Our Public Service 2020

Public Service Innovation Fund 2019
Final Monitoring Report

Project Code: PSIF190137

Project Title: Telemetry PV Panel Supply & Remote Data Recovery

Project Lead: Pat Doherty

Date of Report: 31/12/19

Progress report on timelines, milestones and confirmation of ability to delivery on Project Outcomes by December 2019

Proposal Outline

A research team within IFI had been experiencing problems while surveying the movements of fish on the Owenriff and Erriff systems using radio telemetry.

Problems included:

- Frequent replacement of heavy 30kg batteries at stations which were located on rough terrain in isolated locations which was likely to cause injury to staff;
- Accessing the stations to manually download information from the telemetry data loggers.

The solution was to use a Photovoltaic (PV) panel to provide a consistent supply of power to the battery to eliminate the manual handling & slip, trip & fall hazard. Furthermore a SIM card was connected to the data-logger to allow the information to be uploaded to the IFI network making it remotely accessible to researchers. This provides the information in a safe manner which is time saving, economical by eliminating travel and subsistence costs and also reducing our overall carbon footprint. A basic schematic of the system is outlined below in figure 1.

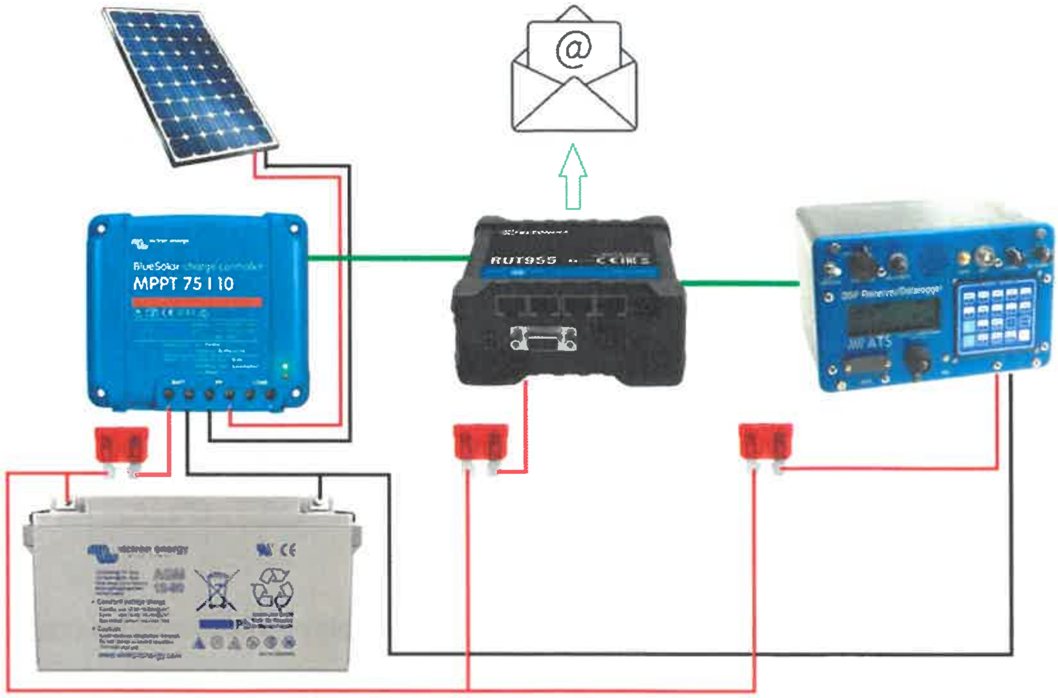

Figure 1. Schemcatic of PV powered radio telemetry station with remote data recovery.

Funding Approval Letter of Award: 2nd August 2019

Tender Submitted to E-tenders 25th September 2019

Contract awarded 18th November 2019

Assembly of the telemetry stations and beta testing December 5th -15th 2019.

Units erected at the following locations subject to suitability of lands underfoot for safe erection/installation 15th – 20th December 2019.

A prototype of the system was erected on the Owenriff in the early stages. The radio aerial receiver can detect tagged fish from a distance of 300m. The use of the prototype helped to identify some weakness in the system. Adjustments have been made to the height of the panel and an increase in the size of the panel used from 90W to 115W. The materials used at each station have also been upgraded.

Plate 1 shows the setup of the prototype and plate 2 gives an indication of the remote and untempered nature of the station locations.

Plate 1. Prototype Station

Plate 2. Location of prototype.
The above photograph gives an indication of distances and terrain traversed carrying a 30kg battery and laptops for download. These stations are located, as can be seen, in remote areas and staff time and vehicle usage will be greatly reduced along with a significant health and safety risk.

The telemetry station locations are depicted on the maps in figures 2. & 3.

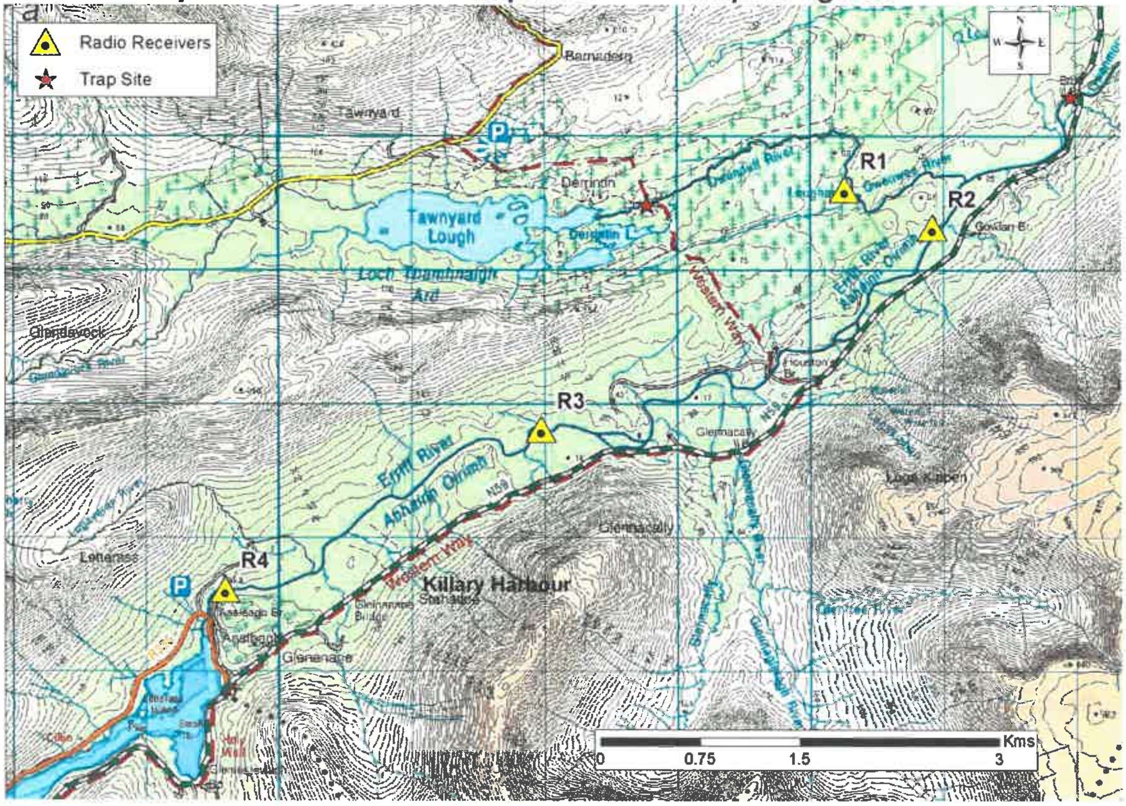

Figure 2. Erriff Station Locations

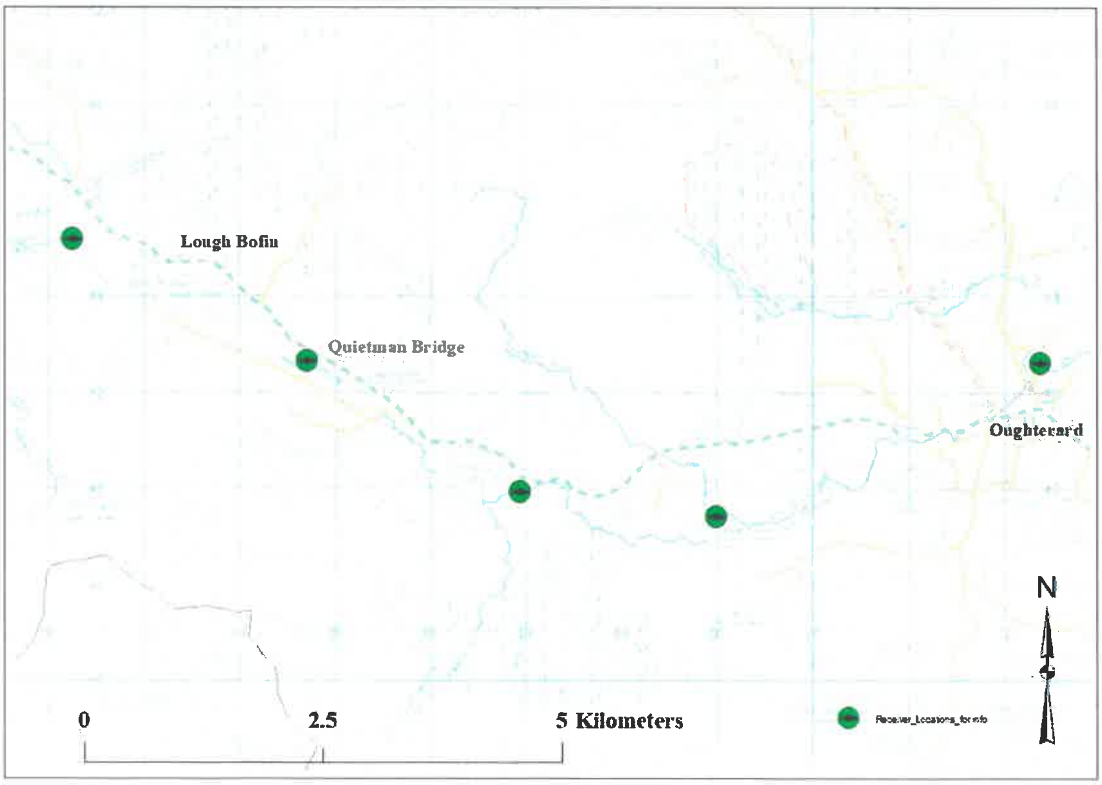

Figure 3. Owenriff Station Locations

Our Public Service 2020

Upgrade to prototype materials using Innovation Funding

The prototype plastic housing for the data-logger, battery and SIM router has been replaced with a secure stainless steel locker. The temporary wooden post is replaced with galvanized steel. The battery used at the stations has also changed to a safer sealed unit. The 12V 220Ah Gel Deep Cycle Battery are more suitable to store energy in stand-alone solar systems. In these batteries the electrolyte is immobilized as gel. Gel batteries in general have a longer service life and better cycle capacity than AGM batteries. The batteries are compliant with both CE and UL specifications in ABS fireproof containers

Plate 3. New telemetry station in situ.

These stations were finally deployed after delays from weather issues and also galvanizing of the steel.

Outcome

These units are now deployed and there has been and will be significant savings in staff time (travelling to and from the location to change out the battery, every 2-3 weeks), IFI's carbon footprint due to a lot less mileage travelling to remote locations. Weather is no longer a factor in being able to reach the equipment as the information is uploaded via an SMS card and issued as an email. There was a glitch with frequencies emitted from the equipment that interfered with the recording of fish as they were similar frequencies. Overall a much more effective and efficient way of working with a serious health and safety risk eliminated in the process. The stations can be relocated quite easily so that they can be used on other projects in different locations.

Signed: P Doherty