ABOUT eDNA

- Environmental DNA (eDNA) can be used to survey biodiversity in both freshwater and marine environments. In freshwater, the DNA of terrestrial species can be detected in addition to aquatic ones.

- Animals leave traces of DNA in the water; these are captured on a filter and sequenced to identify the species present (a process called 'metabarcoding').

- eDNA democratises acquisition of biodiversity data by making sampling easy enough for non-specialists to collect high-quality samples. This opens the door for a standardised citizen science approach to be applied globally.

- eDNA can revolutionise global capacity to obtain on-the-ground biodiversity data and address knowledge gaps on species distributions in poorly-documented and hard to access places including freshwater habitats.

- eDNA metabarcoding has been extensively validated for fish surveys and consistently outperforms conventional survey methods (netting, electrofishing) wherever side-by-side comparisons have been carried out. It also provides at least as much data as conventional survey methods for terrestrial mammals and amphibians, as well as valuable records of birds and reptiles.

- DNA reference libraries remain incomplete in many parts of the world but can be built up alongside a large-scale eDNA sampling campaign, creating valuable national resources and institutional capacity building within each country. As reference databases grow, species names can be retrospectively assigned to previously unidentified sequences in the metabarcoding datasets, thereby confirming species presence in a library of previously collected samples.
- Even in the absence of good reference databases, a wealth of ecological information is obtained from eDNA data, including diversity metrics, connectivity assessments and tracking of community change. Unidentified species are named at higher taxonomic levels (family or genus).
- DNA left over from the initial analysis can be stored and the same samples used later to generate data on additional taxonomic groups e.g. invertebrate groups or specific human pathogens.

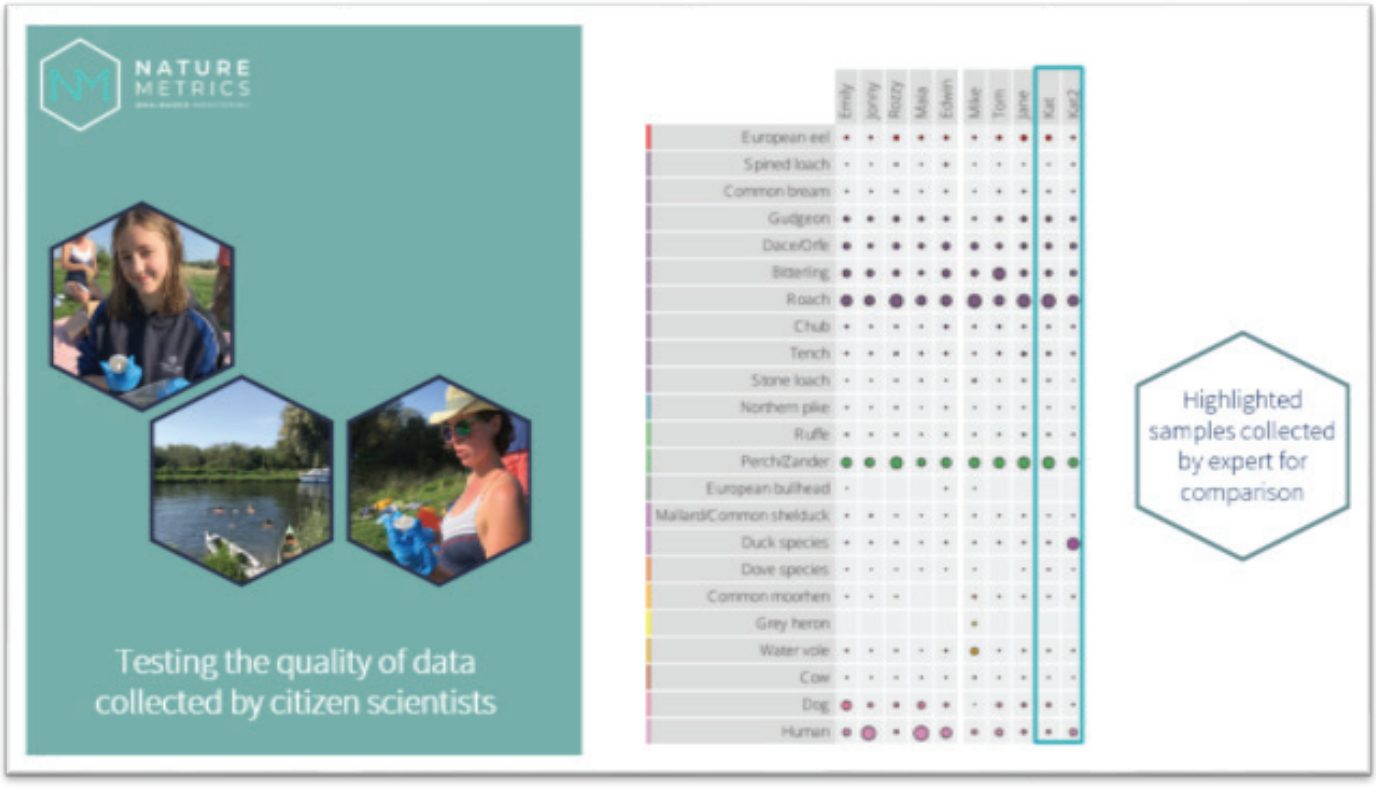

Figure 1: Citizen scientists of all ages can collect high quality eDNA samples with minimal training