NaturMetrics' technology can be used to help businesses measure their impact on biodiversity | Photo source IUCN and NatureMetrics

USING DNA TO MAKE ENVIRONMENTAL SURVEYS EASIER AND CHEAPER

SUSTAINABILITY

New techniques for DNA sequencing are allowing a startup to scale up environmental surveys – supporting more rapid decision making

Spotted: Environmental monitoring is key for environmental protection strategies. Monitoring data helps policymakers set priorities and activities. At the same time, businesses are faced with a growing need to report on biodiversity, yet monitoring has traditionally been costly and difficult to perform at scale. For biodiversity startup NatureMetrics, the answer is in environmental DNA (eDNA), DNA that is released from organisms into the environment through faeces, urine, slime, scales, and other forms.

All living things leave DNA in their environment, and this eDNA is easy to collect through sampling. NatureMetrics carries out tests in a facility purpose-built for metabarcoding — a method of DNA sequencing that can identify multiple species in a single sample. The system can process more than 100 samples in parallel, reducing sequencing costs and time. Samples can be collected with NatureMetrics own iDNAture kits or as bulk samples of organisms – such as insects collected in a trap.

The results of the tests can inform organisations not only about what organisms are present, but also their abundance and distribution. Tracking organisms in the environment over time can not only broaden the understanding of biodiversity, it also makes it easier to analyse the factors that drive change in biodiversity, and to rapidly detect new invasive species and pathogens.

NatureMetrics' system is of tremendous use not only to ecologists and governments, but also to businesses, which are faced with increasing regulations on reporting their impacts on biodiversity. The company points out that they can, "deliver biodiversity data for environmental impact

assessments ... Combining deep scientific expertise with our global experience of field-sampling, we offer bespoke solutions to suit [individual] project needs."

We are in the midst of a DNA revolution. From CRISPR to mRNA vaccines, new tools and techniques are leading to advances in health, technology, crop development, and much more. At Springwise, we have already seen developments in this space such as sequencing bacteria DNA to identify hidden building damage, and using plant DNA to allow crops to 'communicate'.

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Takeaway:

Ecological monitoring and biodiversity surveys are a vital tool not only for managing and measuring the impact of human activities on wildlife, but also for tracking the presence of pathogens and invasive species that can harm both human and animal health. Until the development of commercial-scale DNA technologies like those used by NatureMetrics, environmental impact assessments (EIAs) were costly to conduct and often required a large number of experts in the field. By providing tools to allow organisations to collect their own field samples, and by scaling up the processing of samples, companies like NatureMetrics are transforming the field and allowing a much greater number of EIAs to take place. This in turn makes it much more likely that organisations will carry out frequent EIAs and be in a position to take mitigating actions much earlier – before an ecosystem is irrevocably damaged.