Achieving nutrient neutrality for new housing development

Demographic analysis of Natural England's advice

Home Builders Federation

March 2022

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Executive Summary

1 The issue of nutrient neutrality has become increasingly important in large parts of England where there is a concern about the impacts of the discharge of nutrients on sensitive protected habitats and bird species.

2 The principal source of nutrients is from wastewater from the existing built environment and from agriculture. However, whilst the nutrients generated by new housebuilding are limited in comparison, the issue has led to much discussion about the effect of new development and the ways to mitigate any harmful impacts. At a time of national housing crisis, it is having a definite and increasingly significant impact on housebuilding rates.

3 At the heart of the matter is not a discussion about additional houses or even households. The key issue is population. It is people that drive the nutrient load and so an assessment of the additional population that might arise in a local catchment area as a result of residential development must be at the forefront of any analysis undertaken in respect of this topic.

4 The evidence clearly shows that there is not a perfect correlation between the delivery of new housing and the increase in population. This is because it is changes in household formation and occupancy levels which result in a need for an increased number of dwellings to house the existing population.

5 Going forward, any mitigation measures should be proportionate to the impact arising from development – the actual increase in population that will occur. At present, mitigation is based on the Natural England calculator which overestimates significantly the likely increase in population associated with new development and results in a requirement for mitigation that is neither needed nor compliant with the Section 106 tests – and in some cases results in serious delays to much needed new housebuilding that would be unjustified on the basis of the volume of nutrient that is likely to be produced.

6 The absence of mitigation solutions can render planning permissions undeliverable. Equally, the cost of providing mitigation could make some developments unviable when it may not be necessary. Time delays will also add to viability challenges and increase the risk of planning permissions expiring.

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7 This report has been prepared by Lichfields on behalf of the Home Builders Federation. It appraises the veracity of the average figure of 2.4 persons per household that is used to inform calculations of the nutrient load associated with new residential developments. In so doing, it explores two broad themes:

   a. The extent to which new development will result in new people moving into the area and thereby increase the nutrient load; and,

   b. The falling average household size in England as a whole and within each authority and catchment area affected by this issue.

8 The purpose of this report is to inform a discussion about how the importance of protecting our sensitive water habitats does not undermine the need to address the housing crisis through an increased level of housing delivery.

9 The average household size has fallen continually for many decades. Such changes can be attributed to a range of social and economic trends and are projected to continue in the future. In all of the catchments affected by the nutrients issue, the average household size is significantly below the national average of 2.35 and is expected to fall to between 2.1 and 2.2 by 2039. This will need to be factored into the nutrient calculations of new residential developments because many of the residents of these developments will already be living in the catchment area.

10 Given the lead-in times associated with house building, it would be appropriate to consider current and emerging trends in household formation and occupation when calculating the nutrient load associated with residential development proposals.

11 Changing dynamics within the existing population also create a demand for additional housing without having any impact on the number of people living in an area. For example, in Cornwall zero migration would result in a population reduction of 6,850 people between 2022 and 2032, yet the number of households would still increase by 2,700. Were the population to remain static for the next ten years, it would still be necessary to supply homes for an additional 7,200 households. This illustrates the importance of maintaining housing delivery to meet the emerging needs of the existing population. In other words, the need for new housing is not exclusively generated by outsiders but by changes in household composition among the existing resident population. This will have implications for calculating the amount of additional nutrient generated by a new development as many of the residents of new developments will already be living within the catchment area. As such, it would be wrong to oppose all new housing schemes on nutrient grounds when many of these homes will be housing the existing resident population.

12 Applying the average of 2.4 people per household to the Standard Methodology housing need figure in Cornwall (2,790dpa) results in an implied household population increase of c.6,700 p.a. between 2022 and 2032. This is 75% above the actual level of household population increase that is set out in the official household projections (3,814 p.a.).

13 Further analysis of the application of the Natural England figure of 2.4 persons per household to the Standard Methodology assessment of local housing need shows that if applied across the seven catchment areas, it would suggest an annual increase in population that is over double the change in household population indicted by the official population and household projections (c.73,500p.a. compared to 35,250p.a.).

14 The significant difference between the household population and calculator-based figures can be attributed to changes in household formation within the existing population. The scale of the difference can be understood by reference to the fact that over the period from 2022 to 2032:

a. The change in total household population across the seven catchments (35,250 p.a.) equates to 0.6% of the existing household population level (5,897,000)

b. The Standard Methodology assessment of local housing need (30,650 p.a.) equates to 1.1% of the existing housing stock (2,705,700 at 2020).

15 The explanation for this difference is that the nutrient calculators take account of the total population that would live in new homes, irrespective of where they might have moved from. Taking account of the typical housing transaction chain, c.1/3 of households moved less than ten miles from their old home and c.1/2 moved less than 20 miles. In many cases, this means that they would remain living within the same catchment and would therefore not have any impact in terms of additional nutrient discharge into the designated sites. These movement trends allow for a consideration of the dynamics of population of household change within an existing population and help to explain and frame the evidence set out above regarding the relationship between the official household population projections and the application of Natural England's methodology.

16 Multiple strands of analysis all point to the fact that the nutrient calculators that have been applied throughout the seven catchments over-estimate significantly the likely *additional* population that would result from the development of new housing. This will tend to over-estimate the nutrient load associated with new development and expect levels of mitigation that may not be necessary.

17 By way of solution, we recommend that the nutrient calculator should be amended to adopt a more sensitive assessment of population change. This should reflect the level of households/dwellings associated with a net zero population growth scenario for which no mitigation would be required. Mitigation associated with the provision of new housing to accommodate population growth should be

based on the net average household size figure; this will be lower than average household size to take account of the fact that the resident population in the existing stock will be falling going forward.

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1.0 Introduction

1.1 In November 2018 the European Court of Justice (ECJ) ruled[1] that any additional nutrient loading to designated sites – including Special Areas of Conservation (SAC), Ramsar, Special Protection Areas (SPA) and potential SPA sites – that were already in an unfavourable condition would be unlawful. The issue is that high levels of nitrogen and phosphorus input to the water environment can cause eutrophication at designated sites. In some circumstances, the nutrient inputs, which come from agriculture and wastewater from built development, results in the formation of dense mats of green algae that then impact on protected habitats and bird species.

1.2 Natural England has indicated that it is undertaking further research to identify the impact of new development on designated sites but at present there is uncertainty regarding the potential for future housing development to exacerbate these impacts and thereby risk the ecological well-being of protected sites.

1.3 Natural England has indicated that this uncertainty can be addressed by all developments in affected catchments demonstrating "nutrient neutrality". This means that a new development would not add to the nutrient load in the catchment. In other words, the sum of nutrients from all surface water runoff and wastewater generated by the development must be equal to or less than the nutrients generated by the existing land use. On or off-site mitigation can be used to help achieve nutrient neutrality; this can reduce the export of nutrients from the development site or achieve offsets through reductions elsewhere in the catchment.

The scale of the issue

1.4 This issue has become increasingly prevalent and in England. At the time of preparing this report, the issue affected 32 local authorities and seven river catchments across the south of England, as summarised below. On 16 March 2022, the Government announced that an additional 27 catchment areas, affecting an additional 42 planning authorities, would now be subject to the requirement for nutrient neutrality.

[1] Judgment of the Court (Second Chamber) of 7 November 2018 (requests for a preliminary ruling from the Raad van State — Netherlands) — Coöperatie Mobilisation for the Environment UA, Vereniging Leefmilieu v College van gedeputeerde staten van Limburg, College van gedeputeerde staten van Gelderland (C-293/17), Stichting Werkgroep Behoud de Peel v College van gedeputeerde staten van Noord-Brabant (C-294/17) (Joined Cases C-293/17 and C-294/17).

Figure 1.1 River catchments affected by the nutrient neutrality issue

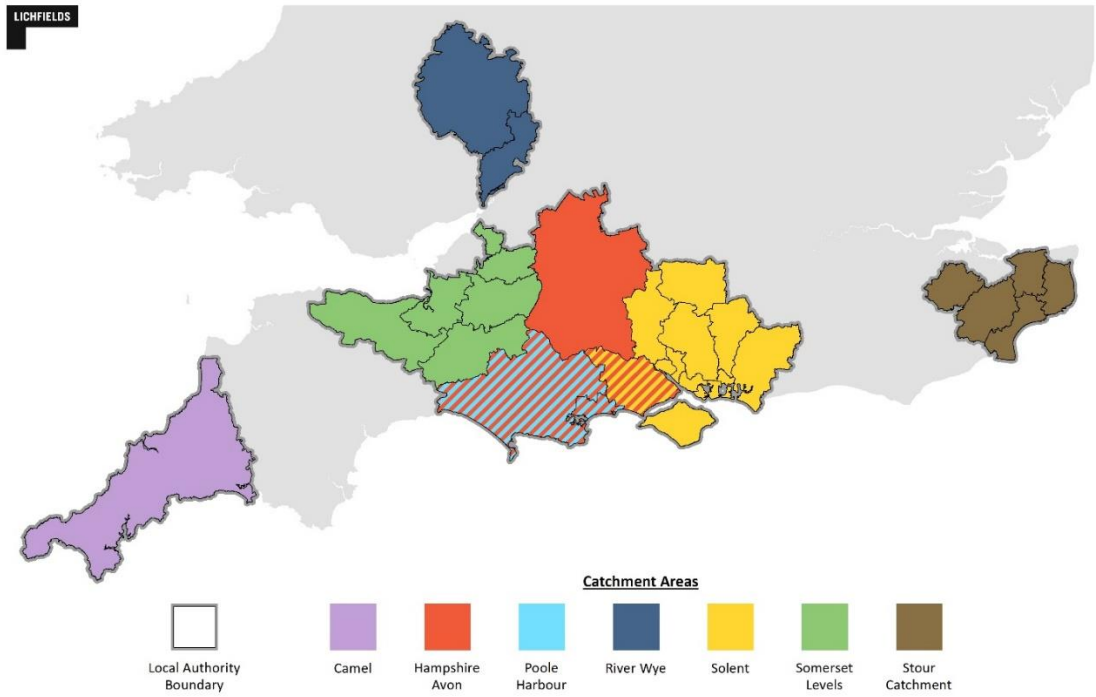


Table 1.1 Summary of local authorities in each affected catchment

River catchment	Local authorities within catchment
Camel	Cornwall
Hampshire Avon	Bournemouth, Christchurch and Poole Dorset New Forest Wiltshire
Poole Harbour	Bournemouth, Christchurch and Poole Dorset
River Wye	Forest of Dean Herefordshire
Solent	Basingstoke and Deane Chichester East Hampshire Eastleigh Fareham Gosport Havant Isle of Wight New Forest Portsmouth Southampton Test Valley Winchester
Somerset Levels	Bath and North East Somerset Bristol Mendip Sedgemoor Somerset West and Taunton

	South Somerset
Stour	Ashford Canterbury Dover Maidstone Shepway

1.5 Over the past three years, housing completions in these local authorities have fallen steadily from 26,800dpa in 2018/19 to 24,550dpa in 2020/21[2]. The average annual delivery over this period has been 25,390dpa. Whilst this has exceeded the total housing requirement set out in the relevant local plans[3] by 4% (+1,049dpa), it is 17% below the Standard Methodology figure[4] (-5,262dpa).

1.6 In considering these supply figures, it is important to recognise that the issue of nutrient-related harm to protected wetlands has been understood for many years, but it has only really begun to delay housebuilding following the ECJ judgment on the so-called "*Dutch Case*". The number of authorities within which nutrient neutrality has been an issue has increased over time, with the Solent catchment being the first affected. Many housing completions that have been delivered over the past three years may have related to planning permissions granted prior to this issue becoming a planning consideration – and in some cases, work on site might have commenced prior to the issue first being raised.

1.7 Going forward, the impact is likely to become increasingly significant. Critically, Natural England has advised a number of local authorities that planning permission, including reserved matters cases and where conditions still need to be discharged, cannot be legally granted for residential developments unless they are able to demonstrate nitrate or phosphate neutrality.

1.8 However, despite the effective moratorium on new housing delivery in these authorities, the need for additional homes has not gone away. For example, in December 2020[5] and July 2021[6], the leaders of Mendip, Sedgemoor, Somerset West and Taunton and South Somerset Councils and Somerset County Council wrote to the Secretary of State for Housing, Communities and Local Government[7], and the Secretary of State for the Department of Environment, Food and Rural Affairs, seeking assistance on this matter and emphasising that urgent attention is required to ensure that it does not have an adverse impact on meeting local housing needs and maintaining a five-year housing land supply. The July 2021 letter noted that:

"As you are aware this advice has prevented the determination of a significant number of affected planning applications across Somerset, including development sites that would deliver over 11,000 new homes. Future strategic housing sites have also been delayed and as our knowledge has developed in this area, we are now acutely aware of the impact this issue will have on the delivery of brownfield sites, that already face challenging viability issues. As a result, the phosphates issue is continuing to have implications for many affected local authorities to meet local housing needs, to maintain a five-year housing land supply and meet government targets for the delivery of homes."

1.9 Whilst funding support was provided by Homes England to help move work forward, there has been no movement on the issue of housing land supply or on the extent to which this issue

[2] Source: Live Table 122.
[3] Total of 24,341dpa across the seven catchments.
[4] Total of 30,652 across the seven catchments.
[5] https://www.southsomerset.gov.uk/media/4594/cd-1314-letter-from-mendip-sedgemoor-south-west-and-taunton-and-south-somerset-district-council-to-the-secr.pdf
[6] https://www.somersetwestandtaunton.gov.uk/media/2799/letter-to-secretaries-of-state-from-somerset-authorities-23-july-2021.pdf
[7] Now the Secretary of State for Levelling Up, Housing and Communities.

might be used to inform a future housing requirements. The response of 26 January 2021 from the Minister of State for Housing[8] stated:

"I note the concerns you raise about meeting the 5-year housing land supply under the current circumstances. However, it is important to keep the planning system moving to enable it to play its full part in the economic recovery to come."

1.10 As planning permissions granted prior to the introduction of the nutrient issue are built out and reliance is placed on new sites to meet the on-going housing need, the impact of this issue on housing supply will become even more significant. It is estimated that between 50,000 and 60,000 dwellings are currently at risk of non-delivery because of this issue[9]. This is double the annual housing requirement across the seven catchments. The future impact on supply arising from new sites not being granted planning permission is more difficult to quantify but is likely to be even greater. This could have significant implications in terms of under-delivery of new development, a lack of housing land supply, and worsening affordability pressures.

Use of average household size figures to inform calculations of nutrient load

1.11 Natural England has issued guidance to the Solent authorities on how nutrient neutrality can be achieved[10]. Although this is not universal advice, the approach – which is summarised below – has been applied by other authorities,

Table 1.2 Methodology for calculating nitrogen load of a new development

Stage	Task
1	Calculate the total amount of nitrogen that would be discharged via Wastewater Treatment Works (WwTW) into catchments Step 1: Calculate additional population Step 2: Confirm water use Step 3: Confirm WwWT and nitrogen permit level Step 4: Calculate total nitrogen derived from the proposed development that would exit the WwTW after treatment
2	Calculate existing (pre-development) nitrogen) from the current land use of the development site
3	Calculate nitrogen for the non-built land uses proposed for the development site (e.g. public open space)
4	Calculate the change in the total nitrogen as a result of the development
Result	If stage 4 shows a positive number, mitigation is required If stage 4 shows a negative number, mitigation is not required

Source: Natural England advice

1.12 In respect of Stage 1.1, the calculation of population is based on the application of an average household size figure to the number of dwellings that are proposed. Natural England's starting position is that the national average household size of 2.4 should be applied:

[8] https://www.somersetwestandtaunton.gov.uk/media/2575/letter-of-response-from-rt-hon-christopher-pincher-mp-for-mhclg.pdf

[9] Source: HBF survey of reports, letters and press releases issued by a number of local planning authorities affected by the nutrients issue.

[10] https://www.push.gov.uk/wp-content/uploads/2020/06/Natural-England%E2%80%99s-latest-guidance-on-achieving-nutrient-neutrality-for-new-housing-development-June-2020.pdf

"Natural England recommends that, as a starting point, local planning authorities should consider using the average national occupancy rate of 2.4, as calculated by the Office for National Statistics (ONS), as this can be consistently applied across all affected areas." (Natural England's advice on achieving nutrient neutrality for new development in the Solent Region. Version 5, June 2020, paragraph 4.18).

1.13 However, it goes on to accept that local authorities may apply alternative figures where there is evidence to support this approach:

"However competent authorities may choose to adopt bespoke calculations tailored to the area or scheme, rather than using national population or occupancy assumptions, where they are satisfied that there is sufficient evidence to support this approach. Conclusions that inform the use of a bespoke calculation need to be capable of removing all reasonable scientific doubt as to the effect of the proposed development on the international sites concerned, based on complete, precise and definitive findings. The competent authority will need to explain clearly why the approach taken is considered to be appropriate. Calculations for occupancy rates will need to be consistent with others used in relation to the scheme (e.g. for calculating open space requirements), unless there is a clear justification for them to differ." (Natural England's advice on achieving nutrient neutrality for new development in the Solent Region. Version 5, June 2020, paragraph 4.19).

Approach taken by individual authorities

1.14 Many of the local authorities that are affected by this issue (as identified in Figure 1.1) have prepared guidance and/or nutrient calculators that can be used to identify the total nutrients generated by a development. Whilst the majority of these have applied the standard figure of 2.4 people per household, we note that a number of authorities have adopted an alternative figure, as set out below. In the majority of cases, however, the key variation appears to apply to the application of different average household size figures for flats and houses.

Table 1.3 Alternative average household size figures applied

Catchment	Local Authority	Average household size applied	Evidence used to justify alternative figure / Notes
Camel	Cornwall[11]	House: 2.4 Flat: 1.65	Not stated
Solent / Hampshire Avon	New Forest[12]	Studio/1-bed: 1.4 2-bed: 2.1 3-bed: 3.0 4+-bed: 3.75 Unspecified: 2.63	The rationale for these figures is not stated although the unspecified dwelling size assumes a housing mix compliant with 6.1 of Policy HOU1 in the Local Plan 2016 - 2036 Part One: Planning Strategy
Hampshire Avon / Poole Harbour	Dorset[13]	House: 2.42 Flat: 1.65	Dorset Council assumes that anyone living in the catchment also works and uses facilities in the catchment, and therefore any sewage generated by that person can be calculated using the number of new homes built. It notes that this assumption provides a practical approach and assumes a worst case

[11] https://www.cornwall.gov.uk/planning-and-building-control/planning-applications/nutrient-neutrality-in-cornwall/#calculator
[12] https://www.newforest.gov.uk/article/2714/Nutrient-neutral-development
[13] https://moderngov.dorsetcouncil.gov.uk/Data/400/201703281415/Agenda/Appendix%202%20-%20Nitrogen%20Reduction%20in%20Poole%20Harbour%20Supplementary%20Planning%20Guidance.pdf

			scenario, the precautionary principle as required for assessing effects on SPA.
River Wye	Herefordshire[14]	2.3	2011 Census had a figure of 2.3 persons per household for Herefordshire. Herefordshire Council and Dwr Cymru (Welsh Water) use an occupancy figure of 2.3 in relation to Section 106 calculations within the planning system and for determination of population growth, respectively
Somerset Levels[15]	Mendip	House: 2.4 Flat: 1.65	These local authorities have adopted a common approach to the assessment of nutrient neutrality and a single calculator has been developed for use in all four authorities
	Sedgemoor		
	Somerset West and Taunton		
	South Somerset		
Stour Catchment	Ashford[16]	House: 2.4 Flat: 1.75	Any applicant wishing to deviate from these values will be required to provide robust evidence in support of their application in order to justify their approach.
	Shepway (Folkestone & Hythe)[17]	2.18	This is the average dwelling occupancy for the District provided by the Council.

Source: Lichfields review of individual local authorities policies/nutrient calculators. Note that authorities not listed on this table have either not published nutrient calculators or have applied Natural England's recommended average household size of 2.4.

Purpose and scope of report

1.17 This report has been prepared by Lichfields on behalf of the Home Builders Federation (HBF). It appraises the veracity of the average household size figure of 2.4 persons that has been used to inform calculations of the nutrient load associated with new residential developments. In so doing, it explores two broad themes:

1 The extent to which new development will result in an increase in the local population and a consequential increase in the nutrient load; and,

2 Whether the recommended figure of 2.4 persons per household is appropriate in the context of the falling average household size in England as a whole and within each authority and catchment area that is affected by this issue.

1.18 As part of this analysis, we review the key factors that are driving household occupation rates. As is shown, these are critical in informing the assessment of population change arising from the delivery of new housing.

1.19 The purpose of this report is to facilitate a discussion about how the importance of protecting our protected wetland areas does not undermine our ability to address the housing crisis through an increase in housing supply.

[14] https://www.herefordshire.gov.uk/downloads/file/22150/interim-phosphate-delivery-plan-stage-1-report

[15] https://ssccust1.spreadsheethosting.com/1/3d/08e177701b0026/Copy%20of%20P%20budget%20Calc_V3.1%20developer%20version/Copy%20of%20P%20budget%20Calc_V3.1%20developer%20version.htm

[16] https://www.ashford.gov.uk/planning-and-development/planning-applications/making-planning-applications/habitat-regulations-assessment/nutrient-neutrality-information-for-developers/

[17] https://folkestone-hythe.gov.uk/media/3137/EB-02-95-HRA-Addendum-Nutrient-Neutrality-07-12-2020/pdf/EB_02.95_FHDC_Habitats_Regulations_Assessment_Addendum_-_Nutrient_Neutrality__07.12.2020.pdf?m=637429630190700000.

1.20 A separate report has been prepared to quantify the economic impact of the reduction in housing completions as a consequence of this issue.

2.0 Do new homes result in additional people living in the local area?

2.1 The nutrient calculator that has been proposed by Natural England assumes that all new homes will result in an increase in the local population. This approach ignores the dynamics of the housing market whereby people will commonly move short distances and new homes are often occupied by people that are not new to the local area. This section considers the relationship between population and household change in more detail before considering evidence about how far people tend to move from their previous home to their new home.

The relationship population and household growth

2.2 The relationship between the change in population and the number of household and dwellings in any area is not direct. As set out in Section 3, there is a continuing downward trend in the average household size in England and each of the catchment areas to which this study relates. These reductions apply to all households – whether existing, newly forming or new to a particular area – and have a direct impact on the number of additional people that will live in a local area following the delivery of new housing.

2.3 There are a number of trends which pull in different directions. Firstly, not all of the additional people in a local authority area will form a new household and therefore generate a need for additional housing. Perhaps most obviously, new babies will not have any bearing on household formation. Amongst the adult population, not all in-migration movements will result in a demand for additional housing as some people might decide to live with family that already reside in the area or in a shared house. These trends would all point towards an increase in household size, as does the reality that increasing house prices and worsening affordability are affecting negatively the ability of (mainly young) people to form new households.

2.4 Given the overall direction of average household size, however, other trends are evidently dominant. These also highlight the relationship between population and household growth. In particular, the loss of population would not necessarily result in a reduction in the number of households or the release of housing from the existing stock. For example, the death of a family member or grown up children deciding to leave home and move away from the area would contribute towards a reduction in the population but without necessarily having any effect on the overall number of households in the area.

2.5 Changing dynamics within the existing population also exert a demand for additional housing without having any impact on the number of people living in an area. For example, family breakdown and people moving out of shared houses may result in the creation of new households and generate a demand for additional housing. As the local population remains the same size, the nutrient load associated from that population will also remain the same – irrespective of how that population divides itself into households and the number of houses that are required to accommodate them. Consequently, an element of the overall population has no role in generating additional nutrients. It is only new people, moving into the catchment from outside, who will need to be catered for by providing mitigation.

2.6 This is an important consideration and one that casts doubt over the reliability of simply equating new homes with new people. The national average household size of 2.4 persons per dwelling relates to trends in household composition. It does not relate to migration into an area. As such Natural England's default assumption will tend to overestimate the volume of nutrient generated by new housebuilding because it assumes that there will be 2.4 new persons per new house living in the catchment when this will often not be the case

2.7 This can be illustrated in three ways:

1 The impact of zero migration on housing need;

2 The effect of the local population remaining at its current size; and,

3 A review of the relationship between the projected change in the household population and the number of households in a particular area.

2.8 We consider each of these points below, looking at the first two points through a worked example of Cornwall. This case study example has been selected as the River Camel catchment is entirely contained within Cornwall, so this can be used to illustrate the principle at a local authority and catchment-wide level. It is expected that the principles summarised below would similarly apply to the other authorities and catchments.

Demographic modelling of Cornwall

2.9 The 2014-based population projections anticipate that the population of Cornwall would increase by 40,277 people between 2022 and 2032. The 2014-based household projections indicate that this population change would result in an additional 21,052 households over the same period. These figures are used as the basis of the Standard Methodology calculation and result in a local housing need figure of 2,790dpa[18].

Table 2.1 Population and housing change in Cornwall (2022-32): Baseline scenario

	Total change	Annual change
Total population	40,277	4,028
Households	21,052	2,105

Source: Lichfields analysis of 2014-based population and household projections

2.10 Using the PopGroup suite of software, we have tested two scenarios that consider the implications of natural change only (zero migration scenario) and the population remaining constant over the ten-year period on household formation. Despite the fact that not all dwellings will be permanently occupied – particularly in Cornwall where there is a high level of second/holiday home ownership[19] – the Standard Methodology does not apply a vacancy rate to translate households to dwellings. We have replicated this approach in this assessment and focus solely on households.

Zero migration scenario

2.11 Although unlikely to ever occur in practice, modelling a zero migration scenario is helpful in showing the effects of change within the existing population on housing need. Under this scenario, the population of Cornwall is projected to fall by 6,831 people between 2022 and 2032 but the number of households would increase by 2,711 over the same period.

Table 2.2 Population and housing change in Cornwall (2022-32): Zero migration scenario

	Total change	Annual change
Total population	-6,831	-683
Households	2,711	277

Source: Lichfields analysis of 2014-based population and household projections

[18] Based on application of the annualised household change (2,105 p.a. plus an adjustment of 32.56% (686p.a.) to reflect the current affordability ratio of 9.21.

[19] In December 2020 it was reported that Cornwall has the highest number of empty homes in England: 18,621 homes were empty, of which 13,642 were second homes that were used mainly as holiday accommodation (Source: https://structuralrepairs.com/empty-housing-in-england/).

2.12 It is recognised that this scenario results in a much lower level of household growth compared to the baseline, but the fact that such a dramatic decline in population would still result in additional households – and, as such, a need for more new homes – highlights the extent to which the changing dynamics of household formation within the existing population can generate a need for additional housing. Under this scenario, there would be more deaths than births and the population would age considerably, with a 32% increase in the number of people over the age of 75, compared to an 8% decline in the number of people of working age.

2.13 Crucially, the decline in total population would mean that there would be a reduction in nutrient discharge. However, this reality is obscured by Cornwall Council's calculator. Assuming that all of the new properties are provided as houses (and not a mix of houses and flats), it would be assumed that the population would increase by 6,506[20] over the ten-year period[21] and that, as a result, the nutrient load would also rise. This demonstrates a fundamental flaw in the calculator which fails to link mitigation requirements to the needs actually arising from a residential development.

Zero net change scenario

2.14 As a further scenario we have considered the number of additional households that would arise in the event that the population remained steady at its 2022 level[22]. Under this scenario, the population would continue to age but net in-migration would serve to counter-balance the negative natural change. As a result of the changing demographic and household patterns, there would be a net increase of 7,208 households. These will require new homes although the nutrient load associated with the zero population change could reasonably be assumed to be zero. This contrasts to the figures derived from Cornwall Council's calculator which would assume a population increase of 17,299[23] assuming that all of the new properties are provided as houses[24]. Going forwards, we believe that this analysis can form the basis of an alternative – and more robust – methodology for calculating the nutrient load associated with new development.

Table 2.3 Population and housing change in Cornwall (2022-32): Zero migration scenario

	Total change	Annual change
Total population	0	0
Households	7,208	721

Source: Lichfields analysis of 2014-based population and household projections

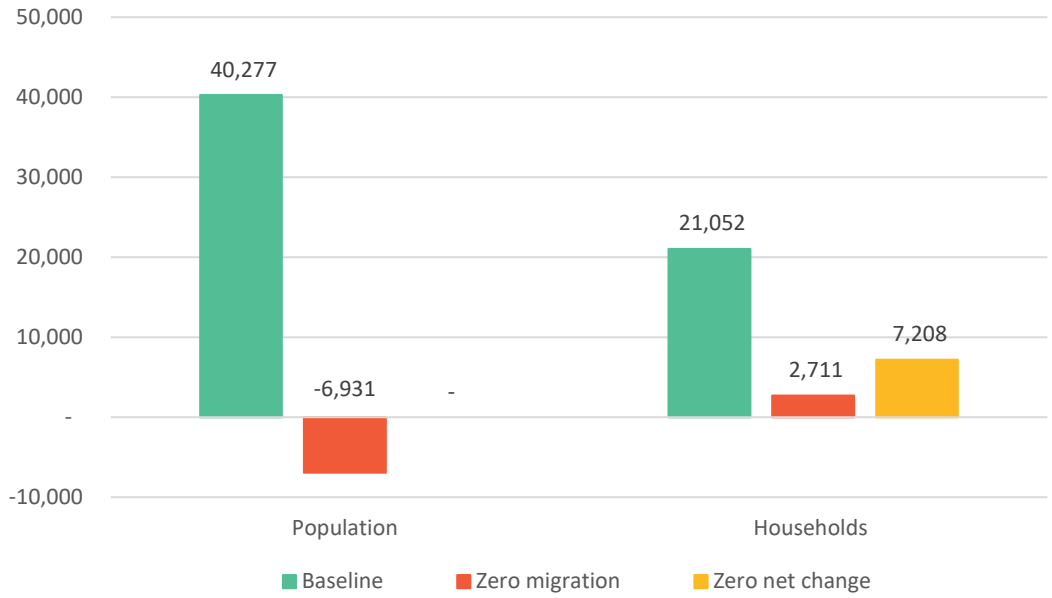
Summary of PopGroup modelling

2.15 It is recognised that the two scenarios that we have tested result in a much lower level of household growth compared to the 2014-baseline. However, the difference in population change is even more considerable. This analysis shows very clearly that, as explained above, new housing is not required solely to accommodate population growth but also to meet the needs of the existing population and reflect changing patterns of living.

2.16 A summary of the three scenarios is set out below.

[20] 2,711 x 2.4. Note that this does not allow for any adjustment to transfer households to dwellings or any uplift to reflect affordability pressures as per the Standard Methodology approach.
[21] Were all the additional homes to be provided as flats, the population increase would be assumed to be 4,473 (2,711 x 1.65).
[22] Based on the 2014-based SNPP projection for 2022.
[23] 7,208 x 2.4. Note that this does not allow for any adjustment to transfer households to dwellings or any uplift to reflect affordability pressures as per the Standard Methodology approach.
[24] Were all the additional homes to be provided as flats, the population increase would be assumed to be 11,893 (7,208 x 1.65).

Figure 2.1 Population and housing change in Cornwall based on the three scenarios tested (2022-32)



Source: Lichfields analysis of 2014-based population and household projections

2.17 Against this context, the official (2014-based[25]) projections show that the household population of Cornwall will increase by 3,814 per annum between 2022 and 2032[26]. This level of population increase would support an additional 2,105 households per annum. As set out above, the Standard Methodology identifies a local housing need for 2,790dpa over the same period. Applying Cornwall Council's average figure of 2.4 people per household for houses to the increase in number of dwellings (i.e. the Standard Methodology figure) would result in an implied household population increase of 6,698 per annum; this is 75% above the projected increase in the household population of Cornwall. Even were the average household size figure to be applied to the projected increase in the number of households[27], this would suggest a household population increase of 5,052 per annum – 32% above the actual projected rise.

2.18 The example of Cornwall shows clearly that the Natural England calculator is over-estimating the population increase associated with new housing, and by a very considerable margin.

2.19 We consider this evidence in relation to the other catchments below.

Review of the projected change in the household population and the number of households in a particular area.

2.20 The guidance issued by Natural England applies an average household size to the number of new dwellings proposed. As set out in Section 3, the figures applied do not reflect the falling average household size in the seven catchment areas that are affected by the nutrient issue. In addition, it also fails to account for the changing internal dynamics of household formation and the fact that not all residents living in a new housing development are new to the area. As such, the correlation between additional households and additional population is not linear.

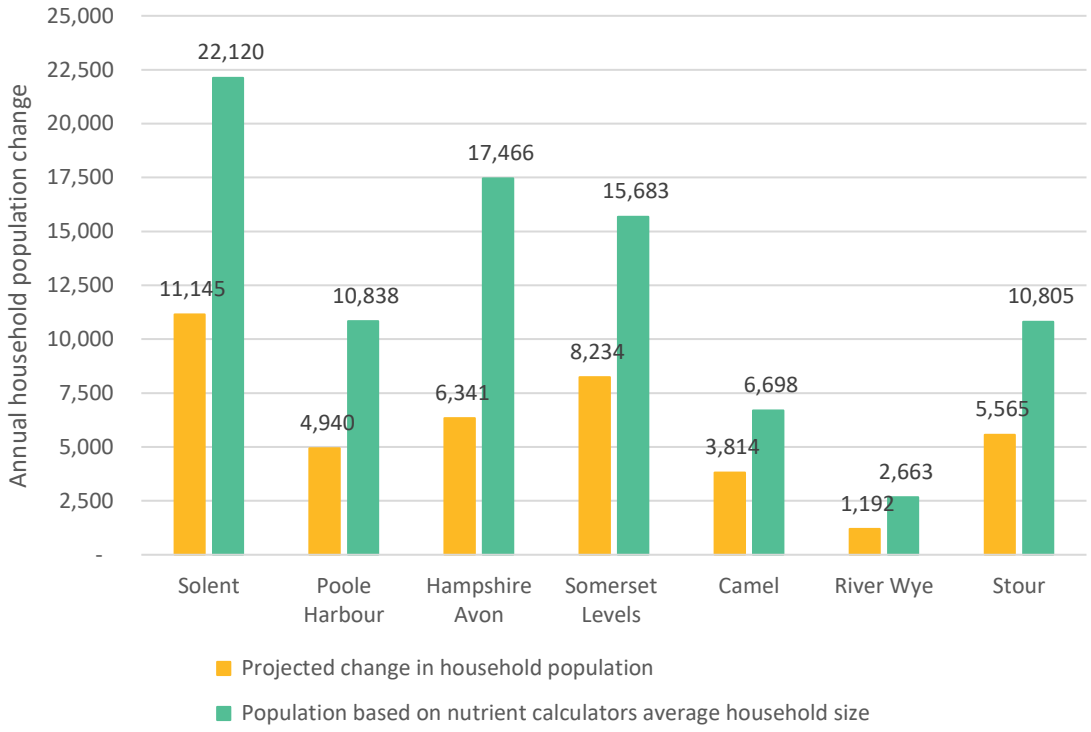
[25] These projections have been applied as they are used in the calculation of the Standard Methodology assessment of local housing need.
[26] The projections anticipate a total population increase of 4,028 per annum over the same period. The difference (214p.a.) relates to the institutional population – i.e. people that live in nursing homes, halls of residence, boarding schools, military facilities, prison, etc, instead of in households.
[27] i.e. rather than applying it to the additional dwellings as per the Natural England calculator.

2.21 In order to further illustrate this point, we have applied Natural England's recommended average household size figure of 2.4[28] to the Standard Methodology local housing need figure in each local authority area within the seven catchments. This provides an indication of the level of population that would be assumed by the application of the nutrient calculators in each area. This equates to an annual average household population increase of c.73,500 between 2022 and 2032.

2.22 We have compared this figure with the change in the household population for each area between 2022 and 2032, as set out in the 2014-based sub national household projections[29]. Across the seven catchment areas, the household population is expected to increase by 35,250 per annum; this is less than half the figure that would otherwise be derived from the nutrient calculators.

2.23 This comparison is set out in relation to each catchment in Figure 2.2 whilst Figure 2.3 illustrates the difference between the actual and implied projected increase in household population in each catchment.

Figure 2.2 Comparison of projected household population change and population based on application of the nutrient calculators (based on SM) – by catchment (annualised, 2022-32)



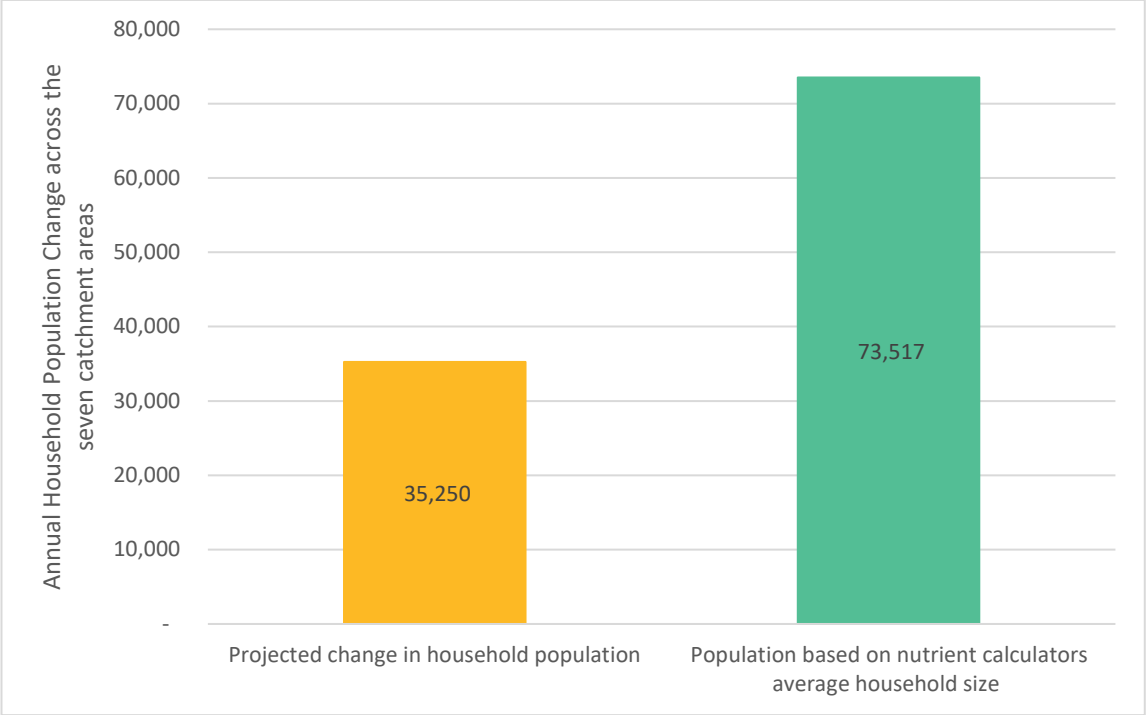
Source: Lichfields analysis

2.24 Figure 2.3 shows the total impact on population change across the seven catchment areas reviewed in this report. Across the seven catchment areas, the population change based on nutrient calculators average household size is more than double (109% higher than) the projected change in household population based on Standard Methodology figures.

[28] Or the alternative figure that has been applied by individual local authorities for houses

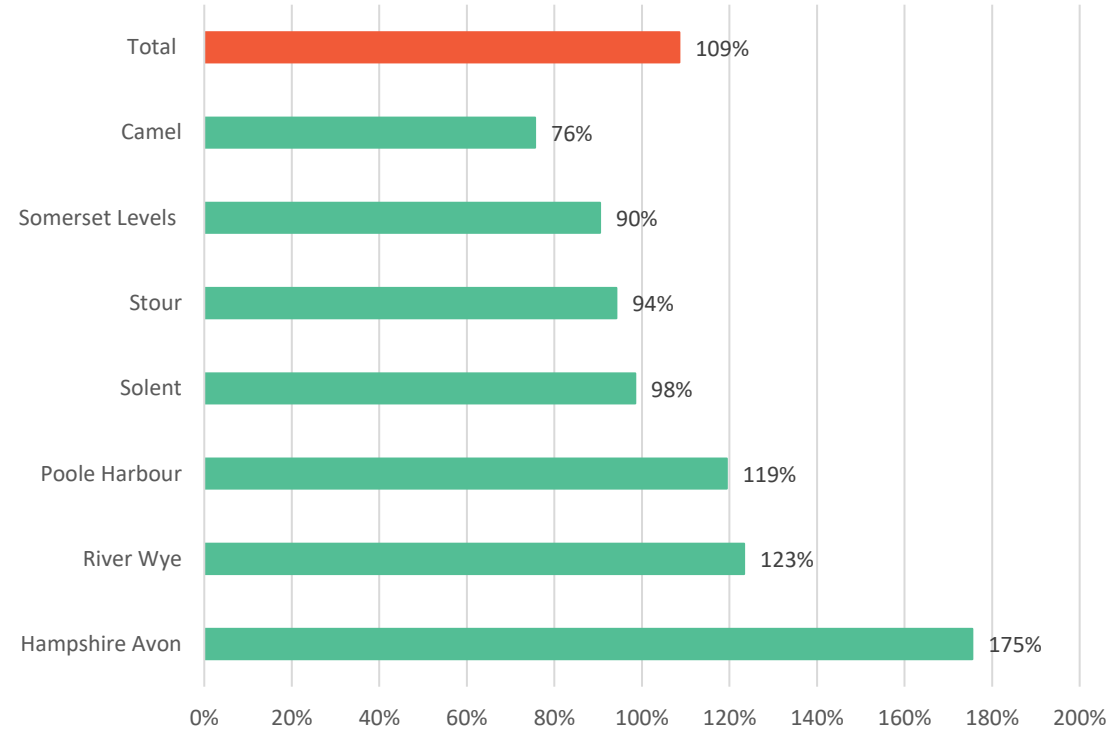
[29] The household population represents the number of people that would live in households – i.e. excluding those living in institutions. This provides a like-for-like comparison with the multiplication of the total number of dwellings by an average size factor.

Figure 2.3 Comparison of projected household population change and population based on application of the nutrient calculators (based on SM) – total figures (annualised, 2022-32)



Source: Lichfields Analysis

Figure 2.4 Difference between projected household population change and population based on nutrient calculators



Source: Lichfields analysis

2.25 As set out above, the significant difference between the household population and calculator-based figures can be attributed to changes in household formation within the existing population. The scale of the difference can be understood by reference to the fact that over the period from 2022 to 2032:

1 The change in total household population change across the seven catchments (35,250 p.a.) equates to 0.6% of the existing household population level (5,897,000)

2 The Standard Methodology assessment of local housing need (30,650 p.a.) equates to 1.1% of the existing housing stock (2,705,700 at 2020).

2.26 The growth in population, households and dwellings therefore represents only a tiny proportion of the total number. Changes within the existing population therefore have the key driving influence on the need for new housing. Against this context, the application of Natural England's figure of 2.4 persons per household results in a substantial over-estimation of the increase in household population across the seven catchment areas. Consequently, the nutrient load of new housing schemes will not be nearly as high as that projected by Natural England.

How far do people move?

2.27 This evidence set out above shows that there is not a perfect – or even a strong – correlation between the delivery of new housing and the increase in local population. As demonstrated this is because of changes *within* the existing population. This can be further understood through a review of the distance that people tend to move from their old property to their new home.

2.28 The English Housing Survey provides evidence on the distance moved by households according to their tenure. As illustrated below, a very large proportion of people move only short distances, such that they will commonly remain within the same local authority and river catchment following their house move:

Table 2.4 Distance moved from old to new home by tenure

		Tenure					Tenure	
		Owner Occ	Private Rented	LA	RSL	Social	Market	Affordable
Distance from previous home	< 1 mile	23.1%	22.1%	26.0%	28.6%	27.6%	23.1%	27.4%
	1 – 2 miles	18.2%	14.6%	16.3%	17.3%	16.9%	18.2%	16.8%
	2 – 5 miles	21.0%	22.5%	24.4%	19.9%	21.6%	21.0%	22.0%
	5 – 10 miles	11.5%	14.1%	11.4%	11.7%	11.6%	11.5%	11.6%
	10 – 20 miles	8.1%	10.8%	4.1%	7.1%	6.0%	8.1%	5.7%
	20 – 50 miles	4.8%	4.7%	7.3%	2.6%	4.4%	4.8%	4.8%
	>50 miles	9.7%	7.5%	7.3%	7.1%	7.2%	9.7%	7.2%
	Abroad (incl Isle of Man, Channel Islands)	3.6%	3.8%	3.3%	5.6%	4.7%	3.6%	4.5%

Source: English Housing Survey – Tenure by distance moved

2.29 This evidence shows that:

1 73.8% of residents in the open market sector and 77.8% of affordable residents moved within a radius of ten miles from their old home; and,

2 81.9% of open market residents and 83.5% of affordable housing residents moved less than 20 miles from their old home.

2.30 The plans set out in Appendix 1 illustrate how a ten or 20 miles isochrone from the centre of each local authority that is affected by the nutrient issue would generally remain within the boundaries of that authority area, and certainly within the relevant river catchment. This indicates that this geographical level of analysis is appropriate. The evidence shows that only a small proportion of people move from outside of the local/local authority area to their new homes. The consequence of this is that a large proportion of new homes are occupied by people that already live within the relevant catchment area. As such, these residents will not be producing an increase in the nutrient load in the area. It is only the people that move into the area from further away that would result in a population increase (other than births) and so result in an increase in the nutrient load.

2.31 In most cases, when someone moves house, a chain is involved whereby someone else moves into their old property. Research by the (then) MHCLG notes that there are, on average, four transactions in each housing chain. The implication of this is that new people from outside the area might move into homes that were vacated by people moving locally into new-build housing. Taking account of this "knock-on" effect increases the estimated that:

1 29.6% of residents in the open market sector and 36.6% of affordable residents moved within a radius of ten miles from their old home; and,

2 45.0% of open market residents and 48.6% of affordable housing residents moved less than 20 miles from their old home.

2.32 Whilst an assessment of the housing chain shows that more people are likely to move from outside of the local area/local authority, it remains the case that large proportion of people within the housing chain remain in the local area even once they have moved home (c.1/3 within ten miles and c.1/2 within 20 miles). On this basis, it is clearly incorrect to suggest that moves into a residential development would be new to the area or would result in an additional discharge of nutrients into designated sites.

2.33 By way of illustration, we have calculated the population change arising from new development on the basis of:

1 The proportion of people moving within ten and 20-miles of their old home;

2 The average household size in each local authority area in 2024[30] in preference to a national average figure of 2.4[31];

3 An application of the Standard Methodology assessment of local housing need (2022 to 2032); and,

4 The number of market and affordable homes that are likely to be delivered based on a review CLG data on affordable housing completions in each of the authority areas that are affected by the nutrient issue between 2018/19 and 2020/21[32,33].

2.34 We have compared this to a calculation of population change derived from application of the Natural England figure of 2.4 persons per household[34] to the Standard Methodology assessment of local housing need which would result in an indicated population change of 73,500 per annum across the seven catchments.

2.35 Application of Natural England's proposed approach would therefore result in an over-estimation of the population across the seven catchments by:

[30] We have applied the 2024 figures as an indicative date of completion for homes granted planning permission in 2022.
[31] See section 3 for details
[32] Source: Live Table 1011: Additional affordable housing supply, detailed breakdown by local authority.
[33] This is relevant given the different figures for the distance moved by households in the open market and affordable sectors.
[34] Or the alternative figure that has been applied by individual local authorities for houses.

1 c.26,300 people per annum when considering the additional population from more than ten miles away; and,

2 c.39,800 people per annum when considering the additional population from more than 20 miles away.

Table 2.5 Comparison of additional population from more than 10 and 20 miles based on average household size of 2.4 and local average household size

Catchment	Standard Methodology local housing need figure (p.a.)	Estimated annual population based on Standard Methodology				
		Average size of 2.4[35]	Additional population from…			
			more than 10 miles		more than 20 miles	
			2024 figure	Difference	2024 figure	Difference
Solent	9,147	22,120	14,234	7,886	11,144	10,976
Poole Harbour	4,501	10,838	6,780	4,058	5,321	5,517
Hampshire Avon	7,193	17,466	10,894	6,573	8,544	8,923
Somerset Levels	6,535	15,683	10,169	5,514	7,962	7,721
Camel	2,791	6,698	4,104	2,593	3,334	3,364
River Wye	1,143	2,663	1,743	921	1,254	4,662
Stour	4,574	10,805	7,142	3,663	5,023	5,216
Total (allowing for overlapping catchments)	**30,652**	**73,517**	**47,193**	**26,324 (35.8%)**	**40,416**	**39,799 (54.1%)**

Source: Lichfields analysis. Note that this data is based on the projected average household size figure for each local authority area in 2024, based on the 2014 household projections

2.36 This analysis shows a much lower population than that assumed using Natural England's approach. It is noted that there is broad alignment between these figures and the household population growth figures illustrated in Figure 2.2 above.

2.37 The implication of this is to underline further the significant over-estimation of population – and hence, nutrient load – by Natural England and the various calculators that are being used by local authorities. Mitigation may not be required in all instances but the expectation that it does could prevent the delivery of much needed housing.

Summary

1 The nutrient calculators that are used to identify how much mitigation is required all assume an increase in population irrespective of the possibility that residents of new homes already reside within the catchment.

2 Changing dynamics within the existing population also exert a demand for additional housing without having any impact on the number of people living in an area. For example, in Cornwall zero migration would result in a population reduction of 6,800 people between 2022 and 2032, yet the number of households would still increase by 2,700. Even if the population was to remain at its current size for the next ten years, an additional 7,200 homes would still be needed to meet changes in household composition in Cornwall. This would not generate a need for mitigation even though the Natural England model assumes that it would.

[35] Or the alternative figure that has been applied by individual local authorities for houses.

3 Applying the average of 2.4 people per household to the Standard Methodology housing need figure in Cornwall (2,790dpa) results in an implied household population increase of c.6,700 p.a. between 2022 and 2032. This is 75% above the actual level of household population increase that is set out in the official household projections (3,814 p.a.).

4 Further analysis of the application of the Natural England figure of 2.4 persons per household to the Standard Methodology assessment of local housing need shows that if applied across the seven catchment areas, it would result in an annual population that is over double the projected change in household population (c.73,500p.a. cf. 36,000p.a.).

5 The reason for this difference is that the nutrient calculators assume that the people living in the new homes will all be new to the area, ignoring that many will already be resident there. Taking account of the typical housing transaction chain, approximately one third of households moved less than ten miles from their old home and about half moved less than 20 miles. In many cases, this means that they would remain living within the same catchment and would therefore not have any impact in terms of additional nutrient discharge into the designated sites.

3.0 Average household size

3.1 This section reviews the evidence regarding the falling national average household size and explores the reasons for this. It then considers the average household size within the authorities and catchments that are affected by the nutrient issue.

Falling national average household size

3.2 The average household size in the UK is falling. Throughout the first half of the 20th Century, the average household size in England and Wales fell from 4.62 (in 1901) to 3.19 (in 1951)[36]. In 1961, the average household size in the UK was 3.0 people per household[37]. It fell rapidly to 2.4 in 2001 and has continued to fall, albeit at a lower rate. In 2011, the average household size in the UK was 2.3[38].

3.3 At 2.36, the 2011 average household size in England was slightly higher than the UK average. A review of the successive household projections reveal a continued projected reduction in average household size in England. As illustrated in Figure 3.1:

1 All of the projections reveal an average household size of less than 2.4;

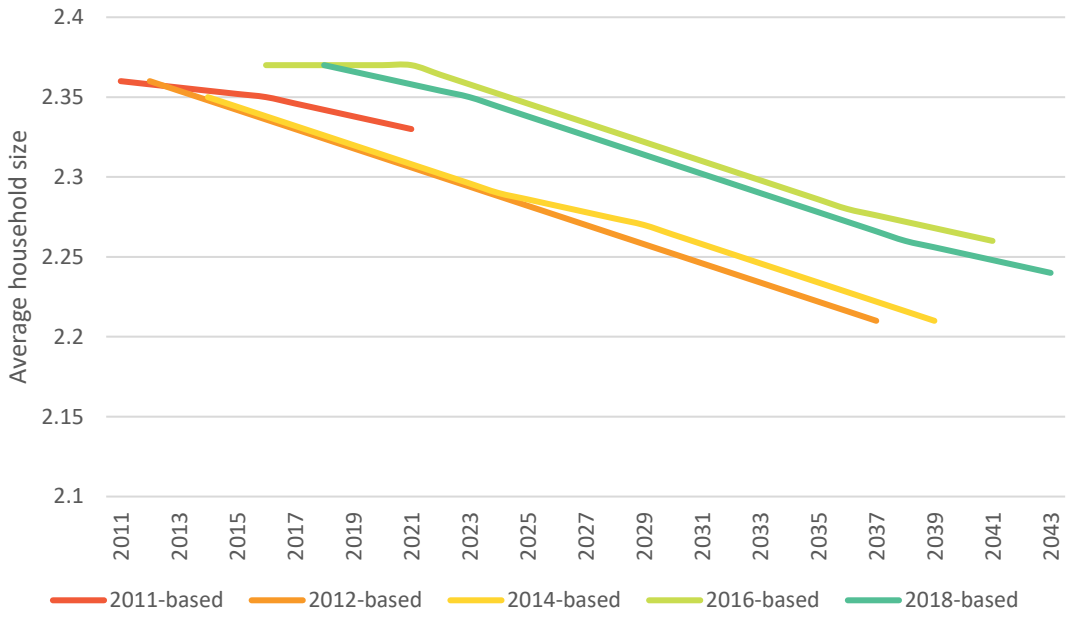
2 All of the projections anticipate that the average household size in England will fall;

3 With the exception of the 2011 interim-household projections – which simply updated the 2008-based projections to reflect Census data rather than reflecting an entirely new set of projections, and were based on a ten-year projection period – the projections all show a similar rate of reduction over time;

4 The more recent 2016 and 2018-based projections assume a higher starting point, and the 2016-based projections anticipated that average household size would hold steady for five years but these nevertheless projected an average household size in England of c.2.25 by the early 2040s.

[36] Source: Size and Structure of the Household in England Over Three Centuries: A Comment, J W Nixon. Published in A Journal of Demography, Volume 24 Issue 3, 1970.
[37] Source: 2011 Census: Population and household estimates for the United Kingdom, March 2011. https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/populationandhouseholdestimatesfortheunitedkingdom/2011-03-21#:~:text=In%201961%20the%20average%20household,was%203.0%20people%20per%20household
[38] Source: 2011 Census: Population and household estimates for the United Kingdom, March 2011.

Figure 3.1 Average household size in England



Source: Lichfields analysis of 2011, 2012, 2014, 2016 and 2018-based household projections

3.4 Assessments of the potential nutrient load of a new development are undertaken at the planning phase – i.e. in many cases several years before the proposed homes are built and occupied, and therefore years in advance of any potential nutrients being released. Research prepared by Lichfields[39] has indicated that it can take in the order of two years to progress from the grant of planning permission to the commencement of work on site and that the annual build rate can range from an average of 22dpa on sites of between 50 and 99 dwellings to 160dpa for larger sites of more than 2,000 units.

3.5 This reality should be borne in mind when applying average household size figures to estimate the future population of a development. Rather than relying on national-level data from the 2011 Census, a forward-looking approach would provide a more robust basis for the estimation of population levels and associated nutrient load, taking account of the latest trends in household formation and occupation.

Understanding the dynamics of household occupation

3.6 The way in which we, as a society, occupy our homes is continuing to change. A review of Census data by London School of Economics[40] has revealed a consistent increase in the proportion of one and two-person households across the UK between 1961 and 2011 with the figure for England rising from c.43% in 1961 to 64.4% in 2011[41].

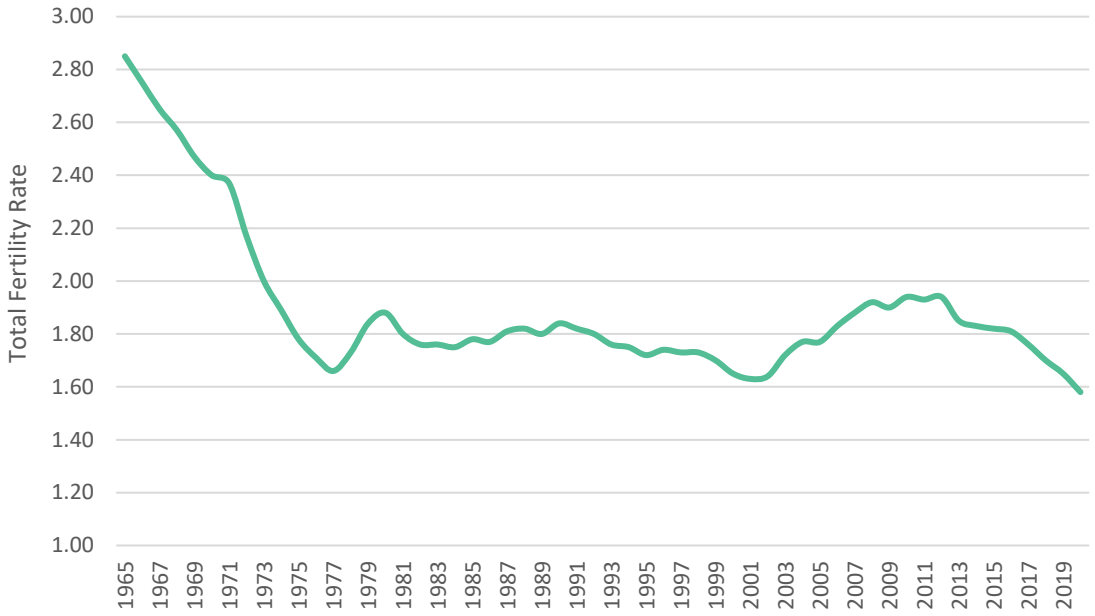
3.7 This change reflects a range of economic and social trends, including:

1 **People starting families later and having fewer children**: ONS data shows that the Total Fertility Rate[42] fell sharply between the mid-1960s and mid-1970s from a peak of 2.85 in 1965, before fluctuating around 1.8 and then rising in the early 2000s. However, it has

[39] Start to Finish. What factors affect the build-out rates of large-scale housing sites? Second Edition. February 2020. https://lichfields.uk/content/insights/start-to-finish
[40] Source: https://www.lse.ac.uk/social-policy/Assets/Documents/bsps/events/Explaining-changes-in-family-size.pdf
[41] Source: 2011 Census – QS406EW.
[42] The total fertility rate is defined as the total number of children that would be born to each woman if she were to live to the end of her child-bearing years and give birth to children in alignment with the prevailing age-specific fertility rates.

declined again since 2012 to an historic low of 1.58 in 2020[43]. This reflects the fact that people are tending to start their families at an older age. Separate ONS data shows that the most common age at childbirth for women born in 1973 was 31 years, compared with 24 years a generation before (women born in 1946)[44].

Figure 3.2 Total Fertility Rate in England and Wales



Source: ONS Births in England and Wales, 2020

2 **Family breakdown**: Although the divorce rate has fallen from the peak of the mid-1990s, it remains high in historic terms, and this data does not reflect family breakdown amongst couples that do not marry. This is a significant factor given the rapid increase in cohabiting couples (137% increase between 1996 and 2020). In 1996, married couples (with or without children) accounted for 76% of families whilst cohabiting couples (with or without children) accounted for 9% of families. By 2020, the proportion of married couples had fallen to 67% of families whilst cohabiting couples had increased to 18% of families[45]. Research by the Institute for Fiscal Studies[46] found that that cohabiting parents are more likely to split up than married ones – so the rates of household dissolution caused by relationship breakdown is likely to be higher than that set out in Figure 3.3.

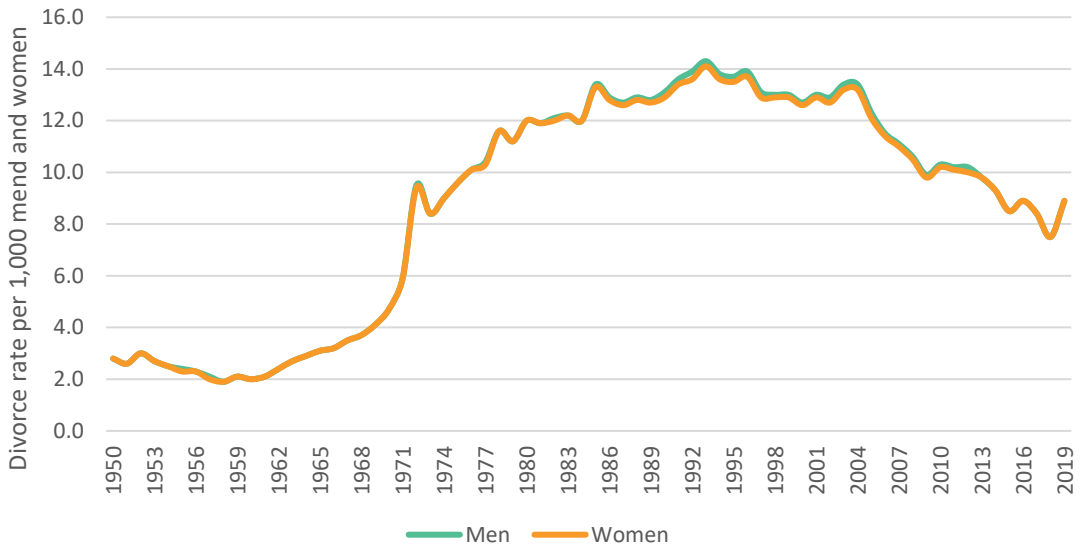
[43] Source: ONS Births in England and Wales, 2020: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/bulletins/birthsummarytablesenglandandwales/2020#fertility-rates-by-geographic-area

[44] Source: ONS Childbearing for women born in different years, England and Wales: 2018 - https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/conceptionandfertilityrates/bulletins/childbearingforwomenbornindifferentyearsenglandandwales/2018

[45] Source: ONS Families and Households in the UK 2020: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/families/bulletins/familiesandhouseholds/2020

[46] Cohabitation, marriage and relationship stability. IFS Briefing Note BN107. https://ifs.org.uk/bns/bn107.pdf

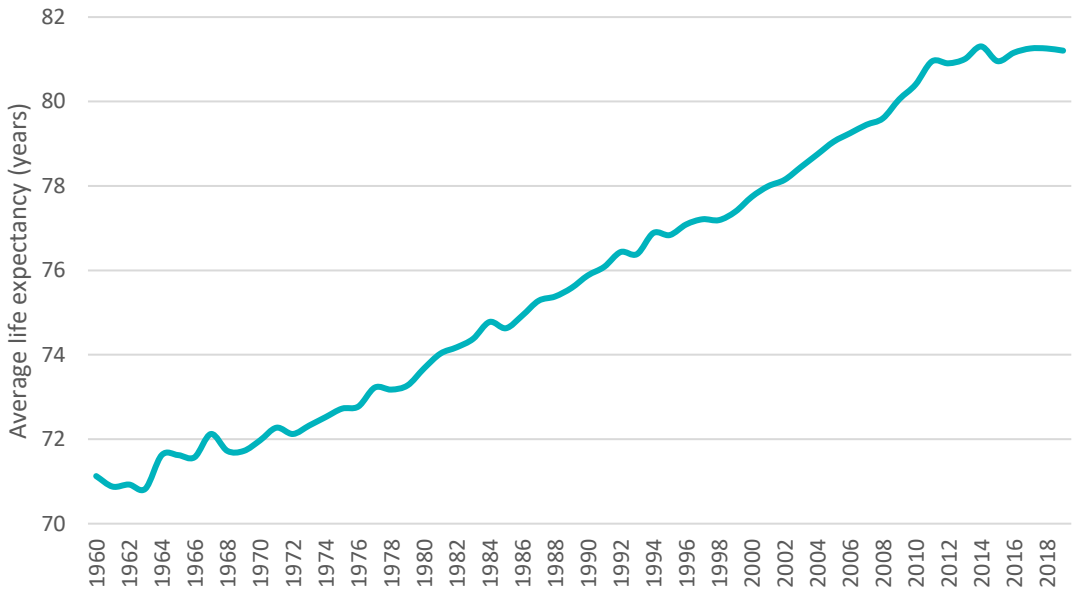
Figure 3.3 Rate of divorce amongst opposite-sex couples in England and Wales



Source: ONS Divorces in England and Wales: 2019

3 **Increased life expectancy and an ageing population**: The average life expectancy in the UK increased from 71.1 years in 1960 to 81.2 years in 2019[47]. The proportion of people over the age of 65 was 18.5% in 2020 and is projected to reach 22.1% by 2032 and 24.7% by 2050[48]. As set out below, evidence shows that older people typically live in smaller households and so this trend will have an increasingly significant impact on average household size.

Figure 3.4 Average life expectancy in UK



Source: World Bank

[47] Source: World Bank: life expectancy at birth – UK: https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=GB
[48] Source: 2018-based national population projections.

Household size by type

3.8 A more detailed analysis of Census data reveals differences in household size by composition of households and how this changed between 2001 and 2011[49].

Table 3.1 Average household size by household composition (2001 and 2011)

Household composition	2001	2011	% change
All households with dependent children	**3.80**	**3.77**	**-0.9**
One family households	3.73	3.66	-1.7
Married couple households	4.05	4.03	-0.5
Cohabiting couple households	3.80	3.80	0.0
Lone parent households	2.81	2.79	-0.4
Other households	4.75	4.87	2.4
All Households without dependent children	**1.75**	**1.78**	**1.3**
One person households	1.00	1.00	0.0
One family households	2.24	2.25	0.4
No children	2.00	2.00	0.0
Non-dependent children only	2.93	2.92	-0.4
Other households	***2.92***	***3.06***	***5.1***
All full time students	3.76	3.77	0.3
All aged 65 and over	2.22	2.30	3.5
Other	2.90	3.02	4.1
All households	**2.36**	**2.36**	**-0.1**

Source: 2001 and 2011 Census / Households and Household Composition in England and Wales: 2001-11

3.9 A number of key points can be drawn out from this evidence:

1 Whilst all household types with dependent children exceeded the national average household size, a much smaller number of household types without dependent children exceeded the national average size; those that did tended to include adults that are sharing, often as a result of an inability to enter the housing market.

2 The average size of households with dependent children fell marginally between 2001 and 2011, with only the sub-category of 'other households with dependent children' experiencing an increase in average size between the two census points.

3 The largest increase in average household size was amongst 'other households without dependent children'. Within this category, the sub-category of 'other households' experienced the largest increase. This sub-category includes unrelated adults sharing a household space and multi-family households with no dependent children. It is likely that the increase of 4.1% in this sub-category reflects a larger proportion of multi-generational households and young working adults sharing accommodation.

4 There was significant decline in the number of older households between 2001 and 2011 but a modest increase in their average size. ONS has suggested that the decline in the number of older households might reflect a definitional change[50] and a greater availability of specialised one-person accommodation for older people. The increase in average household

[49] https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/families/articles/householdsandhouseholdcompositioninenglandandwales/2014-05-29#:~:text=Households%20and%20Household%20Composition%20in%20England%20and%20Wales%3A%202001%2D11&text=In%202011%20there%20were%2023.4,decreasing%20over%20the%20same%20period.

[50] In 2001, the category was for pensionable age rather than 65 and over.

size is likely to reflect more older married couples continuing to live together as a result of increased life expectancy. Despite an increase, the average size of older households remains below the national average.

3.10 Going forwards, trends in the different household types will impact on average household size. Although the official household projections do not categorise households in exactly the same way as the Census, it nevertheless shows a number of clear trends. A review of the 2014-based household projections shows that between 2022 and 2032 (the period over which the Standard Methodology is currently calculated) there is expected to be an 8.6% increase in the number of households, but that there will be:

1 A 25.4% increase in the number of households occupied by people over the age of 65, such that by 2032, over 65 households would account for 35% of all households in England, compared to 30% in 2022 and 28.5% in 2014.

2 A 13.4% increase in the number of 'other households' under the age of 65 – most likely as a result of continuing housing market pressures and affordability difficulties. Whilst this trend would militate against a reduction in average household size, the proportion of households that fall within this category (5.5% in 2014 and 5.9% in 2022, rising to 6.1% by 2032) means that it is unlikely to have a significant impact on the overall average household size in England.

3 A 4.9% increase in the number of single person households under the age of 65. Although lower than the overall increase in the number of households, this is the third largest projected change of all of the identified categories and is more than three times the average rate of change of 1.4% amongst younger (under 65) households.

4 A 3.2% increase in the number of dependent children. This is less than half the total projected increase the number of households and will result in a continuation of the historically falling proportion – from 28.5% in 2022 to 27.1% in 2032

5 A significant reduction in the number of couples – this could have either a positive or negative impact on average household size depending on whether those couples are having children, moving into other households or dissolving into single person households. The comparatively limited increase in the number of families suggests that the reduction in the number of couples cannot be attributed solely to people starting families and thereby forming larger households.

6 A smaller reduction in the number of couples with one or more other adults. As with the change in other households, the proportion of households that fall within this category (5.9% in 2014 and 5.7% in 2022, falling to 5.1% by 2032) means that it is unlikely to have a significant impact on the overall average household size in England.

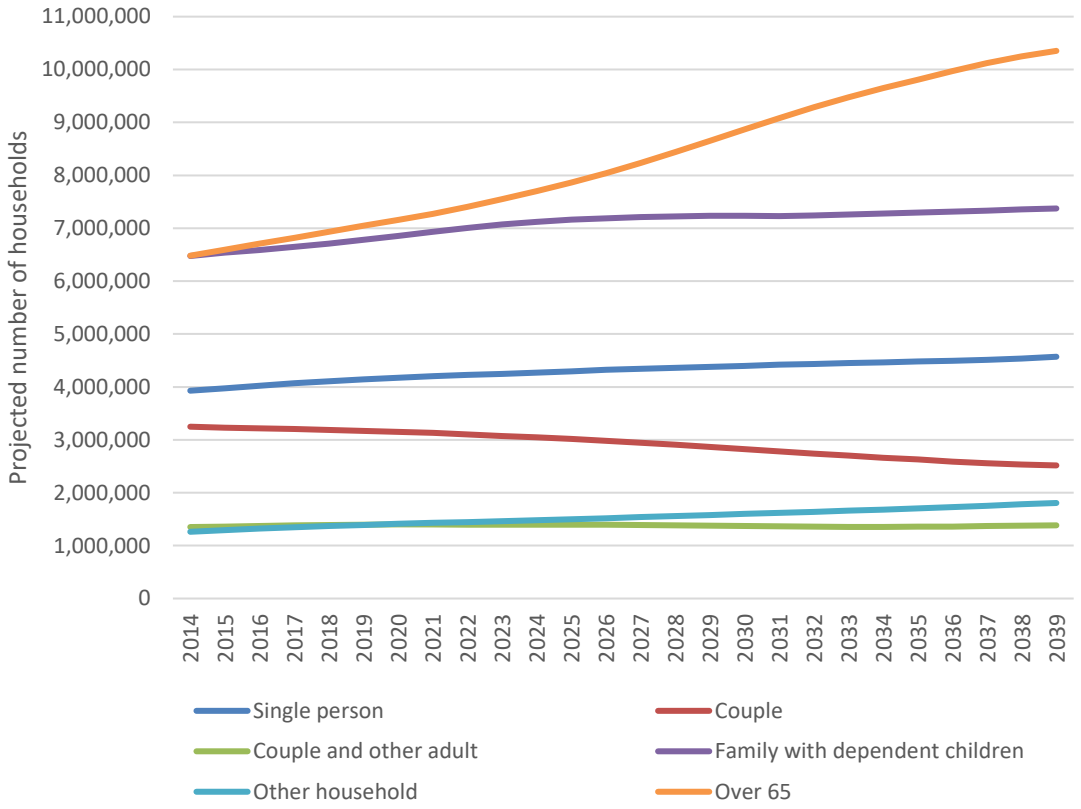
Table 3.2 Projected change in number of households by type in England

Household type	2022	2032	Change	% change
Single person household	4,226,607	4,435,235	208,628	4.9%
Couple	3,102,824	2,741,493	-361,331	-11.6%
Couple and one or more adults	1,397,638	1,357,885	-39,753	-2.8%
Family with dependent children	7,006,784	7,241,385	234,601	3.3%
Other household	1,445,816	1,639,383	193,567	13.4%
Over 65	7,406,354	9,285,626	1,879,272	25.4%
Total	**24,586,023**	**26,701,007**	**2,114,984**	**8.6%**

Source: Lichfields analysis of 2014-based household projections

3.11 Figure 3.5 illustrates these trends over the longer term and shows the particular impact of the increase in older households. The effect of these changes, together with variations in the average size of households in each category[51], serve to explain the projected decline in average household size in England.

Figure 3.5 Projected change in number of households by type in England



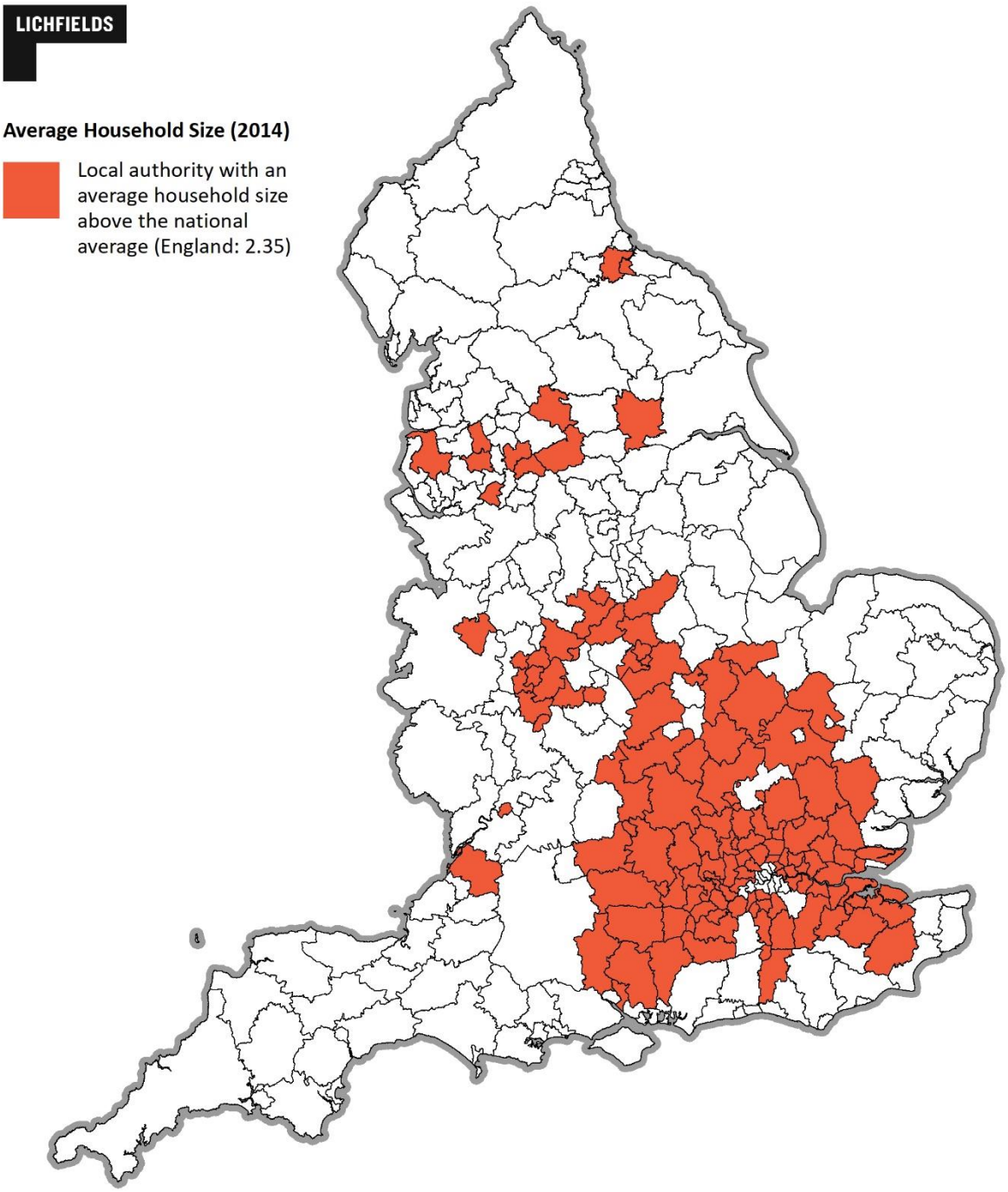
Source: Lichfields analysis of 2014-based household projections

A localised approach

3.12 We think that it is inappropriate to use the national average household size as the default figure when calculating the nutrient load of new housing developments more locally. A review of the 2018-based household projections shows that 124 local authorities in England (38% of the total) have an average household size that is above the national average of 2.37[52]. The 2014-based projections – upon which the Standard Methodology is based – revealed a similar position with 126 local authorities in England having an average household size that is above the national average of 2.35[53]. The geographical distribution of these authorities comes as no surprise, comprising urban authorities and those with more severe affordability pressures.

[51] Only single person households and coupled can be expected to experience no change in average household size.
[52] 2018 figure.
[53] 2014 figure.

Figure 3.6 Local authorities in England with an average household size that exceeds the national average of 2.35 (2014 figure)



Source: 2014-based household projections

3.13 Within the authorities that are affected by the nutrient issues:

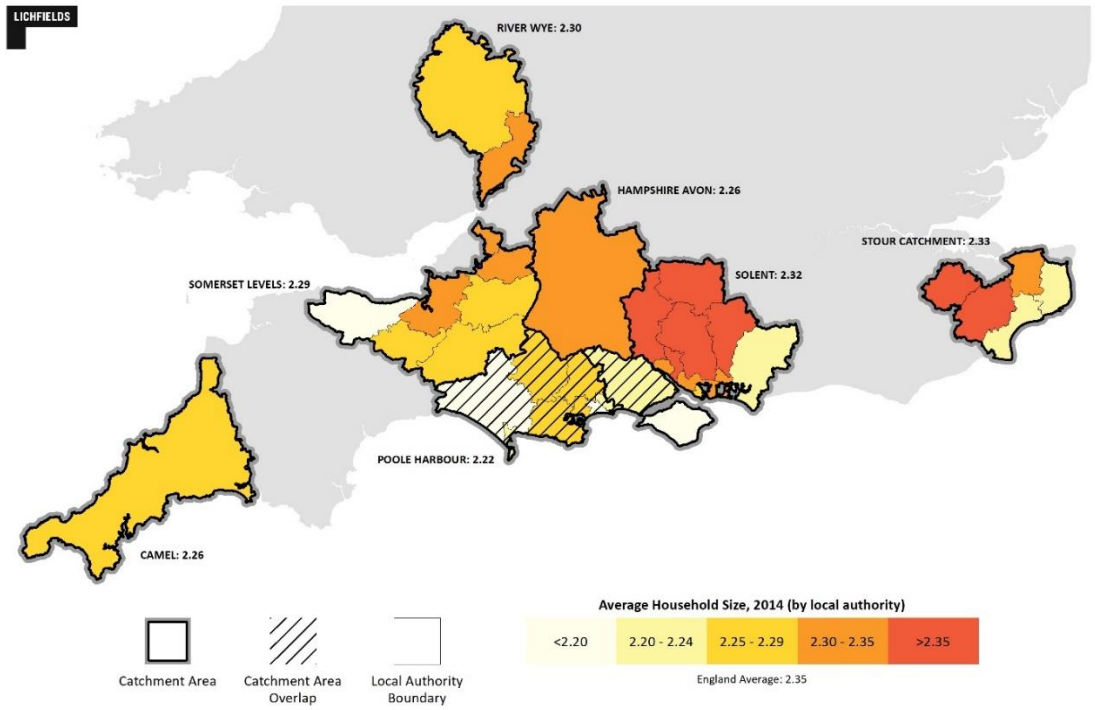
1 The 2014-based projections showed that seven authorities[54] had an average household size that exceeded the average for England; and,

[54] Winchester, Test Valley, Eastleigh, East Hampshire, Basingstoke and Deane, Ashford and Maidstone.

2 The 2018-based projections showed that eight authorities[55] had an average household size that exceeded the average for England.

3.14 When we move away from local authorities and consider the catchment areas, all seven catchments had an average household size below the national average. This is illustrated below.

Figure 3.7 Average household size by affected local authority and catchment



Source: 2014-based household projections

Table 3.3 Average household size by affected local authority and catchment

Catchment	Local Authority	Average household size
Camel	**Cornwall**	**2.26**
Hampshire Avon	Wiltshire	2.33
	New Forest	2.24
	Bournemouth	2.17
	Christchurch	2.21
	Poole	2.27
	East Dorset	2.28
	North Dorset	2.25
	Purbeck	2.25
	West Dorset	2.15
	Weymouth and Portland	2.20
	Total	**2.26**
Poole Harbour	Bournemouth	2.17
	Christchurch	2.21

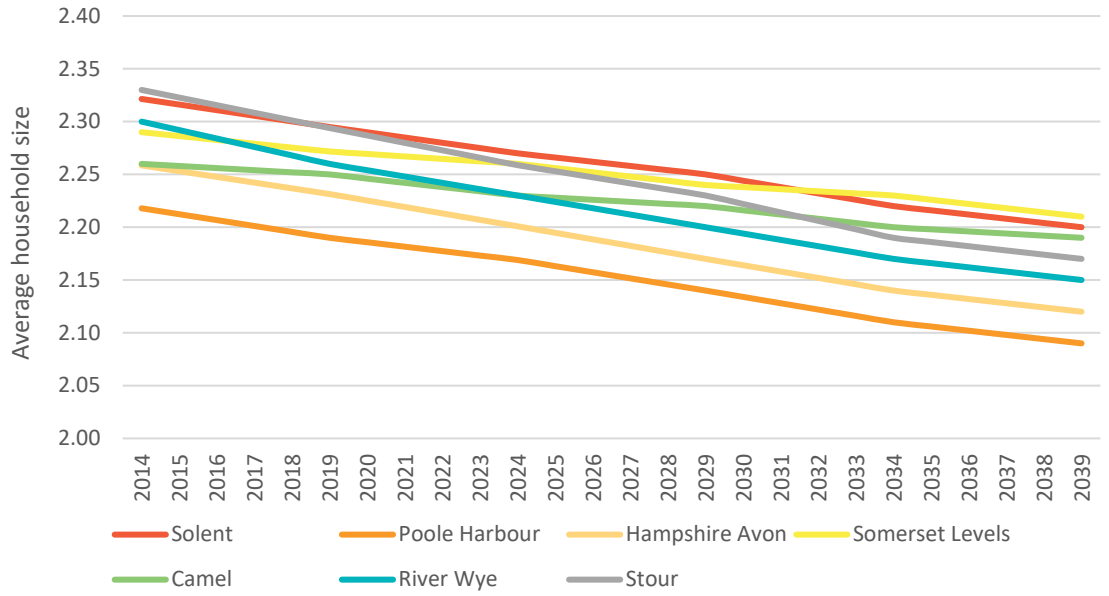
[55] Winchester, Test Valley, East Hampshire, Southampton, Basingstoke and Deane, Bath & North East Somerset, Ashford and Maidstone.

	Poole	2.27
	East Dorset	2.28
	North Dorset	2.25
	Purbeck	2.25
	West Dorset	2.15
	Weymouth and Portland	2.20
	Total	**2.22**
River Wye	Forest of Dean	2.32
	Herefordshire, County of	2.29
	Total	**2.30**
Solent	Basingstoke and Deane	2.39
	Chichester	2.21
	East Hampshire	2.38
	Eastleigh	2.38
	Fareham	2.35
	Gosport	2.28
	Havant	2.32
	Isle of Wight	2.17
	New Forest	2.24
	Portsmouth	2.32
	Southampton	2.34
	Test Valley	2.38
	Winchester	2.38
	Total	**2.32**
Somerset Levels	Bath and North East Somerset	2.34
	Bristol	2.31
	Mendip	2.27
	Sedgemoor	2.31
	South Somerset	2.25
	Taunton Deane	2.25
	West Somerset	2.11
	Total	**2.29**
Stour	Ashford	2.43
	Canterbury	2.35
	Dover	2.24
	Maidstone	2.40
	Shepway	2.20
	Total	**2.33**

Source: 2014-based household projections. Note that data is shown for former districts in cases of recent local authority reorganisation.

3.15 In addition, a review of the household projections reveals that the average household size in all seven catchments is projected to continue to fall in the future.

Figure 3.8 Average household size in seven catchment areas



Source: Lichfields analysis of 2014-based household projections

3.16 The average household sizes of all seven catchments are all already well below the figure of 2.4 that is recommended by Natural England. This difference will increase over time. In five of the seven catchments, the average household size is projected to fall to between c.2.15 and c.2.2 by 2039, with the figures for Hampshire Avon falling below 2.15 and Poole Harbour reducing to 2.09 by 2039.

3.17 As set out in Section 2, the need to take account of changing household formation rates within an existing population means that the simple multiplication of *any* average household size figure to a specified number of dwellings will not provide a robust indication of the net additional population to an area for the purposes of assessing the associated nutrient load. This is because the reduction in average household size will apply to the existing (as well as the new) dwelling stock –meaning that more dwellings are required to accommodate the population, although not necessarily that more nutrient is produced. It is critical that Natural England applies an appropriate estimate of occupation of new stock and also looks at total population change within the catchment.

Summary

1 The average household size is continuing to fall at a national and local level.

2 Such changes can be attributed to a range of social and economic trends and are projected to continue in the future.

3 Given the lead-in times associated with house building, it would be appropriate to consider current and emerging trends in household formation and occupation when calculating the nutrient load associated with residential development proposals.

4	In all of the catchments affected by the nutients issue, the average household size is significantly below the national average of 2.35 and is expected to fall to between c.2.1 and 2.2 by 2039.

4.0 Conclusion

4.1 The importance of preserving and enhancing protected habitats is recognised and supported. But so too is the need to resolve the housing crisis. Across the seven river catchments that are affected by the nutrient issue, the Standard Methodology for assessing local housing need identifies a total need for 30,652dpa. This is more than 10% of the total national housing need. This figure has grown by the high median house price across the seven catchments; in the year ending March 2021, the median house price across this area was £302,700 – 10.5% above the national average.

4.2 The poor affordability of housing is affecting formation rates, especially amongst younger age groups and this has been seen to result in larger households. However, in spite of this, the overall trend continues to be towards smaller households.

4.3 Multiple strands of analysis point to the fact that Natural England's default assumption relating to the household size used when calculating the nutrient load of new developments will overestimate the likely *additional* population that would result from the development of new housing. This serves to over-estimate the nutrient load associated with new development and require levels of mitigation that may not be necessary. A critical reason for this is that calculators fail to acknowledge that much new housing serves the existing population. It is important that we do not put barriers in the way of providing new homes, especially when new housebuilding will have such a limited effect on increasing nutrient levels with the relevant catchments.

4.4 The Natural England guidance recognises that a locally specific average household size figure could be applied where evidence of this is available. However, as set out in this report, whilst preferable to apply a national average figure, that would still result in an indicative population increase that significantly exceeds the number of people that would actually move into a local area or river catchment. As a result it is seeking mitigation beyond that arising from development. This is contrary to the Section 106 tests[56].

4.5 By way of solution, we recommend that the nutrient calculator should be amended to adopt a more sensitive assessment of population change. This could be achieved through application of the following methodology:

1 Model the dwelling change that would arise over a set period (i.e. 10 years in line with the Standard Methodology) in a net zero population growth scenario. This forms the baseline housing figure and there should be no mitigation required for new dwellings up to that figure.

2 Calculate the household population change that would arise based on the actual development plan dwelling requirement or the Standard Method for the same period (depending on the age of the local plan).

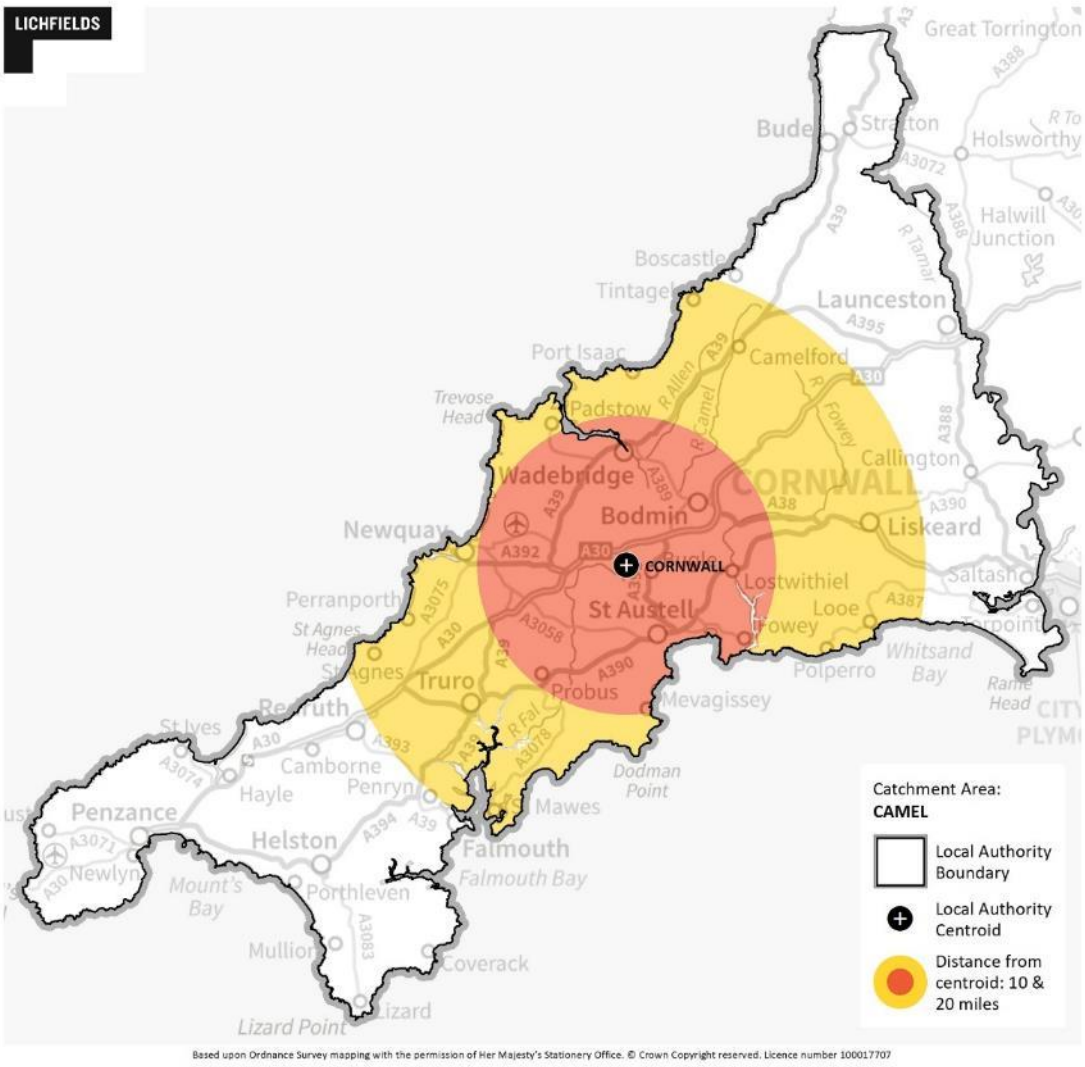
3 Calculate the net average household size by dividing the net population change by the net dwelling change. It should be noted that the net average household size figure will be lower than average household size to take account of the fact that the resident population in the existing stock will be falling going forward.

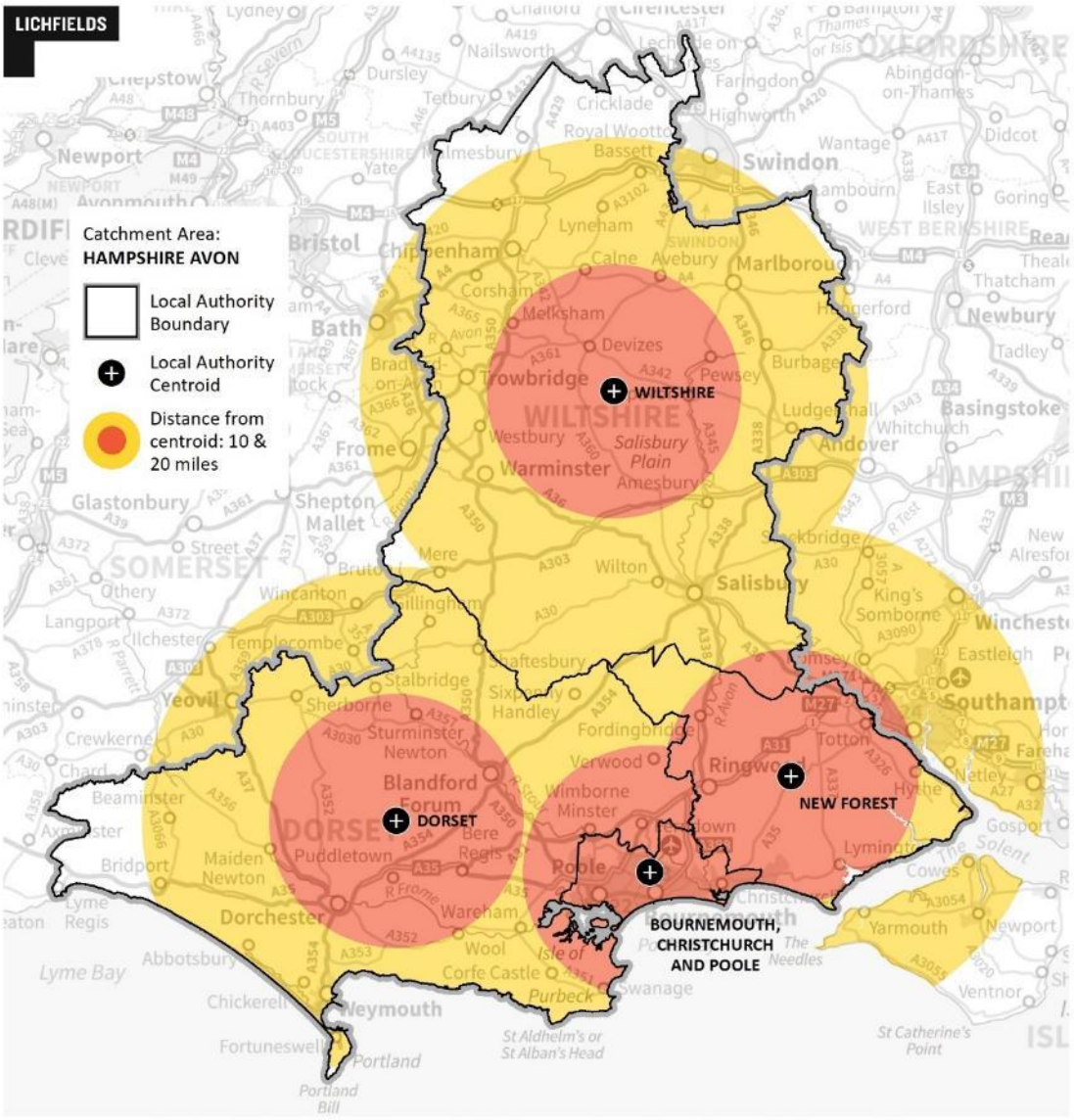
4 The net average household size is the figure used in the Natural England model for new dwellings above the baseline figure.

[56] As set out in Regulation 122 of the Community Infrastructure Levy Regulations 2010 (as amended), namely that they should be necessary to make the development acceptable in planning terms; directly related to the development; and fairly and reasonably related in scale and kind to the development.

4.6 We acknowledge that such an approach would be more complex but it better reflects the nature of the issue and will deliver more robust approach to the assessment of the impacts associated with new development. Crucially, in seeking mitigation that is related to the need arising from new development it would accord with the legal tests in respect of the application of Section 106 agreements. It would also provide a firmer basis by which to balance the need to deliver much-needed new housing against the importance of protecting our most sensitive ecological assets. Whilst some mitigation measures may be required in order to avoid any unacceptable impact on protected natural assets, the current assessment of impact and mitigation is based on an overly simplistic approach that significantly overestimates the population increase – and nutrient load – arising from new residential development.

Appendix 1 Appendix 1: 10 and 20 mile isochrones




LICHFIELDS
Catchment Area:
HAMPSHIRE AVON
Local Authority Boundary
Local Authority Centroid
Distance from centroid: 10 & 20 miles
WILTSHIRE
DORSET
NEW FOREST
BOURNEMOUTH, CHRISTCHURCH AND POOLE
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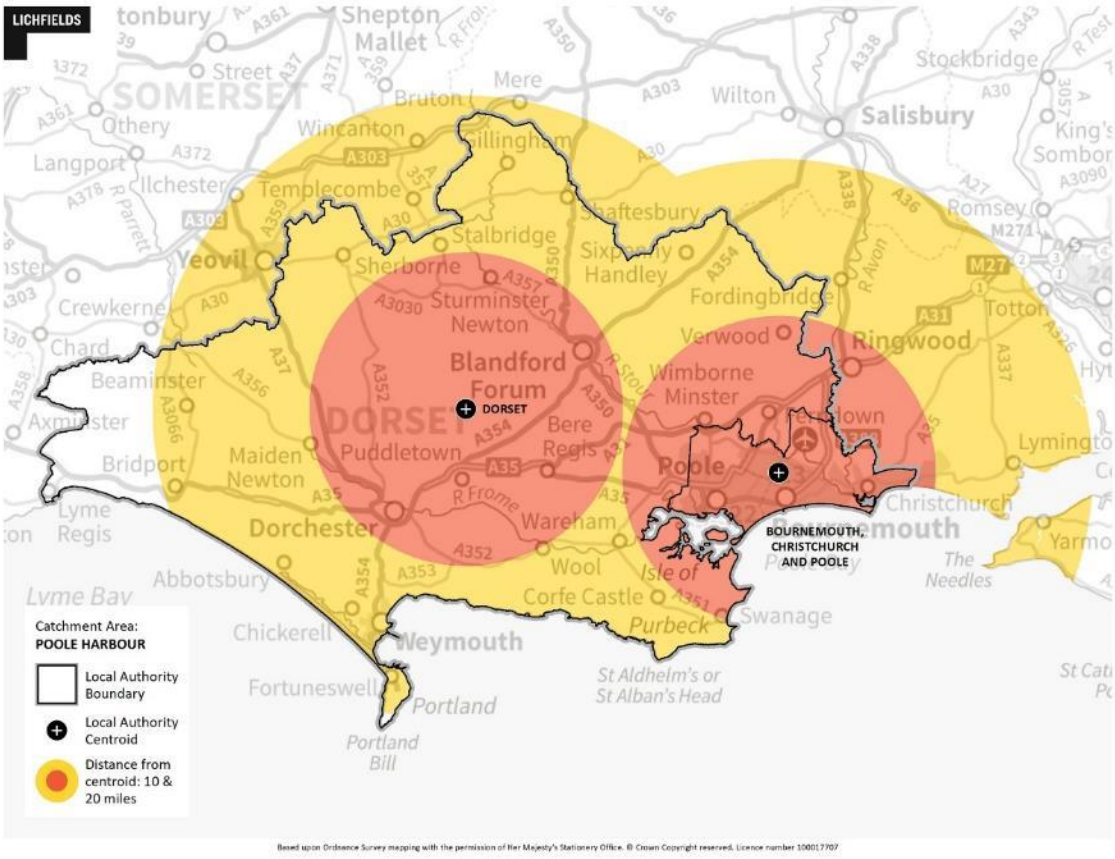
LICHFIELDS
Shepton Mallet
Wincanton
Templecombe
Yeovil
Sherborne
Sturminster Newton
Blandford Forum
DORSET
Puddletown
Bere Regis
Dorchester
Wareham
Wool
Corfe Castle
Swanage
Weymouth
Portland
Portland Bill
Fortuneswell
Chickerell
Abbotsbury
Bridport
Maiden Newton
Beaminster
Crewkerne
Chard
Lyme Regis
Lyme Bay
Isle of Purbeck
St Aldhelm's or St Alban's Head
Salisbury
Wilton
Mere
Shaftesbury
Sixpenny Handley
Fordingbridge
Ringwood
Verwood
Wimborne Minster
Poole
BOURNEMOUTH, CHRISTCHURCH AND POOLE
Christchurch
The Needles
Totton
Romsey
Stockbridge
Catchment Area:
POOLE HARBOUR
Local Authority Boundary
Local Authority Centroid
Distance from centroid: 10 & 20 miles
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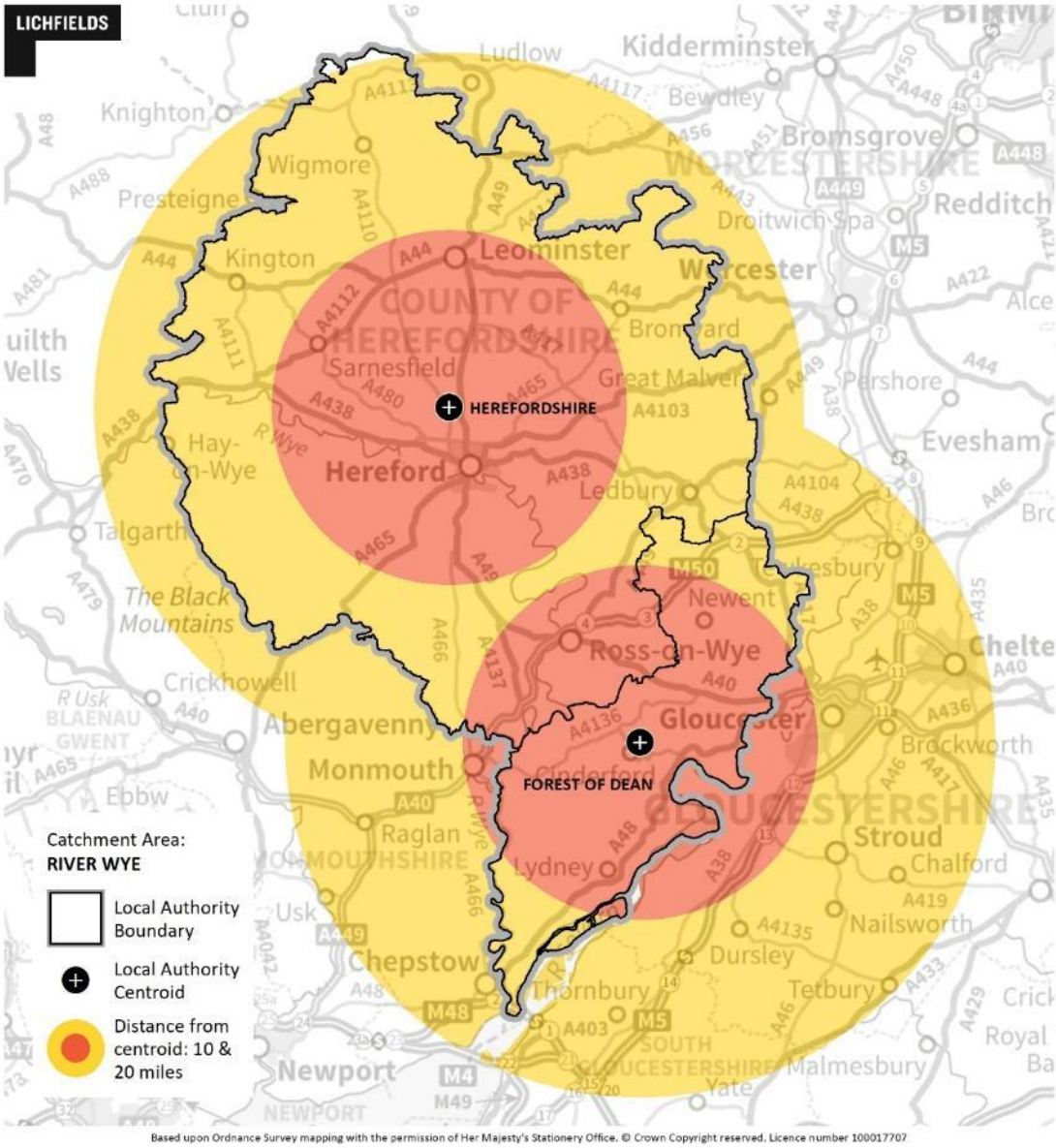
LICHFIELDS
HEREFORDSHIRE
FOREST OF DEAN
Catchment Area:
RIVER WYE
Local Authority Boundary
Local Authority Centroid
Distance from centroid: 10 & 20 miles
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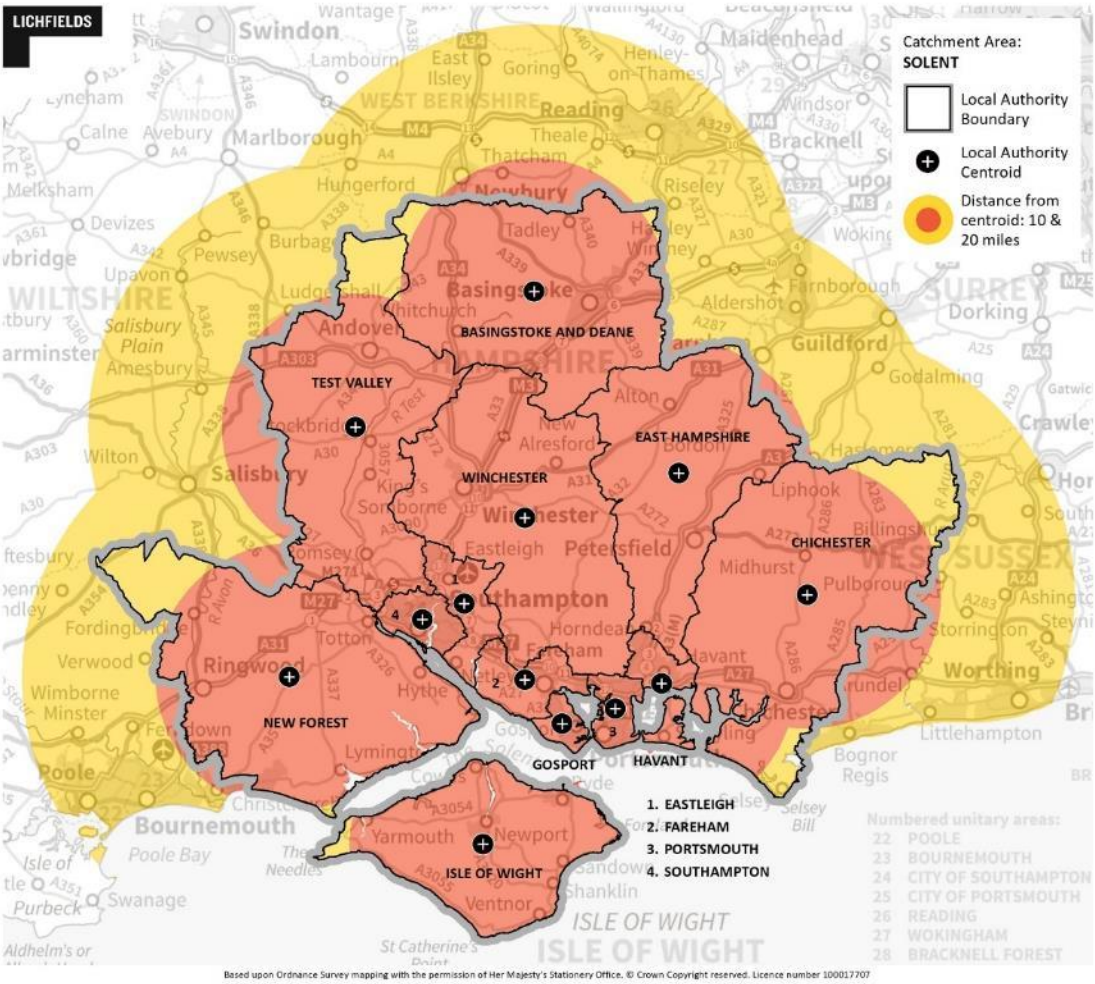
LICHFIELDS
Catchment Area:
SOLENT
Local Authority Boundary
Local Authority Centroid
Distance from centroid: 10 & 20 miles
BASINGSTOKE AND DEANE
TEST VALLEY
WINCHESTER
EAST HAMPSHIRE
CHICHESTER
NEW FOREST
GOSPORT
HAVANT
ISLE OF WIGHT
1. EASTLEIGH
2. FAREHAM
3. PORTSMOUTH
4. SOUTHAMPTON
Numbered unitary areas:
22 POOLE
23 BOURNEMOUTH
24 CITY OF SOUTHAMPTON
25 CITY OF PORTSMOUTH
26 READING
27 WOKINGHAM
28 BRACKNELL FOREST
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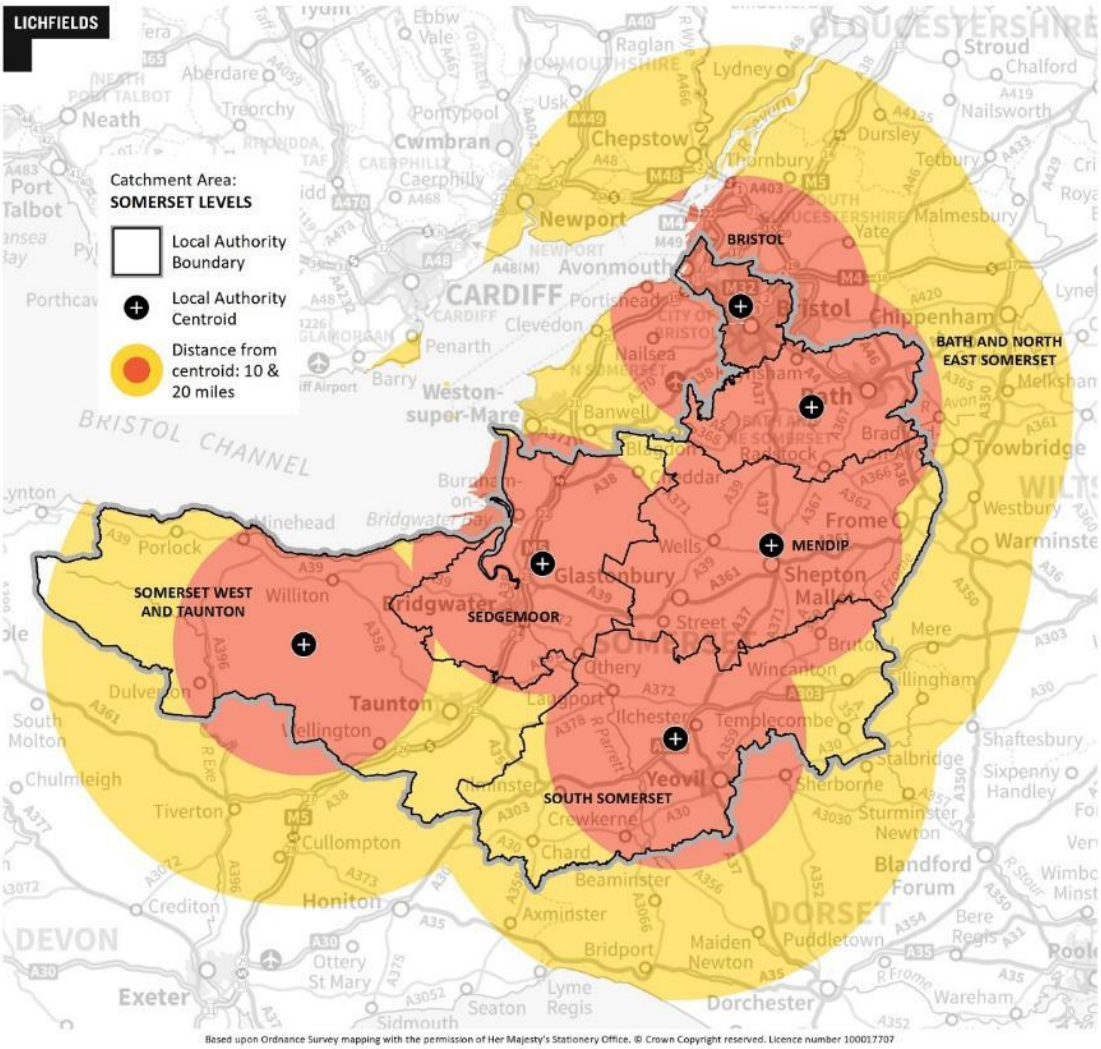
LICHFIELDS
Catchment Area:
SOMERSET LEVELS
Local Authority Boundary
Local Authority Centroid
Distance from centroid: 10 & 20 miles
BRISTOL
BATH AND NORTH EAST SOMERSET
MENDIP
SEDGEMOOR
SOMERSET WEST AND TAUNTON
SOUTH SOMERSET
CARDIFF
Newport
Chepstow
Weston-super-Mare
BRISTOL CHANNEL
Taunton
Yeovil
Exeter
Honiton
Frome
Trowbridge
Warminster
Shepton Mallet
Glastonbury
Bridgwater
Wells
Chippenham
Bath
Dorchester
Blandford Forum
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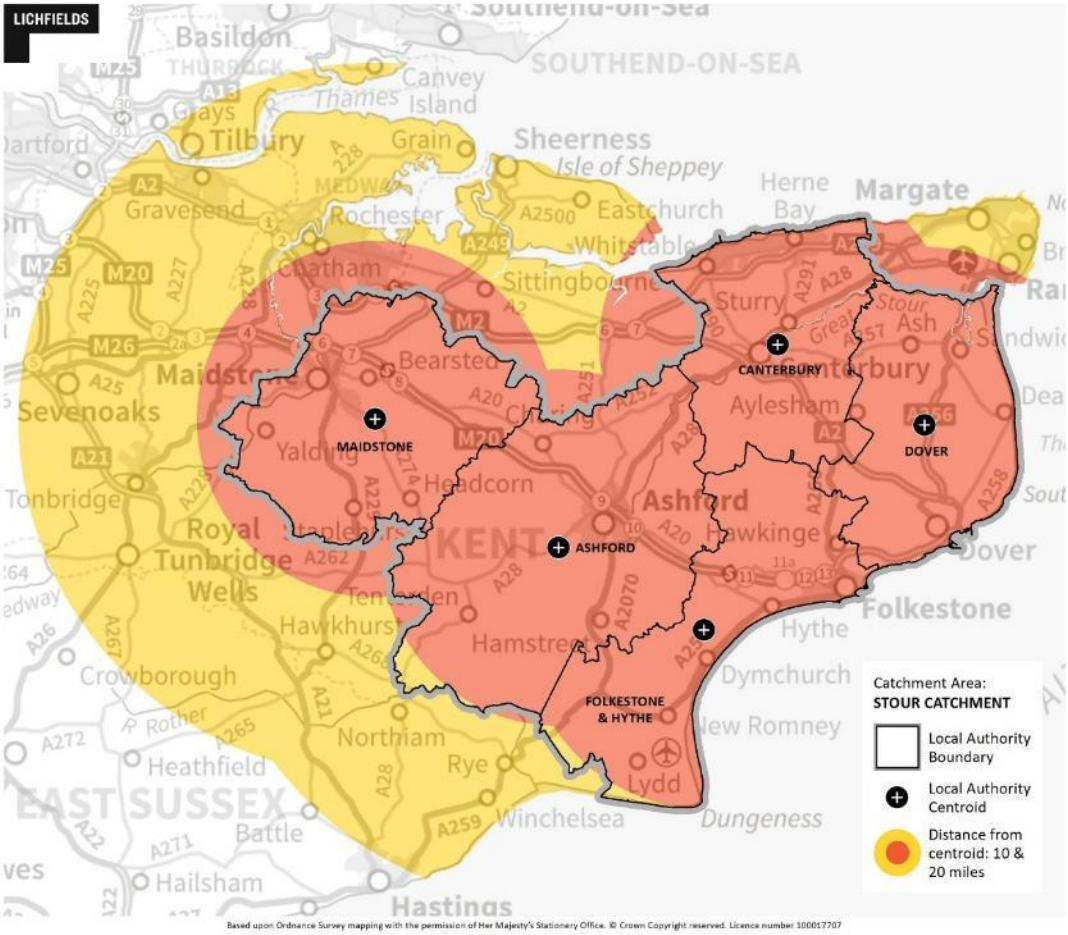
LICHFIELDS
MAIDSTONE
ASHFORD
CANTERBURY
DOVER
FOLKESTONE & HYTHE
Catchment Area:
STOUR CATCHMENT
Local Authority Boundary
Local Authority Centroid
Distance from centroid: 10 & 20 miles
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