

Helping to maintain public safety in the Scottish countryside

Forestry and Land Scotland

The Challenges

- Understand the risk posed by Ash Dieback disease
- Rapidly identify diseased trees that need to be felled or pruned to maintain public safety

The Benefits

- Clear understanding of Ash Dieback risks
- Focused action to maintain public safety
- Efficient data collection in a pandemic
- A scalable and intuitive survey process



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Forestry and Land Scotland is using ArcGIS to survey the condition of ash trees on its land and analyse the impact of the devastating Ash Dieback disease over time. The organisation can now clearly see where it needs to take action to limit the risk of falling trees and branches, which helps it to maintain the safety of people visiting, living and working in Scotland's countryside.

The Challenge

Ash trees are a familiar feature of Scotland's landscape, forests and woodlands, but their survival is seriously threatened. A fungal disease commonly known as Ash Dieback (or 'Chalara') is spreading fast and could lead to the death of 70-85% of native ash trees over the next decade.

Responsible for the management of 640,000 hectares of national forest and land, Forestry and Land Scotland needed to establish how many ash trees are on the public estate and where they are in relation to paths, roads and properties. Most importantly, it needed a way to monitor the condition and gradual deterioration of ash trees, so that it could take action to reduce the risk of diseased branches and dead trees falling and causing injuries or deaths, while at the same time trying to retain as many ash trees as possible in safer locations because of their high biodiversity value.

The Solution

Having used solutions from Esri's ArcGIS platform previously for other initiatives, Forestry and Land Scotland realised that it could implement an effective survey process for ash trees using Esri's Survey123 for ArcGIS. It created its survey solution iteratively in just two weeks in a project involving a small number of users working directly with a GIS developer.

The mobile Ash Dieback survey solution created allows users to record data about ash trees on their mobile phones, while out and about in the countryside and woodlands. The app has a series of dropdown boxes, tree images and tick lists, which make it as easy as possible for users to input accurate, consistent data in the field. All the data collected is uploaded immediately, if the user has Internet access, or stored and uploaded as soon as an Internet connection is found, if the user is working in a particularly remote location.

The data collected is then analysed in a range of ready-made Esri dashboards containing graphs and charts in ArcGIS Online that enable Forestry and Land Scotland to easily see and monitor trends. For example, trees that are in a serious condition are highlighted in red. These ArcGIS Online analysis charts and graphs are used in meetings and reports for senior managers, to explain trends and clarify the scale of the Ash Dieback issue. Finally, Forestry and Land Scotland incorporates its Ash Dieback survey data into its central ArcGIS platform, called Forester Web, so all 800 employees can view it, on demand.

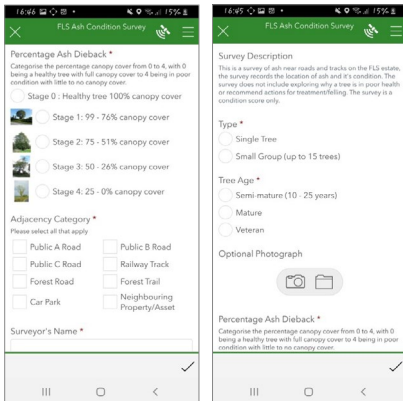
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Alan Gale, Climate Change Adaptation Programme Manager at Forestry and Land Scotland



Employees capture data on smartphones using Survey123 for ArcGIS

The Benefits

Clear understanding of Ash Dieback risks

The ArcGIS survey process provides Forestry and Land Scotland with detailed, accurate information about Ash Dieback risks that can easily inform its Risk Register. Significantly, the use of ArcGIS Online will enable Forestry and Land Scotland to monitor the change of condition in specific trees over time and therefore gain an improved understanding of how fast trees with Ash Dieback deteriorate. “ArcGIS provides the clear insight we need to make informed decisions about how best to tackle Ash Dieback and plan the level of investment that will be needed in the future to manage diseased trees and maintain public safety,” says Alan Gale, Climate Change Adaptation Programme Manager at Forestry and Land Scotland.

Focused action to help maintain public safety

With near-instant visibility of data collected in the field, Forestry and Land Scotland can make faster, well informed decisions to help protect the public from harm. It can easily see ‘hot spot’ areas where there are large numbers of particularly badly diseased trees or weakened branches in close proximity to high risk areas such as public roads and paths. Then it can make rapid, informed decisions about where to prioritise its resources, to remove branches, fell trees and help maintain public safety. “By taking the right action to tackle Ash Dieback, we can help to save lives and prevent injuries, while at the same time retain dead or dying ash trees for their biodiversity value where it is safe to do so,” Gale says.

Efficient data collection in a coronavirus pandemic

In the first two months, Forestry and Land Scotland undertook 2,100 surveys of 6,600 ash trees, despite the additional challenges and restrictions of introducing a new programme and surveying during the COVID-19 pandemic. In 2021 and in subsequent years, it will revisit these trees to compare scores over time, as well as survey thousands of additional trees. “Survey123 provides a far more efficient and cost-effective process than traditional spreadsheet and paper-based survey methods,” says Shona Sutherland, GIS Support Officer at Forestry and Land Scotland. “Completed tree surveys are visible back in the office in near real-time, so we can build up an immediate picture of the risks to public safety from diseased trees, locally, regionally and nationally.”

A scalable and intuitive survey process

Around 60 employees currently use Survey123 to survey ash trees during the course of their usual jobs, whether they are harvesting timber, undertaking maintenance on a recreation route or working on a water vole project. The app can be used on any smart phone, so can potentially be used in the future by any of the organisation’s 800 employees, as well as contractors and partners, to gradually increase the number and frequency of tree surveys. “You don’t need to be tech-minded to use it,” Sutherland says. “Feedback from staff is that the app is intuitive, quick, and easy to use.”

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