Hugh Graham

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Personal Statement:

I am currently working as a researcher at the University of Exeter. The main focus of this role is national-scale geospatial modelling of beaver habitat and population dynamics, in partnership with Natural England and the Environment Agency. This work has developed from my PhD research which I am continuing to work on part time. My PhD project is entitled 'Understanding the Impact of reintroducing the Eurasian beaver *(Castor fiber*) in England'. The key aims of this project are to determine the impact of Beaver on the water resources, geomorphology and riparian vegetation of the River Otter Catchment.

Prior to the commencement of my PhD, I worked at APEM ltd. as an aquatic consultant. During my time at APEM I had the opportunity to work on a broad range of projects associated with the management and conservation of freshwater environments. My primary role was as a GIS technician, tasked with processing and analysing a range of catchment wide data set types.

I studied an MSc in 'River Environments and their Management' at the University of Birmingham in 2014. The course undertook many different topics within freshwater science including: ecology, fluvial geomorphology, biogeochemistry, hydrology and statistical and mechanistic modelling. For my dissertation project, I investigated the impact of the invasive Demon Shrimp (*Dikerogrammarus haemobaphes*) on the benthic macroinvertebrate community of the River Cherwell. This project gave me a fantastic opportunity to observe the importance and complexity of trophic interactions and the knock-on impacts for ecosystem function.

My interest in freshwater science was ignited whilst studying Geography at the University of Exeter (2009-2012) and during a placement at RMA environmental consulting (2013). Over the last two years I have further developed my understanding of freshwater environments and my interest continues to grow with each project that I undertake.

As an active kayaker and fisherman, I always enjoy the opportunity to work in and around water.

Education:

2015-ongoing, University of Exeter

PhD, Understanding the Impact of reintroducing the Eurasian Beaver (Castor fiber) in England

2013-2014, University of Birmingham

Msc, River environments and their management, distinction

Key Modules: Environmental analysis and modelling - 73%: In this module I learnt to use R-Studio software to statistically analyse and physically model environmental data.

Dissertation - 78%: An investigation into the impact of the Demon Shrimp *(Dikerogammarus haemobaphes)* on the benthic invertebrate community of the River Cherwell. *(Available online at http://www.nonnativespecies.org/index.cfm?pageid=559)*

2009 -2012, University of Exeter

BSC (Hons), Geography, 2:1

Dissertation - 78%: A laboratory flume experiment investigating the interaction between bed-load transport, erosion and channel geomorphology.

Employment History:

University of Exeter – Researcher

01/03/2019 – Present

In order to inform national policy on the potential reintroduction of Beavers in England and Wales, I have been employed on several rolling contracts in partnership with Natural England, The Environment Agency and National Resources Wales to undertake national scale modelling to describe beaver habitat, sections of river likely to be dammed and the potential number and density of dams that can occur across a catchment. This work was first developed during my PhD, which I am continuing part-time.

APEM ltd., Cardiff - Aquatic Consultant

15/10/2014 - Present

APEM ltd. is an aquatic consultancy specialising in both freshwater and marine environments. I work within the freshwater side of the company, undertaking a range of different project types including diffuse pollution/fine sediment investigations, habitat mapping and evaluation, geomorphological surveys and drought permit assessments. My key roles include: data interpretation and presentation, GIS creation and image analysis, report writing and field work.

RMA environmental limited, Tiverton – Work Placement

01/05/2013 – 14/06/2013

RMA environmental ltd. is a consultancy which specialises in Environmental impact assessments (EIAs), flood risk assessments, water quality monitoring and hydrology. During my placement at RMA, I was responsible for writing chapters for EIAs, creating flood risk assessments, proposing sustainable urban drainage designs, map creation using QGIS software and interpreting water chemistry and biological data in relation to river water quality.

Other Qualifications/Skills:

Full and clean driving License

R programing

Python programming

Mapping and spatial analysis in ArcGIS and QGIS

Attended SEPA Hydromorphology Technical Group Morphological Survey Course (January 2015)

Attended the ‘Wetland, River and Sediment Management Workshop’ hosted by Salix and Frog Environmental (July, 2015)

Presenter at State of Beaver Conference 2017, Canyonville, Oregon.

White Water Safety and Rescue Training

Publications:

Graham, H.A., Puttock, A., Macfarlane, W.W., Wheaton, J.M., Gilbert, J.T., Campbell-Palmer, R., Elliott, M., Gaywood, M.J., Anderson, K., Brazier, R.E., 2020. Modelling Eurasian beaver foraging habitat and dam suitability, for predicting the location and number of dams throughout catchments in Great Britain. Eur J Wildl Res 66, 42. https://doi.org/10.1007/s10344-020-01379-w

Brazier RE, Elliott M, Andison E, Auster RE, Bridgewater S, Burgess P, Chant J, Graham HA, Knott E, Puttock AK, Sansum P, Vowles A (2020) River Otter Beaver Trial: science and evidence report. River Otter Beaver Trial, Devon. https://www.exeter.ac.uk/creww/research/beavertrial/

Campbell-Palmer, R., Puttock, A.K., Graham, H., Wilson, K., Schwab, G., Gaywood, M.J., Brazier, R.E., 2018. Survey of the Tayside area beaver population 2017-2018. Scottish Natural Heritage Commissioned Report No. 1013. https://www.nature.scot/sites/default/files/2018-10/Publication%202018%20-%20SNH%20Research%20Report%201013%20-%20Survey%20of%20the%20Tayside%20area%20beaver%20population%202017-2018.pdf

Puttock, A., Graham, H.A., Cunliffe, A.M., Elliott, M., Brazier, R.E. (2017) Eurasian beaver activity increases water storage, attenuates flow and mitigates diffuse pollution from intensively-managed grasslands. Science of The Total Environment 576, 430–443. doi:10.1016/j.scitotenv.2016.10.122; https://www.sciencedirect.com/science/article/pii/S0048969716323099

Puttock, A., Graham, H. A., Carless, D., & Brazier, R. E. (2018). Sediment and nutrient storage in a beaver engineered wetland. Earth Surface Processes and Landforms, 43(11), 2358-2370. https://onlinelibrary.wiley.com/doi/full/10.1002/esp.4398

References:

Professor Richard Brazier (Professor of Earth Surface Processes)

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Amory Building, University of Exeter, Rennes Drive, Exeter, EX4 4RJ, UK

Dr Alan Puttock (Post-Doctoral Researcher University of Exeter)

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