Identifying fragile rural areas in the Cairngorms National Park

Supporting document – August 2025

Introduction

National Planning Framework 4 states that local development plans should identify the characteristics of rural areas within the plan area, including the existing pattern of development, pressures, environmental assets, community priorities and economic needs of each area. According to the Scottish Government's 6-fold Urban Rural Classification 2022, the vast majority of the Cairngorms National Park is classified as remote rural (See Figure 1).

National Planning Framework 4 Policy 17 requires local development plans to set out tailored approaches to rural housing with criterion c) supporting new homes in remote rural areas where the proposal:
- Supports and sustains existing fragile communities,
- Supports identified local housing outcomes, and
- Is suitable in terms of location, access, and environmental impact.

Similarly, Policy 29 encourages development that will contribute to rural economies and communities and National Planning Framework 4's cross-cutting outcome to achieve rural revitalisation requires greater constraint in areas of pressure and a more enabling approach in rural areas with fragile communities. This requires local development plans to identify existing fragile communities.

The Cairngorms National Park Authority is currently preparing its next local development plan. This report therefore forms part of the evidence base for its Evidence Report and will be used to inform the preparation of the next local development plan.

6 fold urban rural classification 2022

- Large Urban Areas
- Other Urban Areas
- Accessible Rural Areas
- Accessible Small Towns
- Remote Rural Areas
- Remote Small Towns
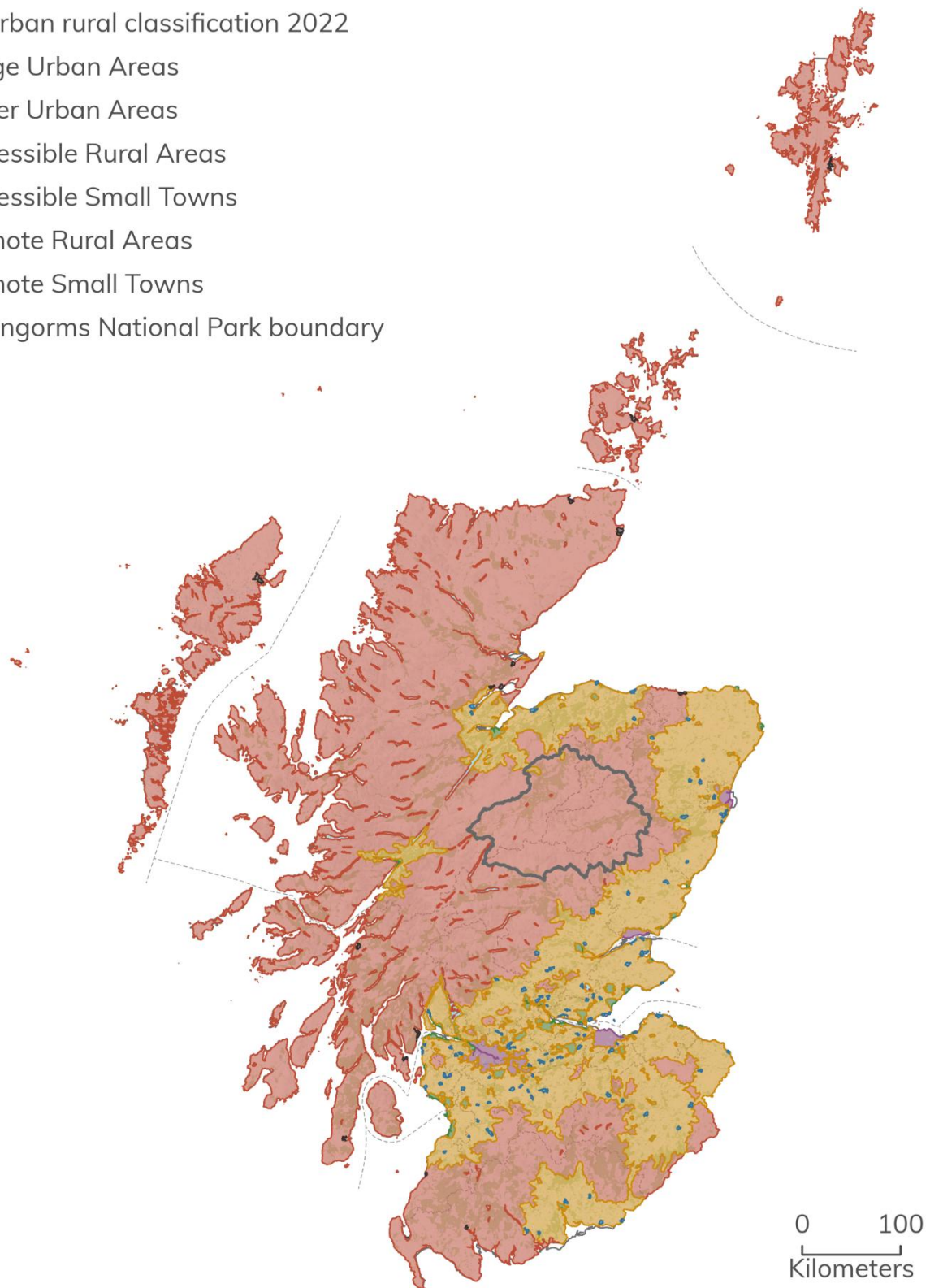- Cairngorms National Park boundary

Figure 1 Scottish Government's 6-fold urban rural classifications 2022.

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While various reports attempt to identify characteristics of fragility, there is no universally established definition of what constitutes a 'fragile community'. The definition of 'community' within this context is also not universally established and the term may be applied to a range of social relationships, which may or may not relate to a specific geography. There is however a range of diverse data available that may be used to characterise 'rural areas' according to their relative socio-economic performance, wellbeing, deprivation or fragility. This data may be used by planning authorities to provide a nuanced, complex and place-specific understanding of the needs and challenges, opportunities and assets of different areas.

This paper therefore contains a review of methods and datasets that may be used to identify fragility, and outlines the Cairngorms National Park Authority's tailored approach to identifying fragile rural areas within its plan area.

Review of existing measures of rural characteristics

To help identity a set of indicators and a methodology for determining fragility, a review of existing methods of measuring rural characteristics has been undertaken.

Rural Planning Policy to 2050: Research to Inform Preparation of NPF4

Published in January 2020, Scottish Government's report, 'Rural Planning Policy to 2050: Research to Inform Preparation of NPF4', provides a starting point for this review, as part of its scope was a literature review relating to the classification of rural areas.

The Rural Planning Policy to 2050 report contains a systematic review of the current, at the time of writing, typologies used to describe Scotland's rural areas. The scope of the review included national typologies and also major regional typologies. Specifically, it discusses:

- The typology of rural Scotland presented in Scottish Planning Policy.
- The Scottish Government's Urban Rural Classification.
- The RESAS Classification of the Rural Economy.
- The Scottish Index of Multiple Deprivation.
- The James Hutton Institute's Index of Socio-Economic Performance for Rural and Small Town Scotland.
- The James Hutton Institute's identification of Sparsely Populated Areas.
- The James Hutton Institute's research into the measurement of wellbeing at community scale.
- Highlands and Islands Enterprise's index of Fragile Areas and Employment Action Areas in the Highlands and Islands.

This report will not go into detail about all of these typologies but will instead draw on information where it is relevant to this analysis. The key interest here is not the identification of typologies, but the data that may be used to identify fragility.

Index of Socio-economic Performance for Rural and Small Town Scotland

The Index of Socio-Economic Performance for Rural and Small Town Scotland was created by the James Hutton Institute for Scottish Government, to provide an evidence base for the targeting of support to rural small businesses through the 2014 – 2020 LEADER programme.

It is an 'index of socio-economic performance, at a micro-geographical level, for rural and small town Scotland'. It is intended to provide an improved understanding of the main dimensions of contemporary geographical variation in socioeconomic characteristics, and to move beyond twentieth-century rural and regional development stereotypes.

The Index combines 20 indicators, using 2011 Census data, background data from the Scottish Index of Multiple Deprivation and other sources. The indicators relate to:

- Population, population change, old age dependency, change in the economically active population.
- Income, unemployment and receipt of or dependency on benefits.
- Drive time and time by public transport to key services.
- Health, disabilities.
- Change in number of business sites.
- Crime.
- Educational attainment and activity, people employed in professional occupations.

The Scottish Government Urban Rural Classification was used to identify all data zones falling in rural areas and small towns. For these data zones, each of the indicators was scored on a scale of 1-to-10 (higher scores indicating stronger performance). The scores for the different indicators were then combined to derive scores relating to four of the Strategic Objectives from the National Performance Framework: wealthier / fairer, healthier, safer / stronger, and smarter. Finally, the Index for a data zone was calculated as a mean of the four Strategic Objective scores.

The 6-fold Urban Rural Classification was used as a 'filter' to analyse the four Strategic Objective indices, revealing different patterns (for example accessible rural areas tend to have the highest performance, while remote small towns have the lowest average performance).

The Index is not designed to specifically identify fragility and the data behind it is now out of date, having been superseded by critical data sets such as the 2022 Scottish Census and the 2020 Scottish Index of Multiple Deprivation. However, its indicators, or at least those still available at a small geography, may be used in a more up-to-date assessment of fragility.

Fragile Areas and Employment Action Areas in the Highlands and Islands

To prioritise their work to sustain and develop communities in the Highlands and Islands – targeting support at the areas that most need it – Highlands and Islands Enterprise has produced indices of 'fragile areas' and 'employment action areas. The index of Fragile Areas was also used by The Highland Council to inform their Highland-wide Local Development Plan.

According to this assessment of fragility, fragile communities are characterised by the following attributes:
- Declining population
- Under-representation of young people within the population
- Lack of economic opportunities
- Below average income levels
- Problems with transport
- Other issues reflecting their geographic location.

Fragile areas are identified according to four key indicators:
- Percentage change in population between 2001 and 2011.
- Drive-time (in minutes) to the nearest mid-sized service centre (defined as having a secondary school, NHS hospital and a large chain supermarket).
- Median household income.
- Average unemployment rate during 2013.

Data on these indicators was analysed for all data zones within Highland and Island Enterprise's area, and each data zone was given a score from 0-to-5 (least to most fragile) for each of the indicators. The scores were then combined to identify fragile Data Zones. This initial list was sense-checked with Highland and Island Enterprise Area Managers and a revised list created.

Employment Action Areas are characterised by a lack of employment opportunities, and they are identified based on:
- An over-reliance on a single employer or sector.
- Having experienced or at risk of significant job losses resulting from major closures.
- Persistent long-term unemployment caused by structural change.

Economic, demographic and skills data is examined in relation to these criteria, and Highland and Island Enterprise Area Managers consulted.

The data behind these indices are now out of date or unavailable. However, factors such as population change, drive-times, incomes and unemployment rates are all potential indicators of fragility.

Scottish Index of Multiple Deprivation

The Scottish Index of Multiple Deprivation is the Scottish Government's official tool to identify areas of multiple deprivation, where there is greater need for support and intervention. It is designed to identify small-area concentrations of multiple deprivation across the country in a consistent way. The index is generated from an analysis of 38 deprivation indicators that are combined into seven 'domains' – income, employment, health, education, crime, housing and access to services.

In calculating the Scottish Index of Multiple Deprivation score for each data zone, the individual domains are weighted, with income and employment being given the greatest weight, followed by health and education and then access, crime and housing.

Some additional work has been undertaken in relation to the application of Scottish Index of Multiple Deprivation for rural areas. People in rural areas face different challenges to those in urban areas, and experience deprivation differently as a result. Poverty and deprivation are more spatially dispersed in rural areas and there is also generally a greater mix of deprived and less deprived people. For example, 9 out of 10 income-deprived people in rural areas do not live in 'deprived areas' identified by Scottish Index of Multiple Deprivation, which is designed to identify concentrations of multiple deprivation. Also, the most significant issues in rural areas are different from those in urban areas. They include, for example, less accessible services, limited broadband access and quality, limited economic opportunities, a lack of affordable housing and higher fuel costs for heating and transport. The weighting applied in the normal Scottish Index of Multiple Deprivation calculation does not necessarily fully reflect the situation in rural Scotland.

The Scottish Government has developed alternative approaches for the use of Scottish Index of Multiple Deprivation data in rural areas. For example, analysis can be restricted to rural areas alone, excluding urban areas. This means that rural data zones are not over-shadowed by urban ones in identifying which areas are most deprived.

Analysis can also be restricted to those domains that are most relevant to rural areas, such as the income, employment and access domains. The income and employment domains are given the largest weightings in the Scottish Index of Multiple Deprivation,

because they are considered to be particularly important indicators of deprivation. In addition, because they are based on counts of people, they are proxies for individual deprivation. The access domain is included because it is particularly important in rural areas.

The figures can also be adjusted to reflect rural patterns. For example, unemployment counts can be averaged to take account of the seasonality of much rural employment.

Scottish Index of Multiple Deprivation data can also be combined with other data. As noted above, this was done in producing the Index of Socio-economic Performance for Rural and Small Town Scotland, where selected Scottish Index of Multiple Deprivation data was combined with Census and other data.

Local level wellbeing mapping tool

In 2020 the James Hutton Institute conducted research into the measurement of different forms of wellbeing at data zone level. This was done to support wider research into the inequalities in socio-economic outcomes in Scotland's rural areas and small towns, and the effectiveness of policy responses to them.

Twelve dimensions of wellbeing were used as a framework for the analysis, i.e.: income and wealth; jobs and earnings; housing; health and health status; education and skills; access to services; safety; environment; civic engagement and governance; life satisfaction; community; and work and life balance.

To identify regional variations in wellbeing, the researchers ranked each of the eight classes in the 8-fold version of the Urban Rural Classification in relation to the 12 wellbeing indicators. This process ordered the eight classes from the best performing to the worst performing for each indicator. For example, 'very remote rural areas' scored best for 'environment' and worst for 'access to services', whereas 'large urban areas' scored worst for environment and best for access to services.

Place-based policy approaches to population challenges: Lessons from Scotland

As set out in Scottish Government's Migration and Population Expert Advisory Group's report on Place-based policy approaches to population challenges (2022), Scotland is not alone in exhibiting a rising interest in population trends and related policy. Concern is manifest across the developed world. Total fertility rates across most of Europe are now well below replacement levels, and nobody really knows whether what lies ahead

for national populations is a steady state, or a slow decline. A report (ESPON 2020) found that almost two-thirds of rural regions[1] across Europe, containing 40% of Europe's population, are 'shrinking'.

The report by the Migration and Population Expert Advisory Group investigates methods of identifying geographical patterns of population change using small area population estimate data. It identifies two ways in which a 'shrinking' population as an embedded and sustained process can be distinguished from other random fluctuations:
• Duration
• Intensity.

In the case of duration, the peak year for each data-zone was identified for 2011 data zones. The number of years since that peak was used as an indicator of duration. The average annual percentage population change since the peak year was calculated (and mapped), as an indicator of intensity.

It should be noted that the precise thresholds of duration and intensity which may define shrinking data zones are a matter of judgement. The report therefore presents an illustrative analysis using thresholds 'which seem reasonable, but we offer no specific scientific justification for them'. The report's intention was not to identify specific target zones for policy, but rather to demonstrate the strengths and weaknesses associated with a replicable and evidence-based selection procedure, based upon available small area population estimate data, but also informed both by an understanding of complex shrinking, and the associated policy requirements.

Therefore, for the purpose of illustrating how such data may be used to identify a set of data zones most affected by sustained population decline the report combines the duration and intensity criteria. It proposed that a shrinking data-zone is one which has been shrinking for more than 10 years, at a rate of at least 1% per annum. The analysis did not identify any data zones which fall within the statistical areas used in the analysis of the Cairngorms National Park as meeting this definition.

It should be noted that the report was compiled before the release of the 2022 census estimates and the subsequent revisions to Scotland's annual small area mid-year population estimate data. Any application of the method would therefore need to be run using rebased small area population estimates for 2011 – 2022.

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[1] Defined as predominantly rural and intermediate according to a Eurostat urban-rural classification.

Population and fragile communities: Demographic challenges of the Highlands and Islands – a focus on peripheral and fragile areas

Paper 6 (2020) of the Convention of the Highlands and Islands analyses fragility across the Highlands and Islands region and highlights numerous factors that may be indicative of fragility. The analysis was carried out at a range of geographies and highlights issues such as:

- Historic population decline.
- Projected population decline.
- The age structure of the population.
- Low population density.
- A narrower range of education and career opportunities compared to Scotland.
- The quality, availability and accessibility of transport and digital infrastructure.
- The availability, quality and energy efficiency of housing.
- A shortage of supply in social care and childcare.

In terms of population, it recognises that population shrinkage is but one potential measure of fragility and that the age structure of the population may play an important role in an area's fragility. Reflecting this, old-age dependency ratios are projected to rise within the region, as they are in the National Park[2].

The old-age dependency ratio is the number of individuals aged 65 or older per 100 people of working age, defined as those aged between 20 to 64 years old[3]. There is no agreed upon threshold upon which a dependency ratio is considered to be a problem as it can depend on a range of contextual factors, particularly at a local level. However, in general high dependency ratios are considered problematic because they can lead to increased financial strain on public services (including health and social care), reduced economic growth, and potential shortages in the labour force. It should however be noted that traditional measures of the population age structure, such as the old age dependency ratio may, become less useful as more people work up to and beyond State Pension age[4].

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[2] See: https://www.nrscotland.gov.uk/publications/population-projections-for-scottish-areas-2018-based/#

[3] This is the definition used by the Organisation for Economic Co-operation and Development (OECD). Some organisations define the working age population as 15 – 64.

[4] See: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/ageing/articles/livinglongerandoldagedependencywhatdoesthefuturehold/2019-06-24

The Convention of the Highlands and Islands report found that, for the Inner Moray Firth area, which includes Badenoch and Strathspey, while the dependency ratio increased between 2011 and 2018 (based on mid-year population estimates), the ratio in 2018 (61.6%) was well below the highest levels, which were found in the Outer Hebrides (71.1%) and Argyll and Bute (68.2%). In addition, the Moray Firth area is expected to receive much of the immigration to Highland (+4,544 people). Paper 6 does not consider that there are any fragile communities in the Inner Moray Firth area, which is in stark contrast to the Argyll and Bute, the Outer Hebrides and Caithness and Sutherland areas where a targeted, inter-agency policy response is recommended due to the extent of the issues associated with very high working-age population decline.

In 2022, the dependency ratio in the Cairngorms National Park was around 50%, which is lower than those recorded for the regions measured in the Convention of the Highlands and Islands, but higher than the Scottish ratio of around 34% and slightly higher than the ratio for the 'remote rural areas', as identified by the 2022 6-fold urban rural classification, of around 47%.

These figures mask variation at smaller geographies.

Local authority engagement

The Park Authority has been engaging with the Highland Council on its approach to identifying fragile areas. This information cannot be published here as at the time of writing the Highland Council is yet to make its approach publicly available. However, the Park Authority has taken cognisance of the Council's approach, so that while the exact measures might differ, there is a degree of similarity between the conclusions of each planning authority.

Developing a methodology

Based on the review of existing measures a method of identifying fragile areas has been developed. This section of the report outlines the considerations that have been accounted for in this methodology.

Geographical considerations

The need to identify fragile rural areas arises from the need to have a means of effectively applying National Planning Framework 4's Policy 17c. This is solely concerned with 'remote rural' areas as defined by the Scottish Government's 6-fold Urban Rural Classification. As illustrated in Figure 1, the majority of the National Park falls within this classification. Those areas classified as 'accessible rural' do not fall within the scope of this assessment.

Statistical data for Scotland is available at a range of geographical levels and the key to a nuanced approach to identifying fragile areas is the granularity at which robust data is available to make an assessment. Scottish data zones, which are the key geography used for producing small area statistics in Scotland, provide the most comprehensive suite of datasets for most purposes in which local level nuance is required. While 2022 data zones have now been released, only limited data has so far been published according to its geographies. Therefore, this report uses data available according to 2011 data zones.

Data zones are attributed according to their place in the 6-fold Urban Rural Classification. The geographies of the data zones and the classification's geographical areas do not however nest within one another (Figure 2). This is because their boundaries are determined according to different statistical needs. Therefore, data zones are attributed to classifications according to the location of their population weighted centroid. The population weighted centroid is essentially the point in the area where population density is the same all around the point, or put more simply, the population 'centre of gravity' of the area. Therefore, data zones may overlap several classifications but will only be attributed to the classification in which their population weighted centroid is located. This relationship needs to be considered in defining the boundaries of potentially fragile areas.

6 fold urban rural classification 2022

- Large Urban Areas
- Other Urban Areas
- Accessible Rural Areas
- Accessible Small Towns
- Remote Rural Areas
- Remote Small Towns

Area covered by data zones attributed with remote rural or remote small town classifications
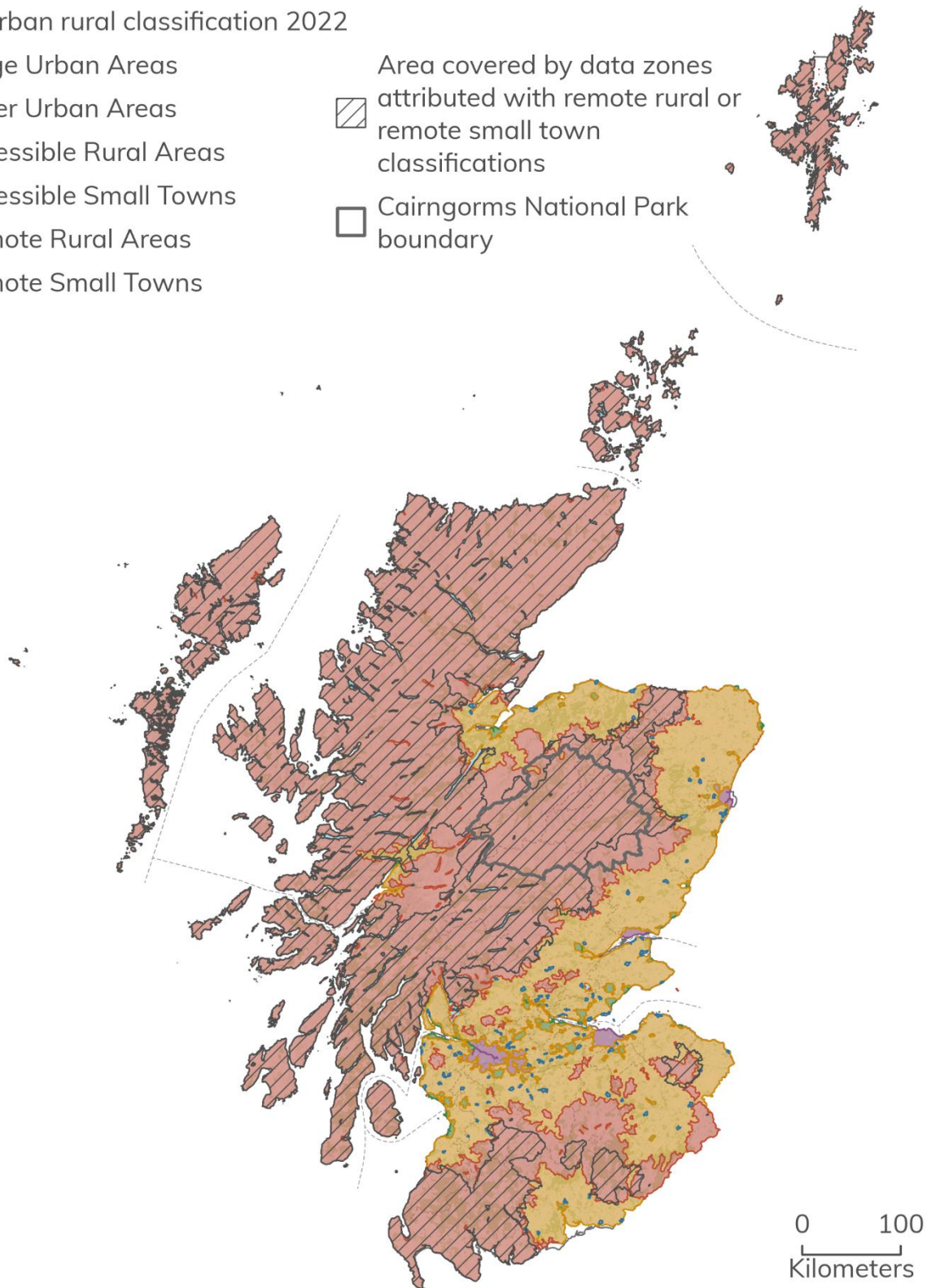
Cairngorms National Park boundary

0   100
Kilometers

Figure 2 The spatial relationship between the Government's 6-fold urban rural classifications 2022 and 2011 data zones attributed with remote rural and remote small town classifications.

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Statistical considerations

While data zones are the key geography used for producing small area statistics in Scotland, there are some important limitations that require consideration:

- Small area estimation relies on having sufficient data for the specific areas of interest. In some cases, data may be limited or unavailable, especially for very small areas or for specific characteristics.
- When working with small area data, especially administrative data, it is crucial to protect the confidentiality of individuals. Disclosure control methods are often used, which can restrict the level of detail that can be released. This may result in data being limited or unavailable, especially for very small areas or for specific characteristics.
- The methodology used to produce small area statistics is often optimised for producing estimates at a specific point in time. This can make it difficult to accurately track trends over time, as the models may not be designed to capture changes in the underlying factors that influence the statistics.
- Low sample sizes in some areas can reduce the statistical power of the analysis and make it harder to draw generalizable conclusions.
- Low sample sizes mean that small area estimates often have wider confidence intervals compared to estimates for larger areas. This means the estimates have a lower level of precision, making it harder to draw statistically significant conclusions, especially when comparing different small areas.

Therefore, to derive robust conclusions from the available data, thresholds for fragility must be set according to their statistical significance.

Identifying indicators

Based on the review of existing measures of rural characteristics, with a focus on those that may indicate fragility, and a review of small area statistical datasets that are currently publicly available, the following indicators have been identified and grouped into four broad indicator types.

Population

- Population shrinkage
- Old-age dependency ratio
- Change in old-age dependency ratio

Economic

- Unemployment rate
- Median gross household income per week
- Proportion of low-income households
- Number of industries

Access to services

- Drive times to a general practitioner
- Drive times to a retail centre
- Drive times to a primary school
- Drive times to a secondary school
- Public transport times to a general practitioner
- Public transport times to a retail centre

Housing

- Median house price to median household income ratio
- Proportion of second homes
- Proportion of long-term empty homes
- Change in proportion of long-term empty homes

These are covered in more detail on page 16 of this report.

Identifying thresholds

As there are no universally agreed thresholds for identifying fragility, this report seeks to identify a tailored approach of using these indicators in a way that reflects the remote rural nature of the majority of the Cairngorms National Park.

There are numerous ways in which this can be achieved. For example, measures such as the Scottish Index of Multiple Deprivation and the Index of Socio-economic Performance for Rural and Small Town Scotland are indices which rank all areas within their sample according to their performance. Thresholds may therefore be set by dividing the index by statistical units such as quartiles, deciles or vigintiles.

However, not all datasets are suitable for indexing. For example, the method suggested by the Migration and Population Expert Advisory Group for identifying population shrinkage is not a relative measure and cannot be indexed against other geographical areas. Therefore, it is considered appropriate to take the approach of benchmarking the performance of data zones within and overlapping the Cairngorms National Park against those of data zones that have similar characteristics. For this we may turn to the typologies of the 6-fold urban rural index. For the purposes of this assessment it is considered appropriate to benchmark against data zones that are attributed to the remote rural and remote small town typologies. The rationale behind this is that settlements like Aviemore and Grantown-on-Spey only just fall under the definition of a remote small town and therefore are likely to share many characteristics with other remote small towns in Scotland. The inclusion also increases the size of the sample, contributing to its robustness. In total it represents a sample of 492 data zones.

For the purposes of this assessment, the average is considered to be a reasonable benchmark for most indicators. Due to the small sample sizes within data zones, it is also necessary to apply a test of statistical significance to this average. For this purpose, the standard deviation may be calculated for each data set and applied to the threshold.

Refining the indicators

Population indicators

Population decline and demographic challenges are central to conceptions of fragility, with many of those quoted in Rural Planning Policy to 2050: Research to Inform Preparation of NPF4 identifying them as significant challenges. The population indicators are therefore considered to be of overarching importance to the identification of fragile areas.

Population shrinkage

A declining population is set out within National Planning Framework 4 as a characteristic of fragility and is used as an indicator in a number of the measures of rural fragility reviewed in this report. It is considered that a simple measure of decline across a set time period, for example 5 or 10 years, is too blunt a measure, particularly as the data is derived from small area estimates and therefore subject to issues of statistical confidence. Therefore, the approach set out in the Migration and Population Expert Advisory Group's report (which considers both the duration and intensity of population decline) offers the most robust measure for determining whether or not a population is shrinking. It is acknowledged that the report's thresholds are a matter of judgement, however in the absence of a compelling alternative, there is a satisfactory rational for their use here.

Table 1 Indicator and thresholds for identifying potentially fragile areas based on population shrinkage.

Indicator	Threshold
Both population shrinkage criteria (duration and intensity) are met.	
Duration	Population has been shrinking for a period of more than 10 years since its peak.
Intensity	The average rate of shrinkage is at least 1% per annum.
Source: Statistics.gov.scot • https://statistics.gov.scot/resource?uri=http%3A%2F%2Fstatistics.gov.scot%2Fdata%2Fpopulation-estimates-2011-datazone-linked-dataset National Records Scotland • https://www.nrscotland.gov.uk/publications/rebased-small-area-population-estimates-for-2011-to-2021-2011-data-zones/ • https://www.nrscotland.gov.uk/publications/small-area-population-estimates-mid-2022/	

Old-age dependency ratio

The old-age dependency ratio is a standard to measure pressure on the productive population and is a useful indicator for all kinds of geographies, not just rural ones. It is used by a number of measures of rural fragility reviewed in this report.

The old-age dependency ratio for data zones may be calculated from a range of sources, with mid-year estimates published by National Records Scotland offering the granularity required to calculate the ratio on an annual basis from 2011 – 2022.

Table 2 Indicator and threshold for identifying potentially fragile areas based on the old-age dependency ratio.

Indicator	Timeframe	Threshold (mean + standard deviation)
Old-age dependency ratio is statistically greater than the average for remote rural areas and remote towns.	2022	67.4%
Source: National Records Scotland • https://www.nrscotland.gov.uk/publications/small-area-population-estimates-mid-2022/		

Change in old-age dependency ratio

While the-age dependency ratio for the most recent year is useful, demographic trends may also offer an indicator of fragility, with the report of the Convention of the Highlands and Islands highlighting the risks posed by the projected aging population. Considering the historic change in the old-age dependency ratio is therefore considered a reasonable indication of fragility, with the extent of the change being the measure.

Table 3 indicator and threshold for identifying potentially fragile areas based on the change in the old-age dependency ratio.

Indicator	Timeframe	Threshold (mean + standard deviation)
The change in the old-age dependency from 2011 – 2022 is statistically greater than the average for remote rural areas and remote towns.	2011 – 2022	22.2% points
Source: National Records Scotland • https://www.nrscotland.gov.uk/publications/rebased-small-area-population-estimates-for-2011-to-2021-2011-data-zones/		

- https://www.nrscotland.gov.uk/publications/small-area-population-estimates-mid-2022/

Economic indicators

Economic factors are highlighted across a range of sources as being a key indicator of fragility, with Highland and Island Enterprise's Fragile Areas index containing a number of indicators that may be used for measuring its extent, for example the unemployment rate and median household income.

Unemployment rate

The unemployment rate is a standard indicator for economic performance and is used within Highland and Island Enterprise's 2014 index of fragility. Highland and Island Enterprise were able to take the quarterly average for the unemployment rate across the year 2013. However, there are now no official quarterly figures for the unemployment rate available at a data zone level.

In the absence of official small area estimates, an alternative means of calculating the unemployment rate has been used based on 2022 Census data. This can be done by dividing the Economically Active (excluding full-time students) population by the population who are unemployed and available for work (excluding full-time students). The Census estimate therefore provides an estimate for Q1 2022. The limitation of this method is that unemployment changes seasonally, and therefore a single quarter may not provide a full picture of the unemployment rate for an area across the whole year. This issue can be mitigated by calculating the standard deviation for the data set and applying this to the threshold for potential fragility.

Table 4 Indicator and threshold for identifying potentially fragile areas based on the unemployment rate.

Indicator	Timeframe	Threshold (mean + standard deviation)
The unemployment rate is statistically greater than the average for remote rural areas and remote towns.	March 2022	4.6%
Source: Scottish Census 2022 - Table UV601 • https://www.scotlandscensus.gov.uk/		

Median gross household income per week

Household income is a standard measure of economic performance and well-being and is used in a range of indices to help identify deprivation or fragility.

Small area household income estimates are published by Scottish Government. These are designed for the primary purpose of assessing housing affordability and housing need in housing need and demand assessments. The most recent estimates are 2018 based and were published in 2020.

They are synthetic modelled estimates, in which data on income and household characteristics from a national survey (the Scottish Household Survey) has been combined with associated local area level data. The estimates generated for a given local area level are therefore the expected levels of income in that area, based on the household characteristics as measured by the associated local level data, and are not aggregations of actual income data at a local level. Caution should therefore be applied in their use, particularly if it is not their primary use.

There are however no alternative sources of data at a data zone level and therefore the estimates are deemed fit to use here as part of a wider suite of indicators.

Table 5 Indicator and threshold for identifying potentially fragile areas based on median gross household income per week.

Indicator	Timeframe	Threshold (mean + standard deviation)
The median gross household income per week in 2018 is statistically lower than the average for remote rural areas and remote towns.	2018	£436.70
Source: Scottish Government • https://www.gov.scot/collections/local-level-household-income-estimates/		

Proportion of low-income households

This indicator is also based on Scottish Government's small area household income estimates. It is based on a close approximation to the former UK Government target measure of relative low income i.e. the proportion of households with an income below 60% of the median net equivalent income before housing costs.

Table 6 Indicator and threshold for identifying potentially fragile areas based on the low-income households.

Indicator	Timeframe	Threshold (mean + standard deviation)
The approximate proportion of households under 60% of median gross income is statistically greater than the average for remote rural areas and remote towns.	2018	24.1%
Source: Scottish Government https://www.gov.scot/collections/local-level-household-income-estimates/		

Number of industries

There are numerous methods of identifying deprivation based on the presence of industries or jobs within an area, for example Highland and Island Enterprise's Employment Action Areas. This indicator uses data from the Business Register and Employment Survey which is available from Nomis. The data presents information about the proportion of the population employed by industrial sector, from which the number of industries can be derived. The rationale behind this is that fewer industries represent a higher probability of fragility as the population will have more limited access to the jobs market.

Table 7 Indicator and threshold for identifying potentially fragile areas based on the number of industries.

Indicator	Timeframe	Threshold (mean + standard deviation)
Number of industries is statistically lower than the average for remote rural areas and remote towns.	2024	4.1
Source: Nomis - Industrial sectors based on Business Register and Employment Survey • https://www.nomisweb.co.uk/		

Access to services indicators

Access to services is considered by a range of measures of deprivation or fragility, including Highland and Island Enterprise's Fragile Areas Index, the Index of Socio-economic Performance for Rural and Small Town Scotland and the Scottish Index of Multiple Deprivation. It is central to the Scottish Index of Multiple Deprivation, representing one of its seven domains. The Access to services domain is informed by average drive times to key services and these statistics may be used for a range of purposes (for example James Hutton Institute's Index of Socio-economic Performance for Rural and Small Town Scotland) including an assessment of fragility.

The most recent Scottish Index of Multiple Deprivation was published in 2020 (with the next updated due to be published in 2026) and therefore its data forms the basis for the measure of fragility in this assessment. The only datasets not chosen were drive times to petrol stations and post offices. This is because they were not considered to be significant enough to indicate fragility.

Drive times to a general practitioner

Table 8 Indicator and threshold for identifying potentially fragile areas based on drive times to a general practitioner.

Indicator	Timeframe	Threshold (mean + standard deviation)
The average drive time to a general practitioner is statistically greater than the average for remote rural areas and remote towns.	2018	14.0 minutes
Source: Scottish Index of Multiple Deprivation 2020 • https://simd.scot/#/simd2020/BTTTFTT/9/-4.0000/55.9000/		

Drive times to a retail centre

Table 9 Indicator and threshold for identifying potentially fragile areas based on drive times to a retail centre.

Indicator	Timeframe	Threshold (mean + standard deviation)
The average drive time to a retail centre is statistically greater than the average for remote rural areas and remote towns.	2018	31.2 minutes
Source: Scottish Index of Multiple Deprivation 2020 • https://simd.scot/#/simd2020/BTTTFTT/9/-4.0000/55.9000/		

Drive times to a primary school

Table 10 Indicator and threshold for identifying potentially fragile areas based on drive times to a primary school.

Indicator	Timeframe	Threshold (mean + standard deviation)
The average drive time to a primary school is statistically greater than the average for remote rural areas and remote towns.	2018	7.6 minutes
Source: Scottish Index of Multiple Deprivation 2020 • https://simd.scot/#/simd2020/BTTTFTT/9/-4.0000/55.9000/		

Drive times to a secondary school

Table 11 indicator and threshold for identifying potentially fragile areas based on drive times to a secondary school.

Indicator	Timeframe	Threshold (mean + standard deviation)
The average drive time to a secondary school is statistically greater than the average for remote rural areas and remote towns.	2018	27.5 minutes
Source: Scottish Index of Multiple Deprivation 2020 • https://simd.scot/#/simd2020/BTTTFTT/9/-4.0000/55.9000/		

Public transport times to a general practitioner

Table 12 Indicator and threshold for identifying potentially fragile areas based on public transport times to a general practitioner.

Indicator	Timeframe	Threshold (mean + standard deviation)
The average public transport time to a general practitioner is statistically greater than the average for remote rural areas and remote towns.	2018	29.0 minutes
Source: Scottish Index of Multiple Deprivation 2020 • https://simd.scot/#/simd2020/BTTTFTT/9/-4.0000/55.9000/		

Public transport times to a retail centre

The indicator and threshold for identifying potentially fragile areas based on public transport times to a retail centre is as follows.

The average public transport time to a retail centre is statistically greater than the average for remote rural areas and remote towns.

Table 13 Indicator and threshold for identifying potentially fragile areas based on public transport times to a retail centre.

Indicator	Timeframe	Threshold (mean + standard deviation)
The average public transport time to a retail centre is statistically greater than the average for remote rural areas and remote towns.	2018	19.5 minutes
Source: Scottish Index of Multiple Deprivation 2020 • https://simd.scot/#/simd2020/BTTTFTT/9/-4.0000/55.9000/		

Housing indicators

Median house price to median household income ratio and proportion of second homes

House prices and second home rates are not found in most measures of deprivation or fragility, although they are included within James Hutton Institute's Local level wellbeing mapping tool. However, housing and the availability of affordable housing was raised as one of the greatest issues facing the National Park's residents and workers in the 2024 – 2025 Resident and Worker Survey, with 60% of those surveyed finding it difficult to find an affordable place to live in the National Park. This is indicative of a potential issue as the scarcity of affordable options may drive young people away from their communities, thereby reducing the working age population and increasing the old-age dependency ration, which in turn may hinder economic growth, and place a strain on local services.

On their own however, relatively high median prices and relatively high levels of second home ownership are not necessarily indicative of fragility. Conversely, they may be indicative of economically healthy locations with good access to services. Therefore, nuance is required in determining how they should be used. Therefore, it is considered that these indicators should be used according to their relationship with one another, and that house prices should be judged in accordance with their relationship with incomes.

The median house price to median income ratio can be calculated using house price data for data zones published by statistics.gov.scot and Scottish Government's small area household income estimates. The most recent house price data is for 2023, while

the income estimates are 2018 based. The change in household income from 2018 – 2023 therefore needs to be calculated to reach an estimate of the ratio. For this purpose, Scottish Government's Housing Need and Demand Assessment Tool's 'Moderate Real Terms Growth' scenario has been used. This is the tool's core / default scenario, which assumes a growth of 2.5% per annum in nominal terms.

One of the key considerations for small area house price statistics is the low sample size, which can be as low as a single sale per annum. Therefore, to increase the robustness of the indicator, it is considered that the median house price to median income ratio for multiple years should be used.

Data on the proportion of second homes is available from National Records Scotland's small area household estimates, which are published annually, with data available up to 2024.

The indicator and thresholds are set out in Table 14. The rationale behind these is that high median house price to median household income ratios can lead to local people having difficulty finding accommodation they can afford. The presence of a high proportion of second homes indicates that they are in competition with those from outwith the area with significantly higher disposable incomes and / or equity. This may indicate that an area is fragile as the working age population is pushed outwith the area or is forced to spend a significant proportion of their income on housing costs.

Table 14 Indicator and threshold for identifying potentially fragile areas based on the median house price to median household income ratio the proportion of second homes.

Indicator	Timeframe	Threshold (mean + standard deviation)
Both the median house price to median household income ratio and the proportion of second homes are statistically higher than the average for remote rural areas and remote towns for the year 2021, 2022 or 2023.		
Median house price to median household income ratio	2021	7.5%
	2022	8.3%
	2023	8.0%
Proportion of second homes	2021	10.9%
	2022	10.9%
	2023	10.8%
Source:		

Scottish Government
- https://www.gov.scot/collections/local-level-household-income-estimates/

Statistics.gov.scot
https://statistics.gov.scot/slice?dataset=http%3A%2F%2Fstatistics.gov.scot%2Fdata%2Fresidential-properties-sales-and-price&http%3A%2F%2Fpurl.org%2Flinked-data%2Fsdmx%2F2009%2Fdimension%23refPeriod=http%3A%2F%2Freference.data.gov.uk%2Fid%2Fyear%2F2023&http%3A%2F%2Fstatistics.gov.scot%2Fdef%2Fdimension%2Fsales=http%3A%2F%2Fstatistics.gov.scot%2Fdef%2Fconcept%2Fsales%2Fnumber-of-sales

National Records Scotland
- https://www.nrscotland.gov.uk/publications/small-area-statistics-on-households-and-dwellings/

Proportion of long-term empty homes

Long-term empty homes can be a key indicator of various issues within a community, including a strained housing market, economic decline, and neighbourhood deterioration. The proportion of long-term empty homes may be calculated using National Records Scotland's small area household estimates.

Table 15 Indicator and threshold for identifying potentially fragile areas based on the proportion of long-term empty homes.

Indicator	Timeframe	Threshold (mean + standard deviation)
The proportion of long-term empty homes is statistically higher than the average for remote rural areas and remote towns.	2024	5.9%
Source: National Records Scotland • https://www.nrscotland.gov.uk/publications/small-area-statistics-on-households-and-dwellings/		

Change in proportion of long-term empty homes

While the proportion of long-term empty homes for the most recent year is useful, recent historic trends may also offer an indicator of fragility, with an increase in long-term

empty homes potentially indicative of a declining economic state. Considering the historic change in the proportion of long-term empty homes is therefore considered a reasonable indication of fragility, with the extent of the change being the measure. This may be estimated by using the most recent National Records Scotland statistical publication on households and dwellings, which presents data from 2014 – 2024.

Table 16 Indicator and threshold for identifying potentially fragile areas based on the change in the proportion of long-term empty home.

Indicator	Timeframe	Threshold (mean + standard deviation)
The change in proportion of long-term empty homes from 2014 – 2024 is statistically greater than the average for remote rural areas and remote towns.	2014 – 2024	3.5% points
Source: National Records Scotland • https://www.nrscotland.gov.uk/publications/small-area-statistics-on-households-and-dwellings/		

Using the indicators to identify fragility

The proposed approach takes into account the review of evidence of the testing of indicators. Not all indicators are of equal weight, with the population indicators being of greatest significance. On their own, many indicators are not likely to demonstrate fragility and therefore need to be considered in conjunction with others.

Accounting for these considerations, a data zone is classified as a fragile area if the thresholds are met for:
• One population indicator, and at least
• One economic, access to services or housing indicator.

Results

Remote rural and remote small towns

Data may be presented for all data zones classified as remote rural and remote small towns according to the 2022 6-fold urban rural classification. According to the analysis there are a total of 133 out of 492 (around 25%) data zones that meet the fragile rural area classification. The results are presented in the following maps:

- Figure 3 – Remote rural and remote small town data zones that meet one population and one economic, access to services or housing indicator and therefore meet the fragile rural area classification.
- Figure 4 – Remote rural and remote small town data zones that meet at least one population indicator.
- Figure 5 – Remote rural and remote small town data zones that meet at least one economic indicator.
- Figure 6 – Remote rural and remote small town data zones that meet at least one access to services indicator.
- Figure 7 – Remote rural and remote small town data zones that meet at least one access to services indicator.

Full details of the analysis may be found in:

- https://cairngorms.co.uk/uploads/documents/Local-Development-Plan-Evidence-Report/Supporting-Documents/Identifying-rural-fragile-areas-data.xlsx

Meets one population and one economic, access to services or housing indicator

- Fragile area
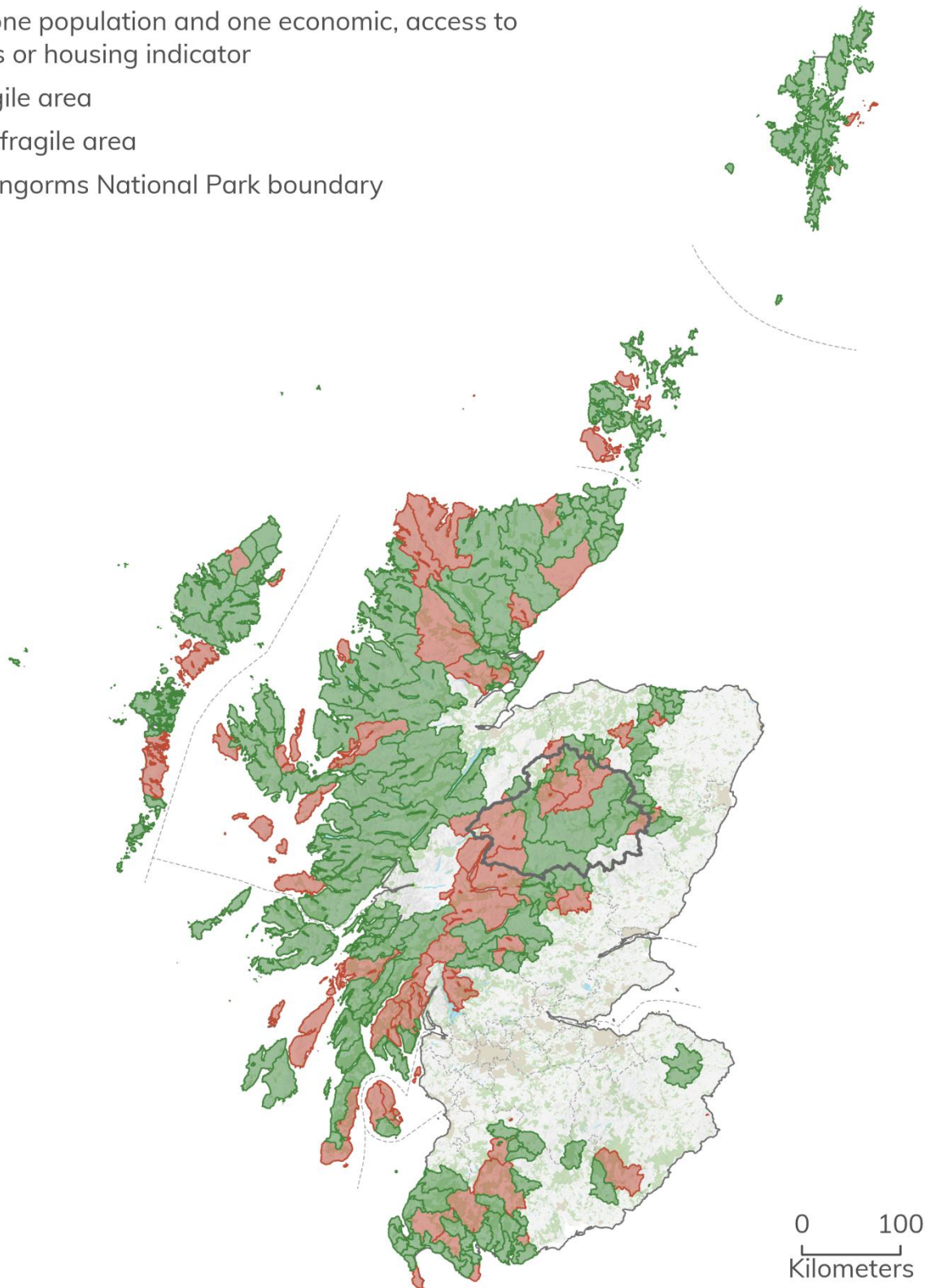- Not fragile area
- Cairngorms National Park boundary

Figure 3 Remote rural and remote small town data zones that meet one population and one economic, access to services or housing indicator and therefore meet the fragile rural area classification.

Cairngorms National Park Authority © Crown copyright and database rights 2025 Ordnance Survey AC0000821810.

Meets at least one population indicator

True

False
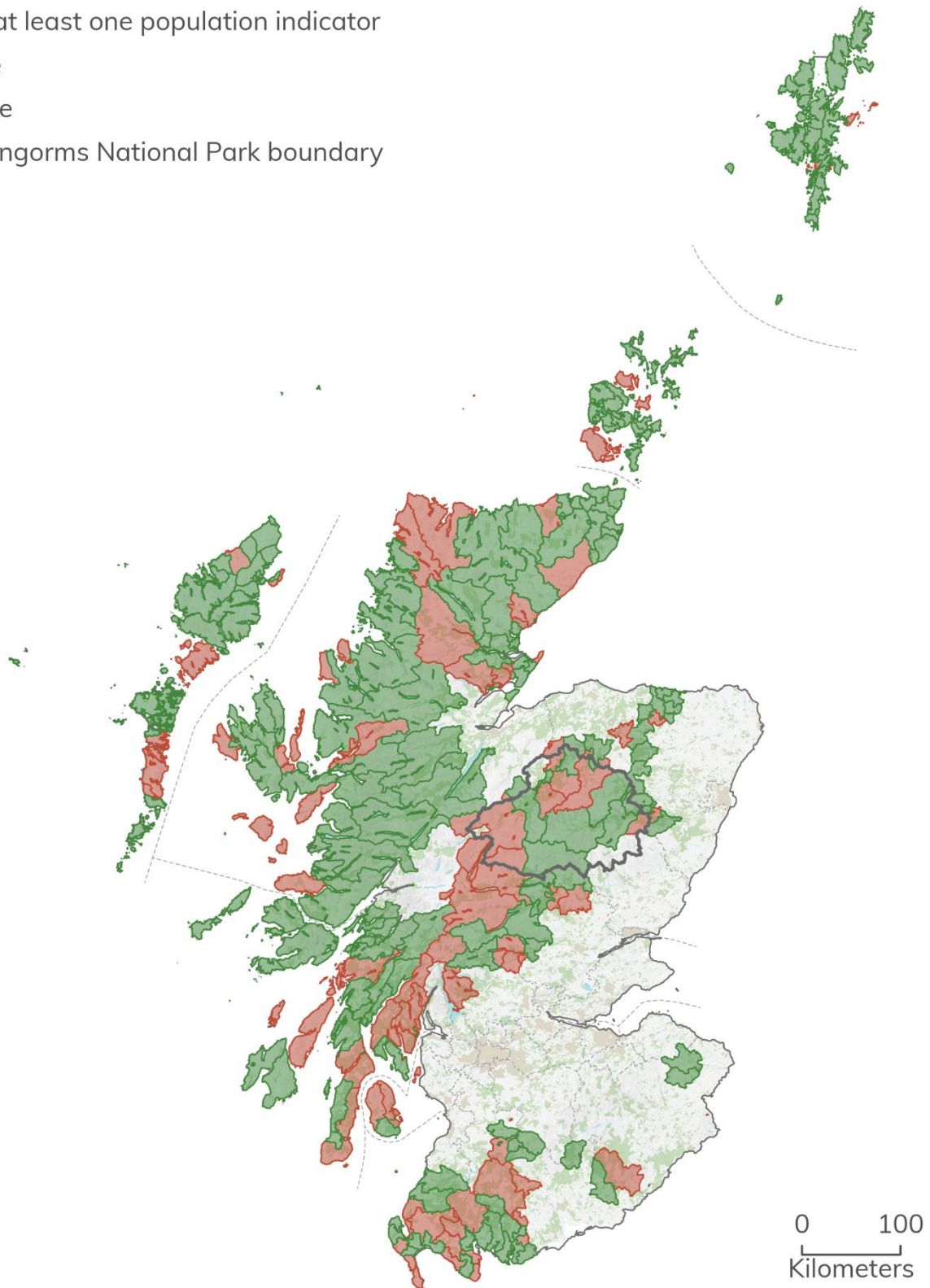
Cairngorms National Park boundary

Figure 4 Remote rural and remote small town data zones that meet at least one population indicator.

Cairngorms National Park Authority © Crown copyright and database rights 2025 Ordnance Survey AC0000821810.

Meets at least one economic indicator

- 🟥 True
- 🟩 False
- ☐ Cairngorms National Park boundary
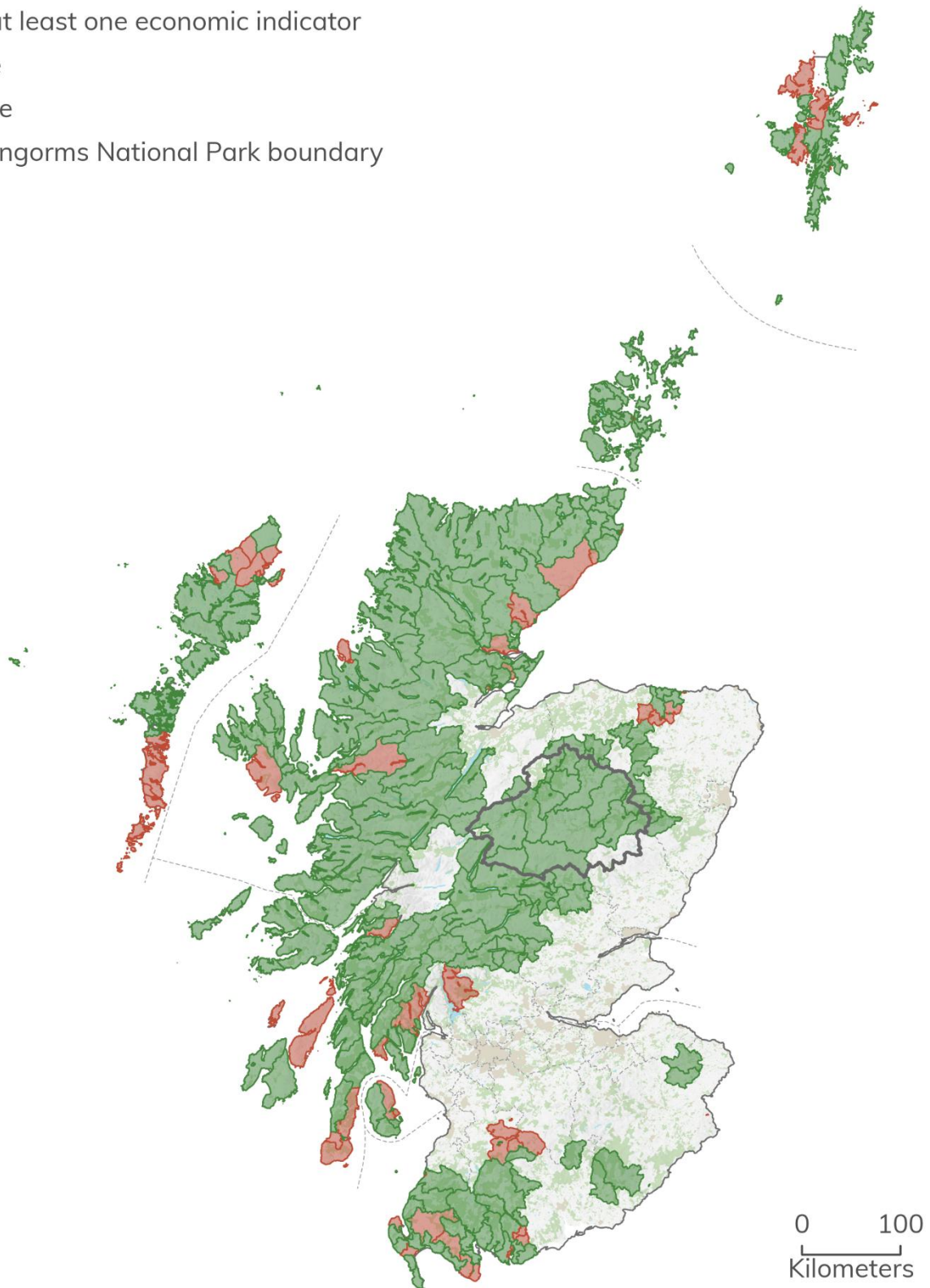
Figure 5 Remote rural and remote small town data zones that meet at least one economic indicator.

Cairngorms National Park Authority © Crown copyright and database rights 2025 Ordnance Survey AC0000821810.

Meets at least one access to services indicator

■ True
■ False
□ Cairngorms National Park boundary

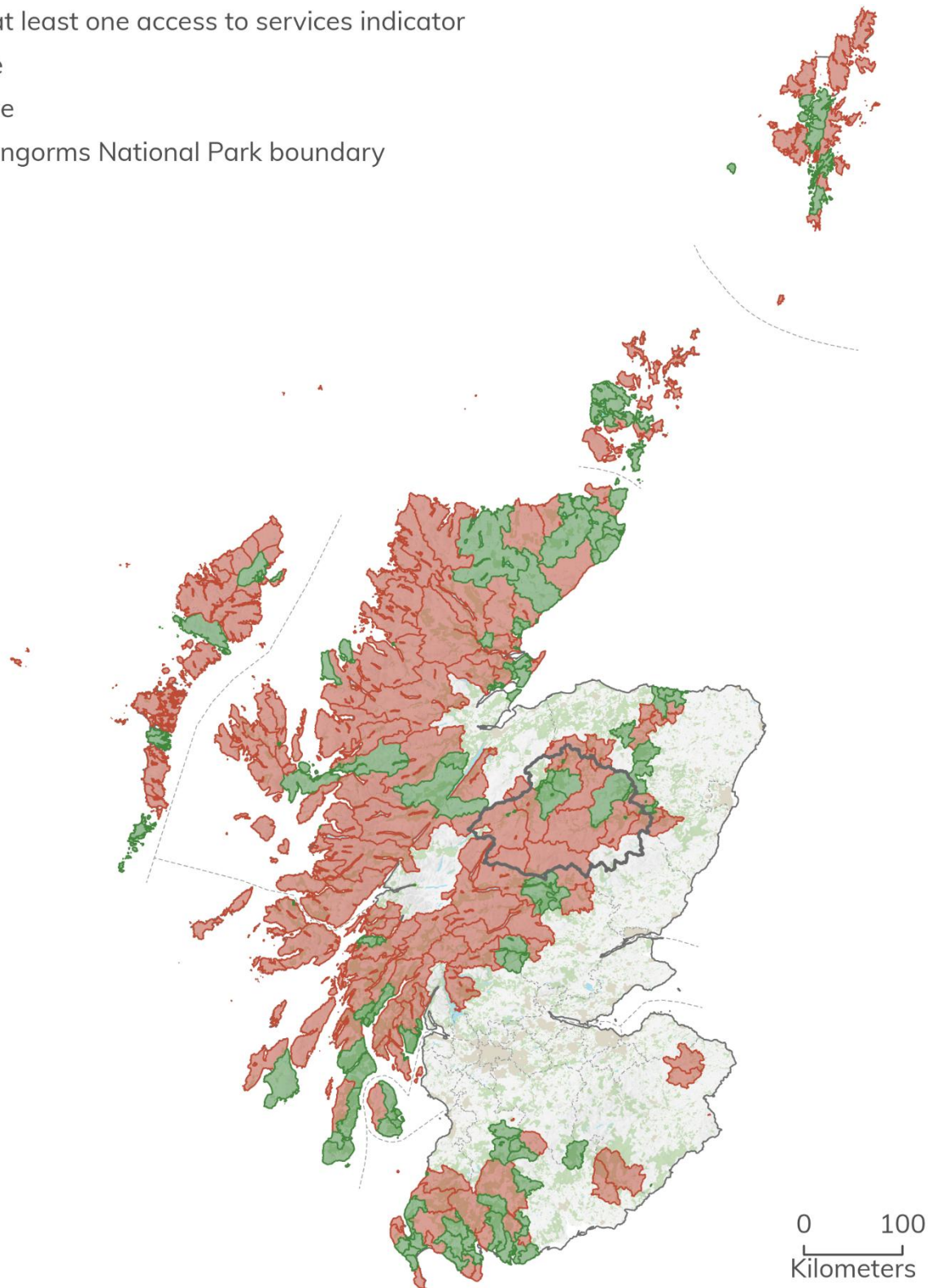Figure 6 Remote rural and remote small town data zones that meet at least one access to services indicator.

Cairngorms National Park Authority © Crown copyright and database rights 2025 Ordnance Survey AC0000821810.

Meets at least one housing indicator

■ True

■ False

☐ Cairngorms National Park boundary
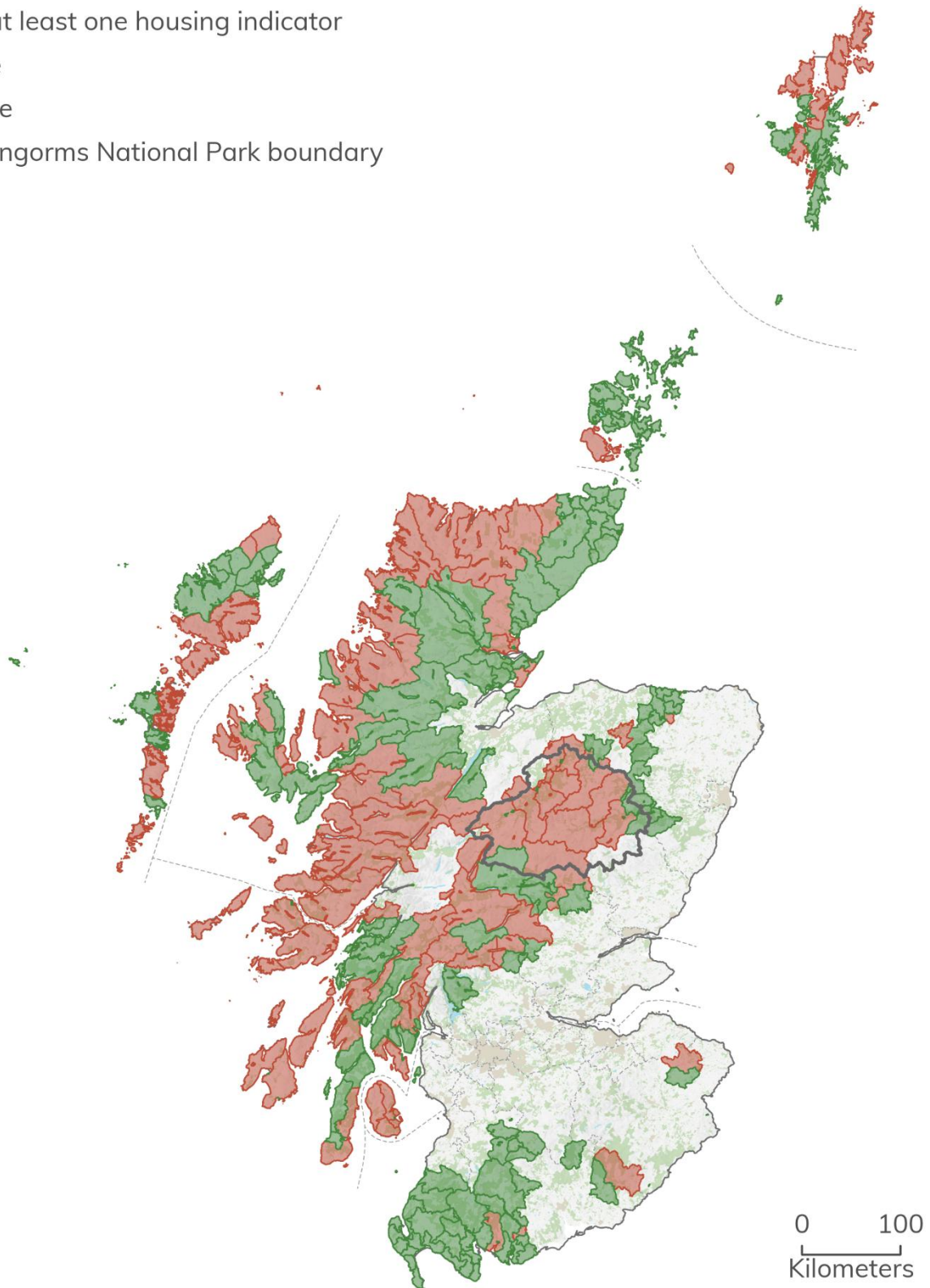

Figure 7 Remote rural and remote small town data zones that meet at least one housing indicator.

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Cairngorms National Park

Focussing on the Cairngorms National Park, there are eight data zones within or overlapping its boundary that meet the classification (Figure 8).
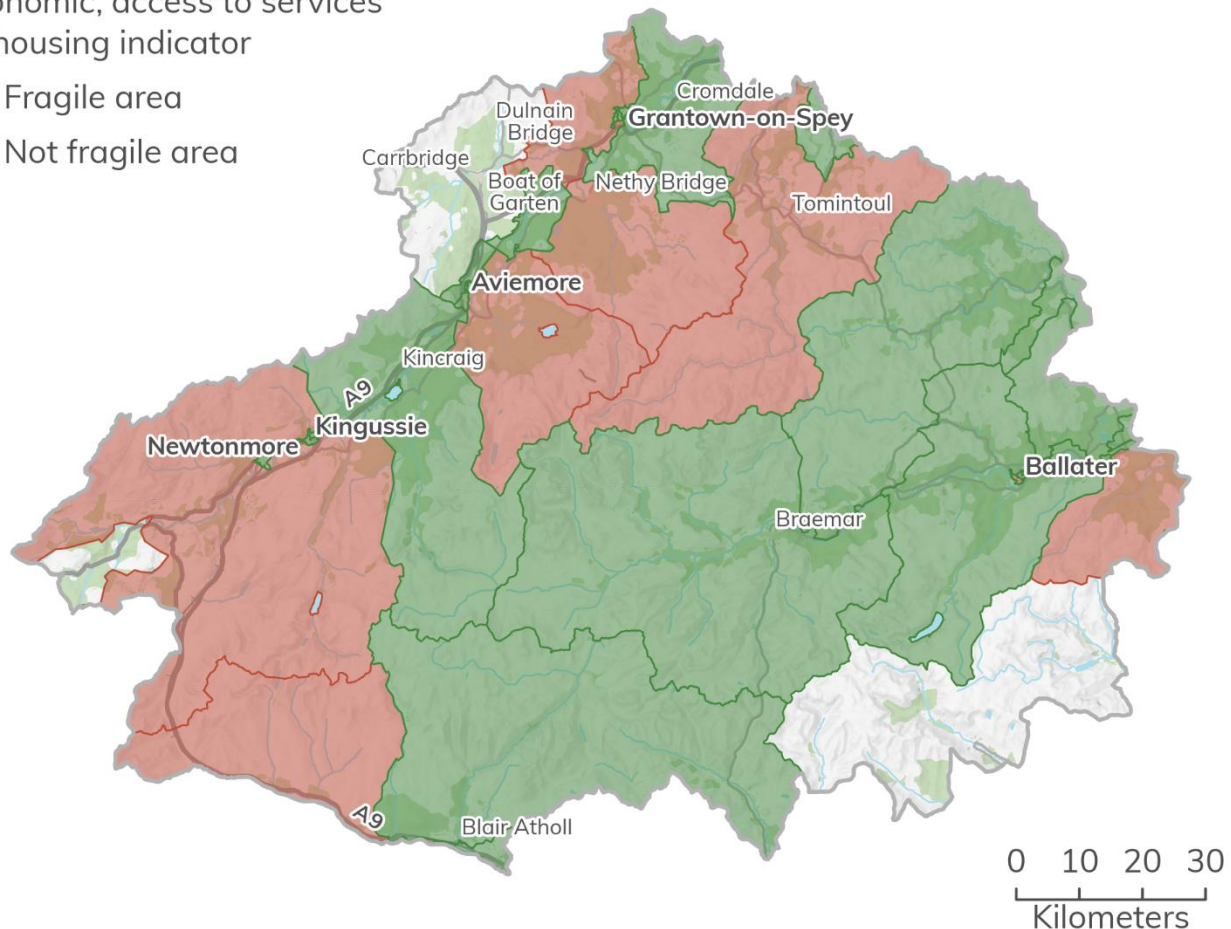

Figure 8 Remote rural and remote small town data zones within or overlapping the Cairngorms National Park boundary that meet one population and one economic, access to services or housing indicator and therefore meet the fragile rural area classification.

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Table 17 provides a summary of the indicator types that were met by each of the areas. Full information may be found in:

- https://cairngorms.co.uk/uploads/documents/Local-Development-Plan-Evidence-Report/Supporting-Documents/Identifying-rural-fragile-areas-data.xlsx

Table 17 Data zones within or overlapping the Cairngorms National Park boundary that meet the fragile rural area classifications.

Data zone reference number	Data zone name	Council area name	Population indicator met	Economic indicator met	Access to services indicator met	Housing indicator met
S01006789	East Cairngorms - 01	Aberdeenshire	✓	✗	✗	✓
S01006797	Aboyne and South Deeside - 04	Aberdeenshire	✓	✗	✓	✗
S01010532	Badenoch and Strathspey South - 02	Highland	✓	✗	✓	✓
S01010539	Badenoch and Strathspey Central - 04	Highland	✓	✗	✗	✓
S01010542	Badenoch and Strathspey North - 01	Highland	✓	✗	✗	✓
S01010543	Badenoch and Strathspey North - 02	Highland	✓	✗	✓	✓
S01011045	South Speyside and the Cabrach - 01	Moray	✓	✗	✓	✓
S01012016	Rannoch and Aberfeldy - 04	Perth and Kinross	✓	✗	✓	✗

The population weighted centroid of two of these data zones (S01012016 – Rannoch and Aberfeldy – 04 and S01006797 – Aboyne and South Deeside – 04) fall outwith the National Park boundary. This means that the majority of their populations live outwith the National Park and that the impact of any policy approaches adopted by the Park Authority are unlikely to have a significant impact on these areas. The areas within the National Park are however worth considering when identifying fragile rural areas in the National Park context, as it will mean that any policy approaches identified in the Proposed Plan may be consistently applied.

The settlements named within the Cairngorms National Park Partnership Plan's 2022 – 2027 spatial strategy, which fall within these data zones are:
- Aviemore (part)
- Ballater (part)

- Coylumbridge
- Dalwhinnie
- Dulnain Bridge
- Glenlivet
- Glemmore
- Inverdruie
- Laggan
- Nethy Bridge
- Tomintoul.

The proposed plan should consider how the boundaries of identified fragile rural areas are drawn, particularly within the context of settlements that are partially identified in this analysis. For example, due to the small size of the two data zones covering Ballater, it may worth identifying Ballater as a fragile area in its entirety. This would simplify the application of policy and should make policy outcomes, for example the delivery of affordable housing, easier to achieve.

Limitations

From a practical perspective, the analysis is limited by the availability of data for small areas. More up-to-date data is due to be published next year (or example, the 2026 Scottish Index of Multiple Deprivation) and this should be taken account of during the preparation of the Proposed Plan.

The analysis is also entirely quantitative in nature and is not informed by qualitative data, such as that that may be gathered through public engagement. Therefore, the identification of fragile rural areas may be informed and refined during the preparation of the Proposed Plan, which will include direct community engagement, with a focus on placemaking.

The key output of this report, therefore, is the framework for analysis that will be used and refined during the preparation of the Proposed Plan, with the aim of identifying fragile rural areas within its spatial strategy.

Engagement on this report

This report forms part of the local development plan's evidence report engagement material. The Park Authority will consider comments made during the engagement and the approach to identifying fragile rural areas may be amended as a result. The

outcomes of this exercise will be submitted to Scottish Ministers for consideration as part of the gatecheck review of the evidence report.

Implications for Proposed Plan

The Proposed Plan should identify fragile rural areas within its spatial strategy based on the analysis carried out in this report. This should include some refinement of boundaries to reflect practical factors such as the implementation of policy. It should also include refinement through direct community engagement carried out during the Proposed Plan's preparation, as this may provide more qualitative information to inform the assessment of fragility.

The identification of fragile rural areas should aid the implementation of National Planning Framework 4. The Proposed Plan may also consider its own policy approach for development within these areas, for example by setting higher thresholds for affordable housing.

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