

Australian freshwater vertebrates eDNA innovation pipeline

Achieving smarter, faster and cheaper genetic surveillance



PRE-IA CRC

Trapping, netting, electrofishing are the major techniques used for freshwater vertebrate (e.g. pest fish) detection



Pre 2009



eDNA detection through the collection of a water sample considered an option for non-invasive solution to detection of freshwater vertebrates

No freshwater vertebrate eDNA research being undertaken in Australia



2009

2011



Freshwater vertebrate eDNA research and development begins in Australia with the development of a tilapia specific eDNA detection technique

eDNA detection only developed for one freshwater vertebrate (tilapia)



2012

Concerns that eDNA detection is not sensitive enough and the technique unvalidated compared with other conventional techniques



eDNA detection techniques developed for three additional freshwater vertebrates (pest fish – oriental weatherloach, carp and redfin perch)

Current eDNA detection techniques only developed to sample for one species at a time -increases the length of time to obtain results



2013

2014



Framework developed to quantitate detection sensitivities, and through a rigorous research program results confirm eDNA detection to be more sensitive than electrofishing, fyke-netting and bait-trapping

No standardised method to maximise recovery rate of eDNA from a water sample



2015



Multi-species eDNA detection technique developed and validated

2016



Method validated to maximise the amount of eDNA that can be recovered and sampled from freshwater

Current eDNA techniques still rely on lab analysis for results, which can take time before knowing if there is a presence/absence of certain freshwater vertebrates in the system, and thus slow a management response



2017

eDNA detection not yet developed to test at the border for searching for new threats such as the red eared slider turtle and Asian black spined toad



2018



CISS funds research looking at real time eDNA analysis – development of a technique where you could analyse samples in the field and on the go, resulting in real-time management actions



eDNA analysis looking at developing markers that can be used for reptile (red eared slider turtles) and amphibians (Asian black spined toad)



eDNA detection deployed as part of an integrated biosecurity surveillance campaign

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