Natural Flood Management Status Report Summary

Final Report

Natural Flood Management Review Part A:
A status report of Natural Flood Management in Wales and its major river catchments

March 2023

Prepared for:

Welsh Government

Llywodraeth Cymru
Welsh Government

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Document Status

Issue date	22 March 2023
Issued to	Dickon Wells - Welsh Government
BIM reference	HRE-JBAU-XX-XX-RP-EN-0031-S4-P03-NFM_Status_Summary
Revision	S4 P03
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Contract

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This report describes work commissioned by Welsh Government, by an instruction dated Monday 28 February 2022. The Client's representative for the contract was Dickon Wells of Welsh Government. Eleanor Pearson and Mary Baldwin of JBA Consulting carried out this work.

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Acknowledgements

JBA would like to thank the following organisations for their contributions to this review: Welsh Government, Natural Resources Wales and Powys County Council.

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Abbreviations

GIS.....Geographic Information System

NFM..... Natural Flood Management

Definitions

Natural Flood Management (NFM) is a process whereby measures are put in place that work with the natural environment to store, slow and infiltrate flood waters to reduce flood risk (Environment Agency, 2018).

1 Introduction

As part of the Natural Flood Management (NFM) review project (the 'Project') for Welsh Government, a Status Report of NFM has been derived. The Status Report intends to provide information regarding existing NFM projects (and wider environmental projects with NFM benefits) across Wales. Data to inform the Status Report was collected by sending an information proforma to partners to complete. No additional engagement with specific projects was undertaken. for a total of 51 projects (Figure 1-1) were identified. The Status Report acts as a baseline of current NFM across Wales and intends to be updated beyond the length of this Project.

The Status Report has been created in a Geographical Information System (GIS) format to allow for easy visualisation of NFM projects across the country. This technical note accompanies the GIS Status Report to demonstrate an overview of the NFM projects included within the work and to summarise the status of NFM across Wales.

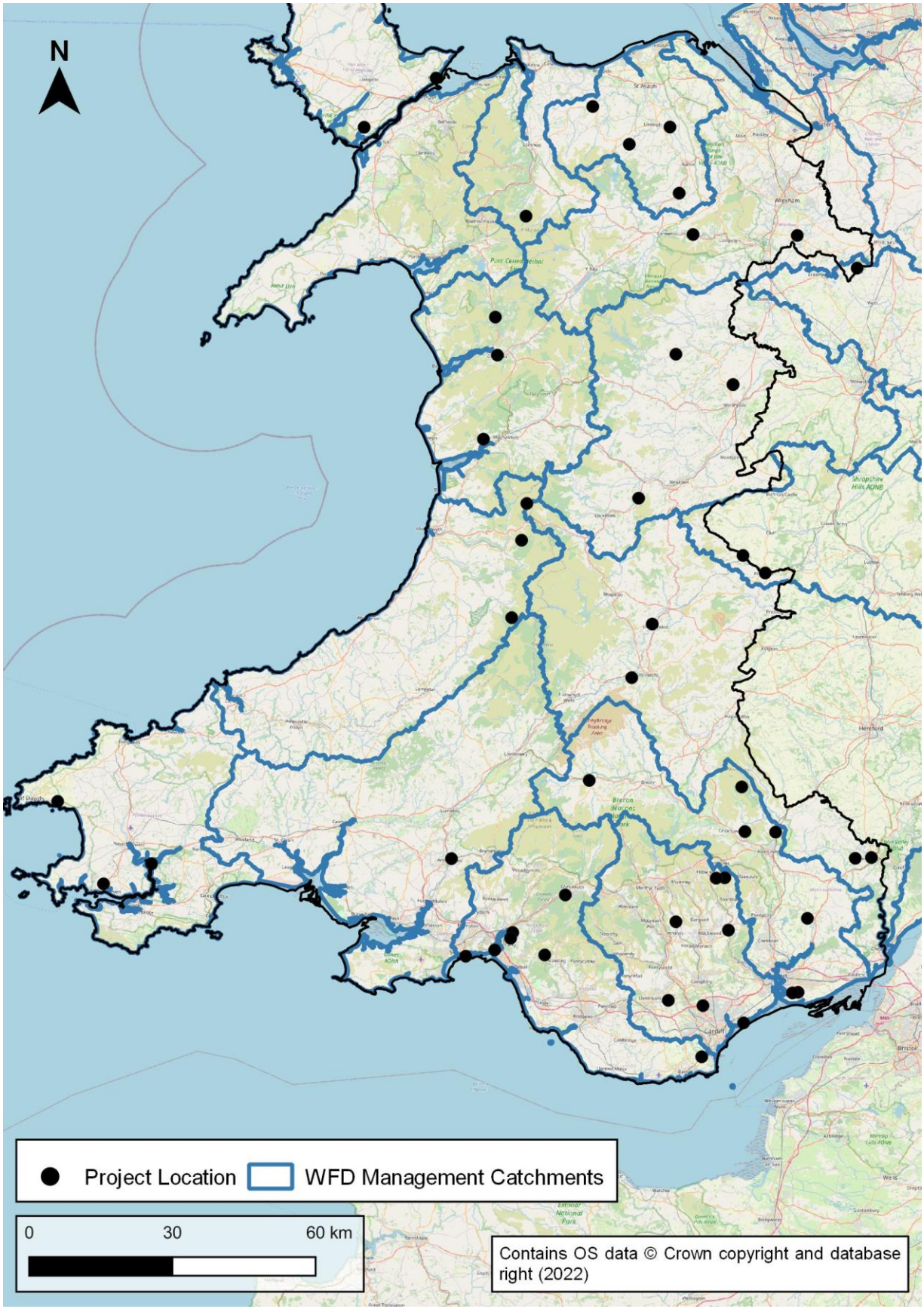

Figure 1-1 Locations of NFM projects across the country.

2 Overview

2.1 River Catchments

The projects identified within the Status Report are located in numerous Water Framework Directive (WFD) Management River Catchments, with multiple management catchments containing more than 1 NFM project. Of the 16 WFD Management Catchments (larger-scale), 15 have at least one NFM project (Figure 2-1). Whilst 33 out of 94 WFD Operational Catchments (smaller-scale) have at least one NFM project (Figure 2-2). It should be noted that those projects which span more than one Operational Catchment, such as the Monmouthshire wide NFM project, have not been included within the count of projects within Operational Catchments as not enough information is known about exact locations, these have been added to a "Multiple" category, within which are 7 projects.

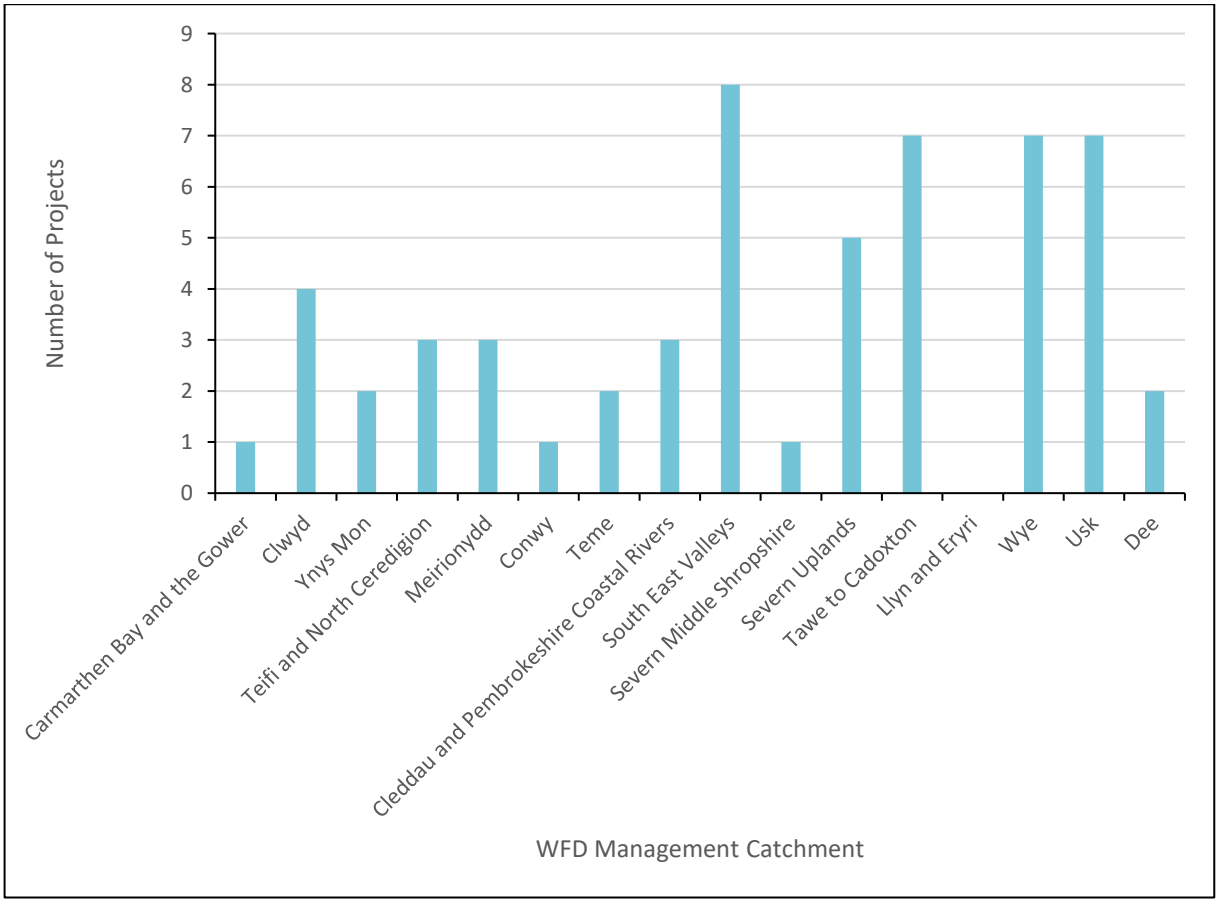

Figure 2-1 The number of projects within each management catchment

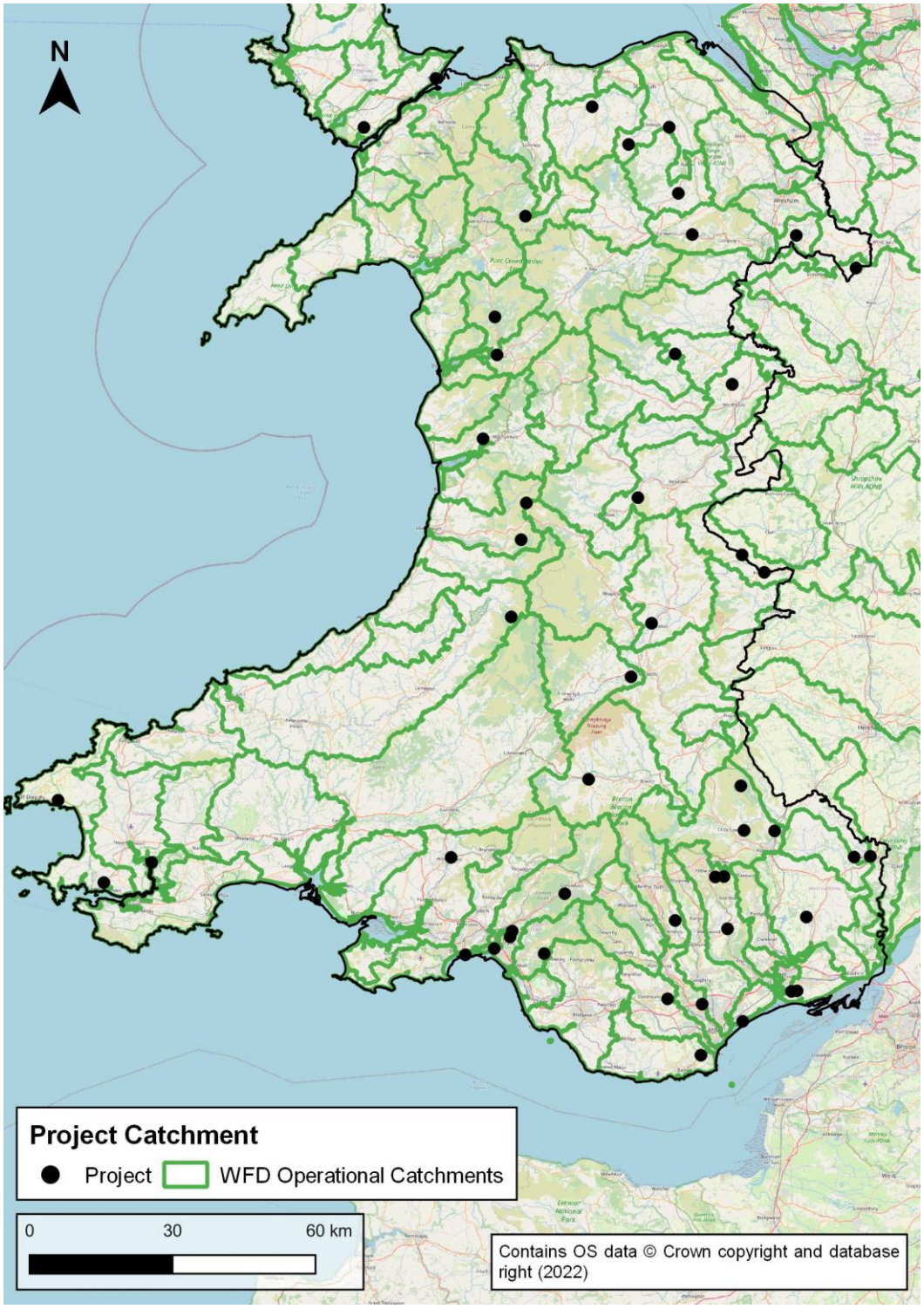

Figure 2-2 Distribution of projects across the country by their WFD Operational Catchment

2.2 Project Type and Stage

The distribution of projects across the country by their known type is shown in Figure 2-3. Across the different project types, approximately 18 were a conceptualisation or feasibility study. 17 projects were construction projects and similarly 16 were implemented projects (Figure 2-4).

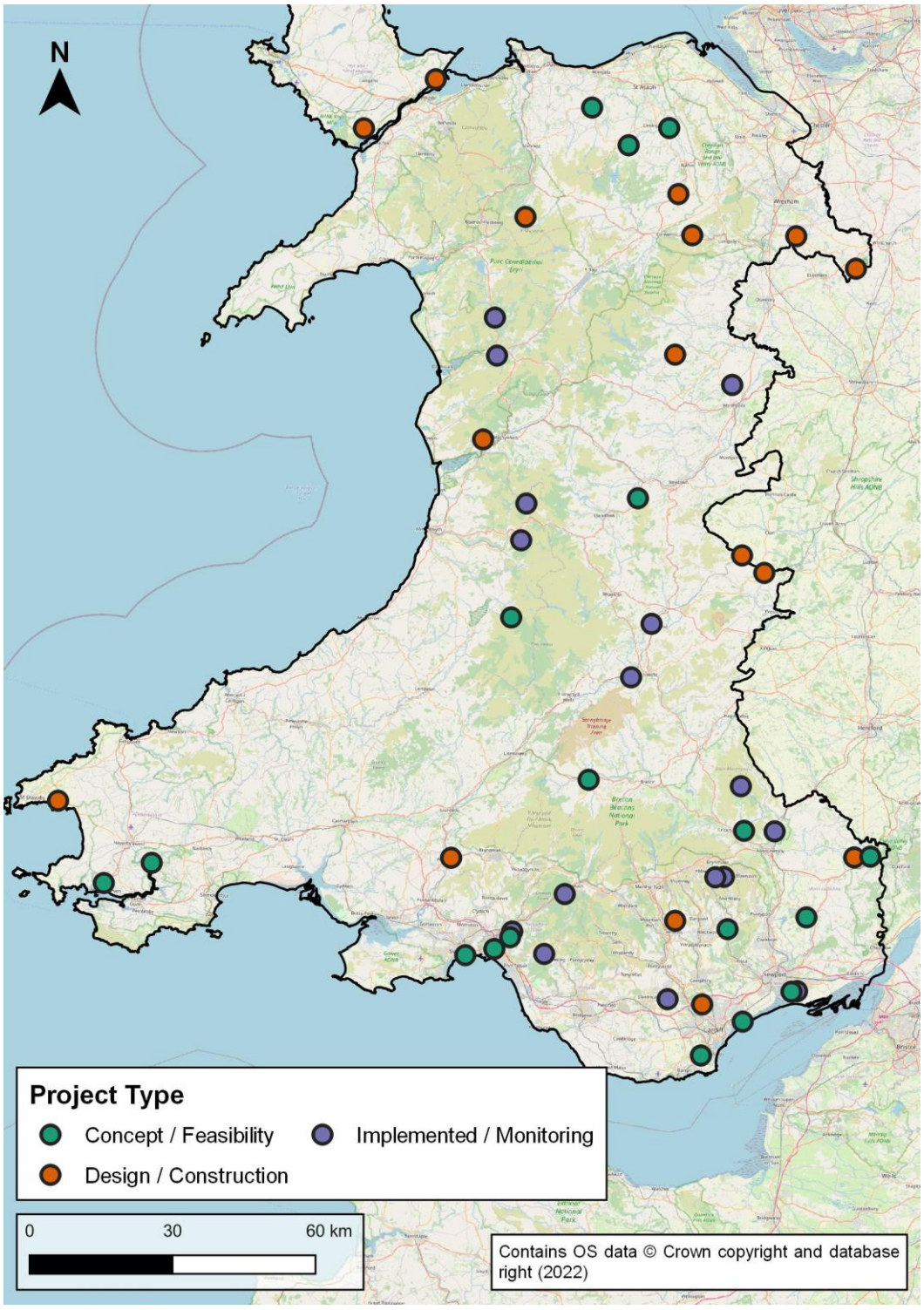

Figure 2-3 Distribution of projects across the country by their known type

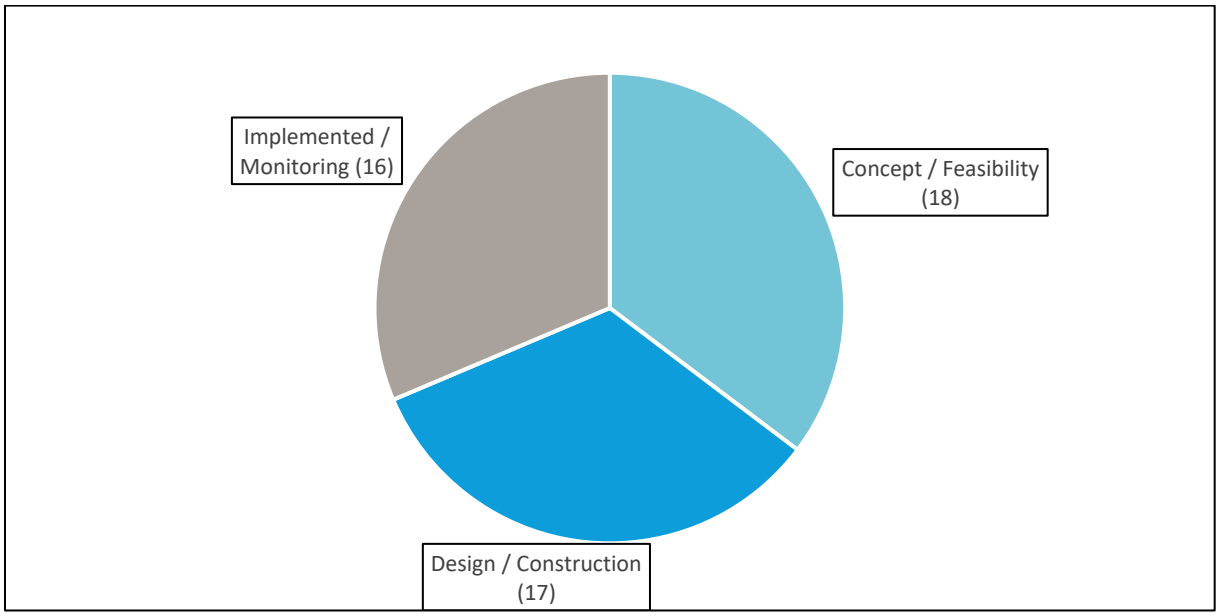

Figure 2-4 Summary of NFM projects within each project type

2.3 Start and End Dates

There was a notable lack of data received regarding start and end dates of projects (Figure 2-5). Of the known dates, four projects were "long-term" (> 5 years), including Pennal 2050, Pumlumon. Nant Alan and Upper Conwy. Nineteen projects have end dates within the last two years (2020 - 2022), however many of those expected to finish in 2022 are currently still under construction. It is likely COVID-19 has caused disruption to projects and caused a delay in end dates.

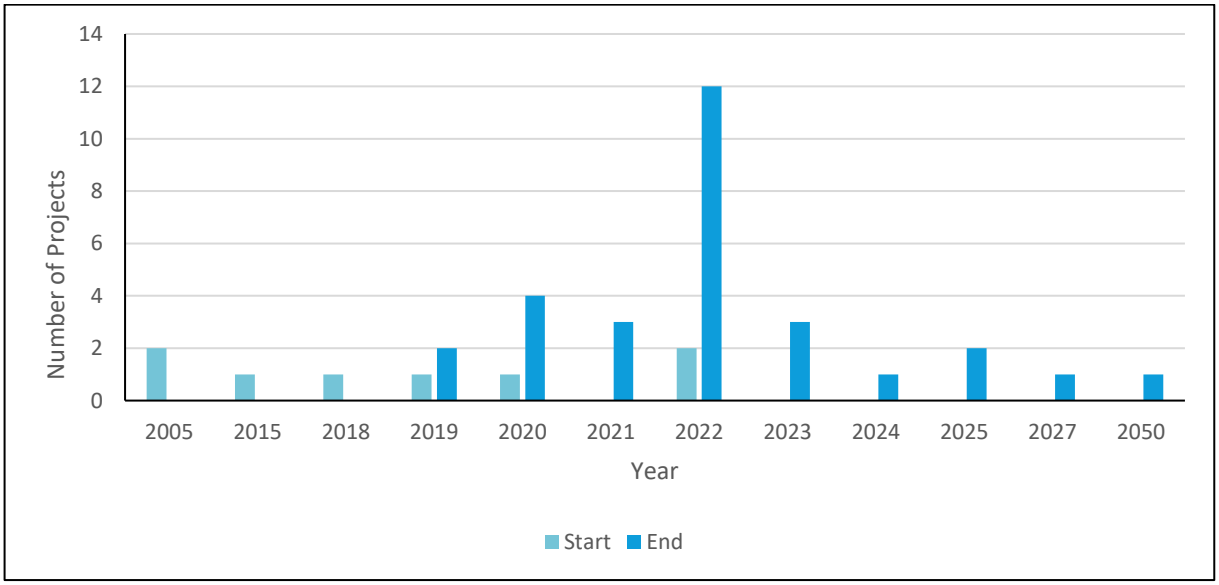

Figure 2-5 The known start and end dates for projects

2.4 Project Partner(s)

A vast range of project partners are involved in NFM in Wales (Figure 2-6). A large proportion of these were non-government organisations with local authorities or government also often supporting (Figure 2-6).

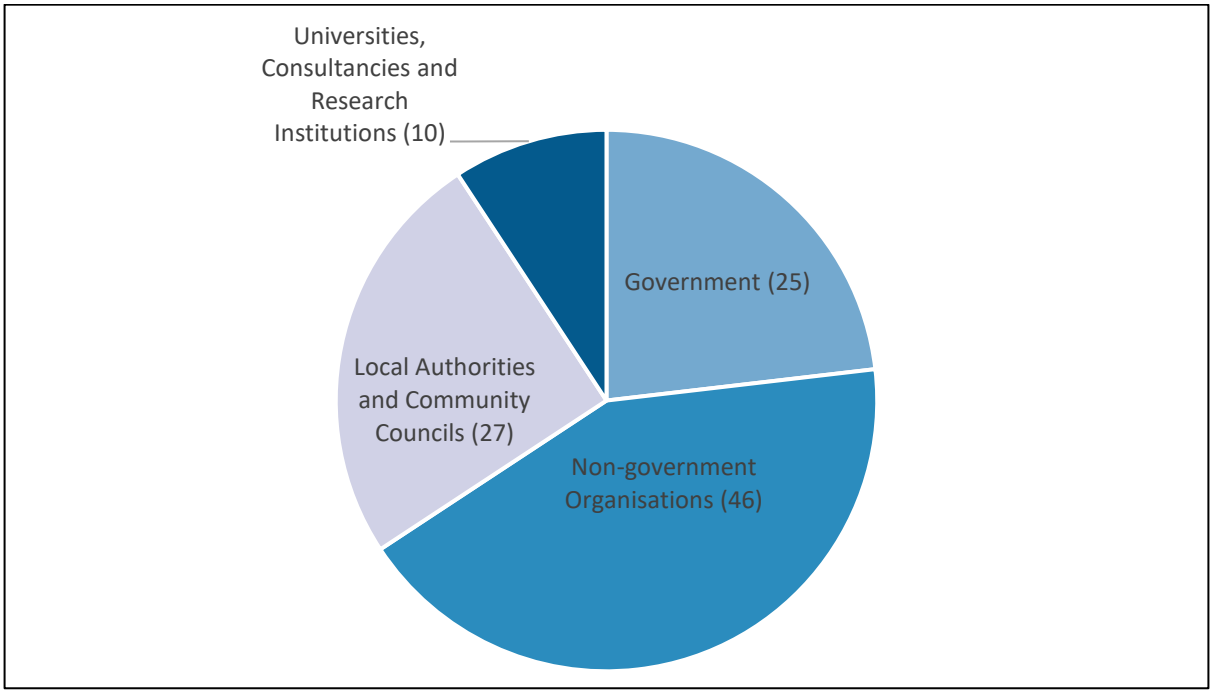

Figure 2-6 Summary of projects by their project partner(s)

2.5 Funding Mechanisms and Cost

Approximately 51% of projects were funded by the Welsh Government via a variety of programmes. A breakdown summary of the costs of the projects included in the status report is shown below (Figure 2-7). Unfortunately, the cost of many of the schemes was unknown/not provided.

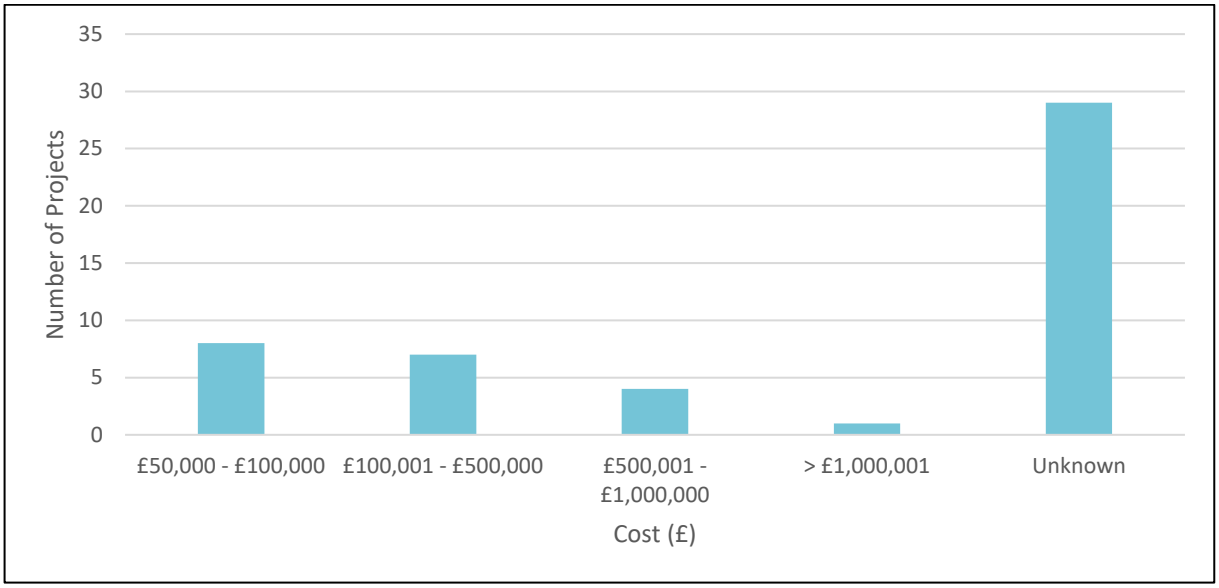

Figure 2-7 Summary of the cost of NFM projects across Wales

2.6 Primary Aim

NFM was noted as the primary aim for the majority of schemes included within the status report (approximately 29 projects). Other frequent project aims include habitat restoration or improvement and catchment or river restoration. The distribution of projects across the country by their known primary aim is shown below in Figure 2-8.

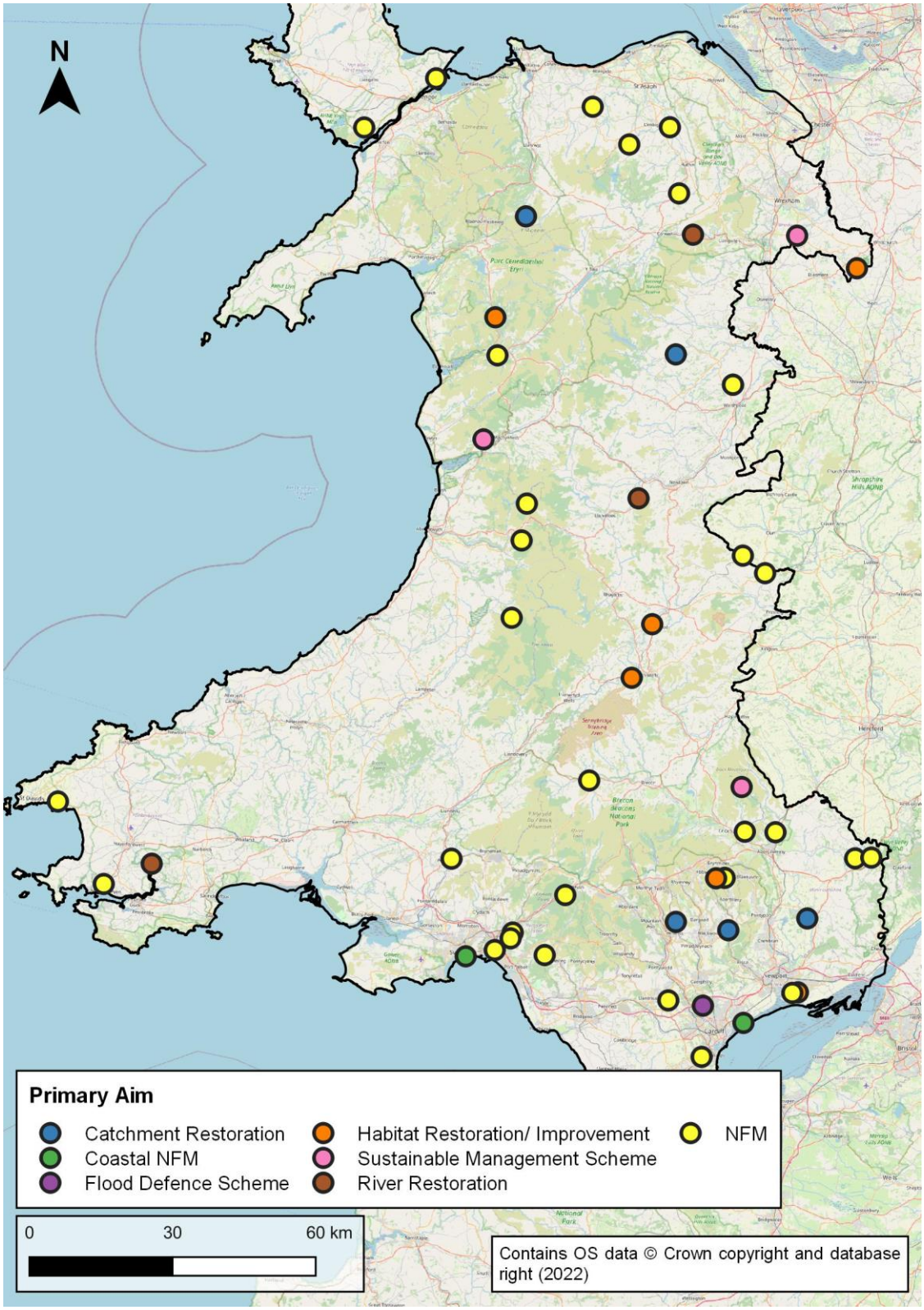

Figure 2-8 Distribution of projects across the country by their known primary aim

2.7 Natural Flood Management Measures

For the purpose of this status report, the measures listed below were grouped more widely than within the literature review previously completed. Consequently, leaky barriers, woodland planting and soil and land management were the measures most frequently noted within the status report. Headwater drainage and run-off pathway management were noted less frequently. An overview of the number of projects which discussed each measure is shown below (Figure 2-9).

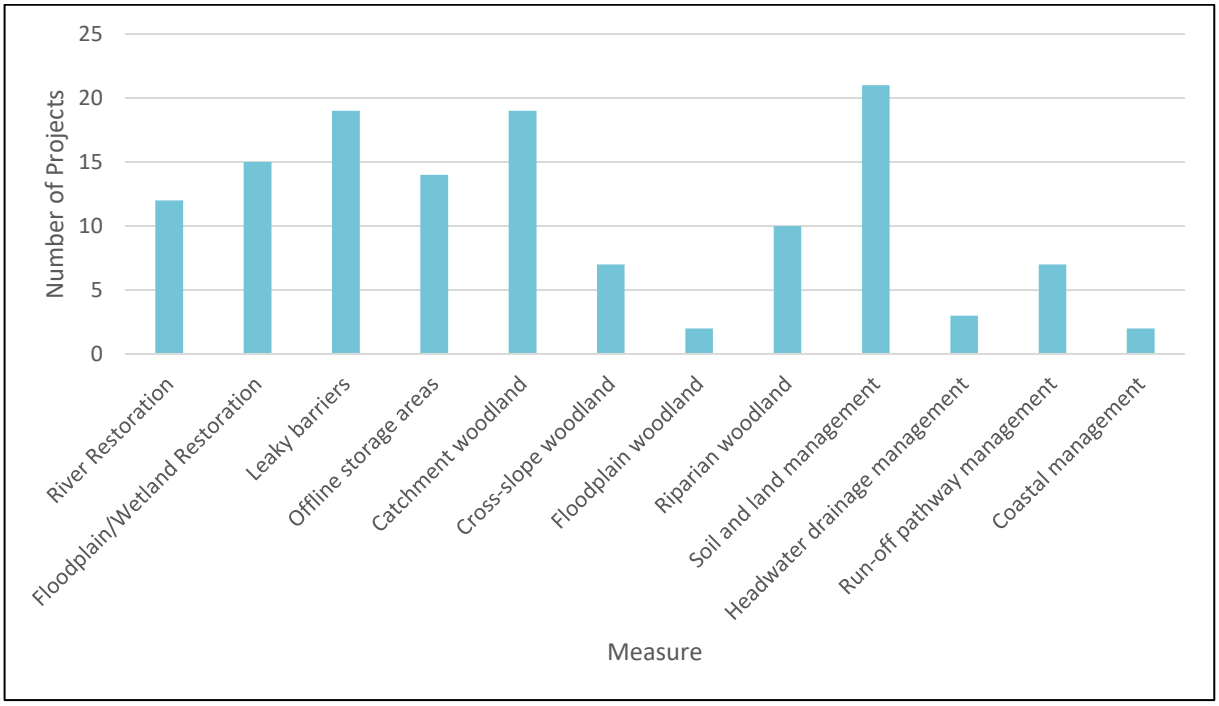

Figure 2-9 Overview of the NFM measures used in projects across Wales.

2.8 Other Benefits

A wide variety of other benefits across the projects were cited, with habitat and water quality referenced the most frequently. Cultural activity, climate regulation and aesthetic quality were only referenced on a few projects (Figure 2-10). It should be noted, not all projects cited additional benefits.

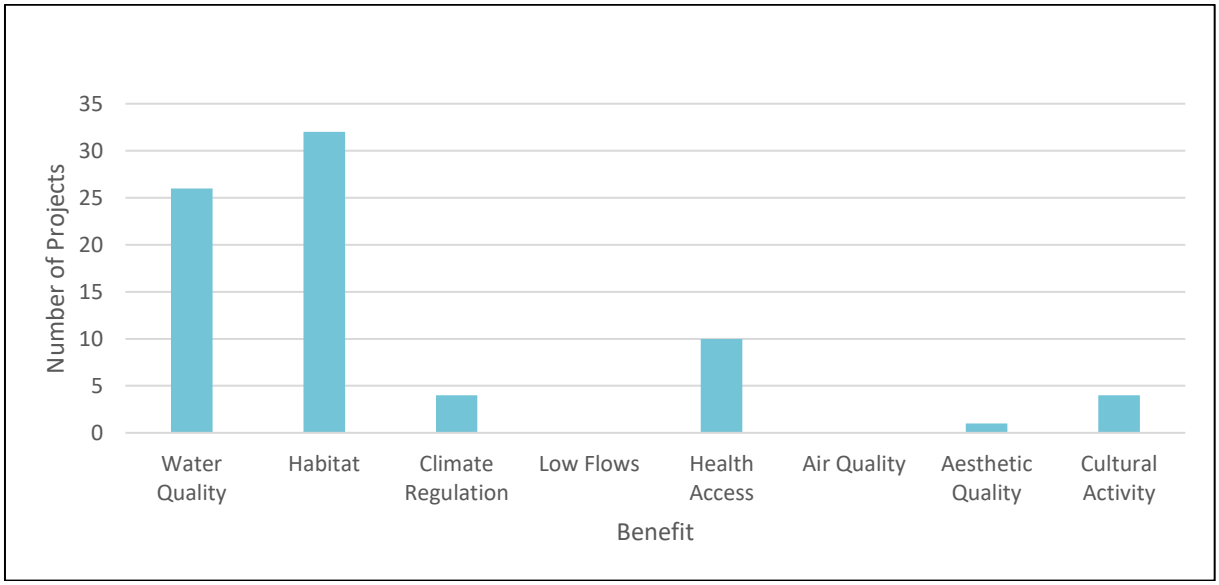

Figure 2-10 Other benefits quoted within project information

3 GIS Layers

3.1 Overview

The main shapefile "All Projects.shp" contains a georeferenced point of the approximate location of each project, and an associated attribute table. In the attribute table, the associated data for each project is stored in columns/categories.

The co-ordinate system for the data is British National Grid (EPSG: 27700).

3.2 Column Description

The Status Report shapefile contains information regarding each project as described below in Table 3-1.

Table 3-1 Description of the data held within the Status Report shapefile

Column Name	Description
Unique ID	A unique ID per project as the ID of the WFD Management Catchment and an alphabetic identifier for those catchments where there are multiple projects.
Name	Name of the project as provided in the information proforma.
Start Date	Start date of the project.
End Date	Known or proposed end date of the project.
Location	Location of the project as provided in the information proforma. Used as a basis for the georeferencing of the points within the shapefile.
ManCatName	WFD Management Catchment the project is located within. The WFD Management Catchments are the unit of geography for which action plans are drafted in implementing the WFD.
OpCatName	WFD Operational Catchment the project is located within. The WFD Operational Catchments are a way of grouping waterbodies together for the purposes of economic appraisal. They are not always hydrologically correct catchments as they may have been grouped based on pressures and measures rather than hydrology.
Partner(s)	Name of the known project partners as provided in the information proforma.
Funding	Name of the known funding mechanism used by the project as provided in the information proforma.
Cost	Quantity of funding allocated to the project as provided in the information proforma. There is uncertainty expected in these values depending on the stage of the project and what the funding has been attributed to.

Column Name	Description
Proj_Type	The type of project to date, where known, project stages to date have also been included.
Prim Aim	The primary aim of the project as the dataset includes both NFM specific projects but also wider environmental projects which have an NFM benefit.
Measures	The known measures which have been proposed and/or implemented in the project.
O_Benefits	The multiple benefits aiming to be achieved as part of the project.
AddInfo	Any additional information to clarify entries in other columns.

3.3 Combining shapefiles in QIS for multiple choice attributes

Most of the categories within the main shapefile are either a direct text input or a single choice from a drop-down list, both of which are set/controlled by the settings for the main shapefile (Figure 3-1and Figure 3-2).

For the categories where multiple selections were required (measures, benefits etc), QGIS requires another shapefile be created to store the options for each category. These shapefiles (currently named measures_test, other_benefits_test, and type_test) store their respective answers in their attribute table (Figure 3-3) and have no geographical information. They can also be edited (e.g. to add more answers) independently of the main shapefile. These shapefiles can be selected in the main shapefile settings (under the 'Attribute Form' tab) as the answer options to their respective categories using the 'Value Relation' widget type (Figure 3-4).

These shapefiles will have to be re-selected in the settings if they are moved between folders or servers and must be loaded in the same QGIS project as the main shapefile. As the attribute form settings are saved into the QGIS project itself rather than the shapefiles, all dropdown menus and multiple selection settings, etc., must be redone if a new QGIS project is used.

The main shapefile attribute table can be populated by direct input if a new project point is created (Figure 3-5) or edited into the attribute table if the project has already been added.

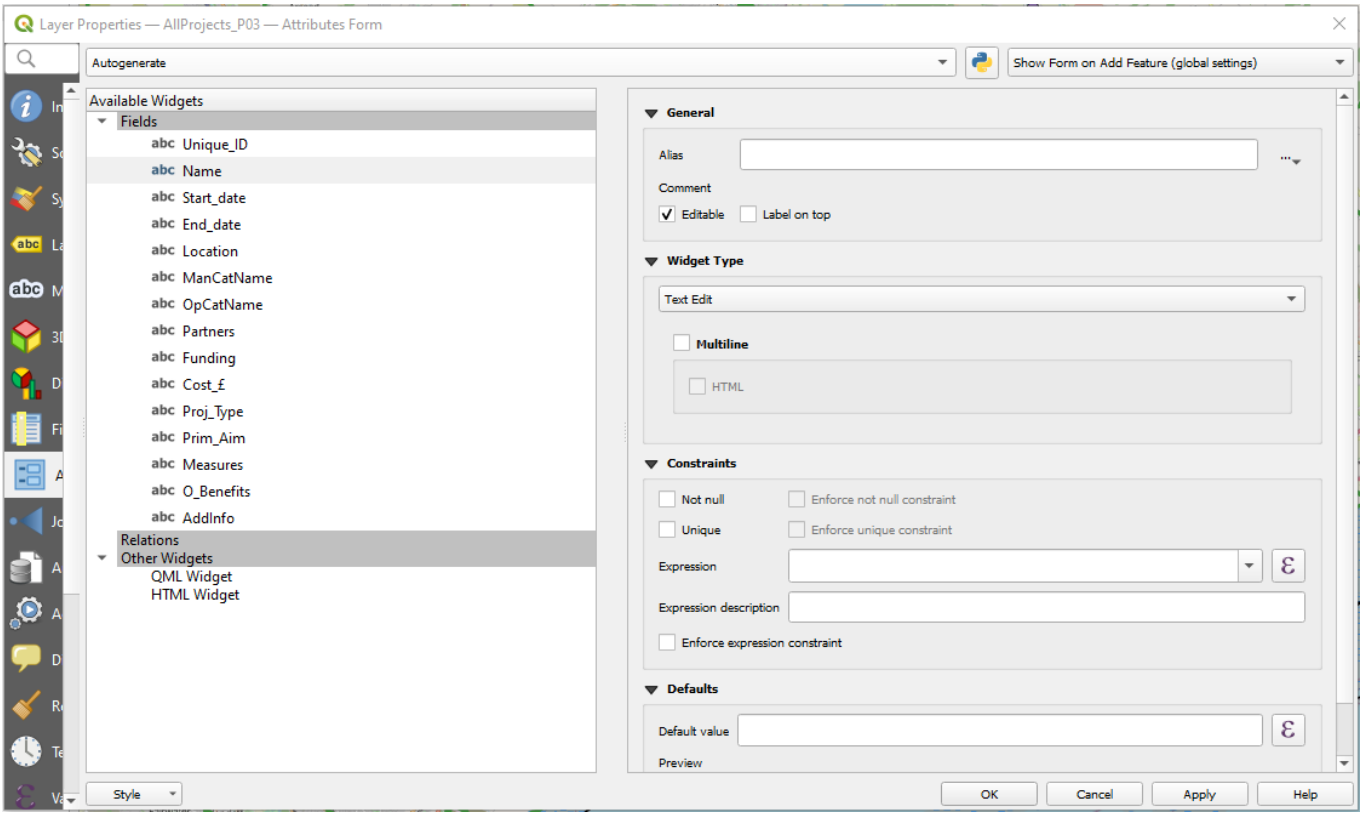

Figure 3-1 Example of text input category

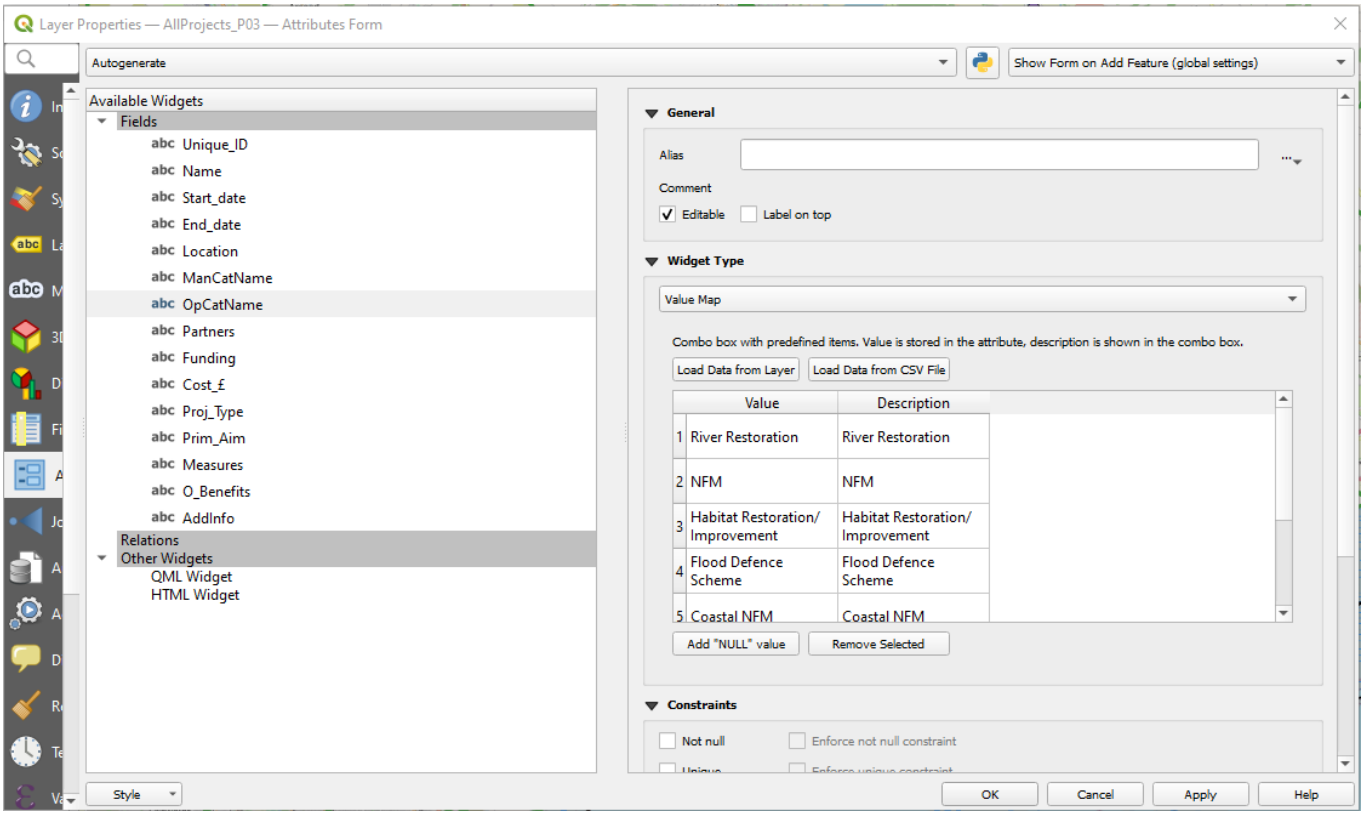

Figure 3-2 Example of single-choice dropdown menu input category

measures_test :: Features Total: 12, Filtered: 12, Selected: 0

	id	Measure
1	1	River Restoration
2	10	Headwater drainage management
3	11	Run-off pathway management
4	12	Coastal management
5	2	Floodplain/Wetland Restoration
6	3	Leaky barriers
7	4	Offline storage areas
8	5	Catchment woodland
9	6	Cross-slope woodland
10	7	Floodplain woodland
11	8	Riparian woodland
12	9	Soil and land management

Figure 3-3 Example of multiple-choice shapefile

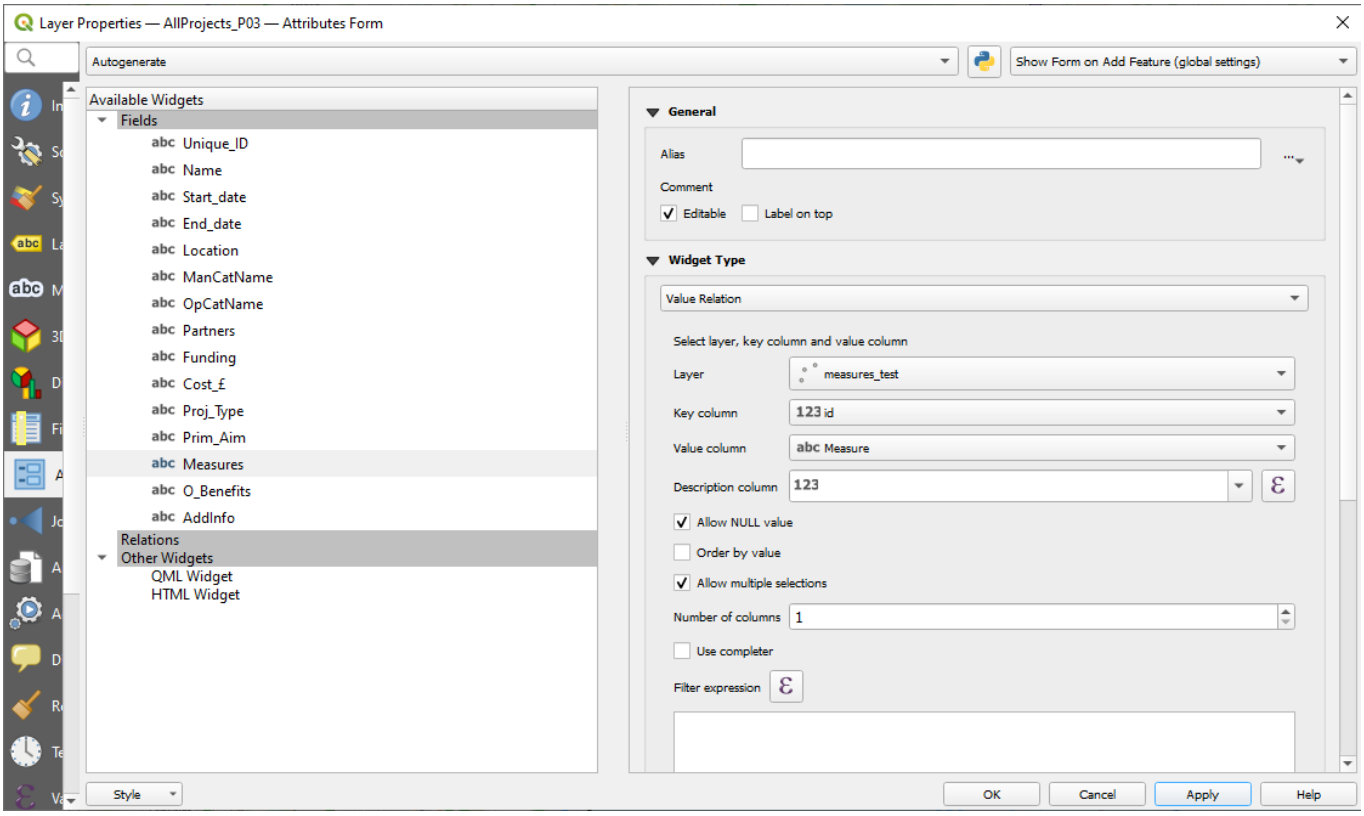

Figure 3-4 Example of multiple-choice input category

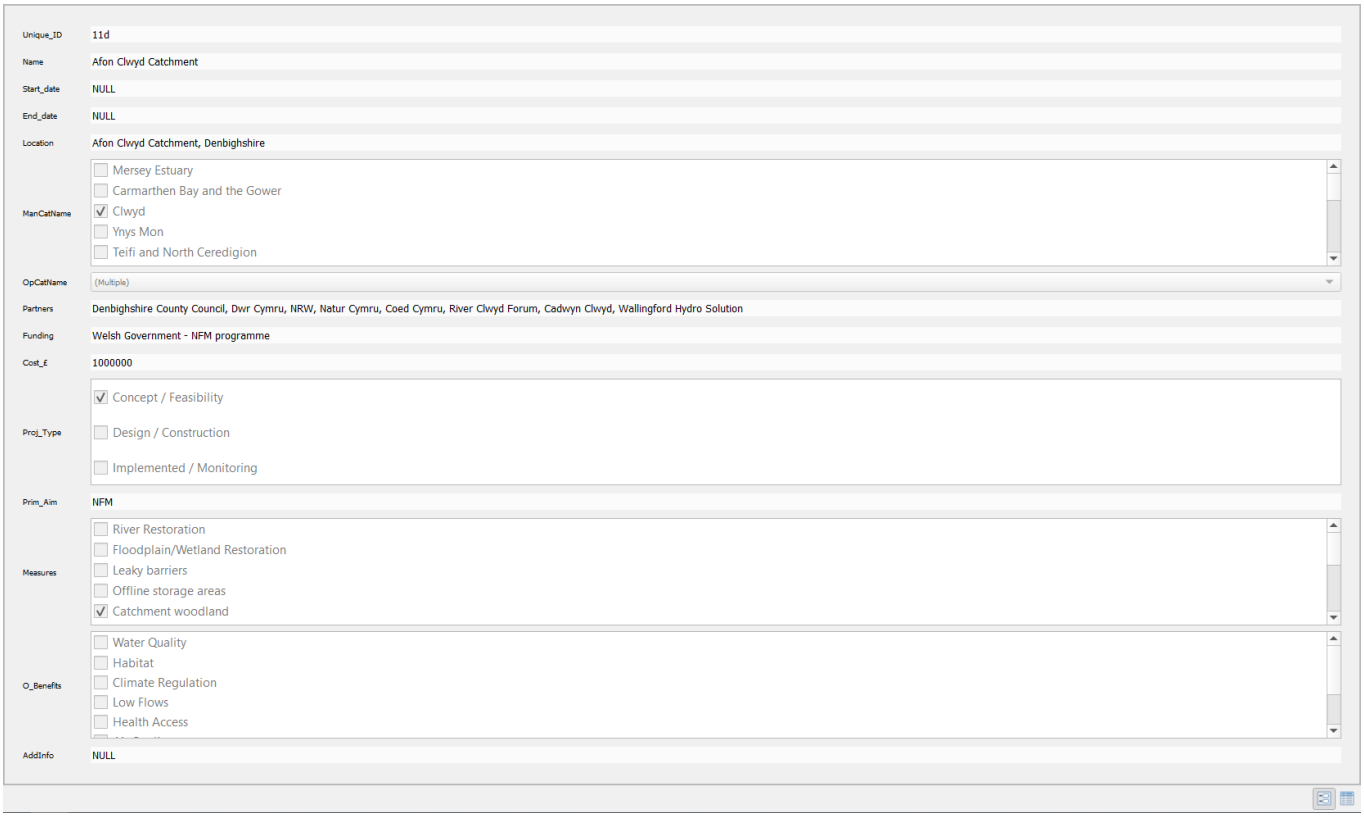

Figure 3-5 Direct input of project information into attribute table.

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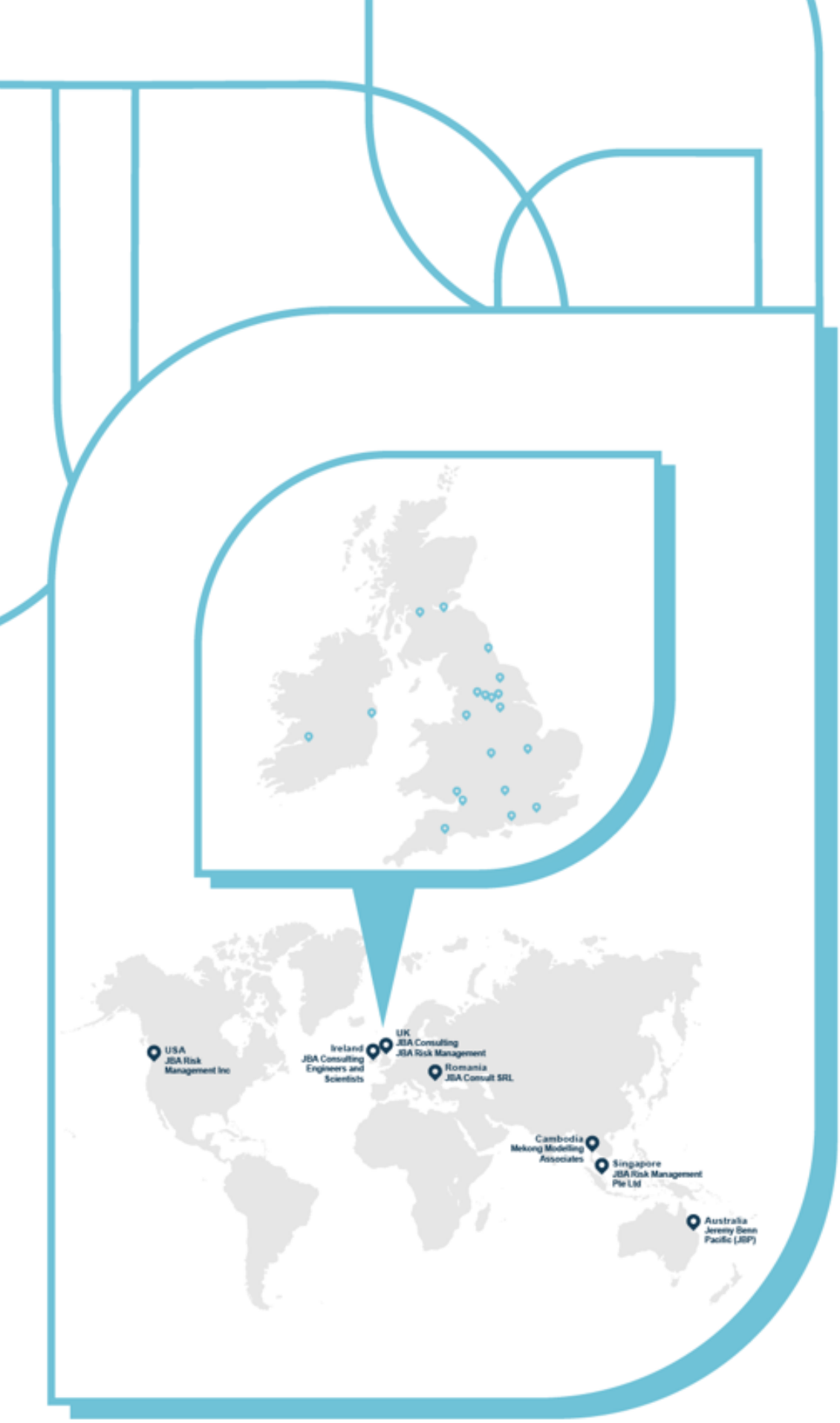
Natural Resources Wales, (2015). Water Framework Directive (WFD) Operational Catchments Cycle 2. Available at: https://datamap.gov.wales/layers/inspire-nrw:NRW_WFD_OPERATIONAL_CATCHMENTS_C2



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