

MMCP Collaboration

eDNA: Review of applicability for monitoring and detecting biotic populations of the Murray-Darling Basin

This synthesis paper is a response to a question posed by the Murray-Darling Basin Officials Committee (BOC) in 2019, in relation to the value of eDNA. The objectives of this theme within the MMCP is to help the BOC address specific questions as they arise. These question will have relevance to the on-going management of Basin Assets.

Background

Environmental deoxyribonucleic acid (eDNA) is genetic material that has been shed from an organism (e.g. cells, faeces, urine and saliva).

- eDNA sampling collects all genetic material present within a sample (e.g. soil or water).
- eDNA is extracted using genetic markers to target species or groups of organisms (e.g. fish, plants, mammals).

Knowledge gaps

- Linking taxonomic and genetic information.
- Developing of appropriate genetic markers.
- Detection errors.

Recommendations

- Ongoing research to refine and develop appropriate standard eDNA methods.
- Incorporate eDNA methods to existing monitoring programs to identify sampling discrepancies.
- Establish centralised and accessible reference databases linking genetic and taxonomy.
- Developing a best practice framework incorporating appropriate Quality Assurance and Quality Control (QAQC) for all aspects of eDNA based methods.

Applications

- Threatened species.
- Invasive species.
- Rare or cryptic species.

Advantage

- Cheaper and require less effort.
- Non destructive (no need to collect & preserve specimens).
- Targeted (i.e. detection of rare species).

Further information

MMCP Collaboration (MMCP) is a project supported by the Joint State Governments and the Murray-Darling Basin Authority to generate and adopt freshwater ecological knowledge through collaboration, to maintain research capability and contribute supporting science to underpin the Basin-Wide Watering Strategy.

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