Nature Recovery Shropshire and Telford & Wrekin

Shropshire and Telford & Wrekin Local Nature Recovery Strategy.
Consultation draft, July 2025

Appendix 7: Summary of key pressures

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Shropshire's natural environment is under pressure. Natural systems are increasingly fragmented, depleted and negatively impacted. Many of the systems that are under threat are key to maintaining the provision of ecosystem services, such as flood water storage, pollination, carbon storage, healthy soils and heat alleviation.

Key pressures

- Climate change
- Habitat loss, degradation and fragmentation
- Water pollution
- Flood, drought and soil erosion
- Carbon release and reduced sequestration
- Air quality
- Afforestation
- Invasive non-native species
- Pathogens
- Light pollution
- Development

Climate change

Like all parts of the world, Shropshire is increasingly impacted by climate change. Continued emissions in greenhouse gases, which retain solar heat energy in the atmosphere, continue to drive up temperatures around the world, resulting in increasingly frequent and extreme weather events and disrupting the stable climate patterns on which humans and ecosystems have relied for millennia. Data comparing each year's average temperature to previous years (from 1850–2023) shows that temperatures in the Shropshire and Telford & Wrekin LNRS area are increasingly warmer than they have been historically.

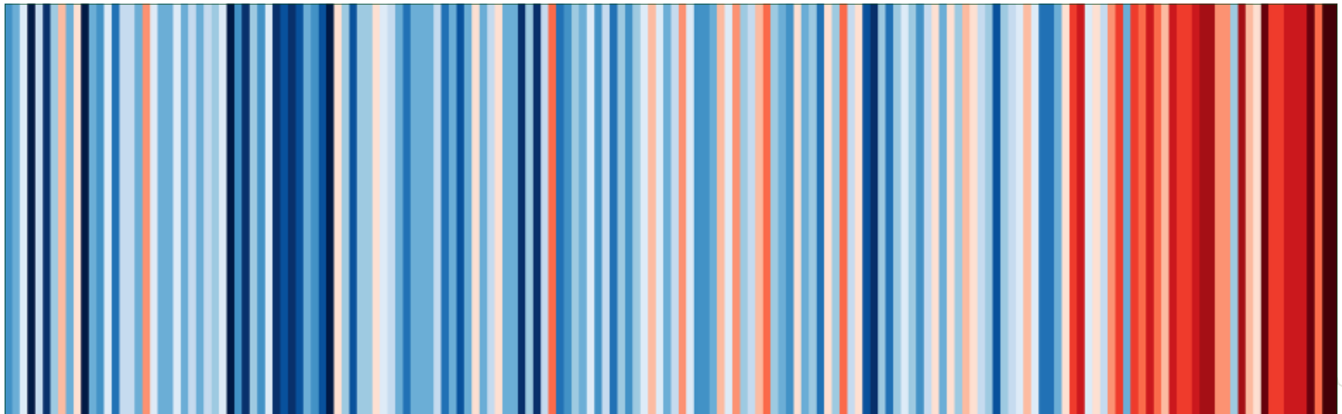

Figure 1: Climate Stripe for the strategy area comparing average annual temperature to historical averages.[1]

Recent climate projections from the UK Met Office predict that winter and summer precipitation levels for the Shropshire LNRS area will increase and decrease respectively as average global temperatures rise relative to 1981–2000 baseline levels.[2]

Many parts of Shropshire often experience flooding during colder months, and these events are likely to increase in frequency and severity in the future as we see higher amounts of seasonal rainfall and associated heavy precipitation events. These events bring significant challenges: damage to homes and infrastructure; soils erosion; nutrient and sediment runoff into watercourses; and the destabilising of tree roots.

Drier conditions in summer are likely to increase the probability of drought conditions, as extreme temperature days (>35° C) are projected to increase in frequency in the coming decades.[4] The highest temperature on record for Shropshire (35.7° C) was recorded in July 2022, and with the next milestone in global warming (1.5° C above pre-industrial levels) the number of extreme summer days is expected to be 35% higher than present-day levels. This trend is likely to cause further drying of ponds and rivers, loss of trees to drought, decreased resilience of vegetation to pests and pathogens, and increased incidence of wildfire.

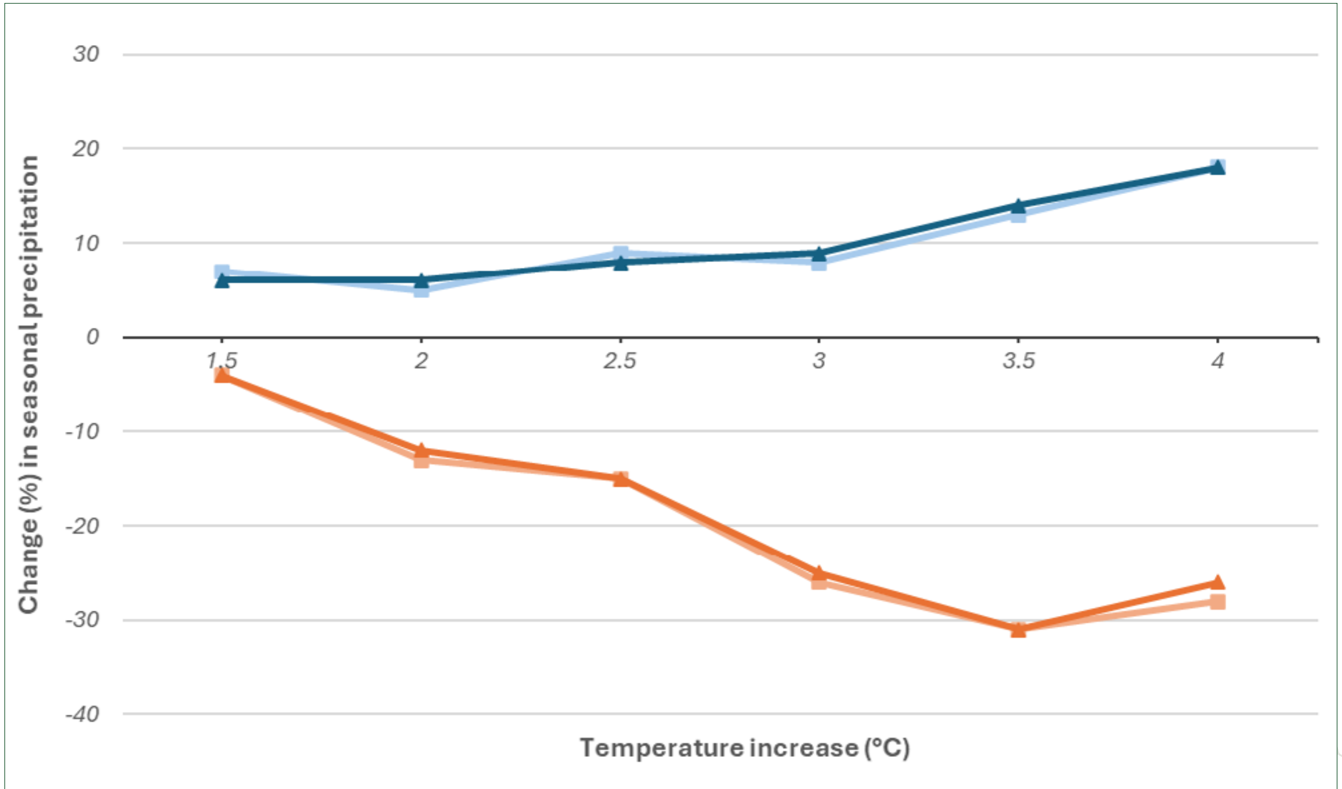

Figure 2: Met Office UKCP18 projections representing percentage change in seasonal precipitation over the 1981–2000 baseline for Shropshire Council (S.C.) and Telford & Wrekin Council (T&W) local authority areas.[3]

These climate and weather changes are also likely to be a key factor in the increase in reported natural disasters annually over time (Figure 3), although it should be noted that this also reflects an increase in reporting over the period.

Evidence suggests that the general warming of the atmosphere will continue to cause significant variations in the timing of seasonal events for many species, such as egg laying and migration.[5] While many species are experiencing earlier seasonal changes, some species in certain habitats are lagging, resulting in natural biological cycles that are out of step. Ecosystem responses are likely to become less predictable as result, leading to greater challenges for future habitat conservation and management.

Changes in climate conditions may also make Shropshire more susceptible to damaging non-native invasive species (e.g. Himalayan Balsam, Japanese Knotweed) that are accustomed to a warmer climate, conversely reducing the viability of less well-accustomed native plant communities. New pests and pathogens are also likely. Agricultural practices may also have to undergo significant adaptations (e.g. introduction of new and climate resilient crop types) to retain current levels of farm production.

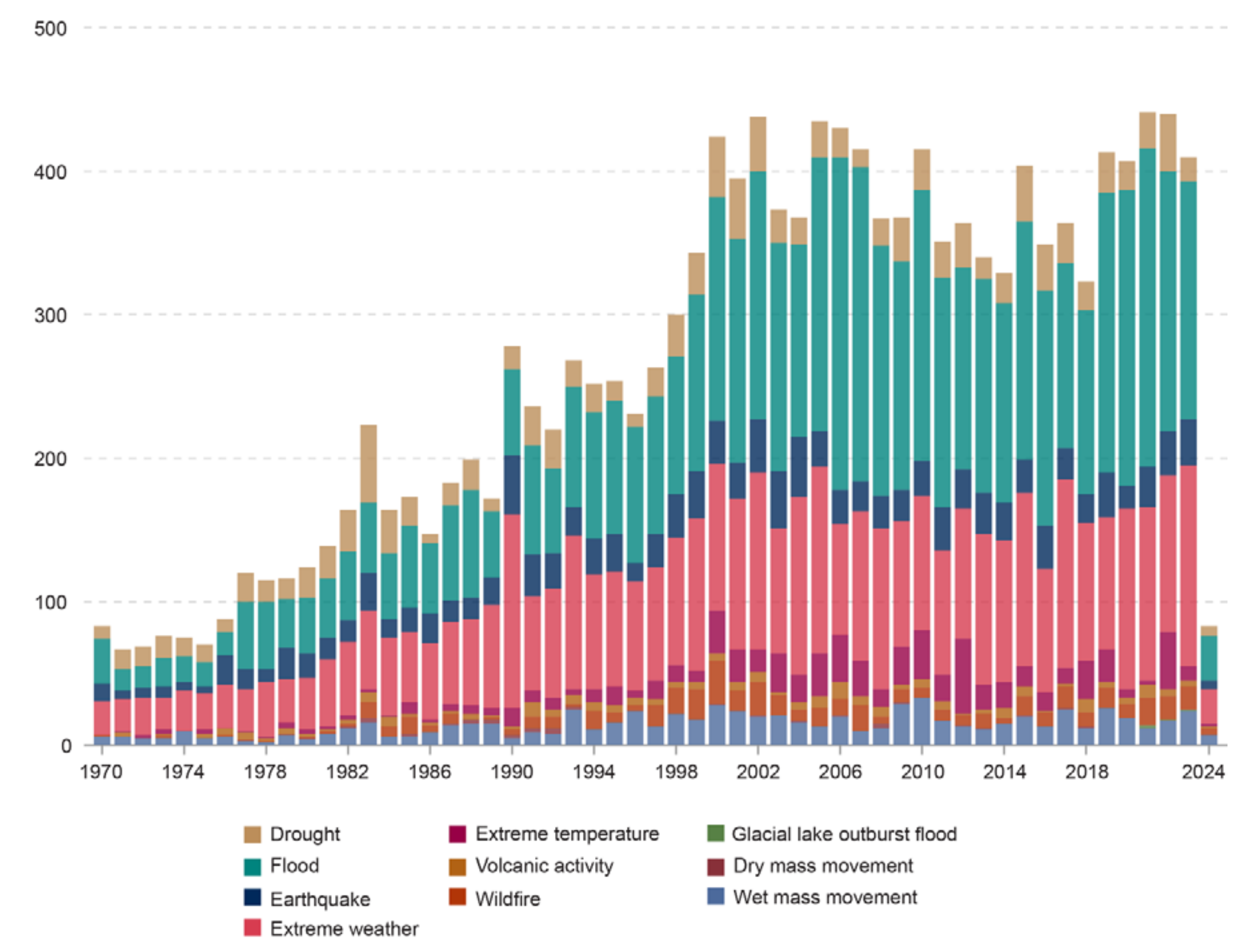

Figure 3 shows the annual reported number of natural disasters globally, by disaster type, 1970–2024 (up to April 2024). The data reflects increases in data reporting, and should not be used to assess the total number of events. Source: EM-DAT, CRED/UCLouvain (2024) OurWorldinData.org/natural-disasters. CC-BY.

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Habitat loss, degradation and fragmentation

Loss and degradation of natural habitats is a threat to the vast majority of all species on the IUCN's global red list[6] and is a major cause of biodiversity loss throughout the UK. As high-value habitats are replaced, or degraded, to make way for more economically productive land uses, the overall area for wildlife habitation is reduced.

The break-up, or fragmentation, of continuous tracts of habitat into ever decreasing pockets impacts dependent wildlife, which may rely on a minimum area and quality of habitat to provide the food and shelter required to sustain a viable population. Fragmentation reduces connectivity and results in increased local extinctions as there is less breeding between population groups, resulting in isolated populations that are more vulnerable to inbreeding, diseases and other environmental threats. Fragmentation also increases the challenges associated with habitat restoration and species recovery.

Within Shropshire, key habitats have experienced significant declines in extent and condition mirroring larger trends across England and Wales. Over 97% of species-rich grasslands have been lost nationally in less than a century, and grasslands continue to degrade locally.[7] Heathland has been impacted by over-grazing and afforestation, with losses in upland heathland in particular resulting from efforts to improve upland land for agriculture since the mid 20th century, mirroring a national 27% decline (up to 1980).[8] Hedgerows also continue to decline in quality and extent across the county – through outright removal or inappropriate management practice. Shropshire's river valleys were once home to significant areas of wet grassland and grazing marsh, and these habitats have declined by at least a fifth in the past 40 years.[9]

The main drivers of habitat loss include intensification of agriculture, growing urbanisation and, to some degree, afforestation. Nature recovery efforts should therefore focus on reducing and reversing the harmful effects of these processes where possible in order to re-establish, as a minimum, pre-existing habitat pockets, which form stepping stones in a wider nature recovery network. Regenerative agriculture is a growing movement that seeks to integrate agriculture with natural systems for the benefit of both and this approach has potential to deliver significant nature recovery while maintaining viable and productive farm businesses. On peat soils re-wetting of current agricultural areas could improve connectivity between bog and other peatland associated habitats, which are currently fragmented across the Shropshire and Telford & Wrekin LNRS area.

Flood, drought and soil erosion

Climate change is, undoubtedly, a significant driver of both flood and drought events in the strategy area, and both these conditions result in potential water quality issues.

Significant rainfall events affect water quality, including increased sedimentation. Runoff from agricultural land, of both soils and nutrients, is exacerbated by heavy rain alongside the loss of hedgerows, vegetated field margins and headlands and by changes in arable cropping resulting in bare or freshly ploughed soils at times of heavy rainfall. Heavy rainfall events also carry silt and sediment into watercourses through surface water and highway drains and cause increased incidence of raw sewage entering rivers as combined sewer overflows activate more frequently.

Periods of low flow are already increasing in frequency and will increase further as summer temperatures rise. This can have direct impacts on river ecology. For example, occasionally sections of the upper reaches of the River Teme, which crosses the Shropshire–Herefordshire border, dry out and the Environment Agency rescue populations of salmon and trout from shrinking and rapidly-heating pools. Licenced water extractions and decreased rainfall combine, in these circumstances, to cause a significant threat to both aquatic habitats and species.

Alternating drought and heavy rainfall has an adverse impact upon trees. Lack of water stresses trees, which makes them less resilient to pests and pathogens, and sudden periods of heavy rain cause soils around roots to become waterlogged or to wash away entirely.

High summer temperatures, with little rain, increase risk of heathland and grassland fires.

Water pollution

Water quality is a national environmental objective. Freshwater ecosystems are among the most impacted and poor water quality is a major pressure on species. Eutrophication happens when pollution delivers an excess of nutrients to ecosystems, resulting in decreased biodiversity. Other causes of water pollution include chemicals (e.g. herbicides and pesticides), silts and sediments.

The LNRS aims to help to address water quality issues by identifying and prioritising actions where the creation of habitat – such as wetlands or riparian buffers – can reduce pollution and deliver multiple benefits, including filtering agricultural runoff, reducing nutrient loading and supporting flood mitigation.

Water quality, which is arguably both one of the biggest challenges to, and one of the largest opportunities for, nature recovery will only improve if all potential pollution pathways are considered, investigated and addressed through both cross-industry legislative change and sustained financial investment.

Phosphorus (P) and nitrogen (N) are the main nutrients involved in eutrophication, with phosphorus being the main problem in freshwaters. The sources of phosphorus in our rivers and lakes are mainly waste waters from sewage treatment works and losses from agricultural land.

Climate change is likely to intensify the risks and impacts of eutrophication.[10] Lower summer river flows will reduce dilution while higher temperatures increase the potential for algal growth. Decreased water entering water courses, ongoing inputs such as outflows from small-scale packaged treatment plants serving nearby residences, highways drainage and permitted outflows from waste water treatment works can have a larger negative impact upon water quality than would be expected under normal conditions. Wetter winters are predicted to lead to increased runoff and erosion from agricultural land.

Eutrophication is a key reason for rivers and lakes failing to achieve 'Good Ecological Status'. Improvements to waste water infrastructure are set out in the UK Government's Levelling Up and Regeneration Act 2023 and should result in upgrades, including phosphate stripping at the most polluting works. Furthermore, targets set under the Environment Act 2021 require that nitrogen, phosphorus and sediment pollution from farming should be reduced by 40% by 2038.[11] For the farming sector, agri-environment schemes have many measures that can be employed to reduce runoff to freshwaters.

Excess fine sediment is a serious issue when washed into rivers and streams. Silt blocks the empty spaces between gravels, damaging habitat of freshwater invertebrates and the spawning gravels of salmonid fish, preventing the establishment of juvenile pearl mussels and suffocating adult pearl mussels.

Carbon release and reduced sequestration

Maintaining land and associated ecosystems as a net sink of carbon and other greenhouse gases is vital to achieve goals in reducing global emissions; however, recent studies suggest many of the world's largest carbon storage ecosystems have become a source of net emissions in recent years.[12] Continued conversion of beneficial habitats to more productive land use – such as peat bogs to arable – transforms land that sequesters carbon into a net emission source. Further shocks to the climate system, such as prolonged heat spells and associated drought, can also negatively impact natural vegetation cycles, reducing carbon sequestration functions of associated plants and soil.

The UK, due to its fortunate geographic location and relatively mild climate, has not to date experienced some of the extreme climate events witnessed in other parts of the world. Current estimates for the Shropshire and Telford & Wrekin LNRS area indicate a net-negative balance in total carbon emissions resulting directly from land and associated management practices.[13] Forest and grasslands currently sequester more carbon than they emit, mitigating positive carbon emissions arising from other land uses, and wider socio-economic activities within Shropshire (see Figure 4). However, the balance is fragile and could shift with continued degradation.

Projected rises in temperature will challenge carbon sequestration patterns. Mature and well-developed trees (>100 years) are typically made up of native species whose phenological cycles and sequestration functions may be negatively impacted by warming above accustomed temperature ranges. Raising water tables in peatlands

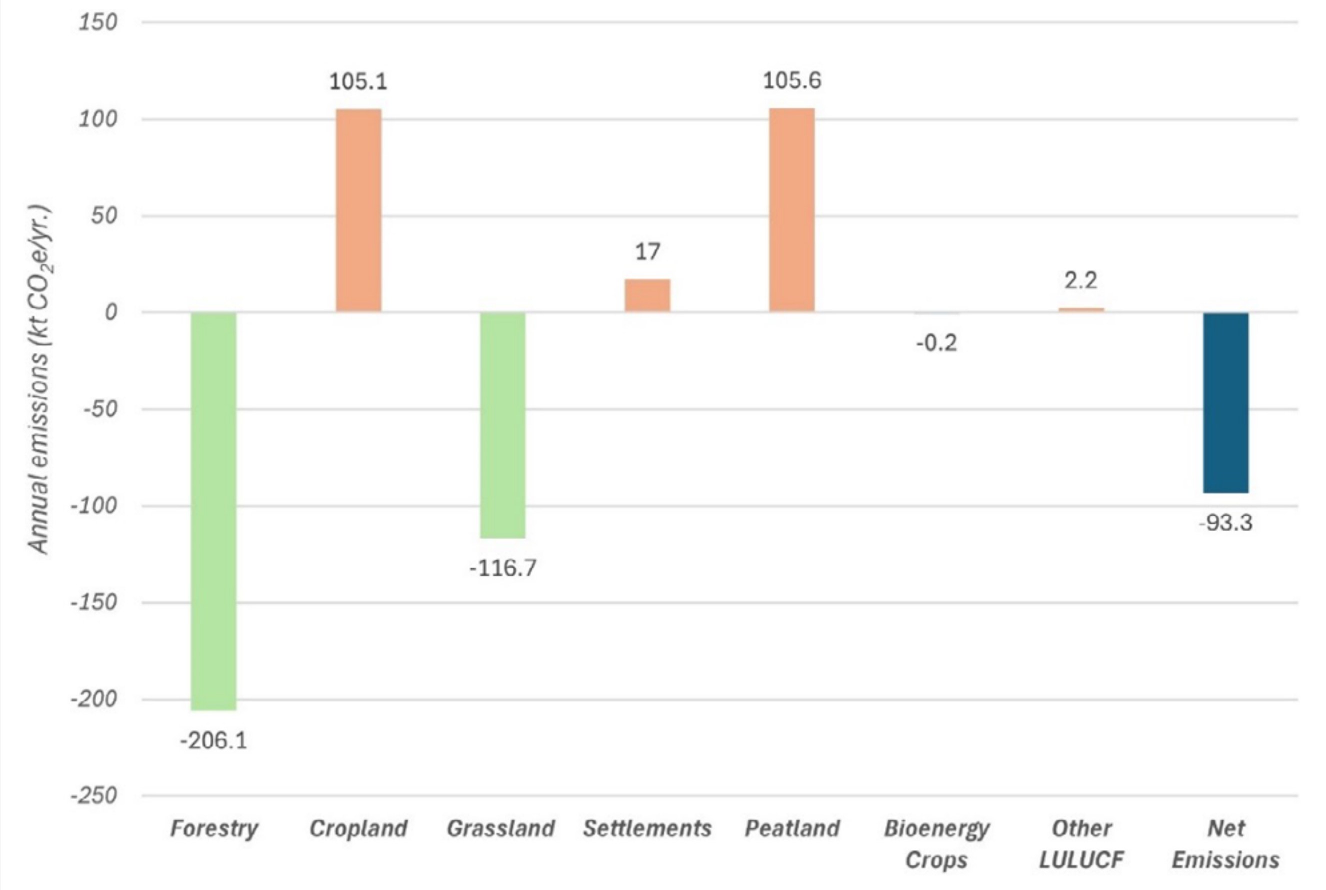

Figure 4: Carbon emission and removal estimates for land use areas within Shropshire.[14] Source: UK National Atmospheric Emissions Inventory (2022) Mapping Carbon Emissions & Removals for the Land Use, Land-Use Change and Forestry Sector (LULUCF).

can provide significant gains in carbon sequestration and may reverse high levels of greenhouse gas emissions from this land source in Shropshire; however, this may become increasingly difficult to achieve in future due to prolonged warm spells and drought conditions.

Wildfires are not unknown within Shropshire and may increase in frequency and extent. Fire not only immediately releases vast amounts of carbon into the atmosphere but also destroys existing habitat communities that may take decades to regenerate to provide current levels of carbon sequestration. Maintaining and improving carbon sequestration in Shropshire therefore not only requires improvement in the condition and extent of sequestering habitats (while minimising carbon impacts of land use conversion – e.g. urbanisation) but also adapting management practices that improve the resilience of habitats to future climate shocks.

Air quality

Airborne ammonia, along with nitrogen oxides (NOx) and particulate matter from vehicle exhausts and industrial processes, can deposit nitrogen and acid onto land. This pollution can significantly alter plant communities and negatively affect both the type and condition of habitats. In the Shropshire and Telford & Wrekin LNRS area, sources of emissions to air include intensive farming units, industrial processes, vehicles (particularly where heavily used roads run close to sensitive habitats), grazing animals, storage and spreading of manure and other fertilisers, quarrying and mineral extraction (generating particulate matter and dust).

Habitats are assigned a critical level or critical load for all pollutants. Where pollutants are above this level, an ecosystem is at risk from potentially negative effects. Those habitats naturally low in nutrients are at increased risk from atmospheric nitrogen eutrophication. For example, woodlands or wetlands rich in mosses and lichens. Above the critical level for nitrogen deposition in ancient woodlands, nitrogen-sensitive plants such as lichens and bryophytes decline in abundance and eventually disappear, resulting in less diverse woodland communities.

In 2018, 6.3% of land in the UK was exposed to ammonia concentrations above the critical level set to protect higher plants ($3\ \mu g/m^{-3}$) and 69.2% was exposed to ammonia at concentrations above the critical level set to protect lichens and mosses ($1\ \mu g/m^{-3}$) – exceedances that been rising since 2010.[15] In 2020, 89%–95% of designated sites in England were exposed to ammonia concentrations above $1\ \mu g\ m^{-3}$ – the level at which damage is considered to occur where nitrogen-sensitive species are present. In naturally nutrient-poor habitats such as heathland and wildflower meadows, sensitive species can, under eutrophic conditions, be outcompeted by grasses that better assimilate nitrogen. Studies have shown heathland transformed into grassland in the Netherlands.[16]

According to three-year averages from the Air Pollution Information System (APIS),[17] the background level of ammonia at Fenn's Whixhall, Cadney & Wem Mosses Special Area of Conservation (SAC) is between $3.0\ \mu g/m^3$ and $3.2\ \mu g/m^3$. With the critical level set at $1\ \mu g/m^3$, the site is therefore receiving in excess of its carrying capacity. APIS three-year averages for nitrogen deposition at the same SAC are between 21.4 kg/N/ha/yr and 22.8 kg/N/ha/yr, exceeding the 15 kg/N/ha/yr critical level for fen habitats.

The picture is much the same for designated sites across the Shropshire and Telford & Wrekin LNRS area, with most SACs, Sites of Special Scientific Interest (particularly those with nitrogen-sensitive habitats present), and ancient woodlands receiving considerably above their carrying capacity for aerial ammonia, nitrogen deposition and acid deposition based.[18]

According to APIS, in the UK, 95% of woodland areas – both managed and unmanaged – receive more nitrogen than the critical load they can safely absorb. This is mainly because trees and forests are more effective at capturing airborne pollutants than shorter types of semi-natural vegetation. As a result, woodlands typically experience higher levels of nitrogen deposition compared to other habitats
The result of high nitrogen deposition in woodlands includes increased sensitivity to natural stressors including drought and increased temperatures associated with climate change, impacts upon root systems and reduced species diversity. Studies have also shown changes in forest ground flora as a result of enhanced nitrogen deposition near farms,[19] as nitrogen sensitive-plant species are typically scarce at sites receiving over 25 kg/ha/year of nitrogen.

When roads are located close to sensitive habitats, and traffic levels increase near these areas, it can negatively affect plant communities. These impacts can build up gradually over time and may not be linked to a single development project – meaning they often aren't fully considered in a Habitats Regulations Assessment.

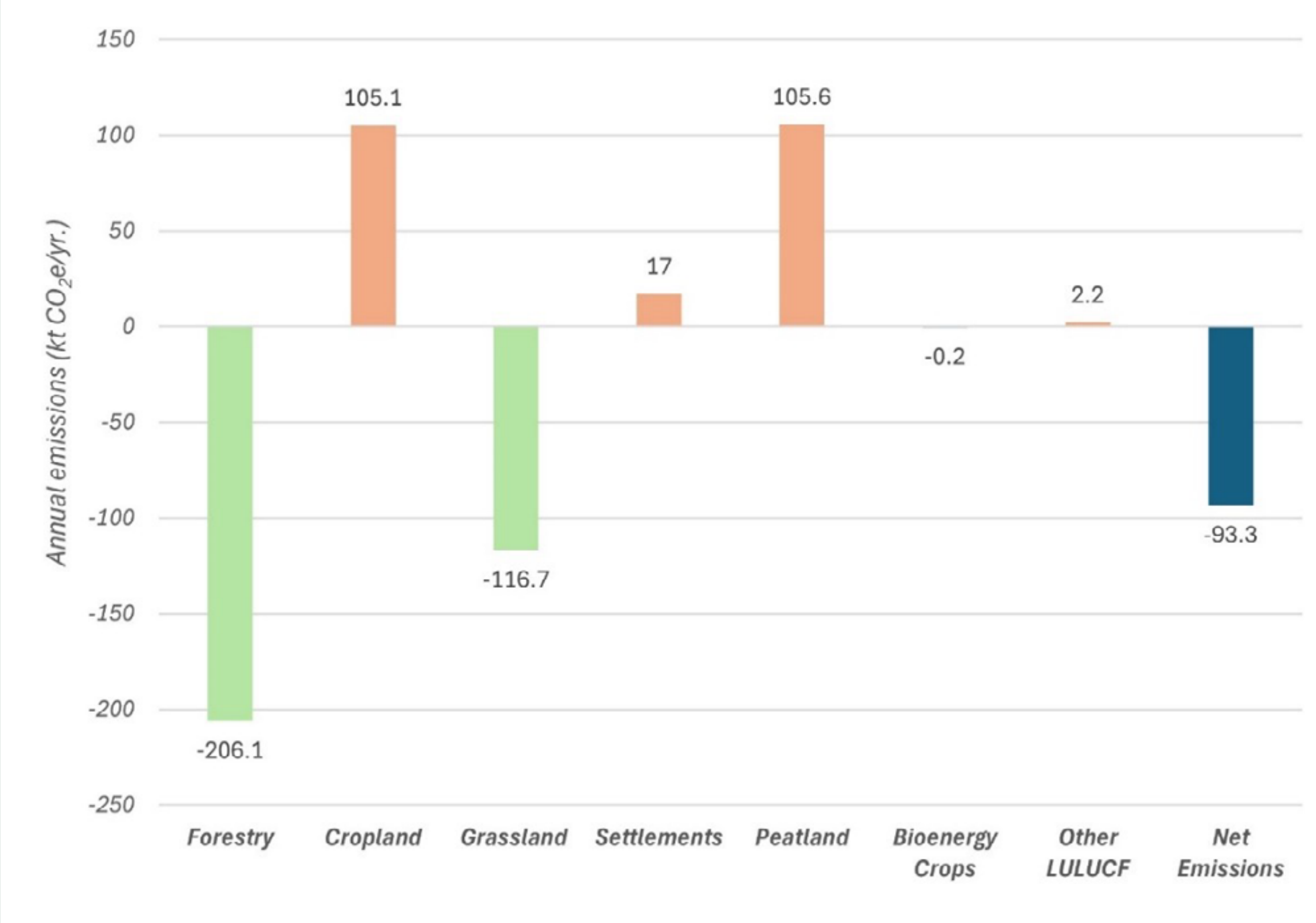

Figure 5 shows estimated ammonia emissions per km2 for Shropshire and Telford & Wrekin.[20]

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Afforestation

Woodland creation is a priority action for achieving carbon net zero targets but the principle of 'right tree in the right place' should be applied. It will be necessary to balance woodland planting with ever increasing demands upon land for other uses such as food, timber production, energy and housing.

Woodland creation is a vital part of any nature recovery strategy but should be approached cautiously. While attractive grants and ambitious targets for forest expansion are important for achieving net-zero carbon goals, they must be balanced with nature recovery priorities. This includes considering the biodiversity value of different types of planted woodland and ensuring that any new planting is compatible with existing land uses.

Non-native conifer plantations, while of value for carbon sequestration and timber production, provide lower nature conservation value when compared to native broadleaved woodland. Balancing the drive for restoration to broadleaf with timber production is necessary; here, mixed woodlands – which integrate timber production from conifer on shorter rotations with the biodiversity value provided by native species – could be a significant tool.

Invasive non-native species

Invasive species can displace or out-compete native species for food and resources. Invasive species are one of the biggest drivers of biodiversity loss in the UK and cost the British economy nearly £1.9bn per year.[21]

In total there are 3248 non-native species on the UK species register, 303 designated as having a negative ecological or human impact.[22]

Shropshire rivers are impacted by the American Signal Crayfish, which as well as out-competing native crayfish are vectors for crayfish plague for which our native species have little defence. The River Onny and the River Teme are particularly affected, and their proximity to the native crayfish in River Clun is cause for concern.

In woodlands, Rhododendron can be a problem as it forms dense thickets, shading and out-competing other plants. It is also a host for *Phytophthora*, a fungal pathogen that affects many other trees and plants.

Invading our riverbanks and wetlands is Himalayan Balsam. The dense shade it creates prevents native wildflowers and grasses from establishing and, when it dies back, it leaves riverbanks bare and at significant risk of erosion from winter floods. Recent surveys of the Clun Catchment have recorded approximately 40 km of river impacted by Himalayan Balsam and, anecdotally, the species appears to be widespread in the rest of the county.

Originally native to North America, American Mink has become a prominent invasive species in the United Kingdom. Its unchecked population growth has caused severe disruption to native wildlife, particularly affecting Water Vole and Kingfisher. Water vole numbers have plummeted by 97% since the 1970s and mink are the main cause.

While the list of invasive non-native aquatic plants is long many have the same impact, in that they spread rapidly, out-compete native species and block sunlight from our ponds and rivers. Many infestations result from the careless disposal of plants.

Pathogens

Woodland and heathland

Promoted by climate change and global trade and travel, an increasingly large number of new woodland pathogens have been detected in the UK over recent years. The most significant threats are:

- Ash dieback *(Hymenoscyphus fraxineus)*, which originated in Asia but is now spreading throughout Europe. Around 80% of ash trees in the UK may die from ash dieback,[23] and the impacts of preventative measures to manage the disease are currently unknown.
- Acute oak decline, which occurs in several regions, including the Welsh borders. This affects all species of oak, with mature native oaks being the most susceptible. It can kill trees within four to six years of the onset. Disease can be more prevalent in areas with high levels of airborne nitrogen pollution.
- *Phytophthora spp*. affects many plants and trees but its main impact in Shropshire is from *Phytophthora alni* causing the high mortality of riparian alder, particularly on floodplains.
- *Phytophthora ramorum* affects a range of broadleaf tree species, including beech, oak, Sweet Chestnut and Horse Chestnut. It also affects important commercial conifer species, in particular Larch. Large-scale tree felling is undertaken to limit its spread.
- *Phytophthora kernoviae* affects heathland and rhododendron, and areas of bilberry (Winberry) in south-west England and Scotland have been severely affected.
- Red band needle blight particularly affects pines, including native Scots Pine.

Birds

Avian flu, or bird flu, affects poultry and wild birds. The recent Highly Pathogenic Avian Influenza (HPAI) is the most serious the UK has ever recorded. A virulent form, H5N5 has been affecting bird populations in the UK since 2021. It causes severe disease and high mortality. This strain has severely impacted UK wild bird populations, especially seabirds, since summer 2021. This is an evolving situation and the impact on other bird species (and other animals) is yet to be understood.

Light pollution

There is no part of the Shropshire and Telford & Wrekin LNRS area that does not receive significant levels of light pollution. Even the relatively dark and rural areas of the county are relatively well-lit at night compared to neighbouring darker-skied areas – particularly into Wales.

Light pollution has significant impacts upon nocturnal wildlife. Artificial light can act as a barrier to some species of bats moving through lit landscapes and can change the behaviour of night-flying invertebrates on which they feed. Nocturnal bird species and their small mammal prey are also adversely impacted. Nocturnal mammals in urban environments may adapt, to some extent, but are none the less affected.

Nighttime light has adverse impacts upon human health and sleep cycles as well as on the wildlife around us.

Light pollution has a range of sources including street lighting, security and safety lighting, floodlights and access lighting on private dwellings. Lighting can be functional, in some cases may be required by law or best practice and can increase our feelings of safety as we move through night-time environments. Lighting should always be appropriate, focused where it is needed, downward facing and cowled to minimise light spill, and on movement sensors and timers where possible.

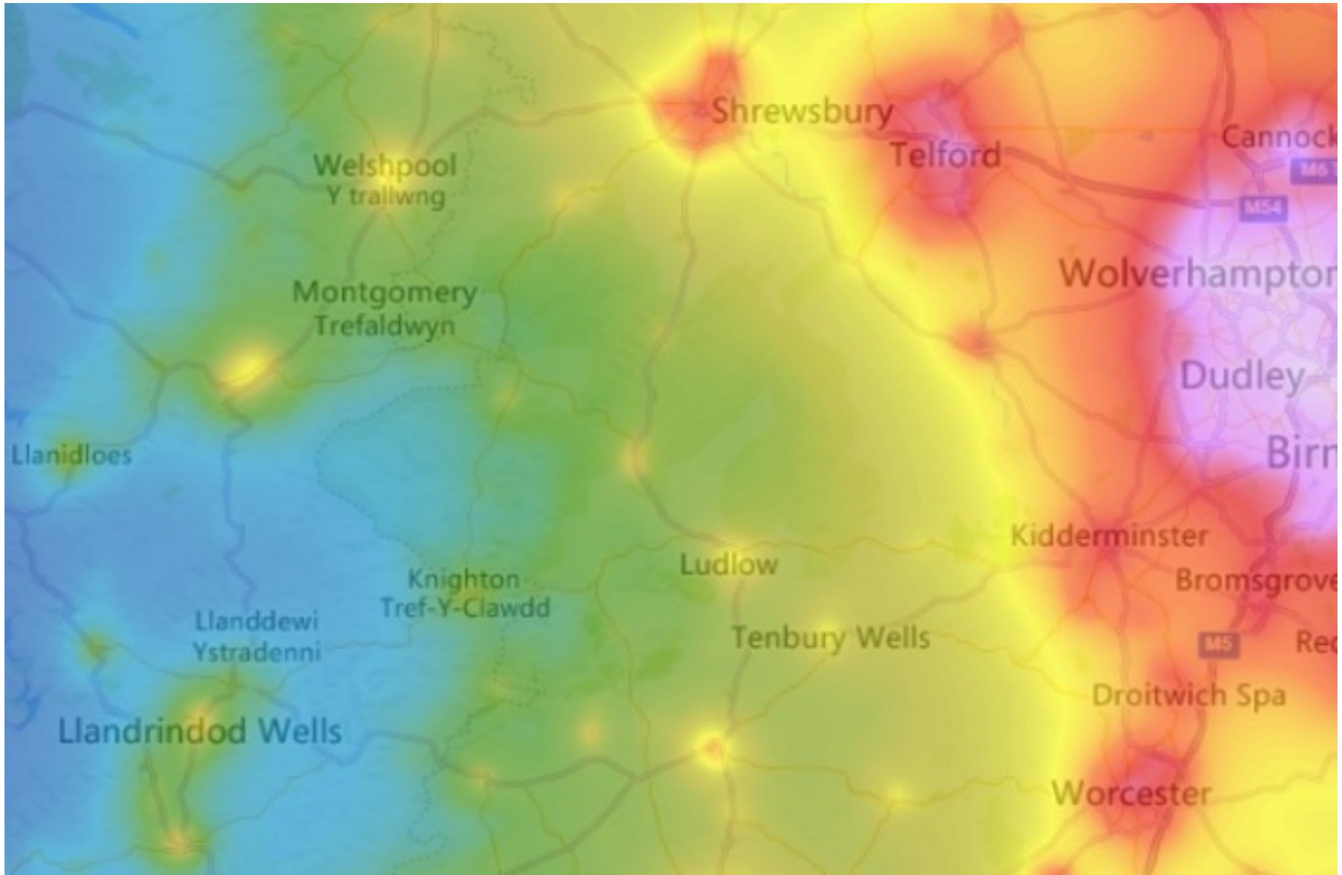

Figure 6 is a map showing light pollution in Shropshire and Telford & Wrekin.
Source: www.lightpollutionmap.info

Development

Shropshire Council's administrative area includes the county town of Shrewsbury and 17 other market towns and key settlements. The adopted Shropshire Core Strategy (2011) sets out a growth requirement of 27,000 new homes between 2006 and 2026. Significant urban extensions are currently underway. Additional pressure came with the updated National Planning Policy Framework (published in Dec 2024), which increased the assessment of local housing need in Shropshire by 924 dwellings per year – the largest numerical increase across the West Midlands and an 86% increase on the county's previous assessment.[24]

Telford & Wrekin Council's administrative area includes the New Town of Telford and the market towns of Wellington and Newport. The adopted Local Plan 2011–2031 sets out a need for 17,280 new dwellings over the plan period. Construction at Lawley, on the western side of Telford, is now entering its final phase, and significant regeneration projects in central Telford and Wellington are underway.

In addition to the requirements for new homes the strategic plans set out requirements for new areas of employment land and for other land uses including ongoing sand and gravel quarrying and renewable energy including solar. Changes in agricultural land uses, including diversification, intensive livestock rearing and other changes in farming methods, also drive development.

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