Llywodraeth Cymru
Welsh Government

Woodland Opportunity Map (WOM) - User Guide

This guidance shows how the Woodland Opportunity Map works in order to support decision making on new woodland planting in Wales.

1.0 Purpose

This guide aims to provide an introduction to the updated Woodland Opportunity Map (WOM) web-map browser, hosted on the Welsh Government's GeoPortal - DataMapWales, This web-browser aims to identify areas of Wales which are most suited to new woodland creation using spatial data and Geographic Information Systems (GIS). **It is relevant to all woodland creation proposals** whether public or privately funded, is used in the assessment of applications for Welsh Government grant funded planting schemes, and informs applications under the EIA forestry regulations. The aim of the WOM is to ensure that trees are planted in the right place for maximum benefit. A brief explanation to the data layers will be provided, as well as an explanation of how to use the functionality within the web map browser to assist in developing a management plan for a woodland creation scheme. This web-map browser is aimed to be a decision support tool, not a decision making tool. The modelled data is no substitute for a site visit, and thorough desk study using all available information.

Table of Contents

2.0 What is contained in the web-map browser?

A ‘Woodland creation score’ is shown in green across all of Wales, highlighting the best opportunities at a strategic level for new woodland creation. This overall score is based on data layers providing benefits arising from new woodland creation, and support a range of Welsh Government’s forestry and environmental policies. The separate input data layers that make up the overall score can be viewed or downloaded individually within the ‘Components’ folder.

The WOM also includes information to show areas that are *potentially* sensitive to new woodland creation and signposts further guidance on consultation with the appropriate authority. These layers can be analysed using the web-map tools to show where a planting proposal potentially intersects with a sensitive area. The datasets can also be downloaded for interrogation within your own GIS, and associated ‘Data catalogue’ pages describe each layer.

Sensitivities have **not** been removed from the scoring layers as in the previous WOM, in order to increase transparency within the web-map. However if a sensitivity is present, management planners must consult relevant stakeholders in order to obtain guidance on woodland design to mitigate the impacts on a sensitivity, allowing woodland creation to proceed.

Overall, the scoring layers **do not** indicate where woodland planting is automatically acceptable. Having a score is not a right to plant. Woodland planners MUST use the sensitivity layers in order to ensure potential impacts are addressed as part of meeting UKFS requirements.

Some areas of Wales are also covered by further information in the form of voluntary layers (within the ‘Voluntary’ folder within the web-map). These are **not mandatory** but include information on specific steps that you can take in your proposal to help enhance potential habitats or landscape characteristics if desired.

Administrative boundaries have also been included to help identify who to contact in terms of local authorities or archaeological trust etc. It does not include contacts relating to sensitivity layers.

This viewer should be used in conjunction with the relevant woodland creation rules booklet, and NRW’s guidance note GN002 which sets out stakeholder contact details for sensitivities.

2.1 Scoring layers

Woodland Creation Score (WCS)

The overall scoring layer gives a strategic overview of the areas which have the best opportunities for woodland creation. The shade of green becomes darker as a site becomes more suitable for woodland creation i.e., more overlapping scoring data layers advocate that woodland creation on that site would provide benefits.

Bear in mind that the lighter shades of green may have areas which provide benefits from woodland creation, but may not be grant funded by Welsh Government as readily. Existing areas of woodland and water bodies have been ‘erased’ from the scoring layer and show a score of 0 (white).

The data layers used to create the overall scoring layer for Wales are listed below, and can be viewed separately within the web-map browser by opening the ‘Components’ sub-folder:

- Air Pollution - PM2.5; scores on the ability of trees to remove air pollution in the form of particulate matter (PM2.5) for the benefit of human populations.
- Air Pollution - ammonia; shows the opportunity for trees to remove air pollution in the form of ammonia.
- Carbon Sequestration; shows areas ranked based on potential to absorb carbon through afforestation.
- Diffuse Water Pollution; scores areas which would benefit most from tree planting to mitigate diffuse pollutant impacts on water quality.
- Flood Mitigation; shows where woodland creation is expected to alleviate flooding.
- Non-habitat land; shows areas identified as not sensitive to woodland creation from a habitat perspective.
- Social Benefits; shows where woodland creation is expected to contribute to improved mental health and greater public access to green space.
- Tree Suitability; shows areas where tree species are expected to thrive.
- Woodland Habitat Networks; shows where tree planting is encouraged to achieve more robust and resilient woodland networks to benefit biodiversity.

Each scoring layer has its own scoring range of 0 to 5 (except air pollution which is up to 2.5 to avoid double counting). These are combined where they overlap, to provide an overall score for a particular site. These layers will be used by Rural Payments Wales (RPW) to score applications for woodland creation as funds become available.

These layers are also relevant to privately funded planting as they indicate the best places for new woodland creation, subject to the presence of sensitivities.

2.2 Sensitivity layers

Areas sensitive to woodland creation

These layers indicate areas that are *potentially* sensitive to woodland creation and require further investigation in line with the UK Forest Standard and the sustainable management of natural resources (SMNR).

The sensitivities have been divided into the following groups to ease identification:-

- Archaeological sites e.g. scheduled monuments
- Bio-physical e.g. red squirrels, deep peat
- Landscape designations e.g. common land, National Parks.

Only sensitivities that have data sets covering the whole of Wales have been included. Some layers have associated buffer layers; other layers have buffers built in, depending on the nature of the data. Click on the layers' 'Data catalogue' page for an explanation of each sensitivity.

Having a sensitivity present in a planting proposal site means that woodland planners should seek further guidance in order to mitigate a likely impact, in many cases allowing planting to proceed. Information on what action to take and/or who to contact is laid out in GN002.

2.3 Constraints

These layers identify areas which are removed from the WCS scoring layer, and represent areas that are physical constraints to woodland creation (i.e. existing trees, or waterbodies). The National Forest Inventory 'Interpreted Other Area' categories (e.g. open areas/ grassland etc.) have been deleted from the dataset and are now scored.

2.4 Voluntary layers

Compliance with these layers is entirely voluntary. They represent areas where woodland creation would benefit a particular species or habitat. Compliance will not affect a woodland proposal's scoring or verification. Further information on each layer is accessed by clicking on the layer and accessing its data catalogue page.

2.5 Administrative boundaries

These layers are present to help identify who to contact in a particular location in terms of local authority, community council, Welsh Archaeological Trusts and others. They do not replace GN002 in terms of who to contact for a particular sensitivity.

2.6 How does the Woodland Opportunity Map relate to Area Statements?

The woodland planting map dataset produced by Natural Resources Wales (NRW) as part of the Welsh Information for Nature-based Solutions (WINS) in support of the Area Statements is intended to *start discussions* around new planting. It **does not replace** this Welsh Government Woodland Opportunity Map, which should be used in the development of all new woodland creation applications for Welsh Government funding, and is also relevant to applications under the Environmental Impact Assessment (Forestry) (England and Wales) Regulations 1999 in Wales.

3.0 Where to find the Woodland Opportunity Map

The Woodland Opportunity Map is hosted on DataMapWales (DMW), the Welsh Government's GeoPortal for spatial data. This can be searched for in any internet browser.

Figure 2: Search bar of DataMapWales, where the user can search for the WOM

However, a simpler way to find the map may be to go to the direct URL: https://datamap.gov.wales/maps/woodland-opportunity-map-2021/ which will take you directly to the WOM home page.

3.1 Selecting a language

At any time during your DMW session, you can select English or Welsh as your preferred language. To change your selection, simply click the grey button at the top of the page labelled either 'Cymraeg', or English.

3.2 Opening the Woodland Opportunity Map browser

Once at the home page of the WOM (https://datamap.gov.wales/maps/woodland-opportunity-map-2021/), this also serves to provide an introduction to the purpose of the WOM, as well as a contact point to make any queries if you would wish to do so (data@gov.wales). This page should also display the relevance date i.e. when the map was last updated, which may help with future alterations (Creation date: 25 June 2021). To enter the map browser, click the green button labelled 'Display in map viewer'.

4.0 Features of the Woodland Opportunity Map (WOM)

Once within the web-map, there are a range of tools to help in the analysis of a potential woodland creation site. These are broken into 6 main categories for explanation, as shown in the image below.

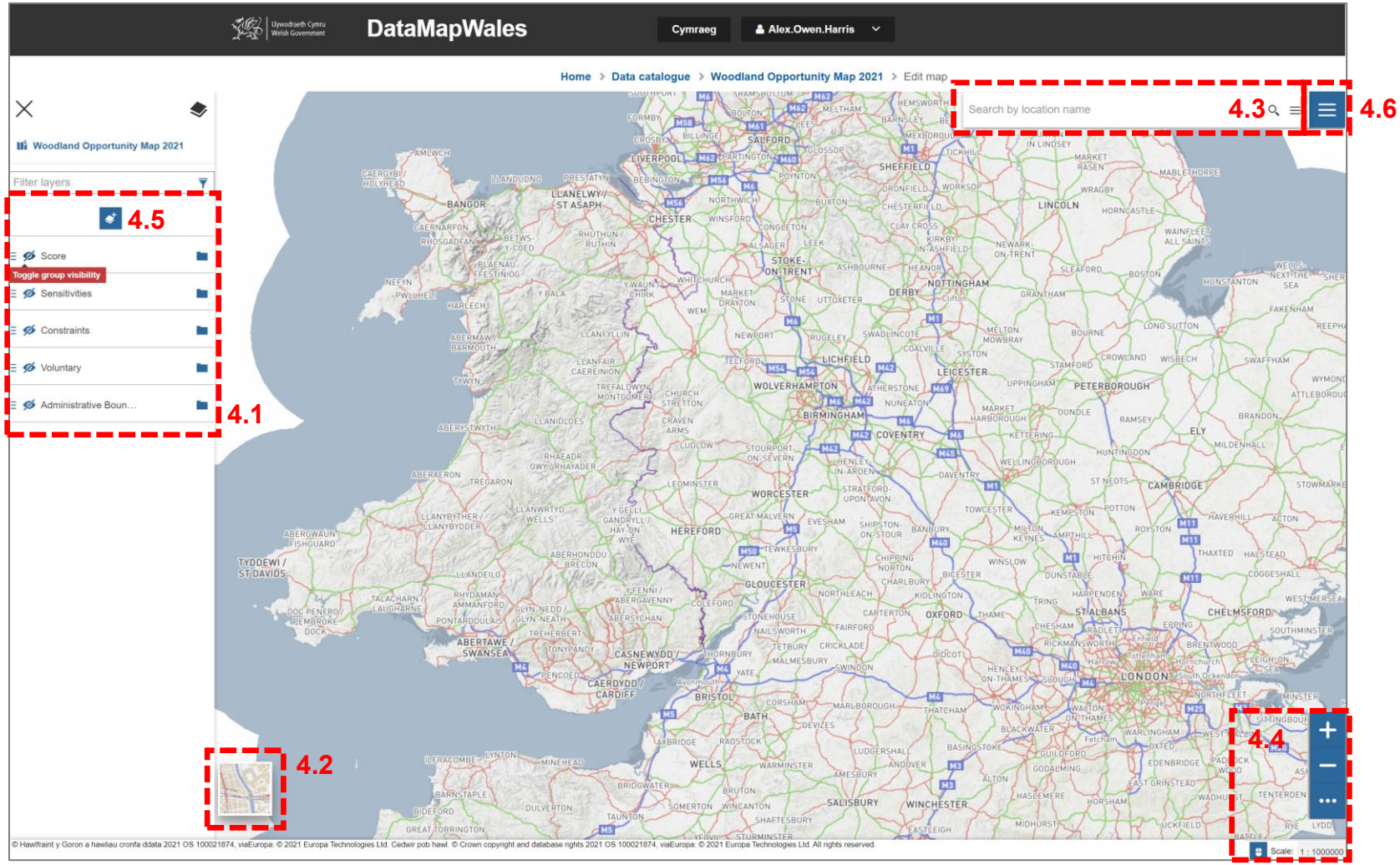


Figure 3: Woodland Opportunity Map opening screen, with available tools split into 6 sections for further explanation

4.1 Data layers and legends

The table of contents on the left of the web-map browser screen lists all data layers within the WOM, grouped into folders and sub-folders for simpler navigation. The folder structure matches the explanations provided in section 2 of this document. The bullet points below list some of the functionality within this table of contents, and Figure 4 represents this graphically.

- Open folder: click the blue square folder icon on the right of the folder name.
- Turn layer on: click the eye symbol associated with any layer to switch it on. The line through the eye symbol indicates that it is switched off. To note, is that the 'Woodland Creation Score', and 'Summarised Sensitivities' layers will only draw on the map when zoomed in <1:100,000, as they are too complex to draw at smaller scales.
- Adjust layer opacity: Click and drag the box under each layer title which says '100%'. As you drag this to the left the layer will become more transparent.
- Add layer: select the layer + icon, which will bring up a search bar and allow the addition of any layers within the entire DMW catalogue.

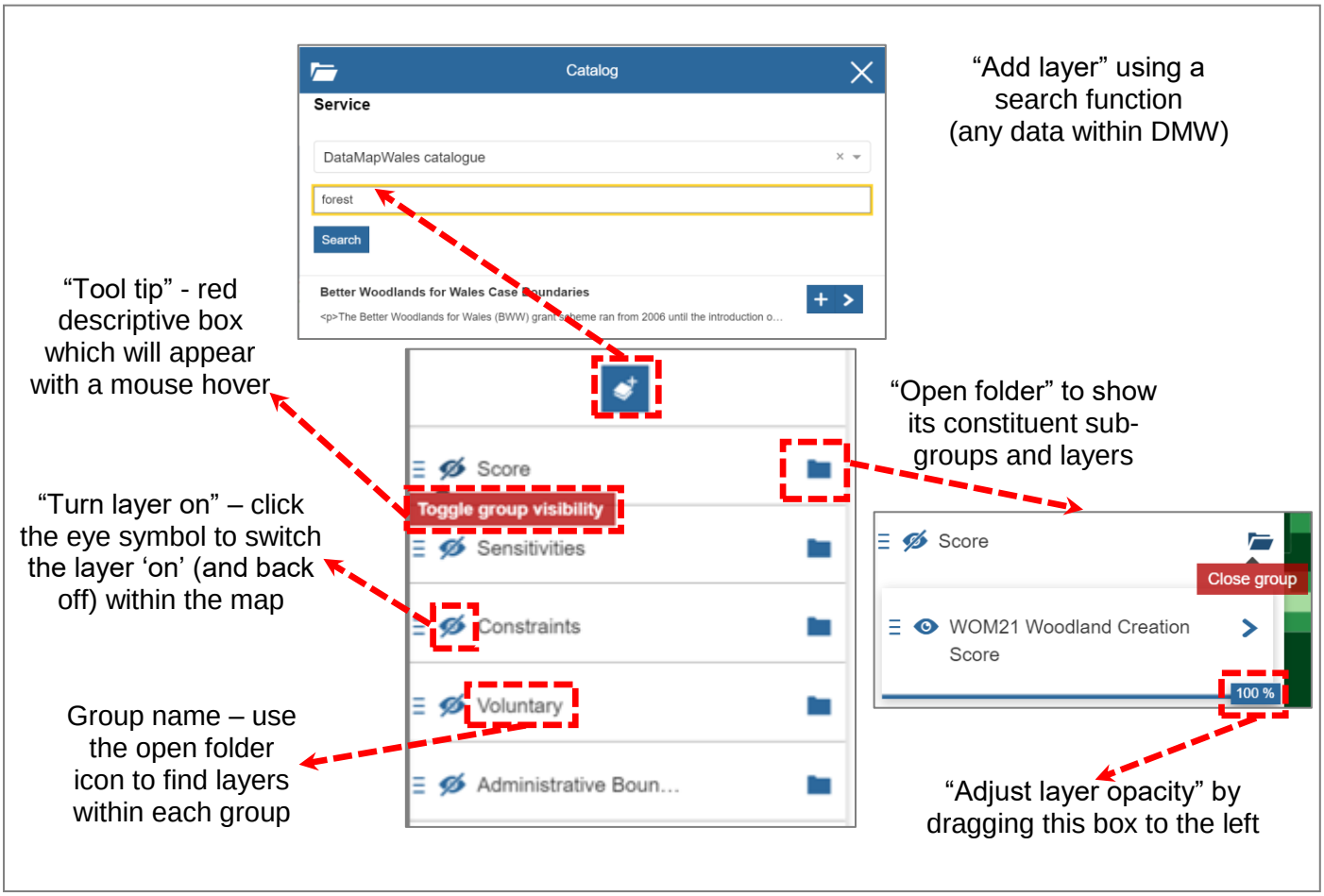


Figure 4: Functionality within the table of Contents

4.2 Basemap selection

The underlying map within the WOM browser can be changed to include black and white mapping, Ordnance Survey mapping, aerial photography, or, should the screen be too busy, then a blank basemap can be displayed. To change the underlying basemap, select the square map symbol in the bottom left of the web-map, and click to choose your preferred option, as shown in Figure 5.

Figure 5: Basemap selection window

4.3 Search an area of interest

There are several ways to find an area of interest, the most simple is to pan and zoom in on the map to find the area you desire. This is explained in more detail in section 4.4. If this is not possible, e.g. you are not sure where in Wales the area is, then there are 4 other ways to find the area:

- Place name search
- Postcode search
- National Grid Reference search
- Latitude/longitude coordinate search

4.3.1 Place name search

Within the search bar at the top right of the screen, type a place name, and select one of the choices that appears in the dropdown menu. The example in Figure 6 shows the map browser finding Aberystwyth.

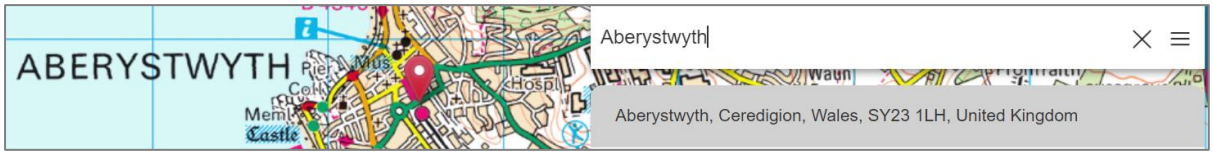


Figure 6: Place name search

4.3.2 Postcode search

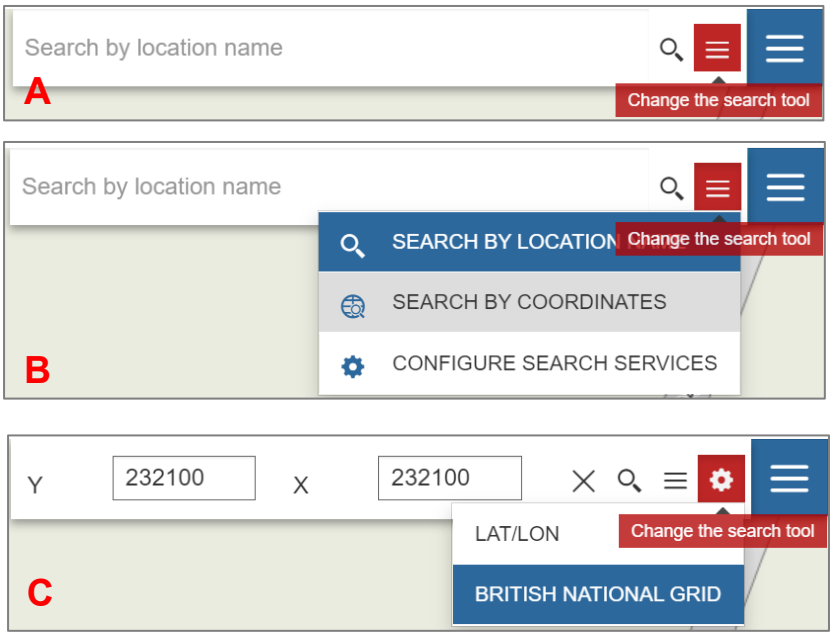
A postcode can also be used to find a place. Ensure that a space is used between the 2 sections of the postcode for the search to work. Once the postcode has been entered, select the available entry to locate the postcode centroid, shown in Figure 7.

Figure 7: Postcode search

4.3.3 National Grid Reference search

There is a way to search the WOM web-map by National Grid Reference (NGR), but at present, this is complicated. There are plans to make this more user friendly, but for now the below process needs to be followed to use NGRs. Usually, Ordnance Survey NGRs have a 2 letter prefix, followed by 6 numbers (accurate to 100m) For example SN 321 321. However, the letters within the WOM are represented by numbers. Within Wales, Ordnance Survey Grid References have 8 possible options for the 2 letter prefix, these are shown in the table within Figure 8.

To find the NGR search option within the WOM, select the 3 grey lines within the search bar (immediately left of the blue box at the top right of the screen). This is shown as a red box in Figure 8A, which has changed as the mouse hovers over it. Once selected, click the 'Search by coordinates' option (Fig 8B). To change the coordinates to NGR, select the cog shaped settings icon, and click 'British National Grid' (BNG) (Fig 8C).



NGR Letter prefix	Easting, Northing
SH	2,3
SJ	3,3
SM	1,2
SN	2,2
SO	3,2
SR	1,1
SS	2,1
ST	3,1

E.g. NGR: SN 321 321 = : 232100, 232100

Figure 8: Selecting the British National Grid search option

Once the BNG search box is showing, the eastings and northings can be entered. Using an example NGR of SN 321, 321, the 'S' letter prefix changes to a 2, and the 'N' letter prefix changes to a 2 (as shown in the table within Figure 8). Therefore, the Easting box should be filled as 232100, and the Northings box as 232100.

4.3.4 Latitude/Longitide coordinate search

The Lat/Lon coordinate entry search uses Decimal Degrees (e.g. 52.41, -4.07 would navigate to Aberystwyth). However, at the time of writing, this functionality was not operational as it is not possible to enter decimal places, and - symbols. This will likely become useable within the coming months.

4.4 Zoom/Pan & Query function

To pan around the map, the user can apply the drag function by mouse 'clicking and holding' within the main map screen, and the zoom buttons in or out can be used to go to a different scale as shown in Figure 9A. If you click the 3 white dots under the zoom buttons, a further menu of additional functions will appear, shown in Figure 9B.

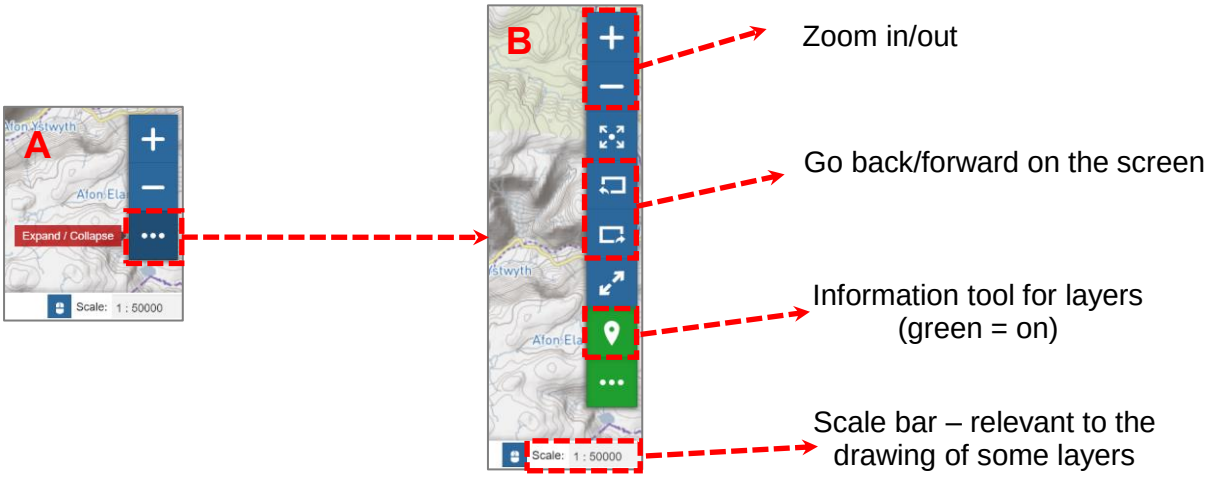


Figure 9: Opening the zoom/pan functionality

Additional tools include:

- Expand the map to cover the entire screen (the keyboard Esc key can be used to close this full-screen mode)
- Return to a previous map view, or forward to the more recent view
- Zoom to the maximum extent of the map (to see all of Wales)
- Information tool, which allows querying of the data layers - switch on or off
- Scale bar - this can be viewed and noted. Some of the data layers will only draw at certain scales (Woodland Creation Score, and Summarised Sensitivities will draw only at <1:100,000 - these layers are too complex to draw at a national scale)

4.5 Additional layer interrogation tools

When a layer is selected within the table of contents, a selection of additional tools will appear as shown in Figure 10. As shown, the 'Woodland Creation Score' layer title has turned blue, because it has been selected with a mouse click, and this has activated the additional tools which are labelled 1-6. These 6 tools are explained below in section 4.5.1 - 4.5.6.

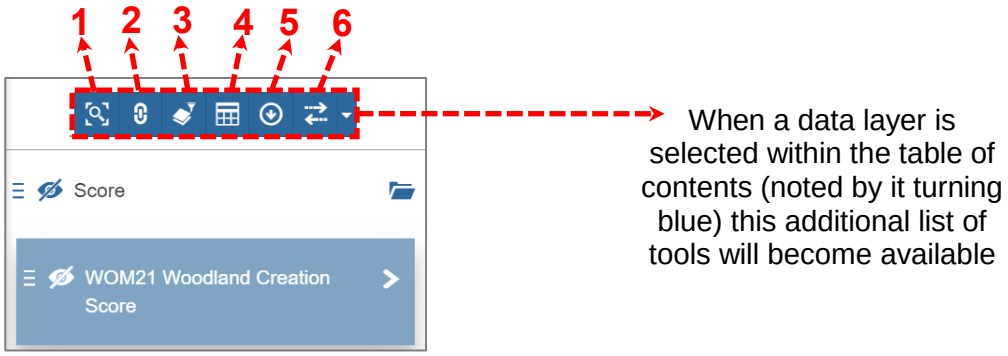


Figure 10: Additional tools available when a layer is selected

4.5.1 Zoom to extent: Zooms to the entire extent of the selected layer

4.5.2 Data catalogue: Links to metadata for that specific data layer - this is where more information can be found out about the layer selected, such as the licensing restrictions, or what the layer represents. Figure 11 show an example using the 'Woodland Creation Score' dataset.

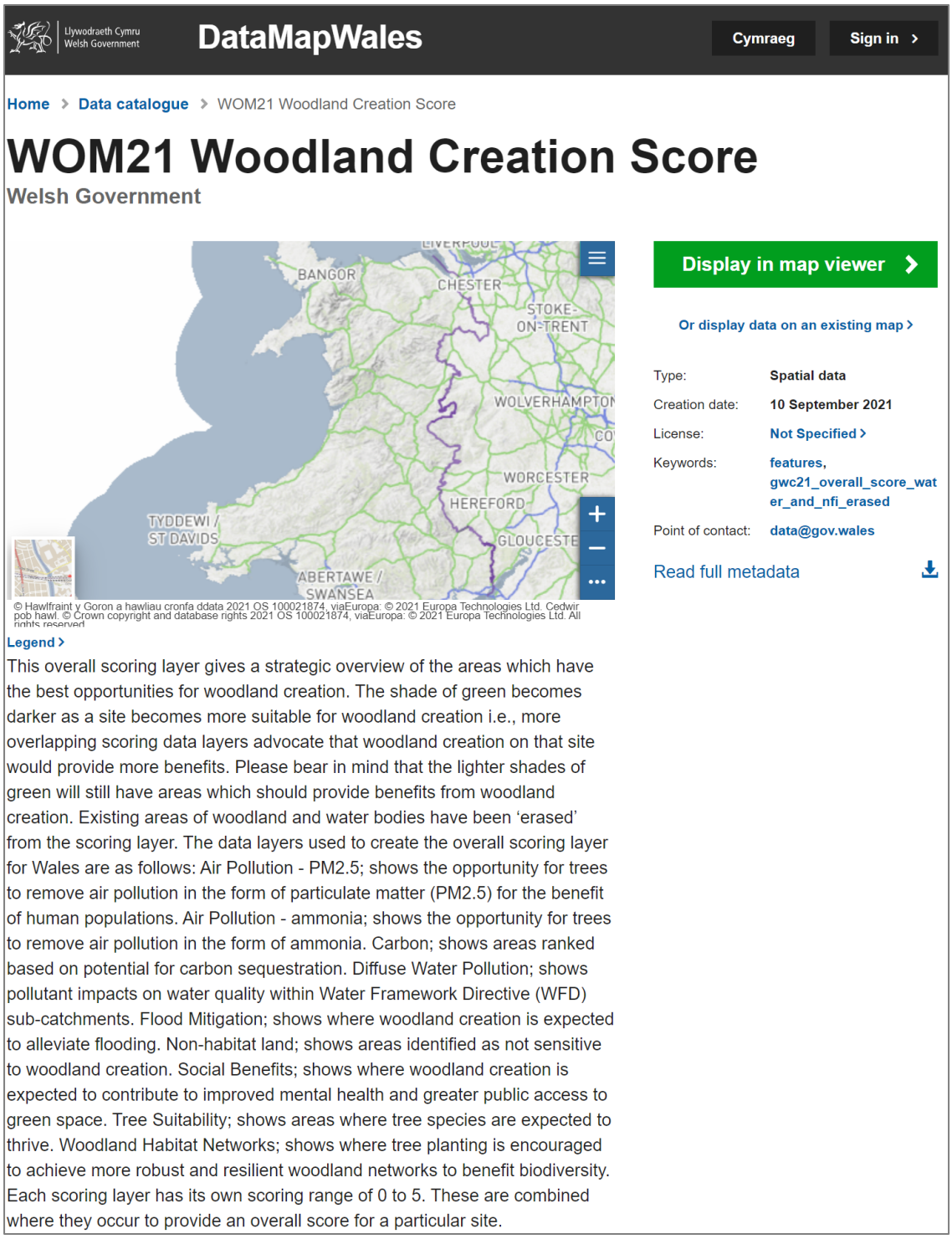


Figure 11: Data catalogue page for the 'Woodland Creation Score' layer

4.5.3 Filter: Opens a further menu, which allows filtering within a selected data layer, for example on a drawn area within the layer as outlined in section 4.6 below.

4.5.4 Attribute table: Opens a detailed table for that layer, showing text information if available, such as range of scores (0-5), or a list of sensitive sites such as SPAs.

4.5.5 Export data layer: this button allows download in GIS format, to your computer, of the selected layer within the table of contents. Once the layer is selected in blue, click the export button to open a further export screen (Figure 12A).

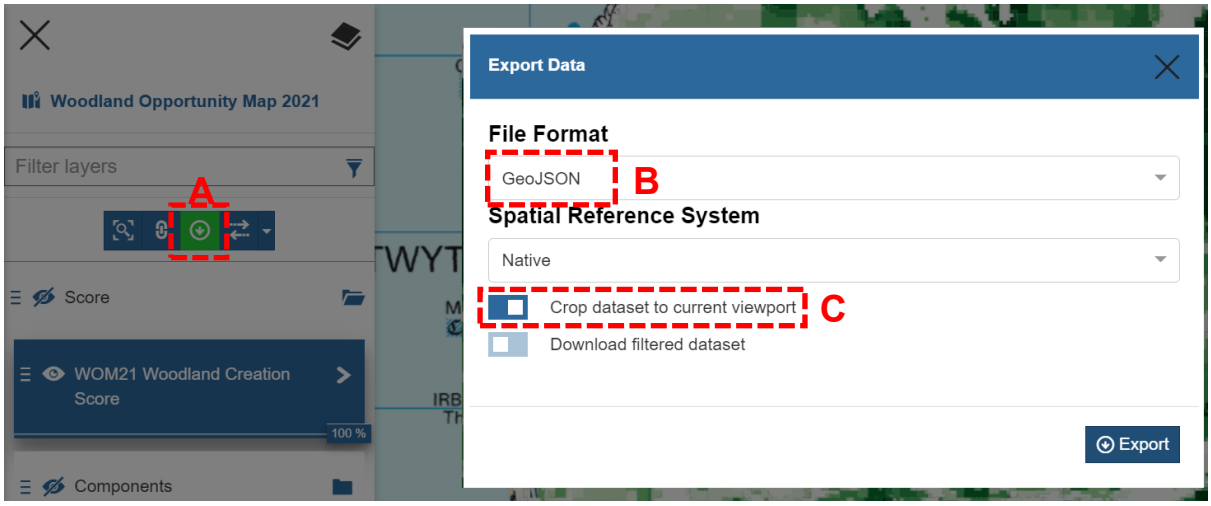


Figure 12: Export GIS data screen, selecting the 'crop to current viewport'

Once the 'Export Data' screen appears, select your preferred GIS format. GeoJSON will work in open source GIS software, and shapefiles in ESRI GIS' (Figure 12B).

N.B.: It is important to note that DMW currently has a 1million feature download limit. To maximise drawing ability, the 'Woodland Creation Score' (WCS) has been tiled, meaning it totals 2.8 million features. Therefore, if you intend to download the WCS dataset, you will need to select the 'Crop dataset to current viewport' when zoomed in to your area of interest (Figure 12C), to ensure that <1 million features are downloaded in total.

Once the export option has been chosen from the 'Export data' screen, an export icon will appear at the bottom right of the screen as shown in Figure 13A.

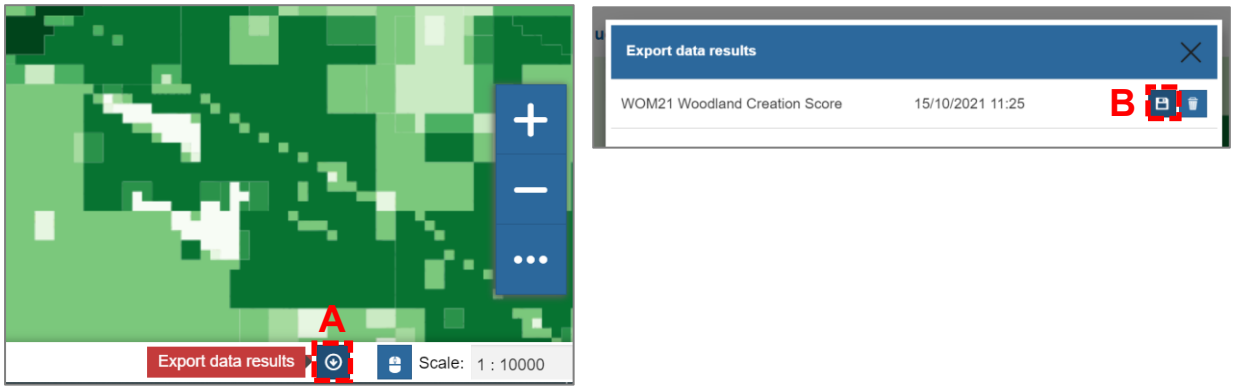


Figure 13: Exporting the GeoJSON file (A), and saving it to your computer (B).

Once the export icon appears, click it and select the save icon (Figure 13B), this will download the dataset and save it within your computer's download folder.

4.5.6 Compare tool: Once the button is clicked (Figure 14A), a 'swipe tool' appears, which allows easier understanding of the underlying basemap (Fig 14B).

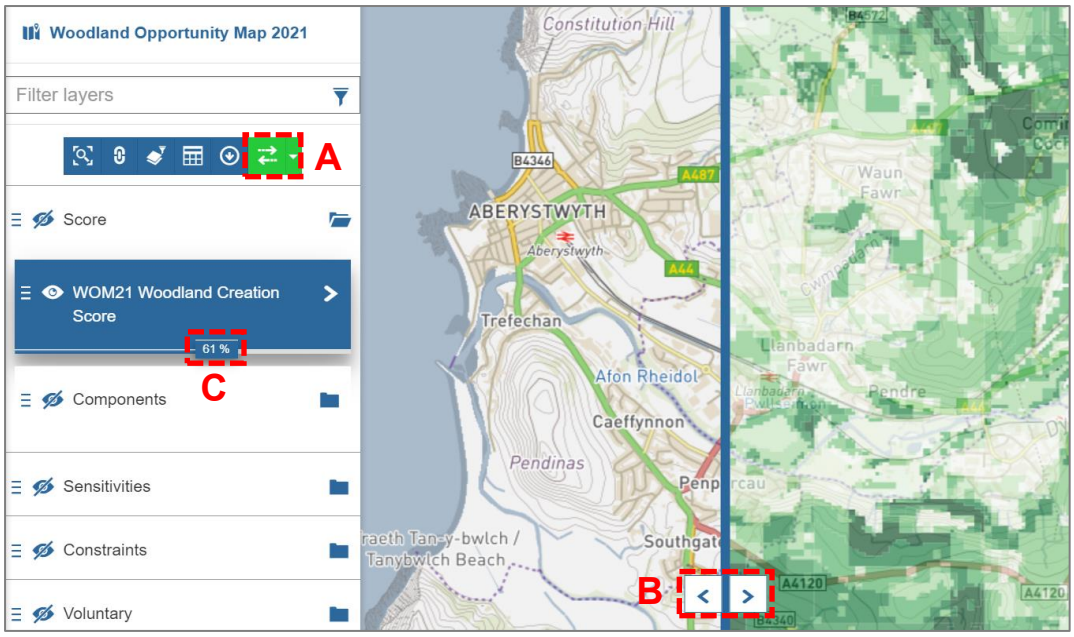


Figure 14: Compare tool selected, and opacity % reduced to allow better interrogation of the basemap

Mouse click the arrows (Fig 14B) and drag the swipe tool left or right to move the selected layer visibility. Reducing the layer opacity will also assist in viewing underlying information (Fig 14C).

4.6 Options menu

This menu is under development and functionality will increase over time. However, the 'Measure' tool can be used to good effect in determining lines or areas across a site of interest.

To use this, click the blue box with 3 white lines at the top right of the screen. This will bring the menu shown in Figure 15A. Select the 'Measure' tool to open the tool functionality (Figure 15B)

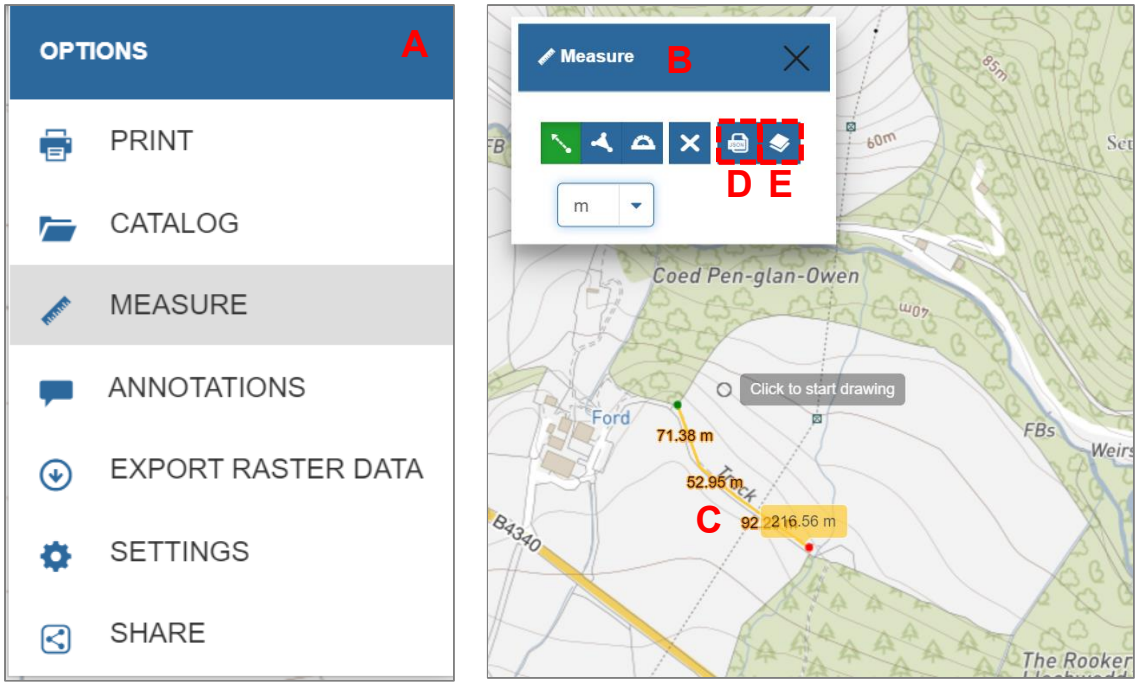


Figure 15: Measure tool (A+B) used to measure a linear feature (C) and then exported (D) or saved in the WOM (E)

Once the tool menu is open, select distance (to measure fence lines for example) or area (to measure prospective woodlands) and use mouse clicks to add vertices, using a double mouse click to finish the shape. The example in Figure 15C shows a potential fence line calculation of 217m.

Once the line or area is completed, this can either be exported as a GeoJSON for interrogation in to your own GIS by selecting the 'Export to GeoJSON' icon (Figure 15D), or added to the WOM as a layer which will remain for the duration of your session (Figure 15E).

If you choose to save the shape within the WOM (Figure 15E), this can be found in the table of contents, which will now have added a 'Default' folder. Upon opening this folder using the blue folder icon, the measurement can be seen, and treated as any other layer within the map (Figure 16).

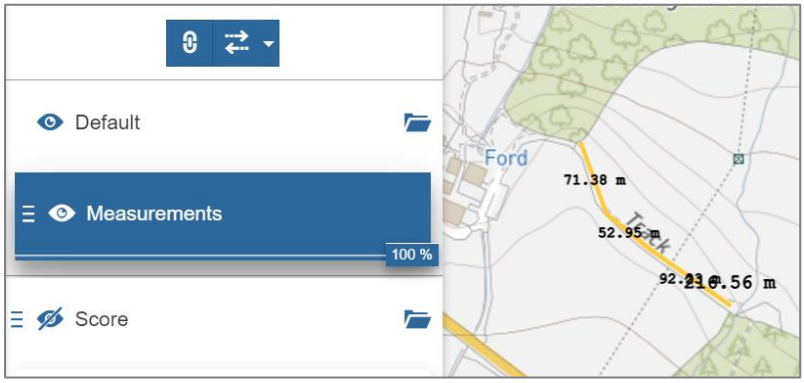


Figure 16: Distance measurement drawn in the WOM, and added as a layer which will be saved for the duration of the web-map session

5.0 Information tools to acquire more detail on layers

5.1 Summarised Sensitivities

Using the Sensitivities Summary as an example, Figure 17 shows how the information tool can be used to find out more detail on a layer within the table of contents. **N.B.** the Summarised Sensitivities will only draw once zoomed <1:100,000.

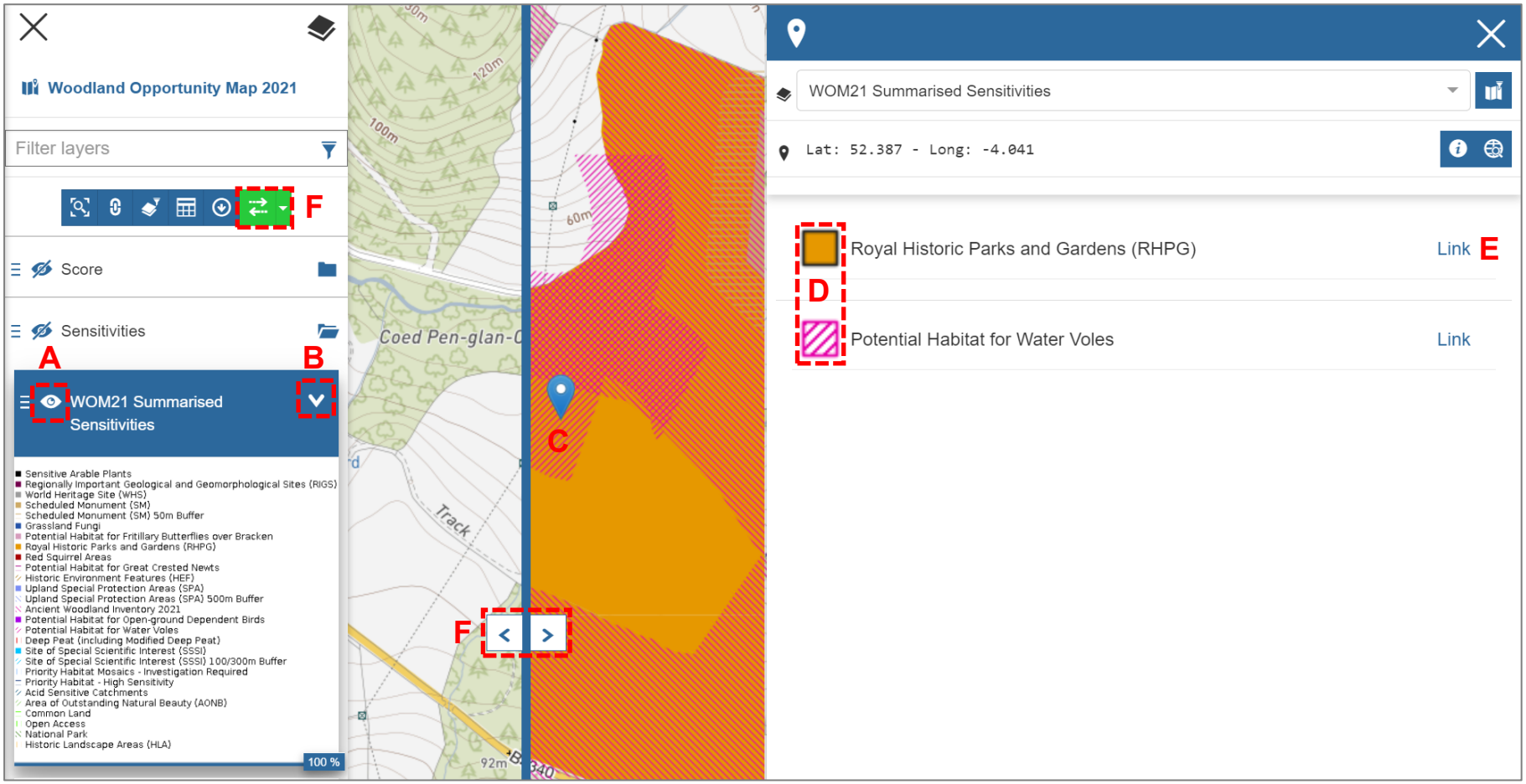


Figure 17: WOM showing the Summarised Sensitivities, and the information tool at a selected point

To see what sensitivities are present at a specific location, zoom into the area of interest, and ensuring that the scale bar is less than 1:100,000 switch on the Summarised Sensitivity layer by clicking the eye symbol (Figure 17A). The down arrow within the table of contents can also be clicked to activate the legend (Figure 17B). This legend is often too small to read if there are lots of merged layers. Therefore, for the Summarised Sensitivity layer (which is the most complex), in order to see in more detail each layer's symbology, left mouse click within the map at a point of interest (Figure 17C), and the feature information box will appear on the right of the screen.

When using the Summarised Sensitivity later (only), the correlating legend symbology at the point of interest will show as boxes of colour (Figure 17D). The data catalogue page for each of the listed layers can then be viewed by clicking 'Link' (Figure 17E). The swipe tool (Figure 17F) may also be useful here to see more detail underneath the complex Summarised Sensitivity layer.

It is advisable to click several points around the proposed planting site as some of the data layers within the Summarised Sensitivities layer are small, and may be hidden under other layers. Interrogation of by area instead of point is a tool in development.

5.2 Underlying Sensitivities

Once you have seen which sensitivities are present within the Summarised Sensitivity layer, more information can be found on each within the individual layer representations. These sensitivity layers are broken into 3 sub-folders for simpler navigation as shown in Figure 18.

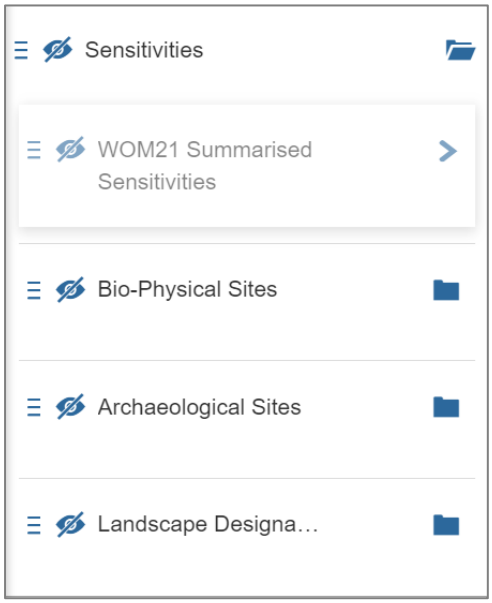


Figure 18: Sensitivity layers folder structure

All of the sensitivity datasets are represented within the 'Summarised Sensitivity' layer. This can only be viewed at scales <1:100,000.

To see more detail on each of the included layers, find them within the 3 sub-folders listed to the left, in Figure 18. Use the blue folder icon on the right side of the sub-folder title to open the folder and see the included datasets.

It is prudent to use these individual layers to ensure that smaller sensitivity layers have not been hidden within the 'Summarised Sensitivity' dataset and nothing is missed.

Using the example in Figure 19, if we interrogate the Summarised Sensitivity layer at a hypothetical area of interest for afforestation, 4 sensitivity layers appear.

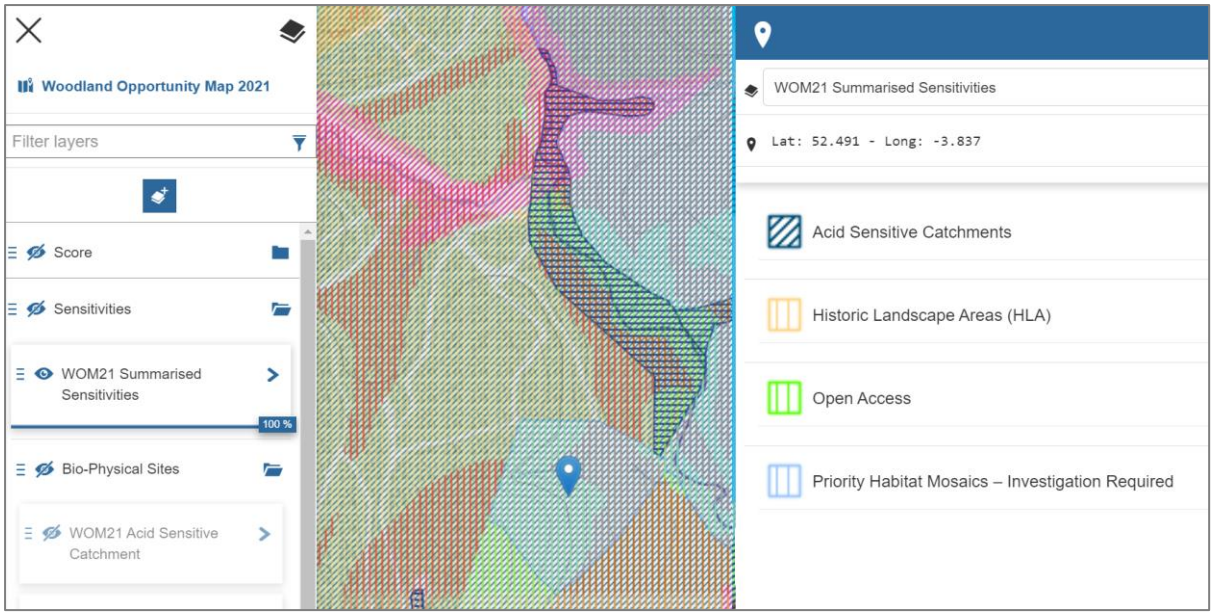


Figure 19: Hypothetical site of interest showing the sensitivities present within the Summarised Sensitivity layer

Each of these 4 sensitivities must be considered in turn and consultation with the appropriate authority sought. If however, we wanted to see more detail on the 'Priority Habitat Mosaics - Investigation Required' dataset for example, we can switch off the Summarised Sensitivity dataset to clear the screen, and then open the Bio-physical Sites subfolder to find the individual layer, as shown in Figure 20.

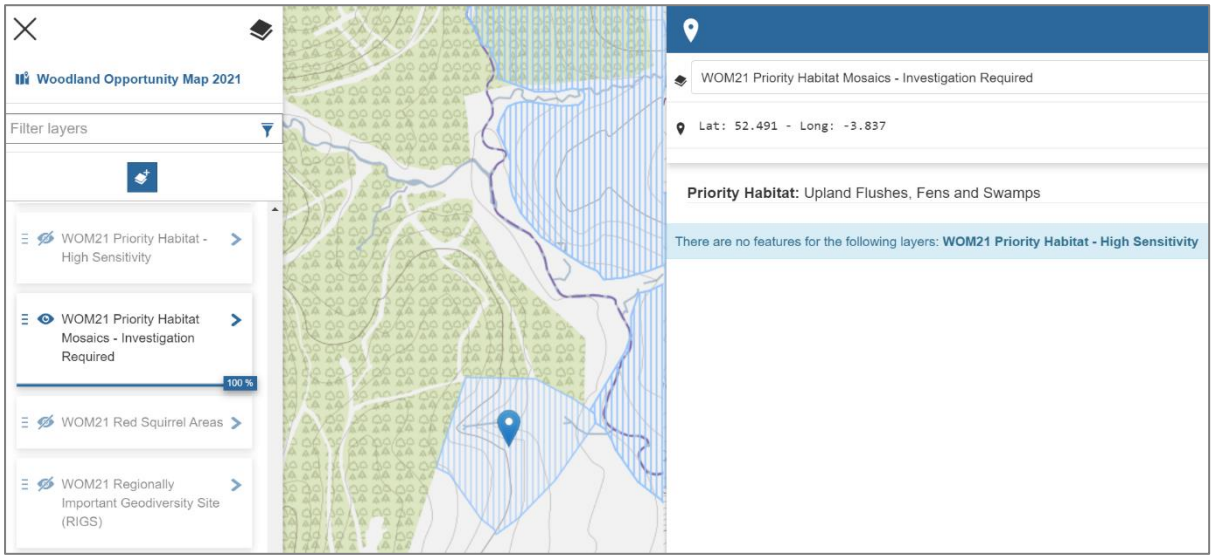


Figure 20: Hypothetical site of interest showing the Priority Habitat Mosaics layer

Clicking the eye symbol to switch on the layer, it is then possible to click within the map, which brings up the feature information tool for that individual area on the right of the screen. As shown in Figure 20, the blue location pin is covered by the 'Priority Habitat Mosaics - Investigation Required' dataset, and the specific habitat type present within the feature is 'Upland Flushes, Fens and Swamps'. If the layer title is clicked within the table of contents to turn it blue, the data catalogue page can then also be opened to see more information about that layer (Figure 21).

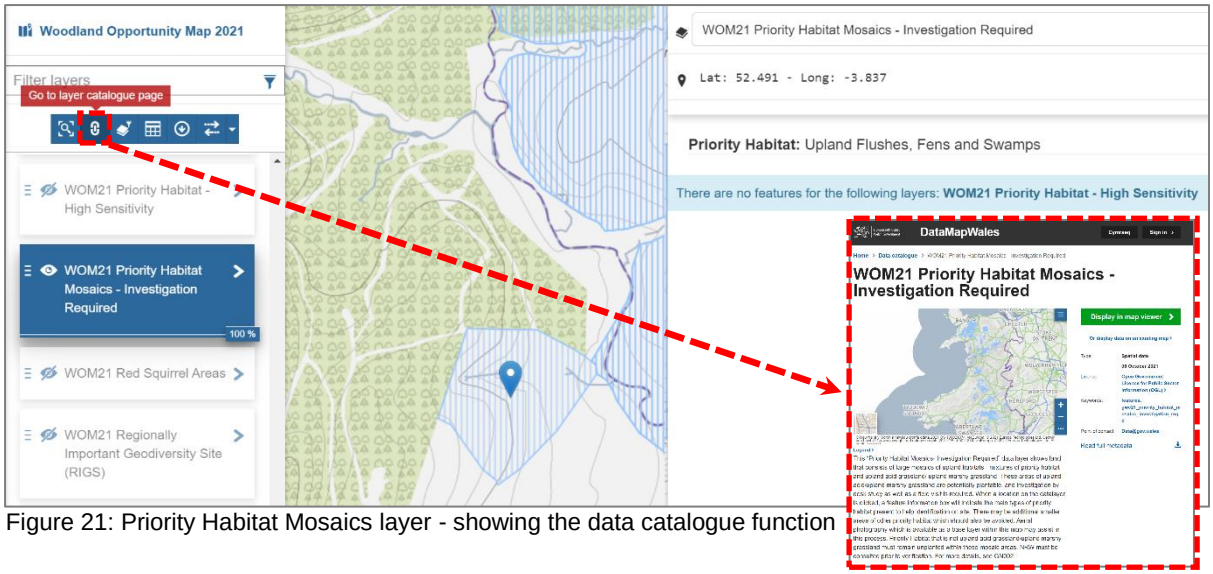


Figure 21: Priority Habitat Mosaics layer - showing the data catalogue function

5.3 Woodland Creation Score

All of Wales is scored from 0 to 38, showing the area's potential to fulfil Welsh Government strategic policy objectives with regard to woodland creation - getting the right tree in the right place. This score is determined by the quantity of overlapping component scoring layers, and their individual score (0-5). To determine the score in an area of interest, navigate to the area and zoom in. The Woodland Creation Score (WCS) is only visible when zoomed in to <1:100,000. An example of this is shown in Figure 22.

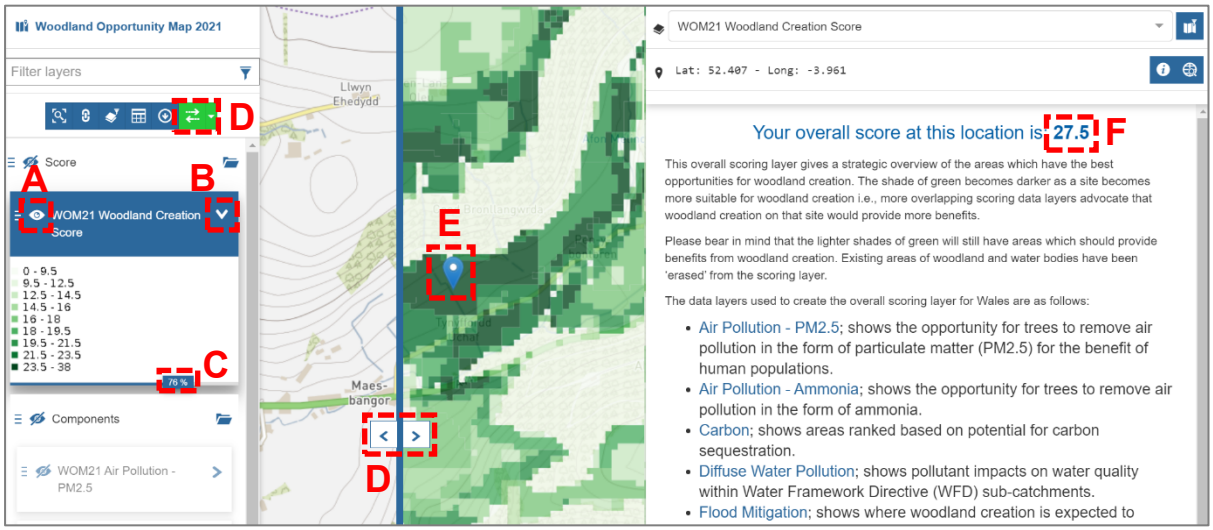


Figure 22: Woodland Creation Score - overall scoring layer with the feature information tool used to see the score at a site of interest

To turn on the layer click the eye symbol (Fig 22A). Click the down arrow to then view the scoring legend (Fig 22B). The opacity can be reduced to see the underlying basemap, or other data layers should they be switched on (Fig 22C). The swipe tool can also help in viewing underlying data (Fig 22D). Once the map is set up as desired, click on the layer title within the table of contents until it turns blue - this is needed to activate the feature information tool. A point of interest can then be clicked (Fig 22E), and the WCS will be visible in the right of the screen (Fig 22F).

5.4 Component scoring layers

Once you have determined the WCS for your site of interest, if desired, you can then analyse that score by looking at the 9 scoring layers within the Components folder. Using the same area inspected in Figure 22, the components in Figure 23 also total 27.5.

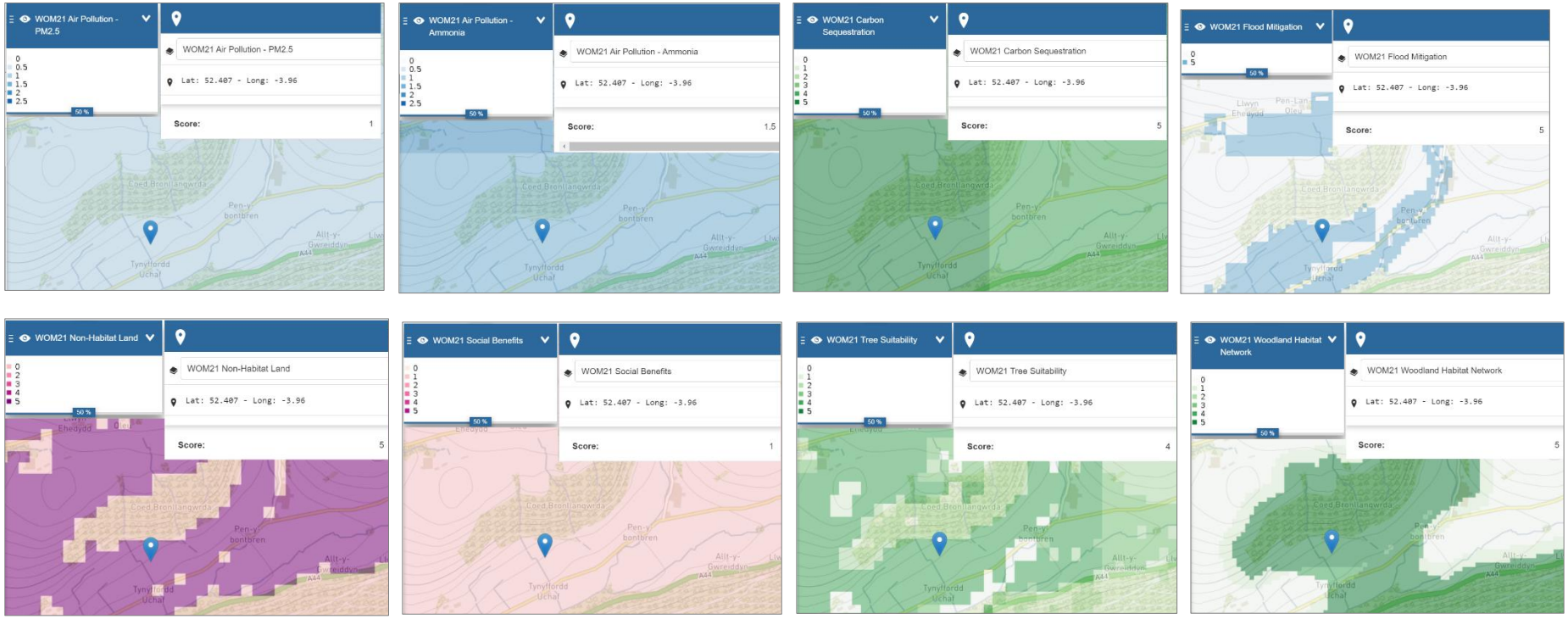


Figure 23: 8 of the 9 scoring components which add to make a WCS of 27.5 (The Diffuse Water pollution layer scored 0 in this location and so is not shown)

Within the ‘Components’ folder of the web-map browser, each of the scoring layers can be switched on to view, or download into your own GIS. These are the underlying datasets that combine to make the overall Woodland Creation Score. These layers are present to maximise transparency of the scoring system to the user, and hold no addition score. The data catalogue page can be used to find more information on each of the scoring layers. The method to find the data catalogue page is shown in Figure 21.

Enquiries: alex.harris@gov.wales