Establishing eDNA as a monitoring tool and determining a best practice protocols - Fish Assemblages in the Canning River

Freshwater ecosystems are highly dynamic systems that host a wide variety of biodiversity and offer essential services. Unfortunately, these systems are increasingly subject to threats such as altered hydrology and water quality, climate change and invasive species. Western Australian freshwater systems are not exempt from this global trend, and many need management to enhance and preserve their biodiversity values. To make management decisions, robust, efficient monitoring efforts are required to understand the current state and trends within the system and what management actions are required. Traditionally, animal biodiversity is monitored by physically capturing and identifying the target species, but over the last decade, environmental DNA (eDNA) monitoring has emerged as a complementary method to traditional methods. This study contrasted eDNA and traditional fyke netting for sampling aquatic vertebrates in the highly modified Canning River in Perth. Additionally, as an alternative to the more labour-intensive active filtration method, we investigated if passive eDNA sampling could be used successfully in a freshwater system, as previously published studies were in marine environments. The implications of this research are the development of an eDNA monitoring protocol that will complement traditional monitoring methods, leading to the potential for greater stewardship of the Canning River.