Case study

Restoring precious peatland ecosystems

Bord na Móna

The Challenge

- Rehabilitate and restore Irish peatlands after years of commercial peat extraction

The Benefits

- Appropriate rehabilitation measures identified
- Accurate implementation of measures
- Efficient working in remote, wild landscapes
- Clear visibility of progress made

Bord na Móna is actively engaged in projects to restore and rehabilitate 33,000 hectares of peatlands. It uses ArcGIS to design the most appropriate rehabilitation measures and then implement a wide range of measures as quickly and efficiently as possible.

The Challenge

Bord na Móna is proud of the role it is playing in helping Ireland to achieve a net carbon zero future. Now that commercial peat extraction has ceased, the organisation is leading the way in restoring and rehabilitating precious peatland ecosystems. Recognising the vital importance of peatlands for carbon storage and ecosystem services, it has set itself the ambitious target of regenerating 33,000 hectares of peatland in just five years via the Peatland Climate Action Scheme, funded by the Government of Ireland and Bord na Móna.

The Solution

Having used geographic information system (GIS) technology from Esri for around twenty years to support its former peat extraction operations, Bord na Móna is now using Esri's ArcGIS solutions for its rehabilitation activities.

For each bog identified for rehabilitation, GIS specialists and ecologists use the desktop solution ArcGIS Pro and 3D spatial analysis tools to examine the ground level and create detailed, map-based rehabilitation plans. The ecology team also uses the web-based editing solution Sweet for ArcGIS, to accelerate the editing and amendment of these plans, before sharing with the engineering team.

Once a rehabilitation scheme has been agreed, the map-based plan is uploaded to ArcGIS Online, where employees in environmental, survey and engineering teams can view it on a range of ArcGIS web apps and field apps to help them implement the recommended measures. For example, surveyors view the ArcGIS-based maps on GPS-enabled tablets while in bogs to accurately mark out on the ground where different measures, such as drain blocks, should be located. In very remote areas, with little or no mobile coverage, maps can be downloaded to mobile devices and updates synchronised later.

During rehabilitation projects, the engineering team uses ArcGIS field apps to record the progress of different initiatives within a bog area on colour-coded maps of each site. This data, collected on maps in the field, feeds into a series of Esri operational dashboards in near real time. Senior managers within Bord na Móna can view these dashboards at any time to obtain an overview of progress on each site and reports for scheme regulators and third parties can be easily generated.

"ArcGIS is engrained in our bog rehabilitation process," says Michael Lenihan, GIS Lead at Bord na Móna. "We have around 85 day-to-day users of ArcGIS either on the desktop, via the web or in the field."

> "With ArcGIS Online, everyone sees the most up-to-date plans, whether they are working in the office or in a bog , and this helps to ensure that ecology plans are carried out as intended."
>
> Michael Lenihan, GIS Lead, Bord na Móna

Esri Ireland
Dublin
Block B | Ashtown Gate
Navan Road | Dublin 15 | D15 NP9Y
T +353 (0) 1 869 3928 | **F** +353 (0) 1 869 3901
Holywood
Twisel River Studios | 18 High Street
Holywood | BT18 9AD
T +44 (0) 2890 767336
E mapsmakesense@esri-ireland.ie
W esri-ireland.ie

Case study

> Using ArcGIS, we can quickly visualise the existing conditions across thousands of hectares of bogs using numerous datasets and design and implement the most appropriate rehabilitation measures to restore peatland function and deliver climate action benefits.
>
> Mark McCorry, Ecology Manager, Bord na Móna

The Benefits

Appropriate rehabilitation measures identified

The use of ArcGIS gives ecologists the detailed insight they need to identify which rehabilitation measures will be most appropriate, not just on each bog, but within different parts of the same bog. Each bog can be quite different, with a variable environment and a mosaic of peat depths, hydrology, habitats and topography, meaning there will be different goals and outcomes. Plans designed by ecologists can comprise multiple interventions such as drain-blocking and bunding to optimise hydrological conditions to re-wet peat. "Using ArcGIS, we can quickly visualise the existing conditions across thousands of hectares of bogs using numerous datasets and design and implement the most appropriate rehabilitation measures to restore peatland function and deliver climate action benefits," says Mark McCorry, Ecology Manager at Bord na Móna.

Accurate implementation of measures

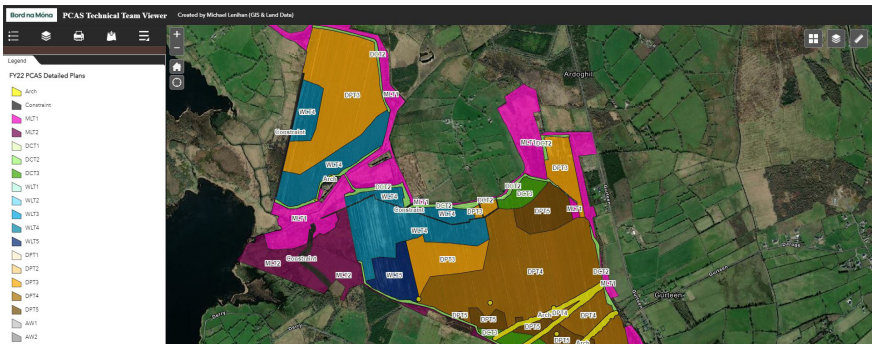
Through the use of ArcGIS Online, Bord na Móna is able to ensure that all employees have access to the latest versions of each of its rehabilitation plans and supporting datasets. This helps to minimise miscommunication, allows constant updating, and eliminates mistakes in the implementation of measures. "Changes to schemes occur regularly," explains Lenihan. "With ArcGIS Online, everyone sees the most up-to-date plans, whether they are working in the office or in a bog, and this helps to ensure that rehabilitation plans are carried out as intended."

Efficient working in remote, wild landscapes

With bogs from Galway to East Kildare, employees are generally dispersed across the country and work in very remote, wild landscapes. The use of ArcGIS field apps eliminates the need for them to record information on paper and type it up later, saving time and improving the accuracy of data collection. For example, the environmental team uses ArcGIS Survey123 to record the locations of railway lines, pipes and machinery, left over from the industrial era, that need to be removed. As the data collected is captured immediately on ArcGIS dashboards, plans to decommission this equipment can be drawn up and enacted more efficiently.

Clear visibility of progress made

Bord na Móna is currently planning or implementing rehabilitation schemes on up to 19 sites per year. The Esri dashboards give senior managers clear visibility of the progress of all of these simultaneous projects, wherever they are happening in Ireland. The GIS team can also use the dashboards to generate automated, accurate reports for stakeholders, such as the Department of Environment, Climate and Communications, and the National Parks and Wildlife Service. "Without the dashboards, we would have to spend a lot of time producing pdf maps and reports," Lenihan says. "Instead, we can output progress data in a matter of minutes."



A detailed plan of rehabilitation measures proposed across a peatland area

Esri Ireland
Dublin
Block B | Ashtown Gate
Navan Road | Dublin 15 | D15 NP9Y
T +353 (0) 1 869 3928 | **F** +353 (0) 1 869 3901
Holywood
Twisel River Studios | 18 High Street
Holywood | BT18 9AD
T +44 (0) 2890 767336
E mapsmakesense@esri-ireland.ie
W esri-ireland.ie

Learn more at: esri-ireland.ie