera* requires sustainable development in catchments supporting the species. Assessing the impact of development on this species is challenging for consultants, agencies, public authorities and other stakeholders. To address this, guidance on assessment and construction management in *Margaritifera* catchments in Ireland has been developed.

The guidance provides detail on the requirements of *Margaritifera*, the level of information needed, and how an assessment should be undertaken to ensure compliance with relevant legislation, in particular the Habitats Directive and Wildlife Acts.

During the impact assessment process, the operational phase must be considered first to ensure the project design will not compromise the achievement of the conservation objectives for the species. Engaging ecologists at the early stages of project design is therefore critical. For construction management, the use of a Schedule of Works Operation Record (SOWOR) is recommended. The SOWOR provides a protocol for managing and demonstrating a standard of excellence in environmental protection during conservation actions and project construction. The guidance can be accessed here: <https://e-mussels.eu/europe/conservation-guidelines>