Chasing Flamingos – Tracking synthetic DNA in a river

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Biography:

Suzanne is a Masters by research student with Edith Cowan University and Department of Biodiversity, Conservation and Attractions (DBCA), studying the movement of DNA in rivers to improve the interpretation of environmental DNA data. Through her 20 year career in monitoring and managing rivers and estuaries, a focus on freshwater ecology has led to a keen interest in the potential applications of eDNA technologies to improve knowledge and management of aquatic ecosystems.

Abstract:

Interpretation of environmental DNA (eDNA) detections in riverine environments are complicated by variable flow conditions affecting the distance eDNA might travel downstream with studies suggesting travel distances of 0.1 km to >20 km. Experiments attempting to quantify distance of DNA passage must demonstrate a clear source of the target DNA before making conclusions about distance downstream that it can be detected. In this experiment, synthetic flamingo DNA was injected into a river and changes to concentration over distance were measured. The DNA was designed to be unique to the experiment area and tested for specificity prior to manufacture. The flamingo DNA was injected into a river concurrently with brine, and the movement from source was tracked using in situ conductivity measurements and targeted water sample collection at multiple sites downstream. The concentration of flamingo DNA in water samples was quantified using qPCR. Spatial and temporal changes in concentration of salt and flamingo DNA, together with river discharge measurements, were analysed using one-dimensional numerical models to determine the longitudinal dispersion coefficient and determine the retardation factor of the DNA. This study quantifies the movement and range of detection of eDNA in a riverine environment and contributes to the growing body of work building an understanding of the ecology of eDNA.

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ABOUT eDNA

The Southern environmental DNA Society (SeDNA) is a newly established Australian and New Zealand society of environmental DNA researchers and end users. We aim to promote best practices and help the adoption of methods across sectors.

Our mission is promoting science and industry collaboration across Australia and New Zealand to advance best practice eDNA methods and adoption in government, private and community sectors.

Visit our website to find more about the society and what we do here. Membership registration is open on our website.

https://sednasociety.com/

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