

Population and Household Projections for the Cairngorms National Park Authority

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This document provides a report of population and household projections for the Cairngorms National Park Authority (CNPA). The first section describes the findings of both the population and household projections. The second part summarises the assumptions and information that were used to produce the projections. The third section assesses the reliability of the projections. The fourth section describes the output files and reporting facilities of POPGROUP that can be used by CNPA to further analyse the projections.

Executive Summary

If the fertility, mortality and migration of recent years continue in the Park area, then

- The population of the Park is predicted to increase by 9% between 2001 and 2025.
- The rate of increase will slow over the projection period.
- The population increase occurs predominantly in the 60+ age groups.
- The projections show that there will be population decrease in younger age groups.
- Population change is stimulated by in-migration which occurs predominantly in the 40 to 60 age group, perhaps a reflection that many of those who move to the Park see it as a retirement area.
- The number of households is projected to increase by 19.6% between 2001 and 2016. This is partly due to an increase in the private household population but is mainly a result of the decrease in the average household size.
- One person households are projected to increase most quickly between 2001 and 2016 (+42.7%) as a result of the increasing elderly population who are most likely to live in such a household.
- The ageing population predicted by these projections has important planning and policy implications. The Park Authority may choose both to meet the needs of an ageing population and to encourage a reduction in the net loss of young adults.

1. Results

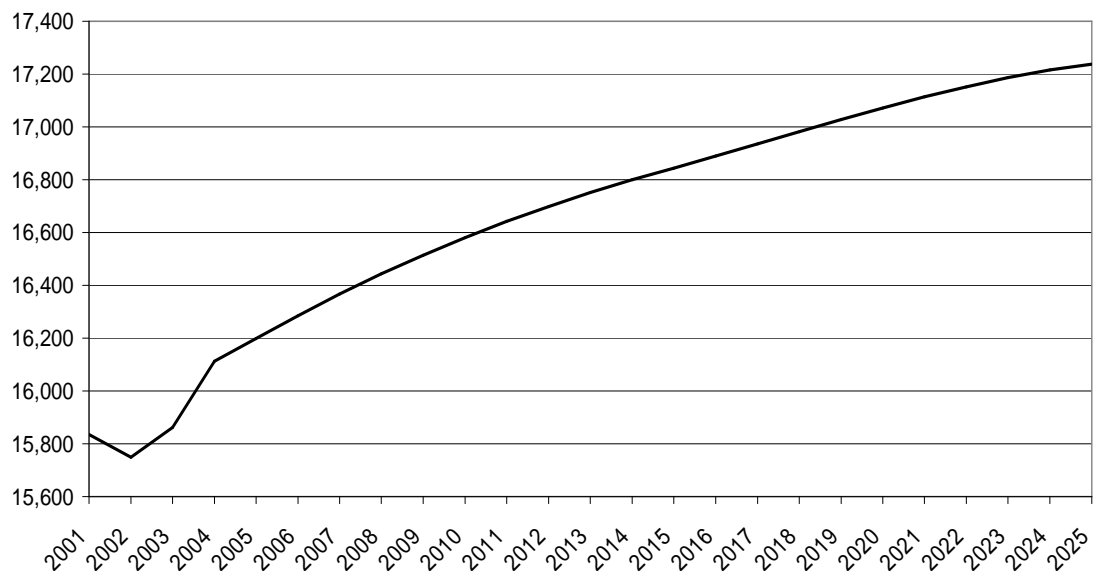
Population Projections

Population change

The chart below shows the population projections for the Cairngorms National Park. The population fluctuates between 2001 and 2004 because it is constrained to observed births, deaths and migration figures during this period. Beyond 2004 a smoother trend is observed because from this point onwards projections are calculated on the basis of averaged or projected components of change. For the same reason, births and deaths also display fluctuations for the first three years of the projections followed by a smoother trend.

The population of the National Park is predicted to rise from 15,835 in 2001 to 17,238 in 2025, a 7% increase. This growth in population is fuelled by migration: between 2005 and 2024, on average, 175 more people per year move into the park than move out. Natural change (births-deaths) increasingly acts as a brake on the population growth caused by migration. In 2005 the natural change was forecast to be equal to a decrease of 95 falling steadily to 153 in 2024.

Population Estimates & Forecasts - Cairngorms National Park Projections
All persons, estimated or forecast



The table below shows the population change by age group. The change in population does not occur evenly across the age groups. The younger age groups see reductions in their populations, most notably the 0-15 and 25-39 age groups reduce by over 30% between 2001 and 2025. The increases in population occur exclusively for the older age groups; the 75+ population is

forecast to double while the numbers aged 60 to 74 are predicted to increase by 85% by 2025.

Age	2001	2006	2011	2016	2025	% change 2001-2025
0-15	2,853	2,741	2,457	2,056	1,891	-33.7%
16-24	1,240	1,337	1,439	1,529	1,110	-10.5%
25-39	2,988	2,463	1,946	1,797	2,075	-30.6%
40-59	4,687	5,188	5,432	5,377	4,381	-6.5%
60-74	2,659	3,012	3,672	4,213	4,923	85.1%
75+	1,408	1,543	1,697	1,917	2,858	103.0%
Total	15,835	16,284	16,642	16,889	17,238	8.9%

The table below compares the rate of population aging for the Cairngorms National Park, Highland local authority and Scotland as a whole. The data for the Highlands and Scotland is from the GRO-S 2002 projections. It can be seen that the Cairngorms population aged over 60 is predicted to age at a faster rate than predicted nationally and for the local authority that comprises the majority of the Park.

Population aged 60+	2002	2018	% change
Scotland	1,074,706	1,342,688	24.9%
Highland	47,359	65,653	38.4%
CNPA	4104	6409	56.2%

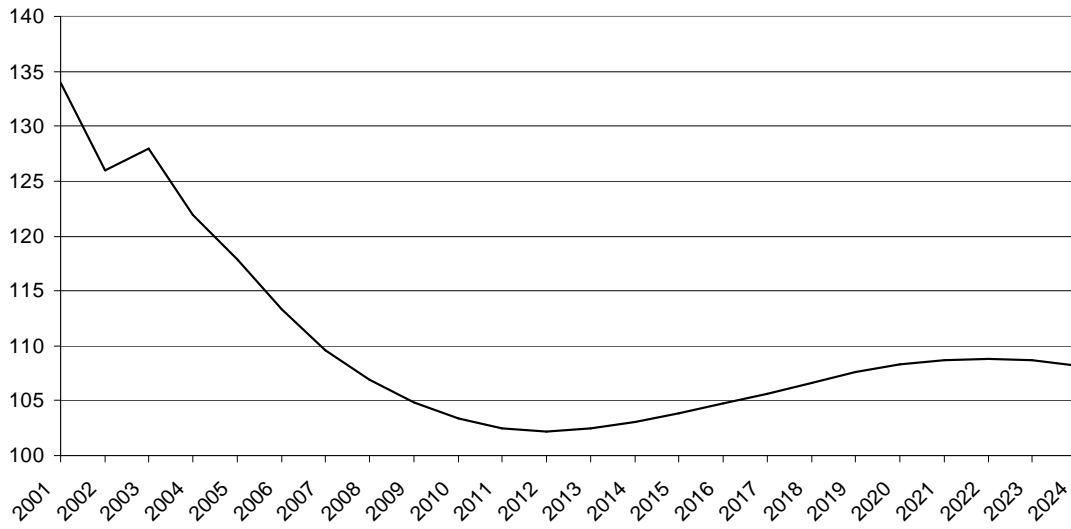
(Note: the 2004 projections are not available for local authorities but predict a 23.9% increase of those above pension age between 2004 and 2026 for Scotland)

Births

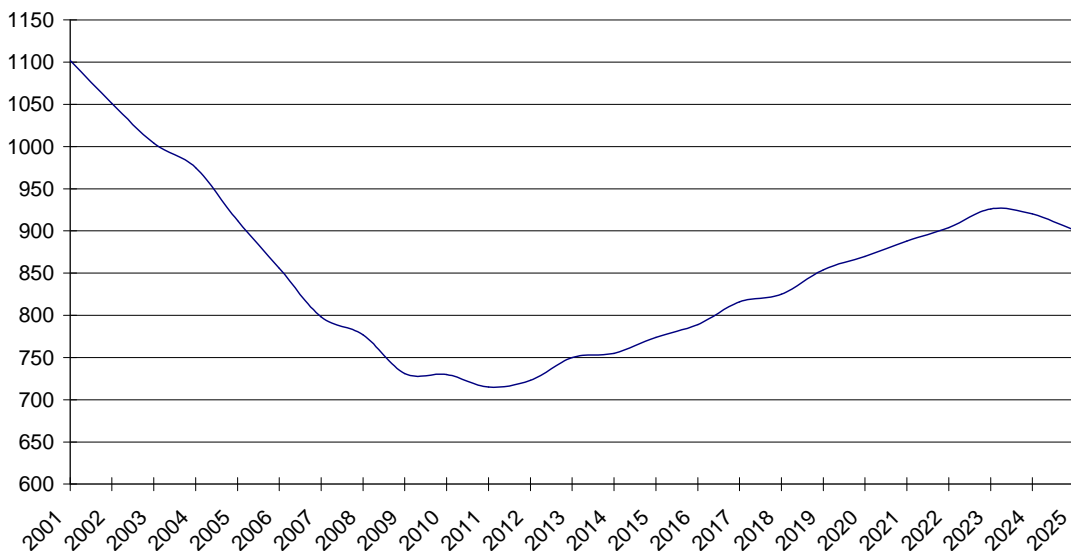
As mentioned previously, the fertility assumptions for the projections are based on those produced by GAD combined with a local scaling factor to reflect the slightly lower levels of fertility in the Cairngorms National Park compared with Scotland as a whole. The TFR (the number of babies a woman is expected to have on average) remains stable at 1.5 for the duration for the forecast. This is slightly lower than for Scotland, a scaling factor of 0.95 is used each year to reduce the TFR predicted for Scotland. The number of births is not only dependent on the fertility schedule but is also influenced by the numbers of women in each of the child bearing years (between 15 and 49): the greater the number of women in age groups with a high probability of giving birth, the more births there will be.

The charts below show the projected births per year and the female population aged 24 to 35. It can be seen from these graphs that the decrease in births from 2001 to 2012 is caused by a decrease in the numbers of women in the child bearing ages. From 2012 to 2023 there is an increase in the number of women in these age groups which stimulates an increase in births. However, this increase does not seem set to continue beyond 2025.

**Population Estimates & Forecasts - Cairngorms National Park Projections
Births per year**



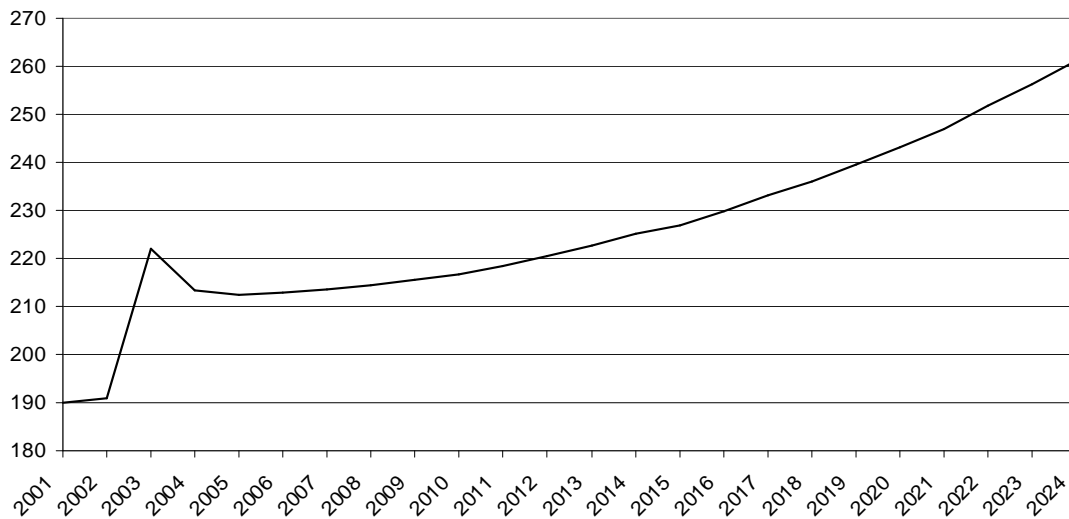
**Population Estimates and Forecasts- Cairngorms National Park Projections
Women aged 24 to 35**



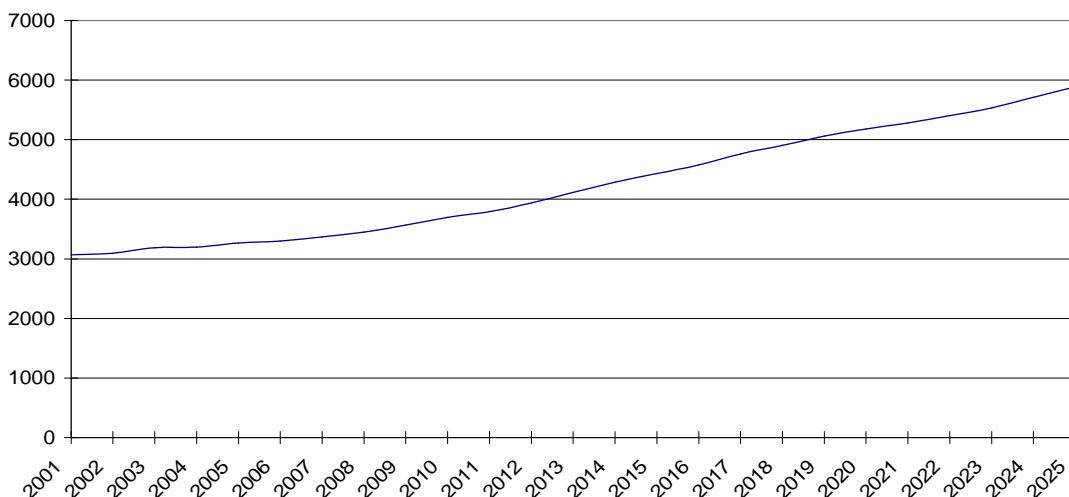
Mortality

The forecast for the Cairngorms National Park is that the population will become 'top heavy' with an increasing number of elderly people. This has the implication that deaths will increase as old people have higher mortality rates compared with those in younger age groups. The graphs below show the number of people aged over 65 and the number of deaths over the forecast period.

**Population Estimates & Forecasts - Cairngorms National Park Projections
Deaths per year**



**Population Estimates and Forecasts- Cairngorms National Park Projections
Population aged over 65**

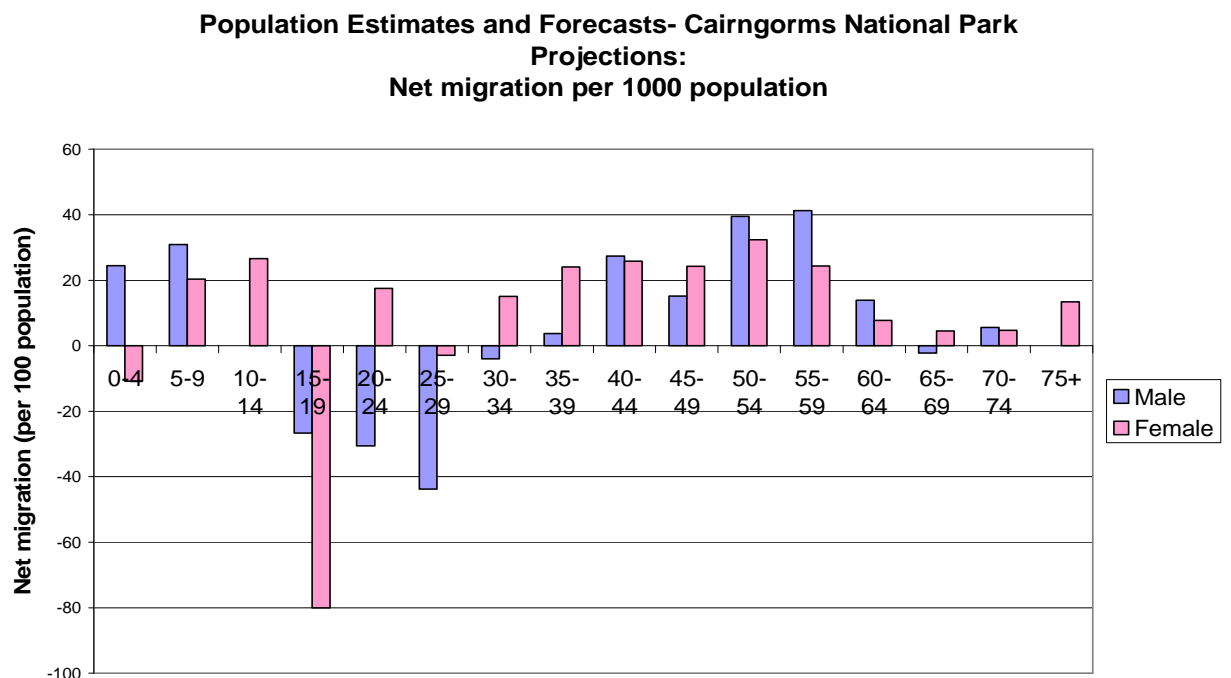


A point to note here is the unusually high number of deaths in 2003-4 (220 compared with 191, 190 and 188 in the previous years). This has not been treated as unusual in our forecasts but it is possible that, in reality, this was an

anomalous year. The total deaths for the first 3 years of the forecast are the observed number of deaths. Beyond 2004 the forecast deaths are based on GAD mortality rates and a local factor based on the observed number of deaths between 2001 and 2004. This local factor is equal to 0.96 and reflects the lower mortality rate in the Park compared with Scotland.

Migration

The migration schedule that is applied to the Cairngorms population is assumed to remain constant for the duration of the forecast. It is calculated as an age/sex rate per 1000 population and is based on migration between the Cairngorms and other parts of the UK, between 2001 and 2004. The net migration rate (in migration – out migration) for each age group is shown below:



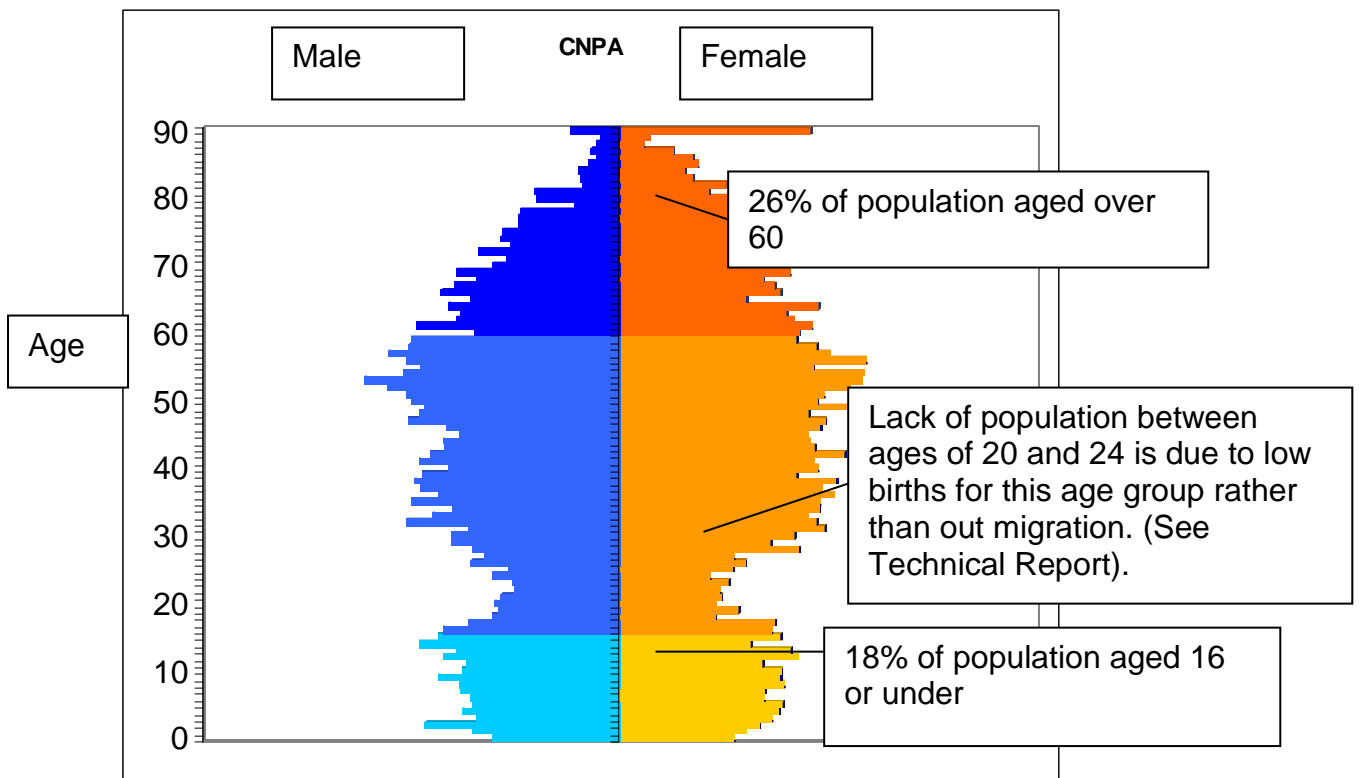
There are several general points to note here. Migration has a different effect according to age group: the park gains population predominantly between the ages of 40 and 60, and loses population between the ages of 15 to 29. Net in-migration is higher between the ages of 50 and 64 for men compared with women. It should also be noted that between the ages of 0 and 30 the net migration figures are quite volatile with some marked difference between males and females. In particular, the net migration rate of -80 per 1000 females aged 15 to 19 is noteworthy.

Over the whole period of the forecast 2001-2025, there is a net gain of 4520 migrants. However, this balance masks a gain of 4809 among those aged 40 or older, and a net loss of 1569 among those aged 15-29.

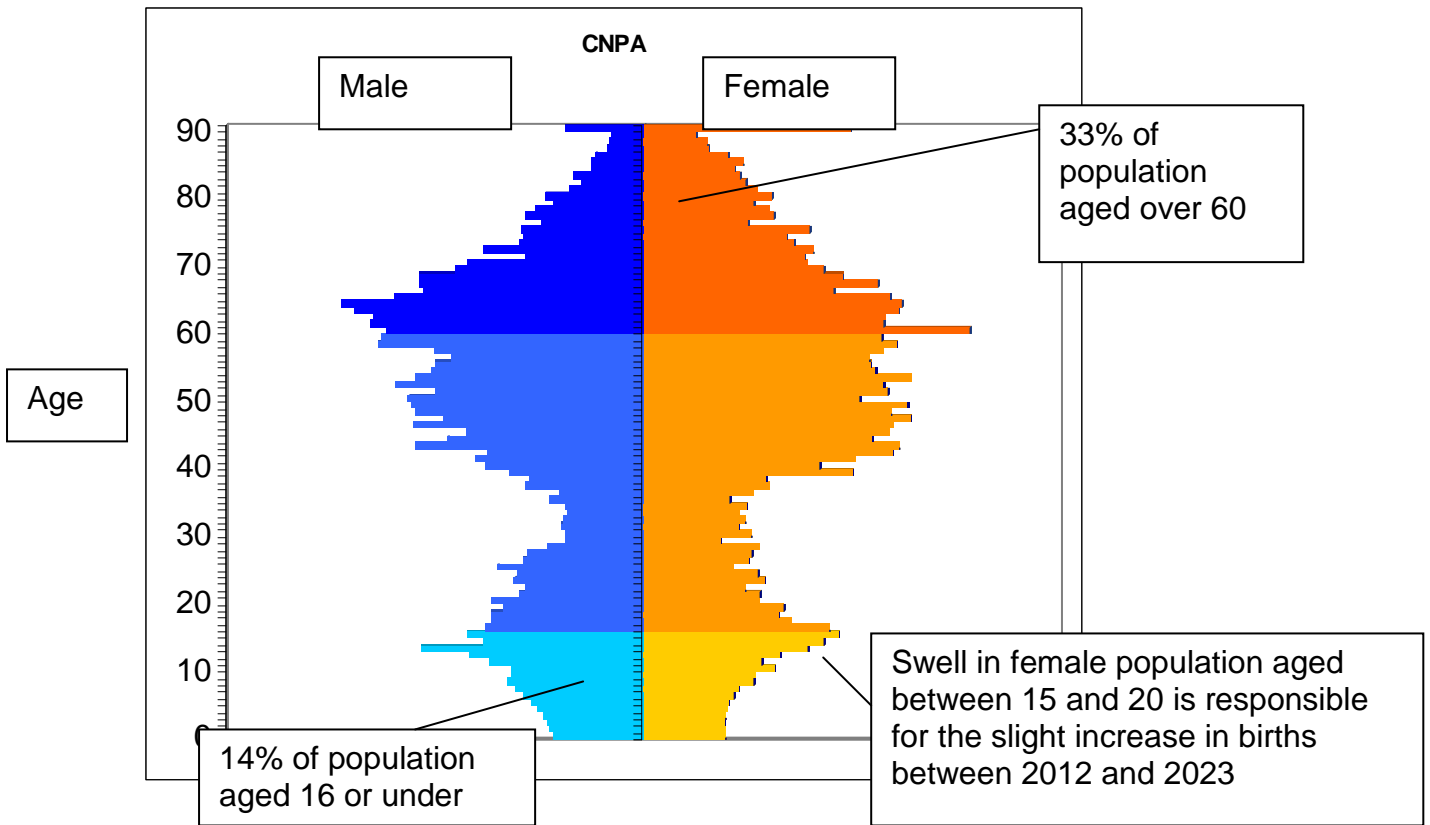
Population Structure

The three population pyramids below show the population structure in 2001, 2012 and 2025. The main point to note here is that if the fertility, migration and mortality continue as in recent years, then the park population is set to age rapidly. This is shown in the top heavy population pyramid for 2025 where nearly half the population are aged over 65 compared with a quarter in 2001. The impetus for this change in age structure comes from migration and, as shown earlier, the people who are moving into the park are mostly in the 40 to 60 age group. As life expectancies increase the elderly population swells. The proportion of the population in the younger age groups decreases over the forecast. Out migration occurs predominantly in the 15 to 30 age group and the decrease in births per year further reduces the young population.

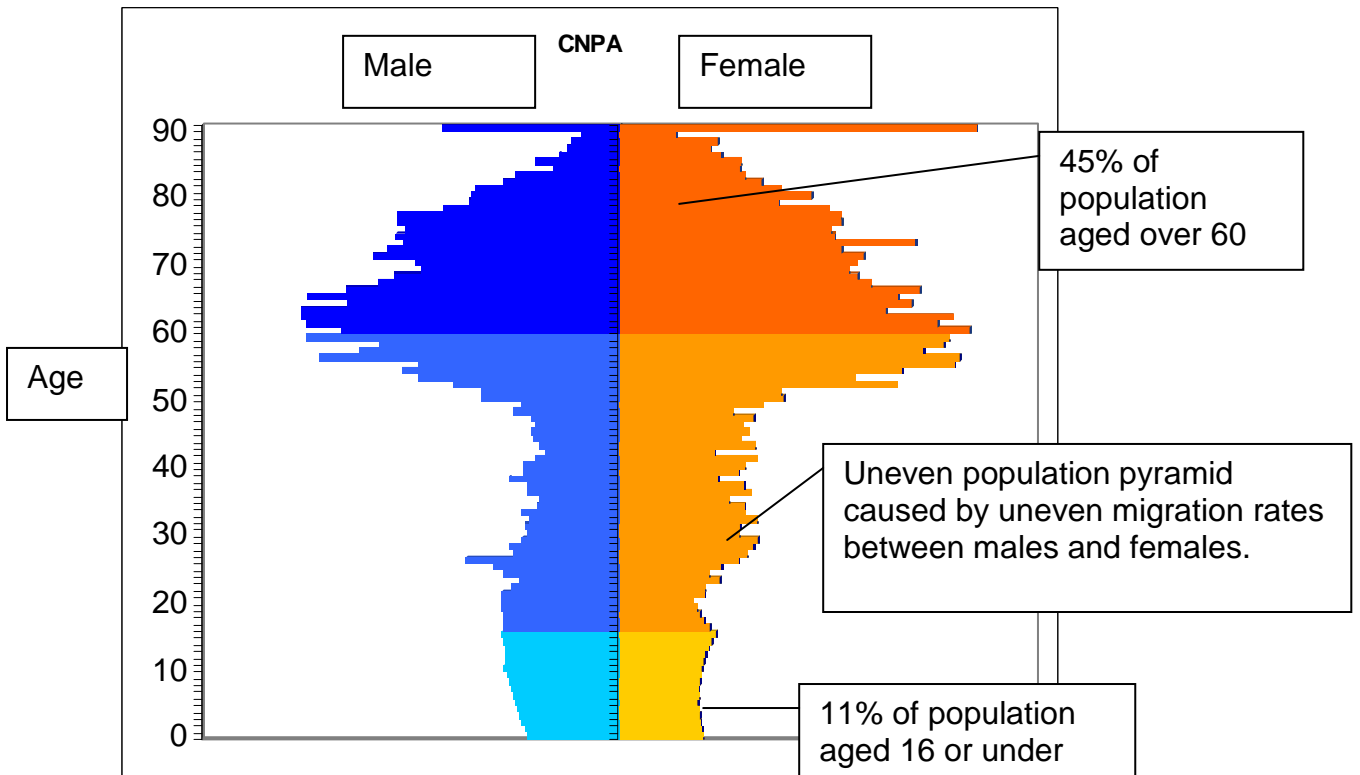
2001 – population pyramid



2012 population pyramid



2025 population pyramid



Household Projections

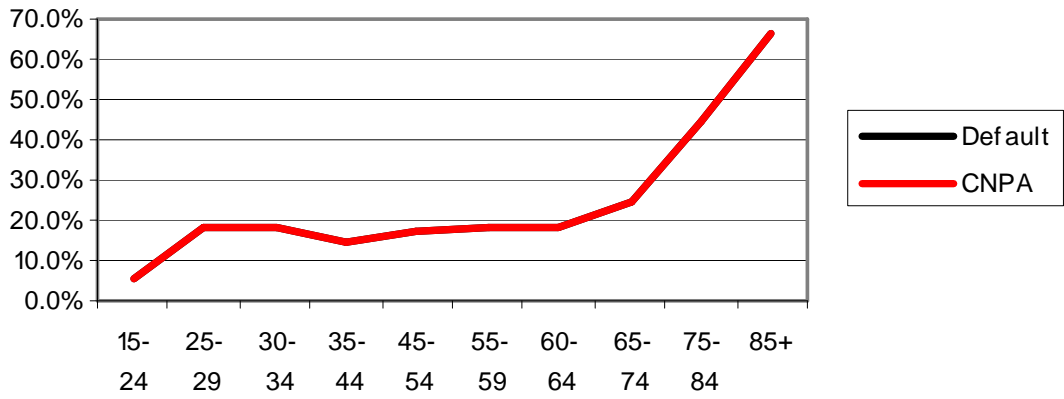
The table below shows the changes in household type over the forecast period. Between 2001 and 2016 the number of households is forecast to increase by 20%. This is caused by the combination of two factors. Firstly there is an increase in the private household population (+6.9% between 2001 and 2016) which implies that more households will be formed. Secondly, the average household size drops from 2.21 to 1.97. A decrease in the number of people per household leads to an increase in the number of households. The decrease in average household size is caused by the large increase in 1 person households (42.7%) and the decrease in households with 2 or more adults and children (-28.8%).

Household Types	2001	2006	2011	2016	% change 2001-2016
1 Person	2,148	2,412	2,729	3,066	+42.7%
2 Person all adult	2,331	2,591	2,912	3,250	+39.4%
Lone Parent	305	330	344	351	+15.2%
3+ adult	6,26	600	573	541	-13.6%
2+ adults with children	1,521	1,419	1,257	1,083	-28.8%
All Households	6,931	7,352	7,816	8,290	19.6%
Private Household Population	15,292	15,741	16,099	16,346	+6.9%
Average Household Size	2.21	2.14	2.06	1.97	-10.6%

The ageing population of the Park plays an important role in the projected increase in households. Elderly people are most likely to live in one person households. Therefore, an increasing elderly population will result in an increase in the proportion of one person households.

The chart below shows the percentage of each age group that live in a one person household according to the projections for 2016. It clearly shows the increased likelihood of the elderly to live in one person households compared with younger age groups.

Headship rates for Cairngorms National Park - 2016 1 person



2. Methods

The population of the Cairngorms National Park Authority is projected to 2025. The following information and assumptions are used. Further detail is given in the technical report.

Population Projections

The general method that was used involved applying fertility, mortality and migration rates to a population in a given year to calculate the population in the subsequent year. The first year's data (base population) was for 2001. As GRO-S mid year estimates were available for 2002, 2003 and 2004, the projections were constrained to these estimates. This allowed assessment of the similarity of the early years of our projection and that produced by GROS. The population projections are based on the data below:

Base population	2001 Census data (single year by sex).
Fertility	GAD 2004 projected age-specific fertility rates for Scotland and a local scaling factor to reflect the slightly lower fertility in CNPA.
Mortality	GAD 2004 projected age/sex-specific mortality rates for Scotland and a local scaling factor to reflect the slightly lower mortality in CNPA.
Migration	Age/sex schedule based on CNPA local migration data between 2001 and 2004. The same schedule is applied for each year of the forecast. International migration is assumed to have no net effect.
Constraints	GRO-S mid year estimates for 2002, 2003 and 2004.

The park boundary does not correspond to existing administrative areas for which data are released by GRO-S. The population estimates for the park area are based on aggregations of datazones. Where a datazone overlaps the park boundary, a proportion of it is included on the basis of the proportion of the population within postcodes that are both within the datazone and the park boundary.

Household Projections

The households in the Cairngorms National Park Authority are projected to 2016. Households are divided into 5 categories matching those used by GRO-S. These are: 1 person, 2 person all adult, lone parent, 3+ adults and 2+ adults with children.

The household projections follow the same method used by GROS in their 2002 Scottish household projections. A household population is calculated by subtracting the population not in households (the communal establishment population figure from the Census 2001) from the total population (population projections) for each year of the forecast. This household population is then divided into the various household types using GRO-S projected headship rates (the probability associated with each household type).

The GROS projected headship rates were provided at local authority level. CNPA projected headship rates were calculated by weighting the local authority rates according to the proportion of the CNPA population who live in each local authority area.

3. Reliability of Projections

Population Projections

By choosing 2001 as the base year the reliability of the forecasting assumptions can be evaluated by examining the difference between the projected population for 2002, 2003 and 2004 and the mid year estimates for each of these years (produced by GRO-S). If the projected population is similar to the GRO-S mid year estimates this indicates that the assumptions and data that the projections are based on are similar to those used by GRO-S to produce the mid year estimates. This ensures that these population projections are consistent with those used officially elsewhere in Scotland.

POPGROUP records the difference between GRO-S estimates and the projections. The differences are then used as a constraint to ensure that the projected population equals the estimated populations for the first three years of the forecast. As migration data for the CNPA area were provided for the whole period 2001-2004 rather than for each year, we can only fairly compare the projection with the estimates at 2004.

The projections only differ from the GROS mid year estimates by 6 between 2001 and 2004. This indicates that the assumptions and data that have been used closely match those produced by GRO-S.

Households

The household projections are based on the population projections. The table below compares the GRO-S household estimate for 2001 with our projections. The estimates are very similar; the total households only differ by 17 and although there are larger differences between household types, as a percentage these never differ by more than 1.7%. The Census figures are probably most accurate for 2001, but we needed the extra detail of age of head of household for the forecasts, which is not available from the Census. The projected change in number of households over the forecast period is much bigger than these discrepancies in 2001, so that they do not affect the policy implications of the forecast.

Household Type	Projection - Households		GRO-S - Households	
	Number	%	Number	%
1 person	2148	31.0%	2220	32.1%
2 person all adult	2331	33.6%	2421	35.0%
Lone parent	305	4.4%	320	4.6%
3+ Adults	626	9.0%	553	8.0%
2+ adults with children	1521	21.9%	1399	20.2%
Total households	6931	100%	6914	100%

4. Exploring the Results for Further Service Implications

The population projection is made for single years of age. The output files and reporting facilities of POPGROUP allow the Cairngorms National Park Authority to examine the implications of the projection. The output files and their functions are as follows:

<i>fore</i>	Detailed projected population by sex and single year of age, each year since 2001.
<i>summ</i>	Summary of population, births, deaths, UK and overseas migration, each year since 2001, suitable for printing on a single page.
<i>comp</i>	Detail of population, births, deaths, UK and overseas migration, each year since 2001.
<i>fore-reports</i>	Reporting facility allowing tabular display of results for specified age groups, time series charts, and population pyramids.

All output is on Excel sheets and can therefore be further manipulated and displayed by Cairngorms National Park Authority, and copied to other software for reporting purposes.