

**SEPA Planning Advice Note for Planning Authorities**

**LDP Evidence Gathering: Water Scarcity**

**March 2025**

# Purpose

This advice note provides guidance on evidence sources relating to water scarcity that are relevant in preparing Local Development Plans (LDPs). In the context of a changing climate where water scarcity events are already happening and are predicted to become more prevalent, intensify and lengthen in duration, there is a growing need for evidence to ensure that LDPs can support water resilient places, alongside wider water resource management actions. This advice note includes a summary of current relevant evidence and outlines how it can be used to support [National Planning Framework (NPF4)](https://www.gov.scot/publications/national-planning-framework-4/) policy delivery. It will be monitored and updated to reflect any new emerging evidence.

The advice note supplements the LDP Evidence Gathering Resource Pack shared with planning authorities in November 2023.

# Context

The need to create climate resilient places is a central theme in NPF4. To achieve this there is a need to understand the challenges and opportunities presented by the water environment for our places. An increasing risk for now and in the future is water scarcity. Climate change, in particular predicted drier summers, or instances of prolonged drier weather, presents a significant challenge in terms of increased frequency, intensity, and duration of water scarcity events. Water scarcity can result in:

* Pressures on public and private water supplies.
* Impacts on businesses and the agricultural industry from reduced or stopped water abstraction.
* Impacts on ecological interests.
* Drier soil conditions which can exacerbate or cause flash flooding.
* Impacts on discharge processes caused by lower river flows.
* Increased risk of wildfire events during periods of drought.

There are also additional demands on water resources anticipated (e.g. use of water for hydrogen production) that will need to be considered. As a result, water resource management, from the local to national level, will be crucial to ensuring the impacts from water scarcity are managed and mitigated as far as possible.

The [River Basin Management Plan for Scotland (2021-2027)](https://www.sepa.org.uk/media/594088/211222-final-rbmp3-scotland.pdf) sets out the framework for protecting and improving Scotland’s water environment including the identification of water bodies that are under pressure from water resource availability.

Both SEPA and Scottish Water have published plans that set out actions for dealing with water scarcity across relevant stakeholders including identifying areas where resilience plans are already underway/planned:

* [SEPA: Scotland's National Water Scarcity Plan (2020)](https://www.sepa.org.uk/media/219302/scotlands-national-water-scarcity-plan.pdf#:~:text=This%20plan%20sets%20out%20how%20we%20will%20work,manage%20water%20resources%20during%20periods%20of%20low%20rainfall.).
* [Scottish Water Adaptation Plan (2024)](https://www.scottishwater.co.uk/-/media/ScottishWater/Document-Hub/Key-Publications/Climate-Change/290224ScottishWaterAdaptationPlan.pdf).

Scottish Water have also published a [Draft Long Term Strategy (2024)](https://www.scottishwater.co.uk/-/media/ScottishWater/Document-Hub/Key-Publications/Strategic-Plan/Draft-Long-Term-Strategy/040225OurSustainableFutureTogetherScottishWaterDraftLongTermStrategy.pdf) setting out key challenges facing the water industry over the next 25 years and the actions needed to tackle these. This includes challenges around the changing climate which is expected to bring more extreme weather to Scotland.

The [Scottish National Adaptation Plan (2024-2029)](https://www.gov.scot/publications/scottish-national-adaptation-plan-2024-2029-2/documents/) sets out actions the Scottish Government and partners will take to respond to the impacts of climate change, including increasing risks from water scarcity. In particular, the Scottish Government is committed to undertaking a review of water industry policy, and continuing to assess how water, sewerage and drainage services can adapt to the impacts of climate change to avoid water scarcity through future legislation.

# Role of the Planning System

The planning system plays a key role in managing how land is used and where development should be located. NPF4 places a significant emphasis on addressing the climate and nature crises. Water scarcity is regarded as a key risk from climate change and can itself result in significant impacts on ecological interests. Through a planned and collaborative approach, LDPs can support efforts in avoiding or minimising the impacts of water scarcity, including:

* Taking an integrated infrastructure-first approach to planned development.
* Supporting a holistic approach to how the water environment is managed including developing spatial strategies where existing land and proposals for new development can be best managed/planned for sustainable water management.
* Maximising opportunities for multi-functional blue and green infrastructure and nature networks.
* Protecting and restoring land that provides multiple benefits including natural flood management measures, sustainable soil management, and peatland protection/restoration.
* Avoiding new private water supplies in areas which are vulnerable to water scarcity.

Evidence on water scarcity is important in supporting the delivery and implementation of NPF4 policies. In particular, understanding water scarcity issues through evidence, helps deliver the policy intent and outcomes for the following NPF4 policies:

| **NPF4 Policy** | **How will the evidence support policy intent and outcomes?** |
| --- | --- |
| Policy 1 (Tackling the climate and nature crises)Policy 2 (Climate mitigation and adaptation) | Water scarcity is considered a current and future climate risk and LDPs will need to plan for places (including new development) that address the global climate emergency and nature crisis and are designed in a way so that they are climate resilient. |
| Policy 3 (Biodiversity)Policy 4 (Natural Places) | Water scarcity events can have significant ecological impacts and LDPs are to be designed in a way that protects, restores, and enhances biodiversity and natural assets, including strengthened nature networks and nature-based solutions that can benefit the wider water environment. |
| Policy 5 (Soils) | There is a strong interrelationship between soils and the water environment and LDPs should protect and restore valued soils including minimising disturbance from development and restoring peatlands. Water scarcity events can result in direct impacts on the function, health, and condition of peatland areas. |
| Policy 11 (Energy) | LDPs are expected to promote and facilitate the development of a range of renewable energy developments, and these should be informed by climate risks including water scarcity. In particular, certain technologies which may require water abstraction, or have an impact on the water environment, can be informed by this evidence. |
| Policy 18 (Infrastructure First) | LDPs are expected to take an infrastructure-first approach towards new development, which should be planned with an understanding of current and future climate risks including the impacts of water scarcity. This includes water management infrastructure and blue and green infrastructure. |
| Policy 20 (Blue and Green Infrastructure) | LDPs play a key role in protecting and enhancing Blue and Green Infrastructure which is designed to deliver multiple functions including climate mitigation, nature restoration, biodiversity enhancement, flood prevention and water management.  |
| Policy 22 (Flood Risk and Water Management) | An understanding of the current and future climate risks including the impacts of water scarcity should inform a holistic approach to managing the water environment and how development is planned. Water resources should be used efficiently and sustainably, including avoiding private water supplies where these are not resilient to periods of water scarcity. Opportunities should be taken to implement improvements to the water environment through nature-based solutions including blue and green infrastructure.  |
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**Evidence**

The following evidence sources (Table 1) can be used to inform the Evidence Gathering phase for new-style LDPs. The evidence sources provide context and background information on the risks associated with water scarcity and can help inform how we plan for water resilient places.

**Table 1: Evidence Sources – Water Scarcity**

| **Source** | **Why is this evidence relevant?** | **How can the evidence be used?** |
| --- | --- | --- |
| [Water scarcity | Scottish Environment Protection Agency (SEPA)](https://www.sepa.org.uk/environment/water/water-scarcity/)[Drought Risk Assessment Tool / Scottish Environment Protection Agency (SEPA)](https://www2.sepa.org.uk/drought-risk-assessment-tool)  | SEPA data identifies areas which are currently at risk of water scarcity/drought. This includes water scarcity seasonal reports and a Drought Risk Assessment Tool. | SEPA information sources provide a snapshot of current water scarcity/drought risk levels across Scotland which can provide some indication of areas already susceptible to water scarcity. |
| [Private Water Supplies and Climate Change The likely impacts of climate change (amount, frequency, and distribution of precipitation), and the resilience of private water supplies.](https://www.crew.ac.uk/sites/www.crew.ac.uk/files/publication/CRW2018_05_report_FINAL%2Blink.pdf)[[1]](#footnote-2) | This research report considers the vulnerability of existing Private Water Supplies (PWS) to climate change and potential mitigation measures that can be taken. The research analysis indicates that there is a higher probability that climate change will result in drier and warmer summers that will consequently increase water deficits and the vulnerability of PWS, particularly those more reliant on surface water. It identifies regions of Scotland where PWS are most vulnerable to climate change.  | Plans should be informed by future climate risks, including the probability of water scarcity/drought events which are anticipated to increase and intensify across Scotland. Wider considerations of water resource management should be informed by research on future water scarcity, including where new private water supplies are being considered as these are particularly susceptible to periods of drought. NPF4 Policy 22d presumes against the use of private water supplies unless these are sourced from a sustainable water source that is resilient to periods of water scarcity.  |
| [Water Scarcity in Scotland: A Knowledge Review (2023) - Climate Crisis: informing Scotland's actionable mitigation and adaptation response to water scarcity](https://storymaps.arcgis.com/stories/f9bc4491b0a6409aa7cd1aa757bac6cb)Full report: [Main Report & Appendices](https://www.crew.ac.uk/sites/www.crew.ac.uk/files/publication/CRW2022_07%20Main%20report%20and%20appendices_2024_04_15_V3_FINAL.pdf) | This storymap provides a knowledge review of water scarcity in Scotland. The research highlights that likely drier and hotter summers will coincide with less water running in our rivers or topping up our lochs, reservoirs, and groundwater than we have been used to. The research also highlights that a recent study commissioned by NatureScot[[2]](#footnote-3) shows how and where these changes could result in droughts becoming more frequent, longer, and more severe including over the next two decades. Furthermore, the research also highlights the likely future implications for public and private water supplies across Scotland. | Plans should be informed by future climate risks, including the probability of water scarcity/drought events which are anticipated to increase and intensify across Scotland. Wider considerations of water resource management – including the role of future land use planning – should be informed by research on future water scarcity. This research provides evidence on areas of Scotland that are likely to experience more extreme droughts and potential implications for public/private water supplies.  |
| [Future Predictions of Water Scarcity in Scotland: Impacts to Distilleries and Agricultural Abstractors (2024)](https://www.crew.ac.uk/publication/water-scarcity-impacts-distilleries-agricultural)[[3]](#footnote-4) | This research study provides an evaluation of future predictions of water scarcity in Scotland and the impacts this may have, specifically on three groups of abstractors: crop producers, livestock producers, and distilleries. The study includes findings and recommendations in relation to the risks of water scarcity on these abstractors and the actions that could be taken to mitigate the impacts of the associated risks.  | Plans should be informed by future climate risks, including the probability of water scarcity/drought events which are anticipated to increase and intensify across Scotland. Wider considerations of water resource management – including the role of future land use planning – should be informed by research on future water scarcity, including for those industries that are likely to be most significantly affected. |
| [JHI (2023) Summary of Climate Trends-Projections and Extremes in Scotland and implications for Natural Capital and Policy](https://www.hutton.ac.uk/sites/default/files/files/Executive%20Summary%20of%20Climate%20Trends-Projections%20and%20Extremes%20in%20Scotland%20and%20implications%20for%20Natural%20Capital%20and%20Policy%20-%20Published%2011-7-23.pdf) | This research study updates and summarises two detailed reports on how Scotland’s climate has changed and what the future projections may mean for our Natural Capital. The study includes findings and recommendations to help inform policy development in relation to future land use management and care for the environment when considering future climate change impacts. Key implications of climate change on natural capital highlighted include:* Increased water stress for multiple species and habitats, affecting ecosystem function.
* Reduced water flow in streams.
* Mix of impacts on peatlands including lack of available water in the summer and autumn impacting on primary function(s).
* Changes to crop yields particularly where soils have lower water holding capacity.

The study recommends the increasing need for nature-based solutions to be delivered through the land use planning system (NPF4).  | Plans should be informed by future climate risks, including the probability of water scarcity/drought events which are anticipated to increase and intensify across Scotland. Wider considerations of water resource management – including the role of future land use planning – should be informed by research on future water scarcity. The study findings can be used to support nature-based solutions to water scarcity including nature networks and blue and green infrastructure.  |
| [CREW (2022) A review of the risks to water resources in Scotland in response to climate change](https://pure.strath.ac.uk/ws/portalfiles/portal/138040432/Boca_etal_CREW_2022_A_review_of_the_risks_to_water_resources_in_Scotland_in_response_to_climate_change.pdf)[[4]](#footnote-5) | Through a review of previous studies, the report has assessed historic and future river flow and water availability changes in Scotland, and evidences how climatic, hydrological, and other catchment-based processes may influence water resource availability in the future. A number of key findings are outlined including a consensual view that there will be an increase across all metrics (frequency, magnitude, and duration of floods/droughts) Scotland-wide in a warming climate.  | Plans should be informed by future climate risks, including the probability of water scarcity/drought events which are anticipated to increase, lengthen and intensify across Scotland. Wider considerations of water resource management – including the role of future land use planning – should be informed by research on future water scarcity. |
| [NatureScot (2021) Anticipating and mitigating projected climate-drive increases in extreme drought in Scotland, 2021-2040](https://www.nature.scot/sites/default/files/2021-02/Publication%202021%20-%20NatureScot%20Research%20Report%201228%20-%20Anticipating%20and%20mitigating%20projected%20climate-driven%20increases%20in%20extreme%20drought%20in%20Scotland%202021-2040.pdf)[[5]](#footnote-6) | This study examined the likelihood of changes to extreme drought risk in Scotland in the near future, including potential impacts on wetland functions. Using modelled temperature and precipitation data and a drought index, changes in extreme drought were calculated for the near future (2021-2040) in comparison to a baseline period (1981-2001). The results of the study showed increases in both the number and length of extreme drought events in the near future. These changes were then mapped to highlight areas and seasons with the greatest projected change, enabling identification of 'hotspot' areas that may be at most risk.  | Plans should be informed by future climate risks, including the probability of water scarcity/drought events which are anticipated to increase, lengthen and intensify across Scotland. Wider considerations of water resource management – including the role of future land use planning – should be informed by research on future water scarcity.The outputs of the study can be used to direct mitigation and management actions to these areas, enabling pre-emption of drought damage and facilitating improved resilience to extreme weather events, including for wetland areas.  |
| [SEPA (2020) National Water Scarcity Plan](https://www.sepa.org.uk/media/219302/scotlands-national-water-scarcity-plan.pdf) [Significant Water Scarcity Guidance](https://beta.sepa.scot/water-scarcity/advice-for-abstractors/significant-water-scarcity-guidance/)  | The National Water Scarcity Plan sets out how water resources will be managed prior to and during periods of prolonged dry weather, ensuring the correct balance is struck between protecting the environment and providing resource for human and economic activity. The Plan sets out the roles and responsibilities for organisations that have the stewardship of Scotland’s water resources. Guidance also provides information on how water resources will be managed during periods of significant water scarcity. | The Plan provides background context to how water resources are, and will be, managed in the event of water scarcity. |
| [Scottish Water Climate Change Adaptation Plan (2024)](https://www.scottishwater.co.uk/-/media/ScottishWater/Document-Hub/Key-Publications/Climate-Change/290224ScottishWaterAdaptationPlan.pdf) | Scottish Water’s Climate Change Adaptation Plan sets out how climate change will impact on it’s services including instances of drought, and the actions that will be taken to adapt to these key risks. The Plan specifically sets out the challenges around water scarcity and actions needed to ensure consistent and reliable supplies of water-related services including drinking water for the future. | The Plan provides background context to the climate change impacts on Scottish Water services and what actions will be taken to adapt to these challenges. |
| [Scottish National Adaptation Plan (SNAP3, 2024-2029)](https://www.gov.scot/publications/scottish-national-adaptation-plan-2024-2029-2/documents/) | This Plan sets out the actions that the Scottish Government and partners will take to respond to the impacts of climate change, including water scarcity/droughts. | The Plan sets out background context to the actions that will be taken by the Scottish Government and partners in adapting to climate change. A particular action is the development of policy around water resources needed to help address water scarcity in Scotland. |
| [SEPA Water Classification Hub](http://www.sepa.org.uk/data-visualisation/water-classification-hub/) | SEPA produces an annual classification for all the water bodies in Scotland. This data provides a classification (high through to bad) based on a range of indicators, and highlights where there are significant environmental problems caused by a number of pressures. | The water classification data can be used to identify those water bodies at potential risk from water scarcity events, including those already in poorer status potentially further deteriorating. For example, a significant water scarcity event could result in adverse ecological impacts in a water body already identified as being of poor/bad status. |

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1. [M.Rivington, I. Akoumianaki and M. Coull (2020). Private Water Supplies and Climate Change The likely impacts of climate change (amount, frequency and distribution of precipitation), and the resilience of private water supplies. CRW2018\_05. Scotland’s Centre of Expertise for Waters (CREW)](https://www.crew.ac.uk/sites/www.crew.ac.uk/files/publication/CRW2018_05_report_FINAL%2Blink.pdf) [↑](#footnote-ref-2)
2. Kirkpatrick Baird, F., Stubbs Partridge, J. & Spray, D. 2021. Anticipating and mitigating projected climate-driven increases in extreme drought in Scotland, 2021-2040. NatureScot Research Report No. 1228. [↑](#footnote-ref-3)
3. Miriam Glendell, Kirsty Blackstock, Kerr Adams, Jack Brickell, Jean-Christophe Comte, Zisis Gagkas, Josie Geris, David Haro, Mohamed Jabloun, Alison Karley, Laure Kuhfuss, Kit Macleod, Shaini Naha, Eleanor Paterson, Mike Rivington, Chloe Thompson, Kirsty Upton, Mark Wilkinson, Kirsten Williams (2024). Future predictions of water scarcity in Scotland: impact on distilleries and agricultural abstractors. CRW2023\_05. Centre of Expertise for Waters (CREW). Available online at: crew.ac.uk/publications. [↑](#footnote-ref-4)
4. Boca, A.-D., White, C.J., Bertram, D. (2022), A review of the risks to water resources in Scotland in response to climate change. CD2021\_02. Centre of Expertise for Waters (CREW). [↑](#footnote-ref-5)
5. Kirkpatrick Baird, F., Stubbs Partridge, J. & Spray, D. 2021. Anticipating and mitigating projected climate-driven increases in extreme drought in Scotland, 2021-2040. NatureScot Research Report No. 1228. [↑](#footnote-ref-6)