sse
Renewables

AI SPECIES
RECOGNITION JOURNEY

PUFFINS
MONITORING
WILDLIFE ON LAND

In Summer 2021, on the Isle of May, SSE Renewables trialled a new way to count puffins. We combined artificial intelligence, machine learning and image recognition technology. This project, which was completed in collaboration with Microsoft, Avanade and NatureScot, could transform the way companies, such as those building developments, understand the impacts on local wildlife.

We placed four cameras on the island to capture live footage of the puffins. Working with Avanade, SSE Renewables trained an artificial intelligence model to recognise images, structures and objects to eventually discern puffins.

This Artificial Intelligence tool can now spot the puffins, separate them from background images such as rocks, and track them, frame by frame, as they move around.

The live trials were successful and approved by NatureScot. This technology is now being rolled-out to field use in June of this year.

SALMON
MONITORING
WILDLIFE IN WATER

Following our success on the Isle of May, further trials were undertaken to explore the use of Artificial Intelligence to count fish at our hydro assets. This is something SSER has carried out since the 1950s to monitor salmon upstream migration. Crucially, we had to train the Artificial Intelligence model to detect if fish are swimming up or downstream, to ensure accuracy as fish swimming downstream are not migrating.

A proof-of-concept project started last Autumn with remarkable results. The Artificial Intelligence model achieved accuracy of 95%, an improvement on our existing counting method.

Live trials of the new counting technology will take place at several sites. Throughout 2022 during the annual salmon migration.

The true test will be if it can operate successfully and accurately in the difficult conditions found within our fish passes. If so, this will provide hugely valuable data in monitoring Atlantic Salmon numbers, at a time when populations are in massive decline.
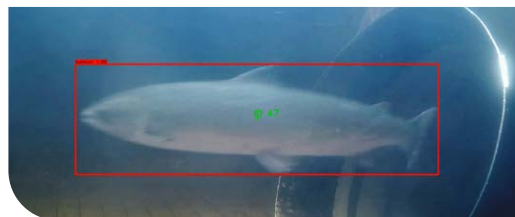
THE DEEP AQUARIUM
MONITORING WILDLIFE
IN LOW VISIBILITY

In February 2022, the SSER team conducted a proof-of-concept trial at The Deep aquarium in Hull, UK. With the objective of developing more advanced Artificial Intelligence detection capabilities in a subsea environment with low visibility. Video cameras were coupled with the use of sonar, lidar and hydrophones to identify and track various species.

Lidar is a 3D scanning technology that uses light to map terrain. Waves of light beaming bounce off objects, returning like an echo. In this way, an accurate and detailed image of the scanned area can be obtained. Sonar can perform many scans per second. Sound travels through water more effectively than light, and so it is an excellent tool for tracking movement underwater. Hydrophones can be used to identify an animal by sound. By converting sound into spectrograms, a computer vision model can be trained to identify individual species.

Bringing all these outputs together we can see a vivid picture of marine life,even in low visibility conditions.