Cairngorms NATIONAL PARK
Pàirc Nàiseanta a' Mhonaidh Ruaidh

PLANNING

Cairngorms National Park Local Development Plan 2020

Strategic Environmental Assessment Environmental Report November 2017

Appendix 2: Topic 5

Topic 5: Material Assets

In SEA terms Material Assets may cover a range of apparently disparate environmental concerns, including natural resources, geodiversity, waste, infrastructure and property. Many can be scoped out of the SEA for the National Park, while others may be dealt with under other topics. For example, soil and water are covered by their own topics. The issues covered within this section therefore, are:

- Geoconservation;
- Energy;
- Waste;
- Transport infrastructure; and
- Broadband infrastructure.

Geoconservation

> "…*geological heritage constitutes a natural heritage of scientific, cultural, aesthetic, landscape, economic and intrinsic values, which needs to be preserved and handed down to future generations.*"
>
> Council of Europe (2004).

Geoconservation involves recognising, protecting and managing sites and landscapes identified as important for their rocks, fossils, minerals, or other geological or geomorphological features of interest. Some of the concepts of geoconservation are still being developed; however, in some areas a good deal has been achieved, particularly in the creation of the UK Geodiversity Action Plan (UK GAP) and Scotland's Geodiversity Charter.

There are many definitions of 'geodiversity', but the majority are variations on similar wording (see Gray, 2008, 2013; Sharples, 1993). Broadly, it may be defined as:

"*The variety of rocks, minerals, fossils, landforms, sediments and soils, together with the natural processes which form and alter them*" (Bruneau *et al.* 2011, p. 3).

As well as being of scientific and cultural importance, geodiversity makes an immense contribution to Scotland's economy, as a source of energy and materials, and as a visitor attraction through its contribution to our unique landscape. Crucially, geodiversity underpins biodiversity through providing mosaics of landforms, soils, water, nutrients and natural processes to support our nationally and internationally important habitats, species and ecosystems (Scottish Geodiversity Forum, 2013; Bruneau *et al.* 2011; Gordon *et al.* 1998, 2001; Haynes, *et al.* 1998; Jonasson *et al.* 2005).

Protecting Geodiversity

There are a range of designations that help to safeguard geodiversity within the Cairngorms National Park, including Sites of Special Scientific Interest (SSSI) and Geological Conservation Review (GCR) Sites. Indeed, geodiversity is part of the special qualities of the National Park.

The landscapes of the Cairngorms National Park have a remarkable history stretching back to some 700 million years. The processes that have led to these old landscapes can be traced today in the rocks, landforms and soils beneath our feet and in the shapes of the straths and mountains around us (Gordon *et al.* 2006; Thomas *et al.* 2004). These landscapes incorporate a wealth of information about past environmental change and in particular, the Cairngorm Mountains are considered to be one of the finest examples in the world of glaciated granite mountains, notable for their distinctive plateau surfaces, tors and glacially sculptured features. These mountains therefore represent a precious scientific, educational, environmental and Earth heritage asset (Kirkbride *et al.* 2010).

There are 16 Geological and Mixed SSSI within the National Park, covering an area of some 680 km^2 (around 15% of the Park's area) (see **Figure 84**, p. 182).

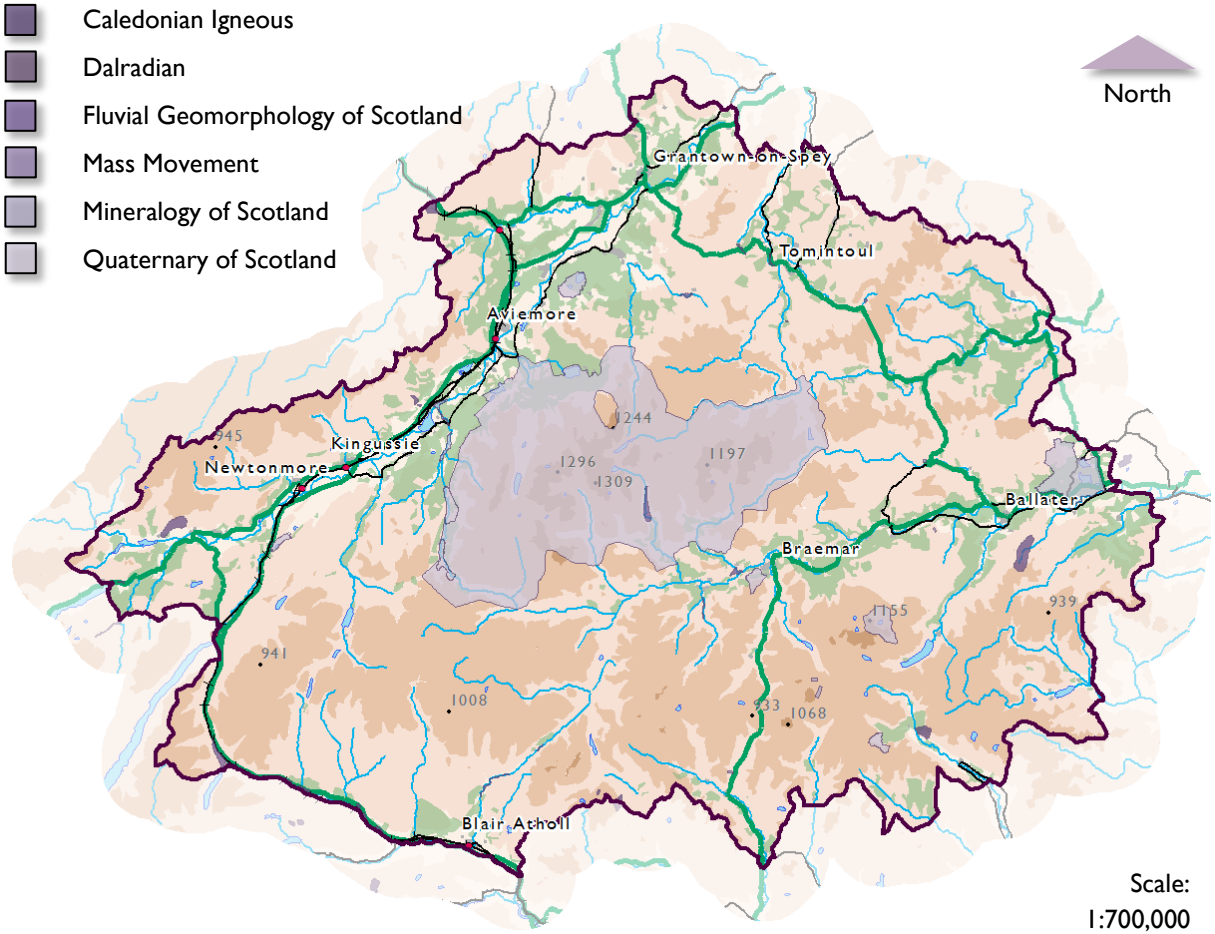


Figure 55 Geological Conservation Review Sites within the Cairngorms National Park by GCR Block Description.

Further protection is given to certain areas, which includes areas both within and outwith SSSIs, by the 39 GCR sites within or overlapping the National Park boundary (**Figure 55** and **Figure 56**). Combined they cover an area of around 592 km^2, the vast majority of which lies wholly within the National Park itself. In fact, the vast majority of this area (around 526 km^2) is attributed to a single GCR site, the Cairngorms Mountains (site 2284), which is listed for its exceptional assemblage of pre-glacial, glacial, glaciofluvial and periglacial features.

Although British Geological Society (BGS) mapping is available for the whole National Park, detailed geomorpholoical information is more limited. However, SNH along with the BGS have compiled a spatial inventory of the geomorphology of the Cairngorm Mountains core area (Kirkbride & Gordon, 2010) (**Figure 57**).

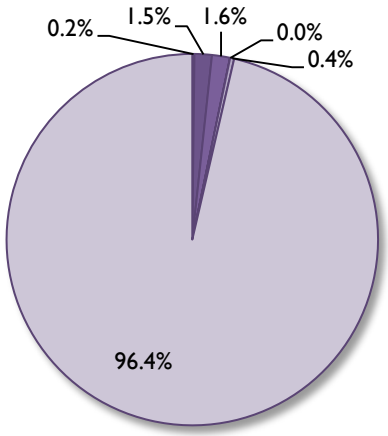


Figure 56 Area covered by GCR Site block description (legend on p. 1413).

The inventory identifies the location and extent of the main landform assemblages: landforms of glacial erosion; landforms of glacial and glaciofluvial deposition; relict periglacial landforms; and postglacial and contemporary landforms and processes. The spatial data is complemented by descriptions of the landforms and additional information on larger landscape features, the survival of relict non-glacial features and details of Lateglacial and Holocene palaeoenvironmental records. Together, they provide a basic source of information for the development of conservation management and interpretation of the Cairngorm Mountains.

The inventory highlights that understanding the links between geodiversity and biodiversity is particularly crucial for conservation management in dynamic environments such as the Cairngorm Mountains, where natural processes (e.g. floods, sediment transport and flow regimes) maintain habitat diversity and ecological functions. It also highlights that consideration of geomorphological sensitivity is a vital part of working in sympathy with natural processes, in assessing natural hazards and implementing sustainable management of ecosystems, particularly under future climate change scenarios.

The inventory recommends that geomorphology is integrated in current monitoring programmes in the Cairngorm Mountains and that much more could be done to raise wider awareness of geodiversity interests within the overall framework for interpretation within the

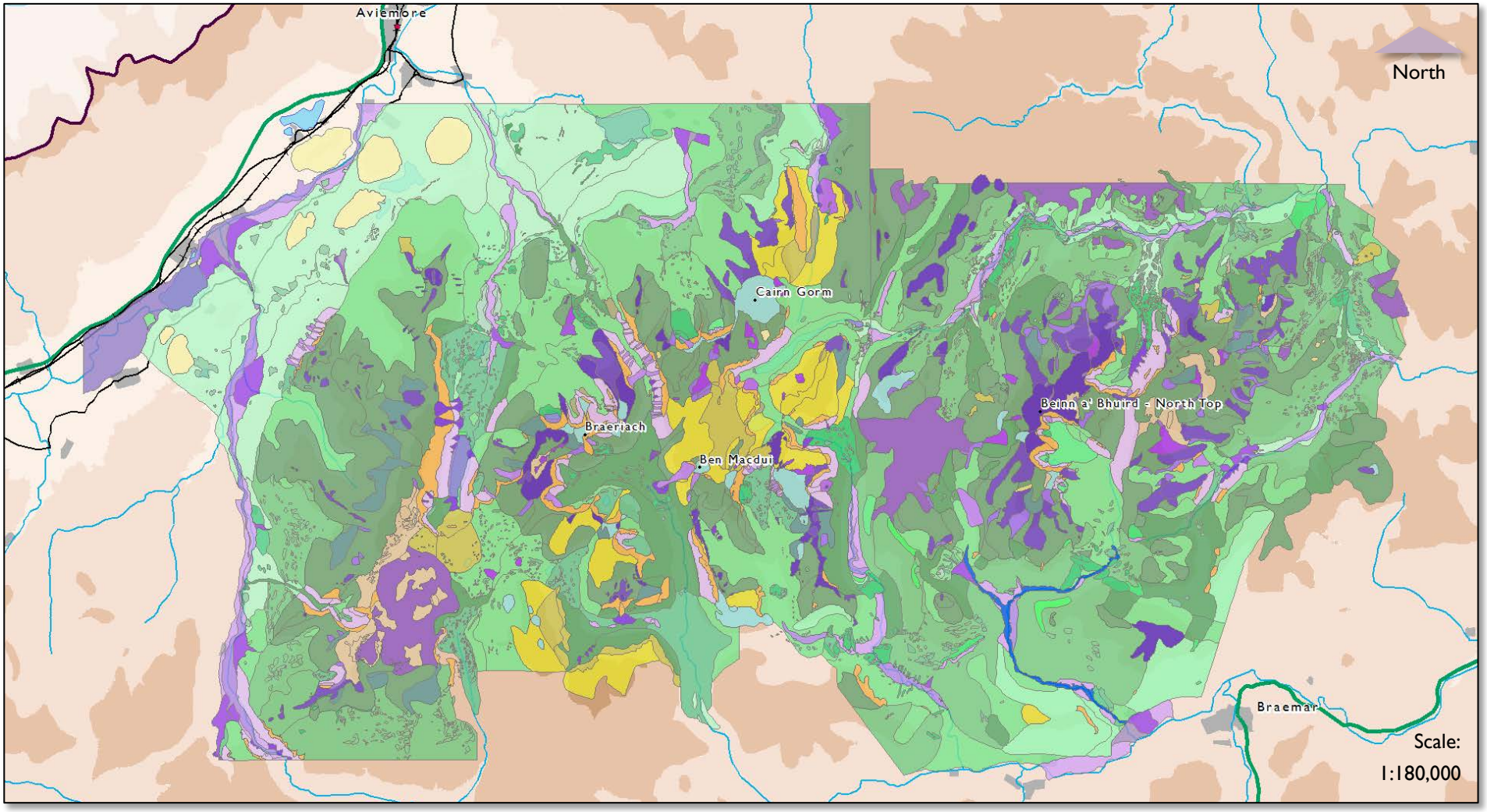


Figure 57 Geomorphological heritage of the Cairngorm Mountains (legend on p. 144).

Postglacial and contemporary landforms and processes

- Active river corridor
- Debris cone
- Debris slope
- Large scale rockfall deposits
- Partially vegetated wind stressed surface
- Peat
- Postglacial active alluvial fan surface
- Postglacial relict alluvial fan surface
- Postglacial river terraces and alluvium
- Semi-permanent snow patch and melt-out deposits
- Snow avalanche modified debris slope
- Sparse vegetation
- Wet flushes and snowmelt drainage
- Wetland

Relict periglacial landforms

- Blockfield
- Boulder lobes
- Patterned ground
- Rock glacier deposits
- Solifluction sheets and lobes

Landforms of glacial erosion

- Corrie headwall
- Ice-scoured bedrock
- Roche moutonnée
- Thin regolith covered rock

Landforms of glacial and glaciofluvial deposition

- Boulder and drift limit
- Delta deposit
- Dissected drift
- Eskers
- Former lake shoreline
- Ice-contact slope
- Ice-marginal kame
- Kames and kettled kame
- Kettle hole
- Meltwater channel (bedrock)
- Meltwater channel (drift)
- Moraine
- Moraine limit
- Undifferentiated drift
- Undifferentiated glaciofluvial deposits
- Undifferentiated ice-marginal deposits

Other landform types

- Rock outcrop
- Stable vegetated surface
- Tor

Cairngorms National Park. Issues include raising awareness of geodiversity *per se*, as well as the links between geodiversity and other elements of the landscape and land use (Kirkbride & Gordon, 2010).

Within the context of the National Park, the diversity of Earth heritage interests also offers potential opportunities for local involvement in income-generating tourism.

Energy

Because the CNPA has historically implemented quite restrictive policies on energy, developments of energy generating infrastructure have been relatively minor. Since 2010 there have only been 24 planning applications approved by the CNPA, giving a total installed capacity of around 4.2 Megawatts (MW). Of these, 14 were for hydroelectric schemes, 5 were wind turbines, 3 were biomass boilers and 2 were solar panel arrays (**Figure 58**).

It should be noted that the CNPA is a 'call in' authority and therefore planning applications in the National Park are decided by either the relevant local authority or by the CNPA. The CNPA only 'calls in' and determines the bigger and most sensitive applications, while the rest are determined by the relevant local authority.

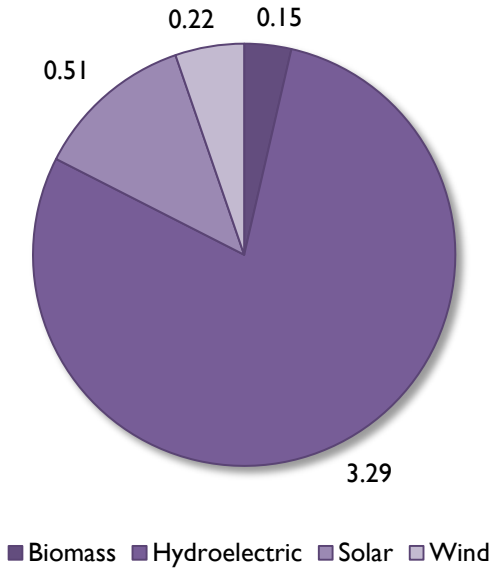


Figure 58 MW of installed renewable energy generation permitted by the CNPA since 2010.

Wind turbines, hydro schemes or large solar panel farms are likely to be 'called in', however smaller scale developments may not be. Furthermore, installing certain renewable energy technologies, such as solar panels and biomass boilers is within the permitted development rights of householders and businesses provided certain conditions are met. Therefore, figures quoted within this section do not offer a comprehensive indication of the amount of energy generated within the National Park.

There is therefore currently a gap in the data available for renewable energy generation within the National Park that will need to be addressed for the SEA of the LDP.

Beauley-Denny Line

In 2010 Scottish Ministers granted consents to install a 400kV overhead electricity transmission line to replace an existing 132kV overhead transmission line between Beauly and Denny.

The proposed route for the replacement line will result in a reduction in the length of the transmission line and in the number of towers going through the Cairngorms National Park (**Figure 59**). The length of

the replacement line in the National Park will be 28 km, supported by 76 towers. It will replace the existing line, which is 36 km long and supported by 128 towers. The proposed route is on the boundary of the National Park and avoids settlements and popular tourist routes as far as possible.

Although the project is due to be completed in November 2015, a major operation will continue during 2015/16 to decommission and dismantle the original 132kV line and reinstate access tracks and ground disturbed by construction activity. Good progress was made during 2014 with the majority of the original 132kV towers being removed along the A9 between Dalwhinnie and Trinafour. Good progress has also been made to install replacement circuits between Etteridge and Boat of Garten, which will allow the removal of a further 40 km of existing overhead lines supported by steel towers. 53 km of 132kV overhead transmission line between Boat of Garten and Cairnmore has already been removed (Scottish and Southern Energy, 2015).

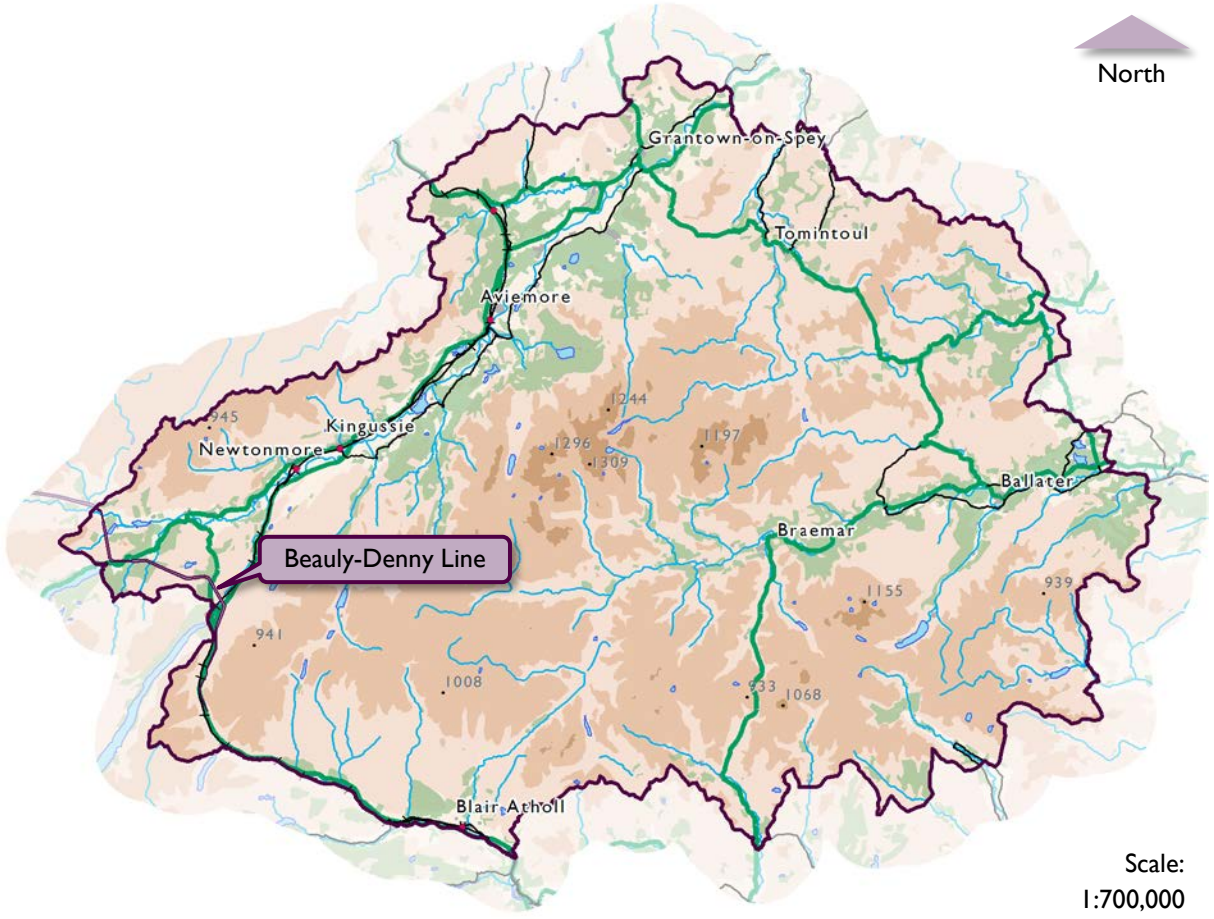


Figure 59 The Beauly-Denny Line.

Waste

Estimates of household waste and recycling for Local Authority (LA) areas for 2011-2014 are recorded by SEPA. Specific data for Scotland's national parks is not available and therefore to get an approximation of the Cairngorms National Park's contribution further assumptions need to be made.

Mid-year population estimates have been used as a proxy for proportionally attributing the waste produced and recycled for the LAs that cover the National Park's area to the National Park itself (see **Appendix 3** for further details). It is recognised that this is a blunt means of estimation; indeed estimates based on estimates should always be treated with caution. However, in the absence of detailed National Park specific information, the information presented in **Figure 60**, **Figure 61** and **Table 13** offer a 'best-guess' and a generalised baseline for measurement over the plan period.

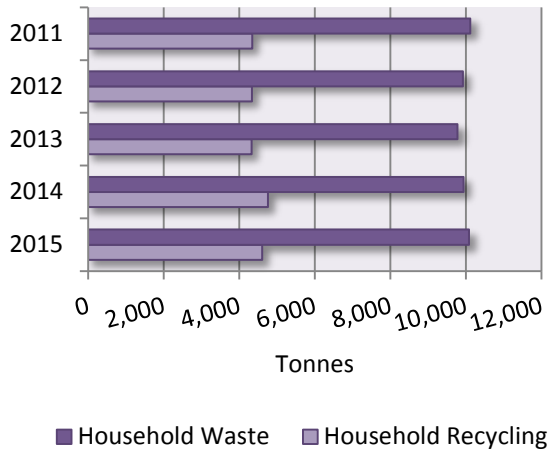


Figure 60 Estimated household waste produced in Cairngorms National Park.

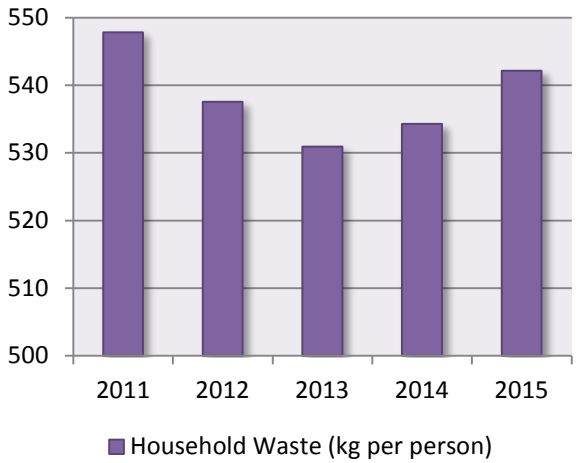


Figure 61 Estimated household waste per person in Cairngorms National Park.

(Source: www.environment.scotland.gov.uk/get-interactive/data/household-waste)

Table 13 Estimated household waste produced and recycled in the Cairngorms National Park.

(Source: www.environment.scotland.gov.uk/get-interactive/data/household-waste)

	2011	2012	2013	2014	2015
Household Waste (tonnes)	10,113	9,923	9,779	9,935	10,080
Household Waste (kg per person)	548	538	531	534	542
Household Recycling (tonnes)	4,340	4,335	4,326	4,759	4,608
Recycling Rate	42.9%	43.7%	44.2%	46.6%	45.8%

According to this estimate the household waste per person is higher than the Scottish average, which for 2014 was 460 kg per person. However, it is estimated that the recycling rate is higher than the Scottish average, which in 2014 was 43.6%.

It should be recognised that the Cairngorms National Park is not responsible for waste management in the area, with this function falling to the Local Authorities that cover its area. The NPPP may however play a role in waste reduction, contributing the objectives of the Scottish Zero Waste Plan (Scottish Government, 2010), by promoting the waste hierarchy of reduce, reuse and recycle

Transport Infrastructure

Road

The National Park benefits from relatively good transport infrastructure and services compared to many other rural areas in Scotland (**Table 14**). Four A Class roads, namely the A9, A93, A95 and A86 connect the area with Inverness, Moray, Aberdeenshire, Perth and Kinross and the West Coast.

The A9 (**Figure 62**) is currently the subject of the A9 Dualling Strategy, which aims to link up the road's existing sections of dual carriageway to create a continuous Category 7 All Purpose Dual Carriageway between Inverness and Perth. It's one of the biggest infrastructure projects in Scotland's history and will involve the:

- Full grade separation of junctions to remove at-grade junctions;
- Grade separated junctions to provide direct links, over and under, the A9 for non-motorised user crossing / access;
- No gaps in the central reserve, to prevent right-turns across carriageways;
- Hard shoulder strips at least 1m width;
- Route, signage and lighting design to minimise overall visual impact (Transport Scotland, 2013, p. 1).

Figure 62 The A9 in the Cairngorms National Park.

Once complete, the project is anticipated to provide the following benefits:

- Improved road safety and reduction in accident severity;
- Improved journey times and reliability;
- Safe crossing points to link non-motorised user touts and public transport facilities;
- Improved access to tourist and recreation sites;
- Improved trunk road transport infrastructure supporting sustainable economic growth, and resilience to climate change (Transport Scotland, 2013, pp. 1-2).

It is therefore anticipated that the programme will have significant implications for the LDP, which may result in cumulative or in-combination effects that demand consideration.

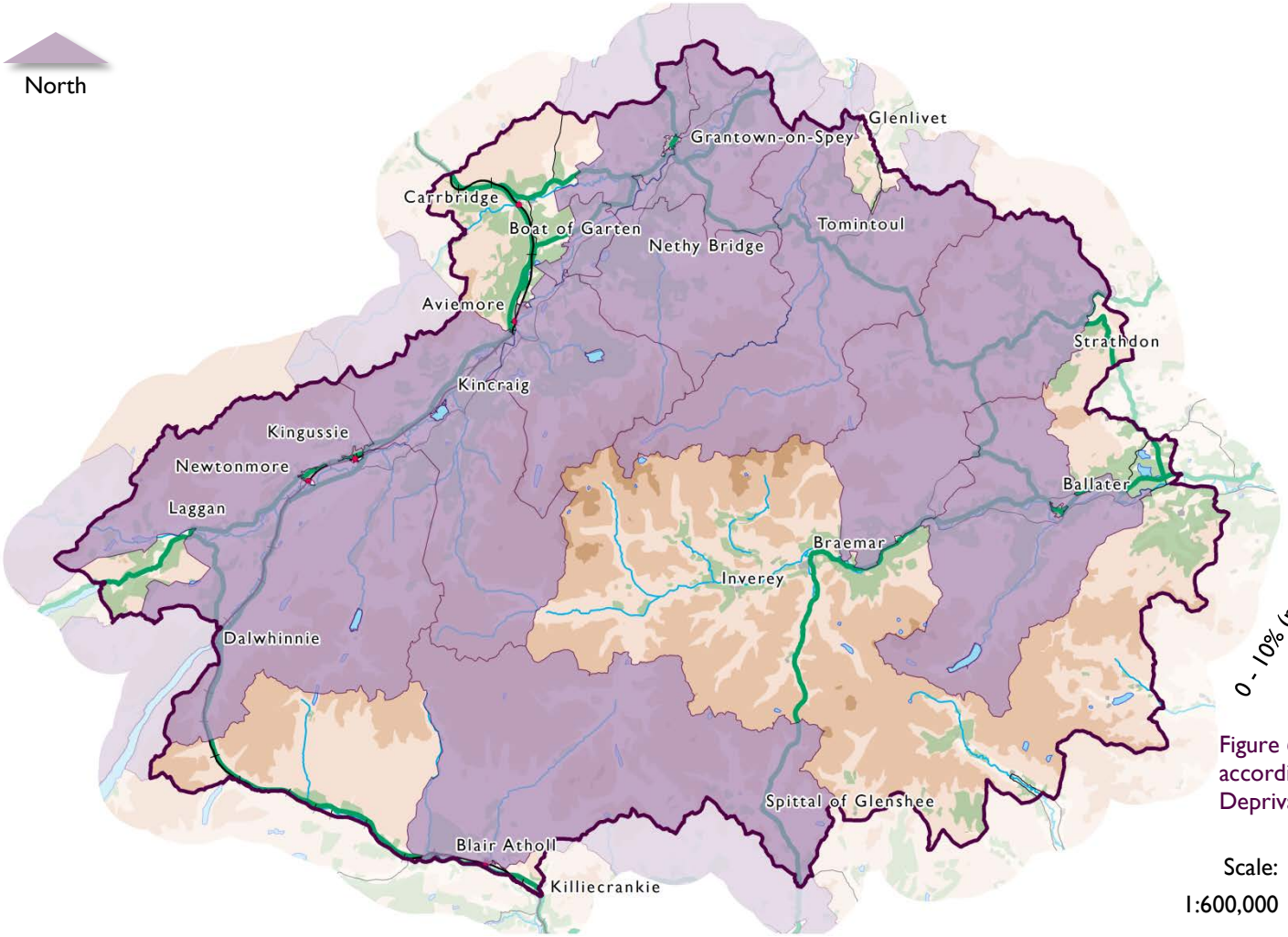
Networks of other A, B, C and unclassified roads provide access to other parts of the National Park. The area's geography means that links between certain parts of the National Park are relatively poor. A notable example is the route between Badenoch and Strathspey and Deeside, with the principle road, the A939 being susceptible to inclement weather.

The Scottish Index of Multiple Deprivation (SIMD) gives an indication some of the accessibility issues faced by certain parts of the part, with 11 of the 24 data zones used to define the National Park falling within the Index's most deprived 10% in terms of geographic access to services (see **Figure 63** to **Figure 76**). It should be noted that such a situation is not unexpected for such a rural area, and none of the National Park's data zones rank highly in terms of overall deprivation.

Table 14 Approximate road infrastructure (in km), and the Authority responsible for its maintenance, in the Cairngorms National Park (source: Local Authorities).

Local Authority	A Class (Trunk)	A Class	B Class	C Class	Unclassified	Total[4]
Aberdeenshire						
Angus[5]	0	0	65.363	49.499	5.979	120.841
Highland[6]	128	40.7	106.7	69.9	169.9	515.2
Moray	0	18.1	24.4	10.6	24.6	77.7
Perth & Kinross	43.54[7]	16.6	15.16	0.34	23.0	124.3

[4] Figures may not sum due to rounding.
[5] Angus Council does not keep a record of road length within the National Park. Therefore the figure quoted are for public roads in Angus that cross into the National Park.
[6] Figures refer to the Badenoch & Strathspey Area of Highland Council.
[7] Trunk A Roads value managed by Perth & Kinross Council includes only one side of the dual carriageway along Glen Garry.



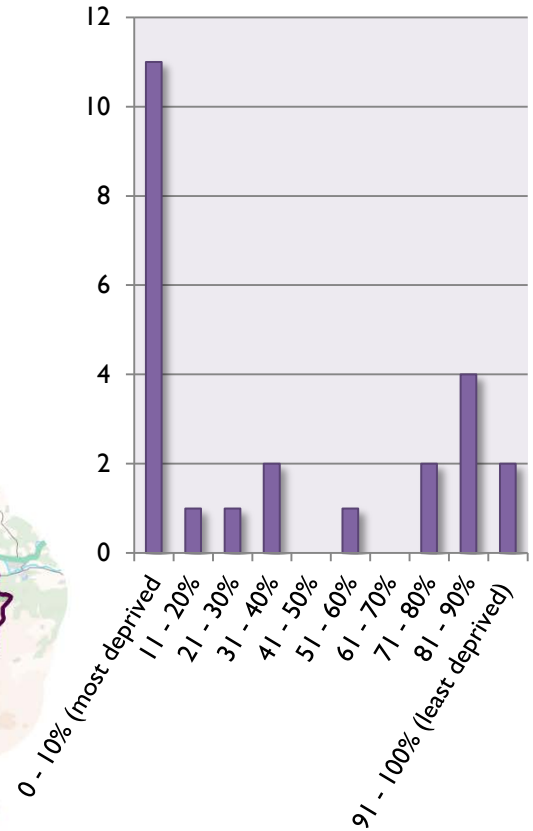
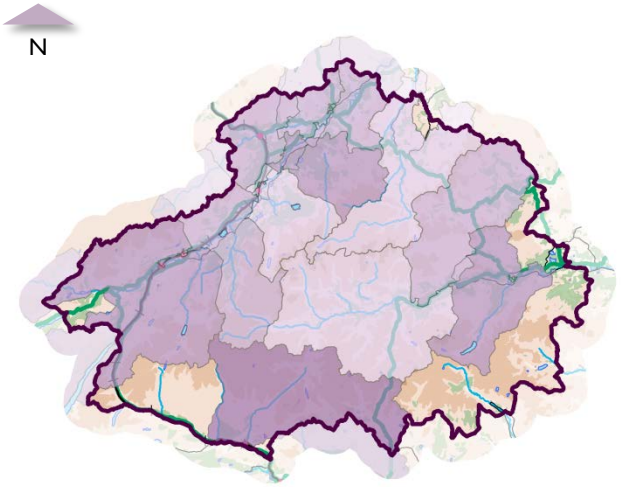
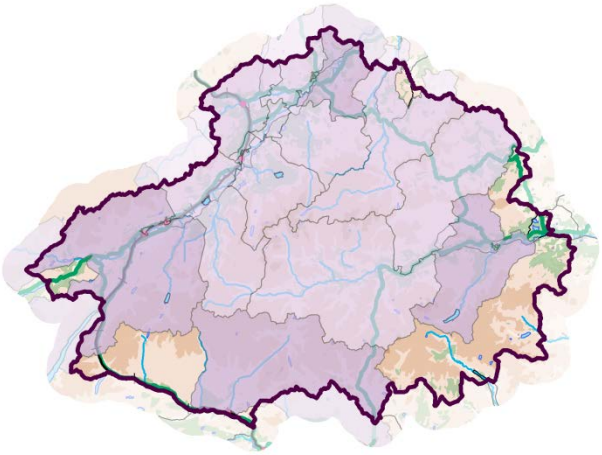


Figure 63 Data zone distribution by decile according to Geographic Access to Services Deprivation (SIMD, 2016)

Scale:
1:600,000

Figure 64 Data zones ranked within the 10% most deprived according to drive times (SIMD 2016).





Drive Times

- 0 to 5 minutes
- 5 to 10 minutes
- 10 to 15 minutes
- 15 to 20 minutes
- 20 to 25 minutes
- 25 to 30 minutes
- 30 to 35 minutes
- 35 to 40 minutes

All drive time maps are produced at a scale of 1:1,400,000 when printed at A4.

Figure 65 Average drive time to a GP surgery (SIMD, 2016). Figure 66 Average dive time to a Post Office (SIMD, 2016).

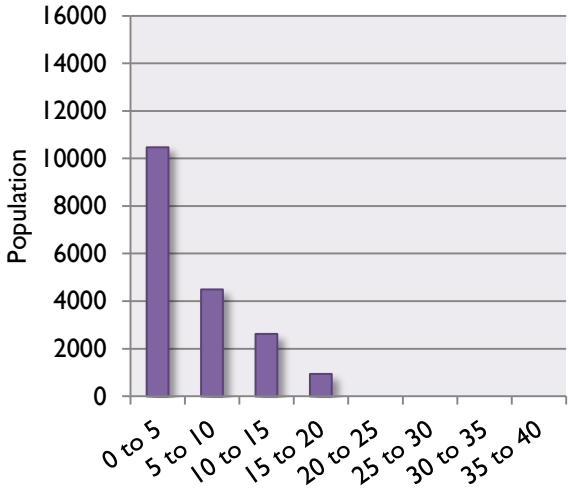


Figure 67 Population distribution by average drive time (minutes) to a GP surgery (SIMD, 2016).

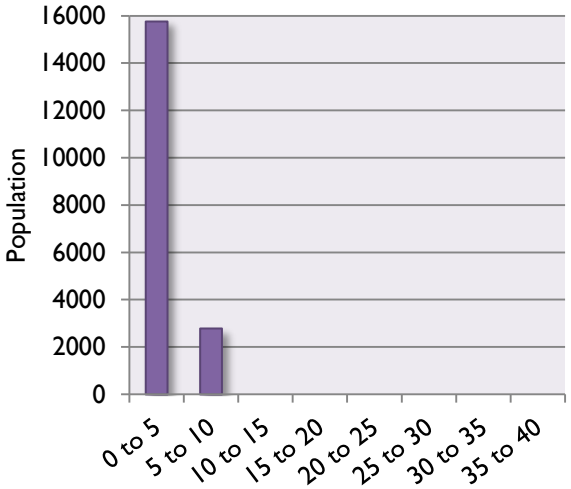


Figure 68 Population distribution by average drive time (minutes) to a Post Office (SIMD, 2016).

To maintain consistency with SIMD data, population data is based on 2016 mid-year estimates.

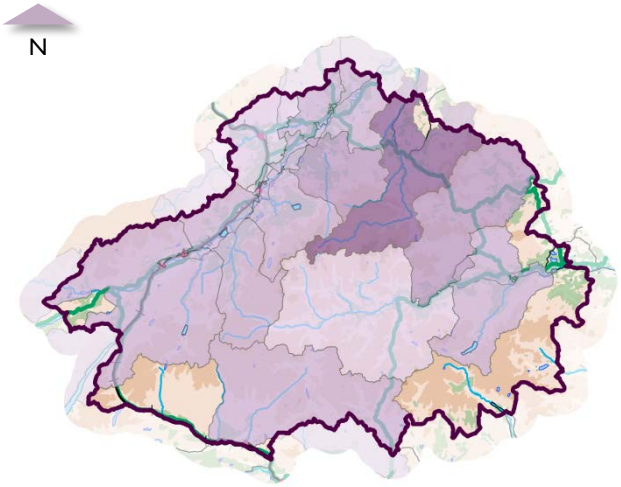


Figure 69 Average drive time to a petrol station (SIMD, 2016).

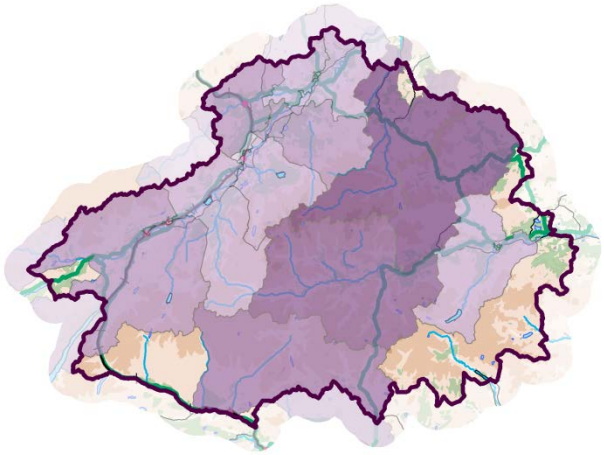


Figure 70 Average drive time to a retail centre (SIMD, 2016).

Drive Times

- 0 to 5 minutes
- 5 to 10 minutes
- 10 to 15 minutes
- 15 to 20 minutes
- 20 to 25 minutes
- 25 to 30 minutes
- 30 to 35 minutes
- 35 to 40 minutes

All drive time maps are produced at a scale of 1:1,400,000 when printed at A4.

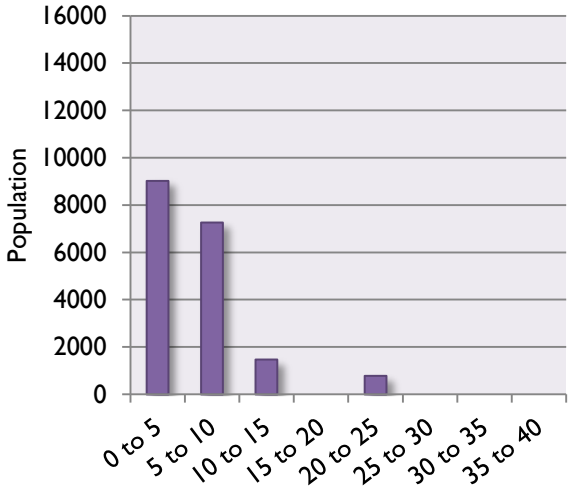


Figure 71 Population distribution by average drive time (minutes) to a petrol station (SIMD, 2016).

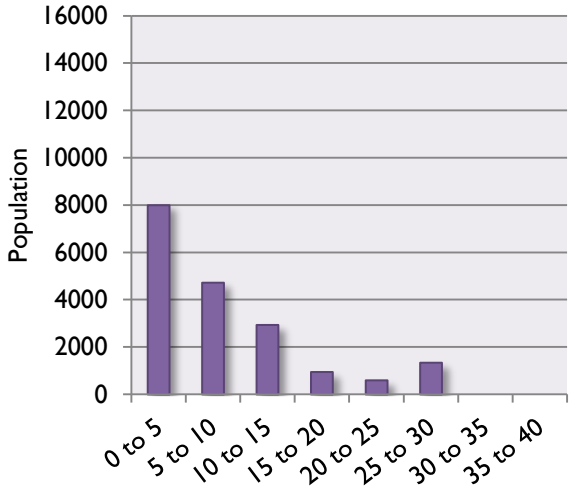


Figure 72 Population distribution by average drive time (minutes) to a retail centre (SIMD, 2016).

To maintain consistency with SIMD data, population data is based on 2016 mid-year estimates.

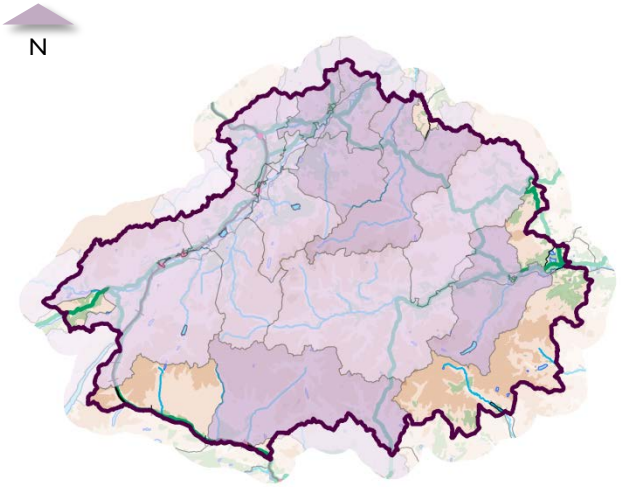


Figure 73 Average drive time to primary school (SIMD, 2016).

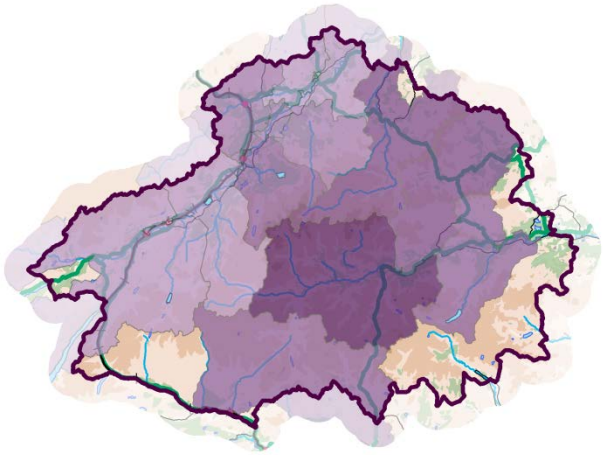


Figure 74 Average drive time to secondary school (SIMD, 2016).

Drive Times

- 0 to 5 minutes
- 5 to 10 minutes
- 10 to 15 minutes
- 15 to 20 minutes
- 20 to 25 minutes
- 25 to 30 minutes
- 30 to 35 minutes
- 35 to 40 minutes

All drive time maps are produced at a scale of 1:1,400,000 when printed at A4.

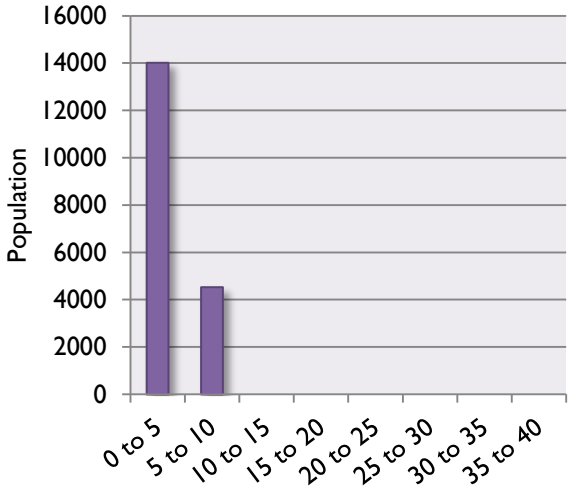


Figure 75 Population distribution by average drive time (minutes) to primary school (SIMD, 2016).

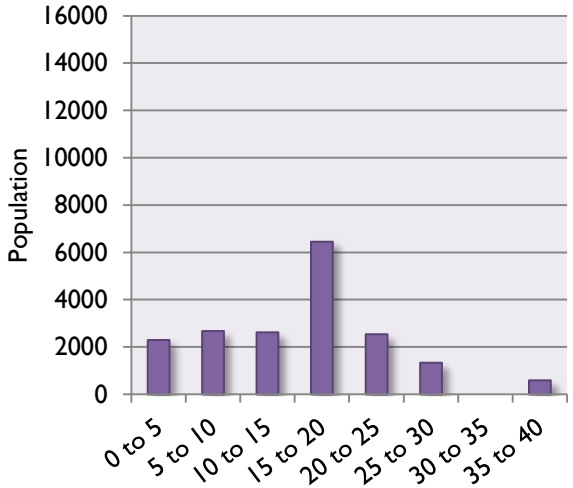


Figure 76 Population distribution by average drive time (minutes) to secondary school (SIMD, 2016).

To maintain consistency with SIMD data, population data is based on 2016 mid-year estimates.

Drive time data provided in **Figure 65** to **Figure 76** also demonstrates the nature of the National Park's road infrastructure, with the population often having to travel for a long time to reach key services. Of particular significance are the times needed to travel from the Braemar area to reach the neatest secondary school or retail centre.

The rurality of the area is also demonstrated through the relatively high instances of car ownership within the National Park (**Figure 77** and **Figure 78**). According to the 2011 Census around 85% of households had access to a car or van, which is higher than the Scottish level of around 70%. As a result, a high proportion of the National Park's population have a reliance on the area's road infrastructure.

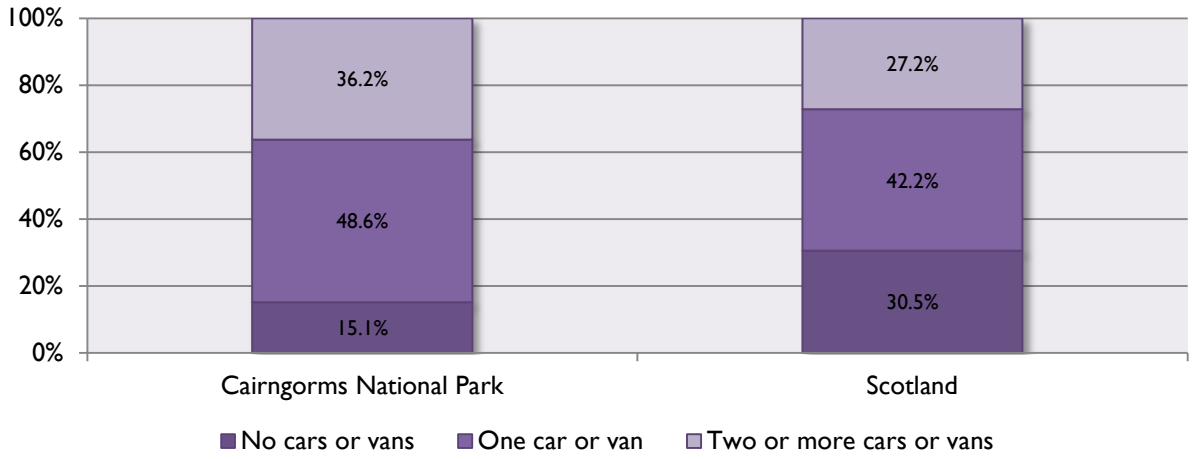


Figure 77 Proportion of households with access to a car or van (Census table LC1401SC).

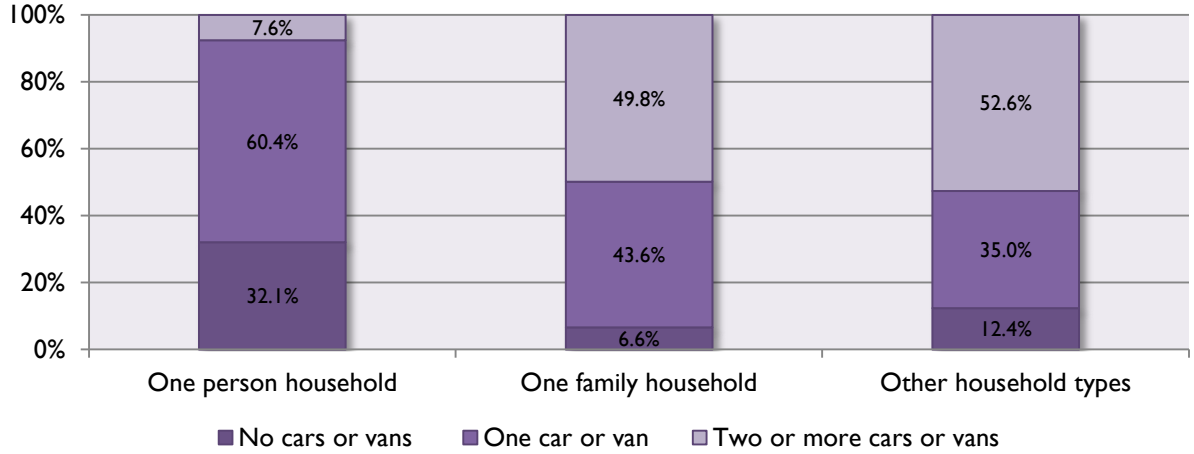


Figure 78 Household composition by car or van availability in the Cairngorms National Park (Census table LC1401SC).

Crown copyright 2014.

For further information on variables, see www.scotlandscensus.gov.uk/variables.

Rail

The Highland Main Railway Line which runs between Inverness and Perth runs through the National Park, with stations at Carrbridge, Aviemore, Kingussie, Newtonmore, Dalwhinnie and Blari Atholl. Much of the line is single track, and trains coming in opposite directions are often timed to arrive at stations at the same time, where crossing loops permit them to pass.

If the annual passenger usage at stations, which is based on sales of tickets, is taken as an indicator of the overall use of the line, then there is an indication that its popularity has increased significantly within the National Park over the last 17 years (**Figure 79** and **Table 15**).

The data on fare types also gives an indication of the types of journey being made. For example, while, season ticket use remains extremely low (around 4%) relative to Scotland (around 28%) and the UK as a whole (around 39%), their increase in their use between 1997 and 2016, particularly at Aviemore station, may offer an insight

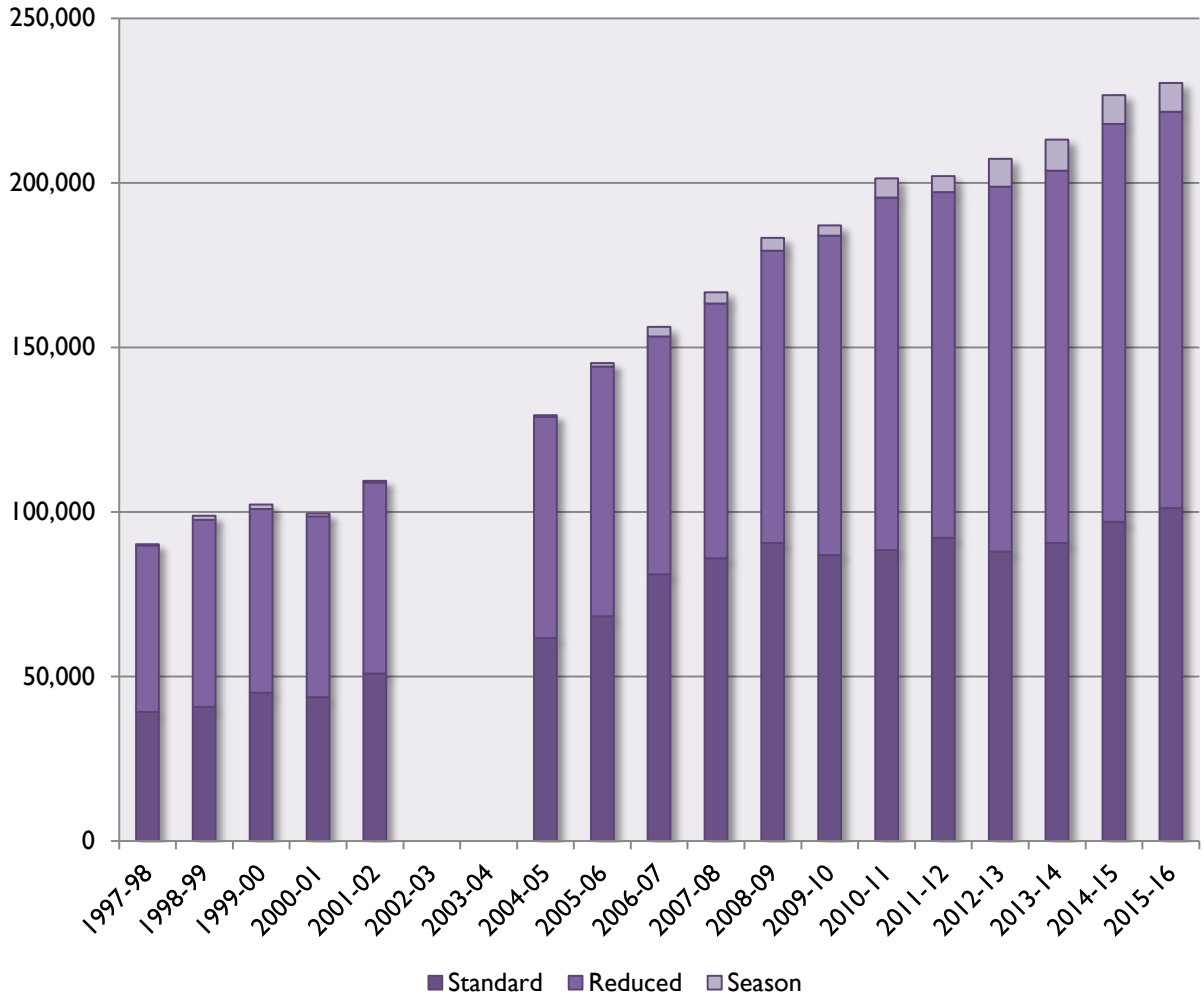


Figure 79 Total annual passenger usage (the sum of entrances and exits) by fare type at stations within the Cairngorms National Park (Source: www.orr.gov.uk/statistics/published-stats/station-usage-estimates)[8].

[8] No fare information is available for 2002-03, while no data at all is available for 2003-04.

into the impact of the town's significant population growth over the past 15 years has had (see **Topic 8: Population and Human Health** (p. 260) for further information).

Table 15 Annual passenger usage at stations (the sum of entrances and exits) within the Cairngorms National Park 1997 – 2016 (Source: www.orr.gov.uk/statistics/published-stats/station-usage-estimates).

Station Name	97-98	98-99	99-00	00-01	01-02	02-03	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13	13-14	14-15	15-16
Carrbridge	2,365	2,030	2,432	2,441	1,930	1,531	1,910	2,987	3,954	5,508	3,796	4,500	5,118	5,636	4,454	5,540	6,256	6,898
Aviemore	53,872	61,358	61,795	62,338	70,230	70,272	80,977	91,456	101,294	108,353	121,090	124,972	132,336	132,052	136,456	141,311	150,724	152,082
Kingussie	17,565	18,856	21,196	19,207	22,585	23,815	27,725	30,045	32,135	33,416	38,054	35,838	38,544	40,298	40,954	41,400	42,522	42,850
Newtonmore	3,528	3,868	4,013	4,146	4,062	4,184	5,396	6,815	6,585	7,060	7,446	7,972	9,484	9,406	8,958	8,326	8,636	9,432
Dalwhinnie	2,080	1,974	1,937	2,027	2,062	2,066	1,619	2,013	1,774	1,975	2,296	2,208	1,894	1,984	2,172	2,472	2,460	2,392
Blair Atholl	10,710	10,776	10,893	9,341	8,573	8,613	11,708	11,896	10,491	10,443	10,580	11,572	13,948	12,608	14,280	14,084	16,062	16,652
Total	90,120	98,862	102,266	99,500	109,442	110,481	129,335	145,212	156,233	166,755	183,262	187,062	201,324	201,984	207,274	213,133	226,660	230,306

Internet Infrastructure

Good digital connectivity is increasingly seen as a basic service that is required by residents, businesses, students, visitors and the public sector.

There are currently 28 telephone exchanges that cover the Cairngorms National Park, not all of which are located within its boundary. Combined they service around 15,065 telephone connections (not all within the National Park area) of which 13,682 are classed as residential and 1,176 as non-residential. All 28 exchanges are enabled to provide ADSL broadband, with all but two providing connection speeds up to 8 Mb/s. The two that are not equipped for these speeds are the Clova (ESCLO) and Advie (NSADV) Exchanges, which only provide speeds of up to 512 Kb/s (SamKnows, 2015). Average speeds across the National Park are however currently in the 5-6 M/bs range (Broadband Speedchecker, 2015).

A survey of 634 National Park households and businesses conducted in 2011/2012 found that 93.7% had access to broadband, with 1.7% claiming to use dial-up and 4.4% not to have any internet access at all. Speed was however found to be an issue for many, with 43.3% rating their connection as slow or very slow (Cairngorms National Park Authority, 2013).

Following the survey, a Digital Connectivity Audit was carried out by Broadband Strategies Limited (2012). The study concluded that the following targets should be set for all premises within the National Park:

- A minimum download speed of 2 Mbit/s and 350 Kbps upload with better than 150 ms latency and a contention ratio of 100:1 or better for residents and 50:1 or better for business by 2014.
- An average download speed of 10 Mbit/s down and 4 Mbit/s up, for all residents by 2015.
- Access to high speed broadband for all residents and businesses by 2020

Since then, high-speed fibre broadband networks have been programmed for expansion across most of the National Park's area by the end of 2016 (**Figure 80**). Once complete, Tomintoul will become the highest village in Scotland to be connected to high-speed fibre broadband (Digital Scotland, 2015).

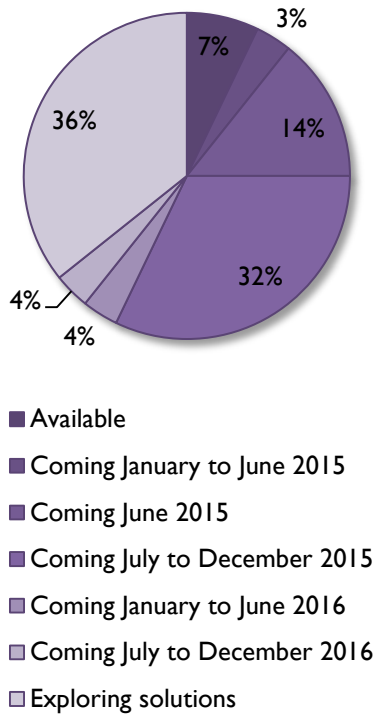


Figure 80 Timetable for rollout of high-speed fibre broadband networks for telephone exchanges servicing the Cairngorms National Park (Digital Scotland, 2015).

Key Messages

Material assets cover a wide range of environmental concerns.

39 GCR sites within or overlapping the National Park boundary; combined they cover an area of around 592 km^2.

The CNPA have permitted around 4.2 MW of renewable energy since 2010 although gaps remain in the data relating to total energy production. The upgrade of the Beuley-Denny line is nearing completion.

The level of household waste produced appears to be reducing while recycling rates appear to be increasing.

Transport infrastructure, while good along the National Park's main corridors, is poor elsewhere in the National Park, resulting in long drive times and high levels of deprivation in SIMD domains relating to access. The development of new infrastructure, in particular the dualling of the A9, may result in cumulative effects when implemented alongside the LDP.

Rail use is on the increase, although the reliance on private transport remains high.

The National Park's internet infrastructure is currently being upgraded, although plans are yet to be confirmed for a third of the exchanges servicing the area.

Inter-relationships with other topics