



Statistical areas used in the analysis of the Cairngorms National Park

July 2024

Introduction

The Cairngorms National Park was established in 2003 having had its boundary set following wide-spread public consultation with interested groups. The boundary was revised and expanded in 2010 following further public consultation. In statistical terms it is therefore a non-standard geographical unit, because unlike other political territories, for example local authorities, its boundary does not align with the standard statistical units used for publishing most of Scotland's socio-economic data. This means that most socio-economic data is not published according to the National Park's boundary and needs to be derived from other sources or proxies.

Where data is published at smaller geographies it is possible construct an aggregate that closely matches the National Park boundary. These smaller geographies may include census output areas, postcodes, data zones and intermediate zones.

This paper provides information on the small area geographies that are used by the Park Authority as an aggregate for the National Park.

Method

The standard method of linking smaller geographies to higher level geographies to produce a 'best fit' match is through the use of population weighted centroids. 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.

Smaller geographies are selected if their population weighted centroid falls within the boundary of the larger geography. The selected smaller geographies can then be aggregated to approximate the higher-level geography that statistics wouldn't normally be available for.

This paper provides details of the smaller geographies used to form an aggregate of the Cairngorms National Park using this method.



Scottish data zones

Data zones are the standard small area geography used by the Scottish Government and offer the widest range of data at sub-regional level. In general, they have populations of between 500 and 1,000 residents.

Scottish Government published revised 2011 data zones in 2014 and these geographies replace the original 2001 boundaries. At a National Park level, the changes are very minor with the 2011 data zone boundaries corresponding closely with those of the 2001 ones. Data is no longer published according to 2001 data zones, therefore they are only used where longer-term trends need to be analysed and the data is not available according to 2011 data zone.

Following the 2022 Census, Scottish Government are once again reviewing data zone boundaries. The 2022 data zones will be used once they have been published in their final form.

Figure 1 and Figure 2 show the data zones that have been chosen to represent the Cairngorms National Park. Though the actual National Park boundary does not precisely match the one derived from the data zones, the difference between the two is very small in terms of population. In 2012, data zone populations were estimated to be just 1.89% less than the overall National Park population.



2011 Scottish data zones by local authority

Aberdeenshire

S01006789 (link)
S01006790 (link)
S01006791 (link)
S01006792 (link)
S01006793 (link)

Highland

S01010531 (link)
S01010532 (link)
S01010533 (link)
S01010534 (link)
S01010535 (link)
S01010536 (link)
S01010537 (link)
S01010538 (link)
S01010539 (link)
S01010540 (link)
S01010541 (link)
S01010542 (link)
S01010543 (link)
S01010544 (link)
S01010545 (link)
S01010546 (link)
S01010547 (link)

Moray

S01011045 (link)

Perth Kinross

S01011981 (link)

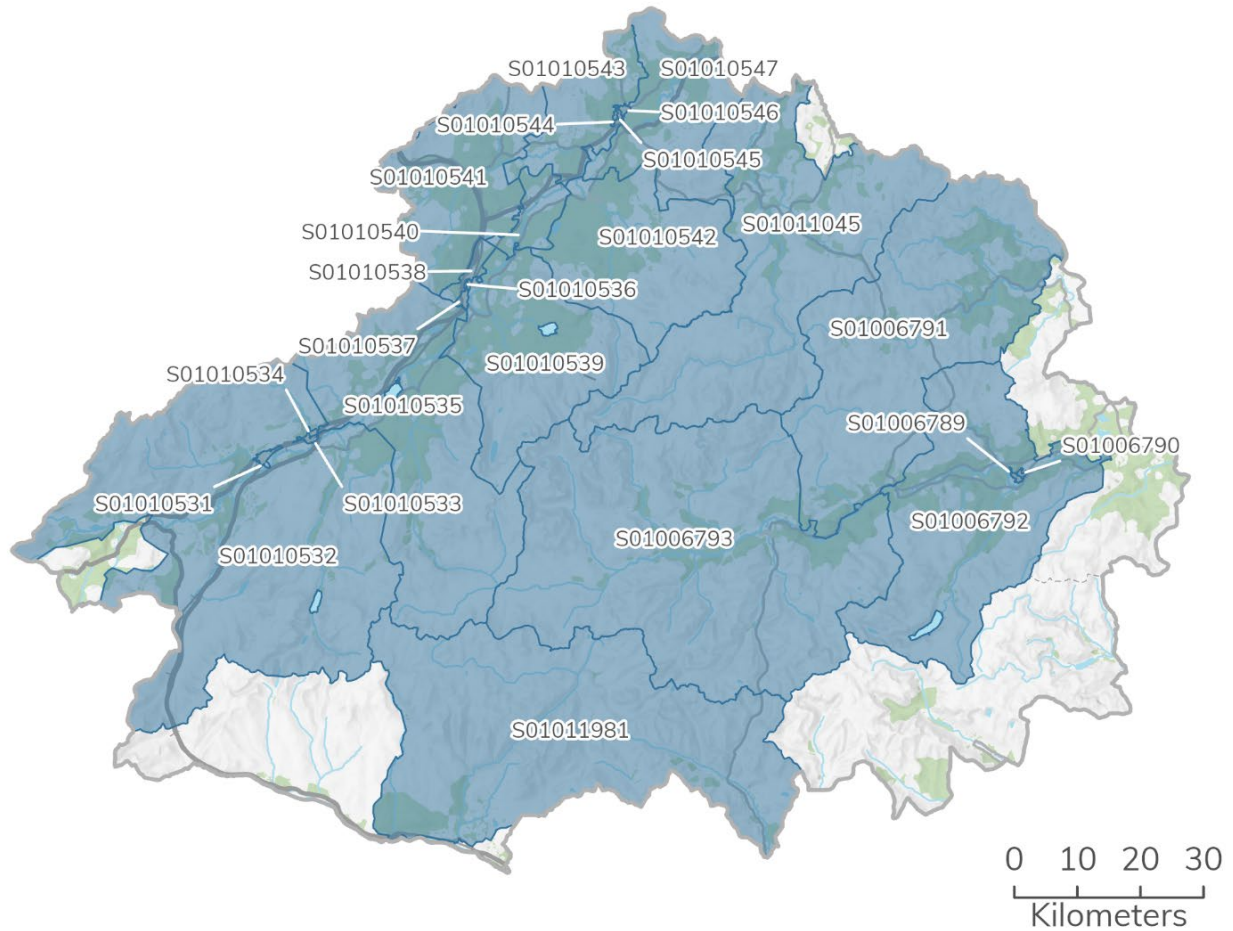


Figure 1 2011 data zones. Reproduced by permission of Ordnance Survey on behalf of His Majesty's Stationery Office. © Crown copyright and database right 2024. All rights reserved. Ordnance Survey Licence number AC0000821810, Cairngorms National Park Authority. Contains data © Scottish Government 2024.



2001 Scottish data zones by local authority

Aberdeenshire

S01000301 (link)
S01000303 (link)
S01000312 (link)
S01000316 (link)
S01000360 (link)

Highland

S01003743 (link)
S01003747 (link)
S01003748 (link)
S01003749 (link)
S01003750 (link)
S01003751 (link)
S01003754 (link)
S01003755 (link)
S01003756 (link)
S01003759 (link)
S01003760 (link)
S01003764 (link)
S01003766 (link)
S01003767 (link)
S01003771 (link)
S01003772 (link)

Moray

S01004233 (link)

Perth Kinross

S01005147 (link)

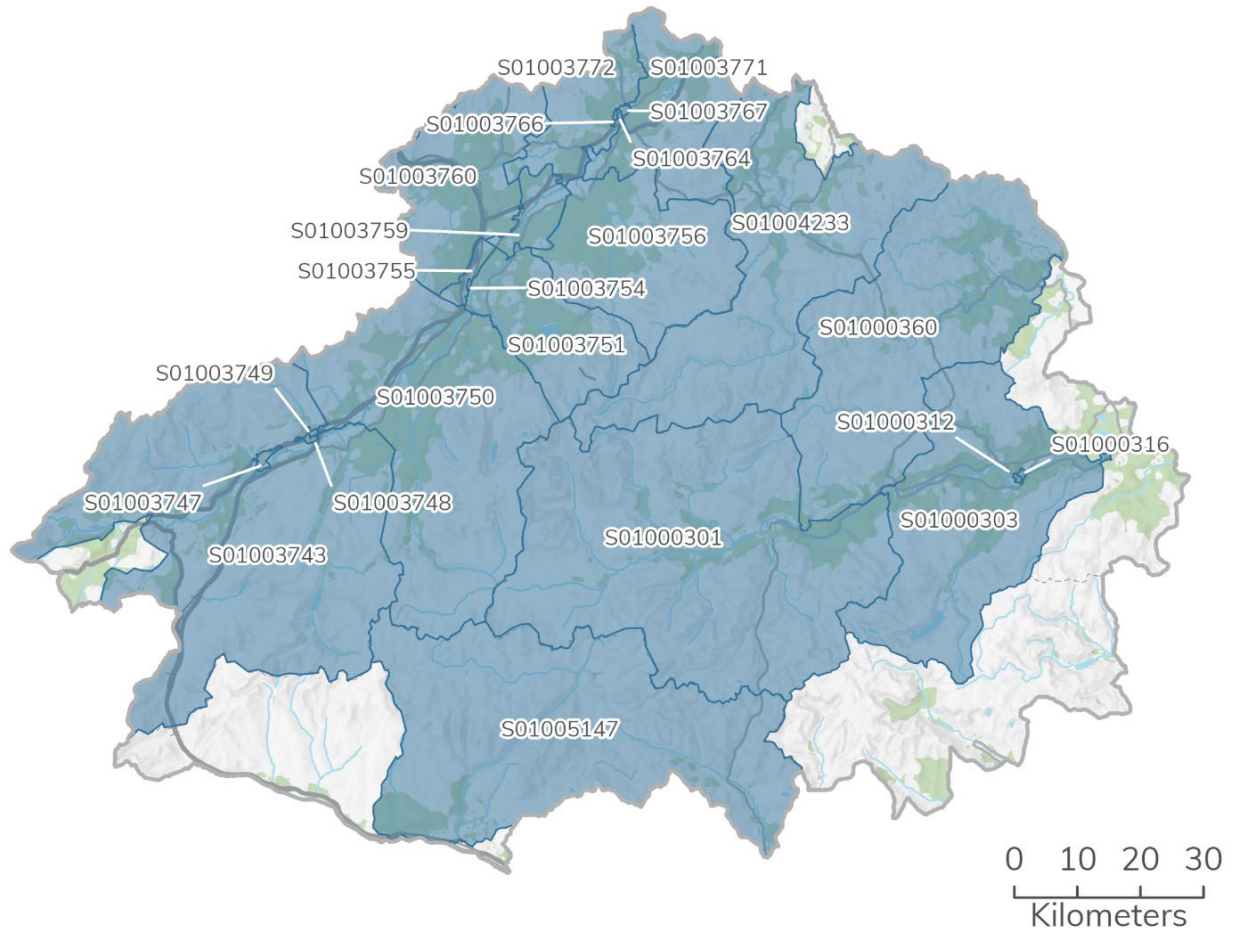


Figure 2 2001 data zones. Reproduced by permission of Ordnance Survey on behalf of His Majesty's Stationery Office. © Crown copyright and database right 2024. All rights reserved. Ordnance Survey Licence number AC0000821810, Cairngorms National Park Authority. Contains data © Scottish Government 2024.



Scottish intermediate zones

Intermediate zones are a statistical geography that sit between data zones and local authorities. Intermediate zones are used for the dissemination of statistics that are not suitable for release at the data zone level because of the sensitive nature of the statistics, or for reasons of reliability. Each intermediate zone contains at least 2,500 residents.

Four intermediate zones have been chosen as an aggregate for the National Park. This aggregate is slightly less accurate than the data zone aggregate due to having a more limited geographical coverage. Specifically, the Moray and Perth and Kinross are of the National Park are not included due to their population weighted centroids being located outwith the National Park boundary. Intermediate zones are therefore only used in circumstances where better alternatives do not exist.

Like the data zones, Scottish Government published revised 2011 intermediate zones in 2014 and these geographies replace the original 2001 boundaries. At a National Park level, the changes are very minor with the 2011 intermediate zone boundaries corresponding closely with those of the 2001 ones. Data is no longer published according to 2001 intermediate zones, therefore they are only used where longer-term trends need to be analysed.

Following the 2022 Census, Scottish Government are once again reviewing intermediate zone boundaries. The 2022 intermediate zones will be used once they have been published in their final form.

Figure 3 and Figure 4 show the intermediate zones that have been chosen to represent the Cairngorms National Park.



2011 Scottish intermediate zones by local authority

Aberdeenshire

S02000056 ([link](#))

Highland

S02001983 ([link](#))

S02001984 ([link](#))

S02001982 ([link](#))

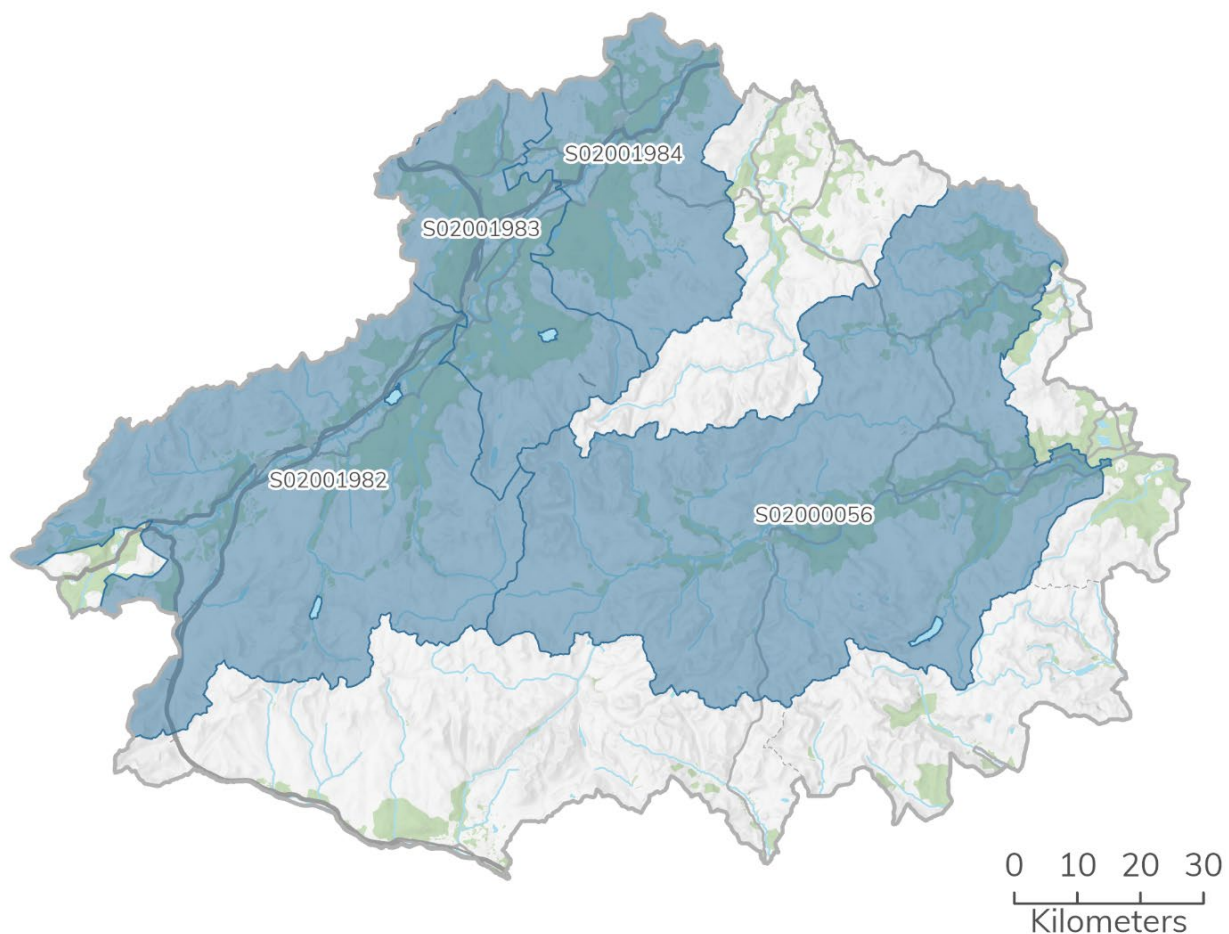


Figure 3 2011 intermediate zones. Reproduced by permission of Ordnance Survey on behalf of His Majesty's Stationery Office. © Crown copyright and database right 2024. All rights reserved. Ordnance Survey Licence number AC0000821810, Cairngorms National Park Authority. Contains data © Scottish Government 2024.



2001 Scottish Intermediate zones by local authority

Aberdeenshire

S02001285 ([link](#))

Highland

S02000723 ([link](#))

S02000726 ([link](#))

S02000721 ([link](#))

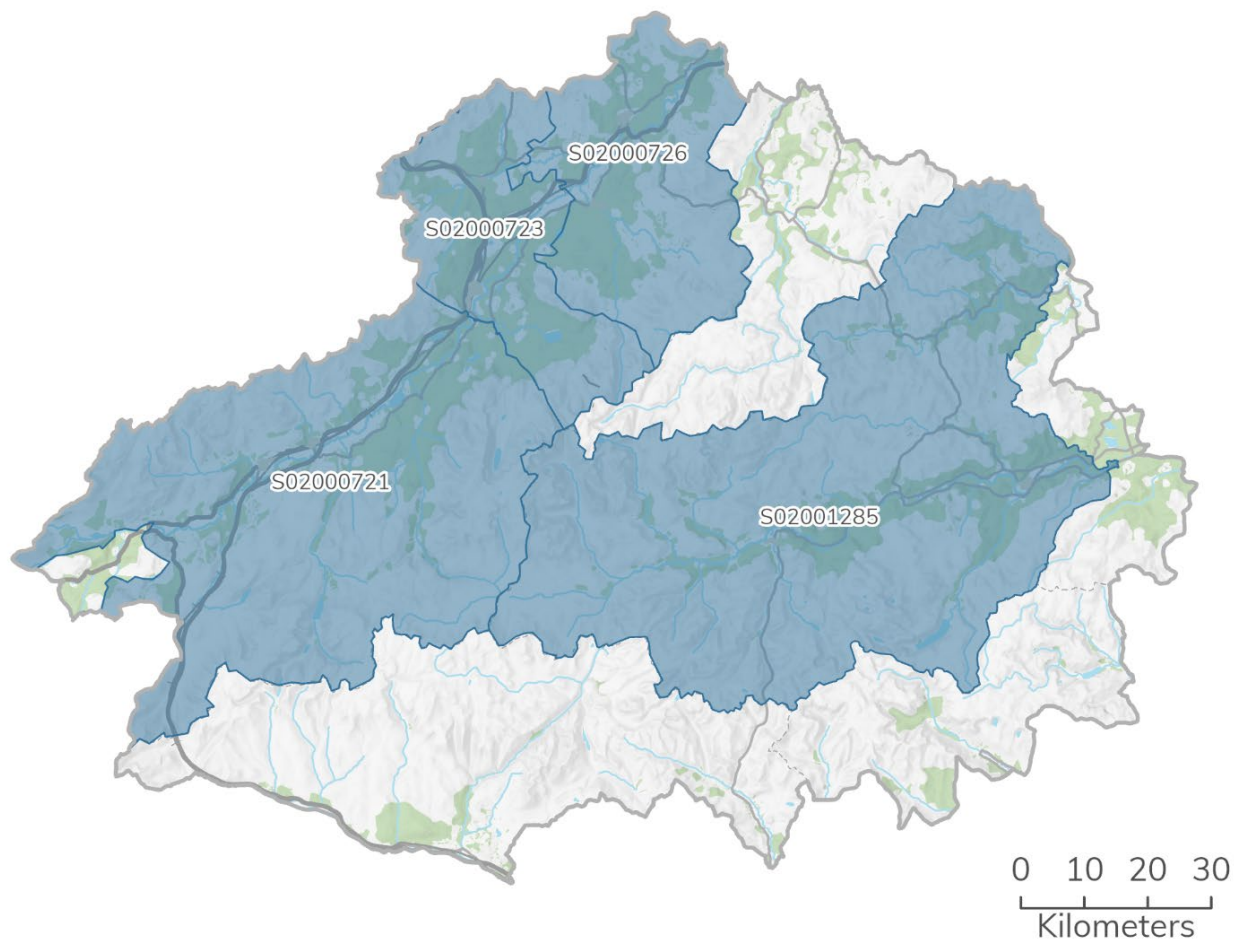


Figure 4 2001 intermediate zones. Reproduced by permission of Ordnance Survey on behalf of His Majesty's Stationery Office. © Crown copyright and database right 2024. All rights reserved. Ordnance Survey Licence number AC0000821810, Cairngorms National Park Authority. Contains data © Scottish Government 2024.



Census output areas

Output areas are the key geography for dissemination of small area statistics from Scotland's Census. Output areas are large enough for Census statistics to be released without infringing confidentiality. They are designed to have relatively small numbers of households (in the range 20 to 77) and population (≥ 50), while nesting within local authority areas. They also act as the basic 'building blocks' for the creation of other geographies such as data zones.

Figure 5 and Figure 6 show the output areas that have been chosen to represent the Cairngorms National Park.

2022 census output areas by local authority

Aberdeenshire

S00166358	S00166361	S00166364
S00166359	S00166362	
S00166360	S00166363	

Highland

S00163702	S00163779	S00163823
S00163711	S00163780	S00163825
S00163732	S00163781	S00163827
S00163734	S00163782	S00163828
S00163748	S00163784	S00163829
S00163752	S00163785	S00163830
S00163758	S00163786	S00163831
S00163759	S00163787	S00163832
S00163760	S00163789	S00163835
S00163762	S00163791	S00163836
S00163764	S00163799	S00163837
S00163767	S00163802	S00163838
S00163768	S00163809	S00163841
S00163769	S00163810	S00163842
S00163770	S00163811	S00163845
S00163771	S00163813	S00163846
S00163772	S00163816	S00163847
S00163774	S00163819	S00163848
S00163775	S00163820	S00163849
S00163777	S00163821	S00163850



S00163851	S00163870	S00163906
S00163852	S00163871	S00163907
S00163853	S00163872	S00163908
S00163854	S00163875	S00163909
S00163855	S00163876	S00163910
S00163856	S00163888	S00163911
S00163857	S00163889	S00163913
S00163858	S00163890	S00163914
S00163859	S00163892	S00163915
S00163860	S00163894	S00163916
S00163861	S00163896	S00163917
S00163862	S00163898	S00163918
S00163863	S00163900	S00163919
S00163864	S00163901	S00163920
S00163866	S00163902	S00163921
S00163867	S00163903	S00163922
S00163868	S00163904	S00163923
S00163869	S00163905	S00163927

Moray

S00166358	S00166361	S00166364
S00166359	S00166362	
S00166360	S00166363	

Perth and Kinross

S00170788	S00170795	S00170800
S00170789	S00170796	S00170801
S00170794	S00170797	

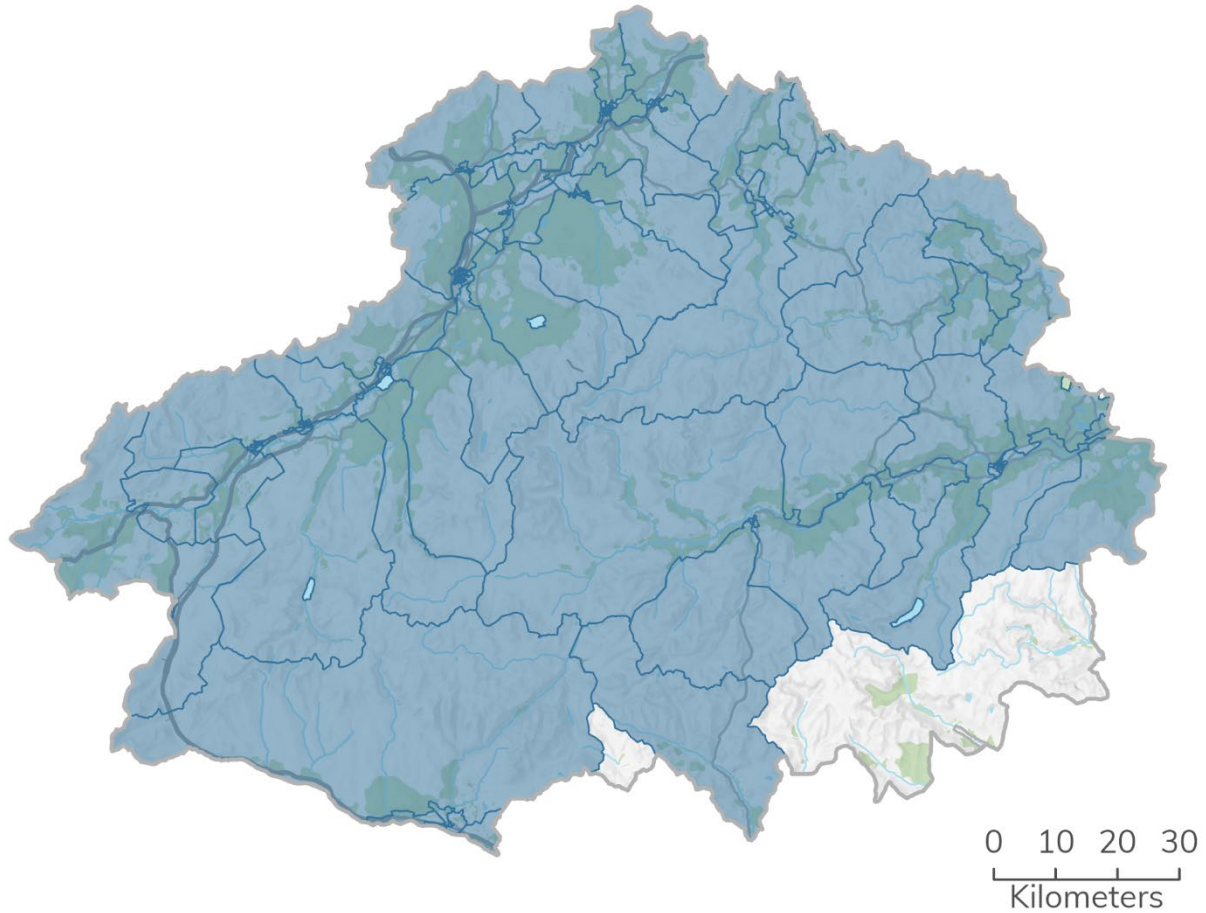


Figure 5 2022 output areas. Reproduced by permission of Ordnance Survey on behalf of His Majesty's Stationery Office. © Crown copyright and database right 2024. All rights reserved. Ordnance Survey Licence number AC0000821810, Cairngorms National Park Authority. Contains data © Scottish Government 2024.¹

¹ It is not possible to label the output areas due to the scale of the map. Census data at various geographies can be queried on the Census' website: <https://www.scotlandscensus.gov.uk/>



2011 census output areas by local authority

Aberdeenshire

S00091289	S00091445	S00092589
S00091290	S00091540	S00092590
S00091291	S00091541	S00092591
S00091292	S00091542	S00092633
S00091419	S00091543	S00092634
S00091420	S00091544	S00092923
S00091440	S00092417	S00092924
S00091441	S00092427	S00092925
S00091442	S00092428	S00092926
S00091443	S00092446	
S00091444	S00092448	

Highland

S00117637	S00117661	S00118226
S00117638	S00117662	S00118227
S00117639	S00117663	S00118228
S00117640	S00117664	S00118229
S00117641	S00117665	S00118230
S00117642	S00117666	S00118231
S00117643	S00117667	S00118232
S00117644	S00117668	S00118233
S00117645	S00118206	S00118234
S00117646	S00118207	S00118235
S00117647	S00118208	S00118236
S00117648	S00118209	S00118237
S00117649	S00118210	S00118238
S00117650	S00118211	S00118244
S00117651	S00118212	S00118245
S00117652	S00118213	S00118246
S00117653	S00118214	S00118247
S00117654	S00118215	S00118248
S00117655	S00118216	S00118249
S00117656	S00118217	S00118250
S00117657	S00118218	S00118251
S00117658	S00118219	S00118252
S00117659	S00118224	S00118253
S00117660	S00118225	S00118254



S00118255	S00119218	S00119410
S00118256	S00119219	S00119411
S00118257	S00119220	S00119412
S00118258	S00119222	S00119413
S00118259	S00119223	S00119414
S00119037	S00119224	S00119415
S00119040	S00119249	S00119416
S00119071	S00119250	S00119417
S00119145	S00119251	S00119418
S00119172	S00119252	S00119419
S00119201	S00119253	S00119420
S00119211	S00119254	S00119421
S00119212	S00119255	S00119422
S00119214	S00119256	S00119632
S00119215	S00119407	S00119633
S00119216	S00119408	
S00119217	S00119409	

Moray

S00121201	S00121205	S00121754
S00121202	S00121206	S00121755
S00121203	S00121208	
S00121204	S00121753	

Perth and Kinross

S00126258	S00126311	S00126315
S00126305	S00126312	S00126316
S00126309	S00126313	
S00126310	S00126314	

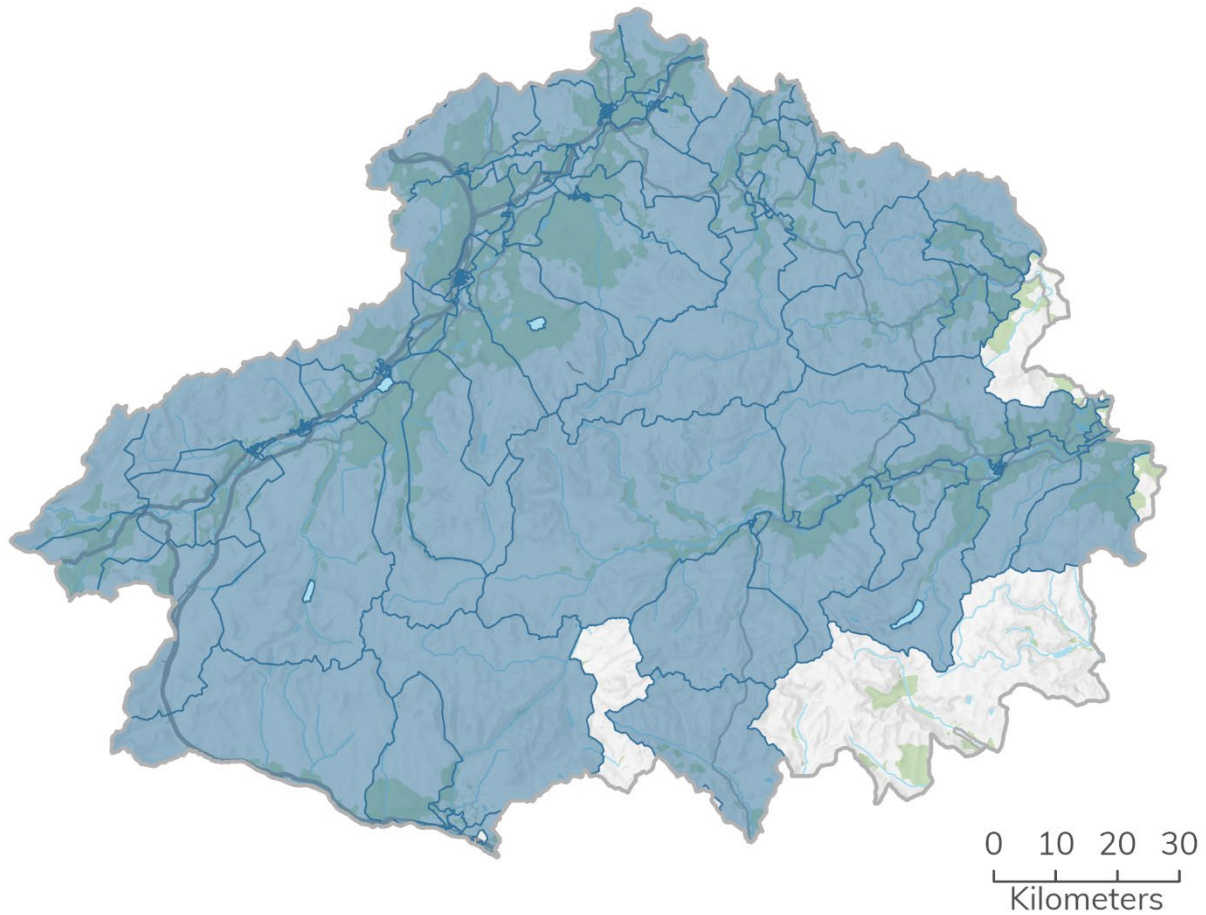


Figure 6 2011 output areas. Reproduced by permission of Ordnance Survey on behalf of His Majesty's Stationery Office. © Crown copyright and database right 2024. All rights reserved. Ordnance Survey Licence number AC0000821810, Cairngorms National Park Authority. Contains data © Scottish Government 2024.



Caveats and limitations

Boundary changes, and consequently changes to the location of population weighted centroids, are common at smaller geographies and while this may have little or no impact on higher level geographies in which those smaller geographies nest, they can have a significant impact on higher level aggregated geographies. This can make temporal comparisons between data sets problematic.

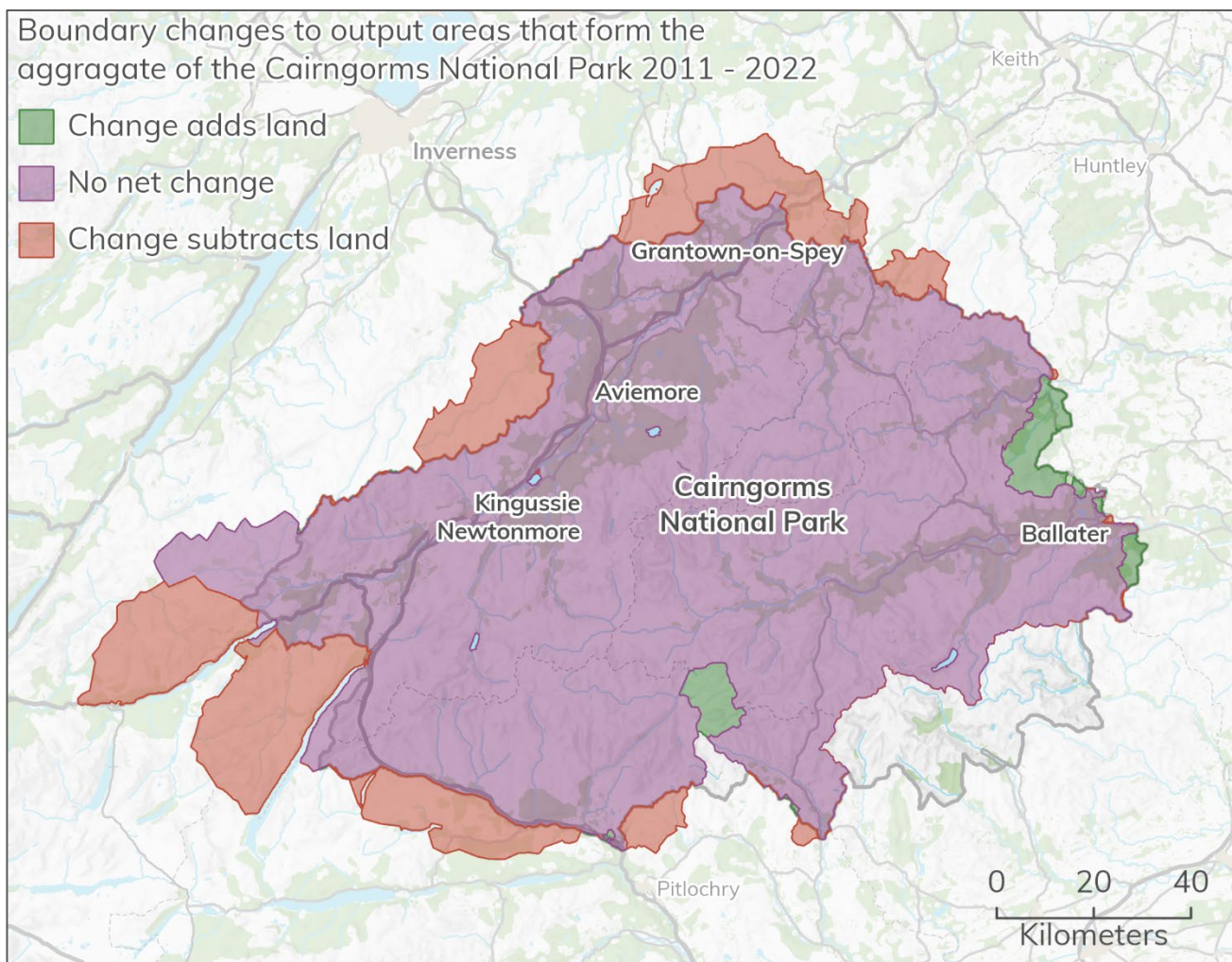


Figure 7 Changes to output areas that form the aggregate of the Cairngorms National Park between 2011 and 2022 Censuses. Reproduced by permission of Ordnance Survey on behalf of His Majesty's Stationery Office. © Crown copyright and database right 2024. All rights reserved. Ordnance Survey Licence number AC0000821810, Cairngorms National Park Authority. Contains data © Scotland's Census 2024.

This must be considered when comparing data from the 2011 and 2022 census as there have been some significant changes to the output areas covering the Cairngorms National Park (Figure 7). Boundaries for the 2022 output areas have been changed to



align much more closely with the National Park boundary, meaning that large areas that were part of the 2011 aggregate are not part of the 2022 aggregate. Based on Ordnance Survey AddressPoint data, it is estimated that there were 157 fewer residential properties located within the 2022 aggregate compared to the 2011 one (Table 1). These properties can be used as a proxy for households and by applying some assumptions about average household size and occupancy rates², it is estimated that this has resulted in around 270 – 310 fewer people being counted as usual residents in 2022 aggregate.

Table 1 Estimated change in residential properties located within the 2011 and 2022 aggregates for the Cairngorms National Park.

Change	Number of residential properties
Residential properties gained in 2022	77
Residential properties lost in 2022	234
Net change in residential properties 2011 - 2022	-157

All other factors being equal, the 2022 aggregate should offer a more accurate picture of the National Park's demographics. However, it also means that the 2011 aggregate is likely to represent a small overestimate of the National Park's overall households and population. This means that caution must be taken when comparing 2011 and 2022 estimates and that direct comparison is not possible in many instances.

² We have assumed a 90% occupancy rate and average household sizes ranging between 1.9 to 2.2 persons. The National Park's average household size was estimated to be 1.92 in 2018, and 2.2 in Scotland.



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