



Somerset
Wildlife Trust



2023

The Somerset State of Nature

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Introduction



Executive summary

This, the first Somerset State of Nature report, provides an important benchmark of how wildlife is faring across our county and comes after the release of the national State of Nature report launched in September 2023. It is produced at a time when the climate and ecological crises are recognised across the globe, and when new legislation is being brought in across the UK with ambitious objectives for nature's recovery. The UK government has made ambitious pledges to protect at least 30% of land and sea for nature by 2030 - the '30 x 30' target.

Somerset Council has declared a Climate and Nature Emergency, and its Nature and Environment workstream, led by the Somerset Local Nature Partnership - currently chaired by Somerset Wildlife Trust - has a core focus of "restoring nature at scale to enable natural processes, such as carbon sequestration and natural flood

management to function". We must lead by example and be bold in our approach setting a target of 30% of Somerset's land and sea being positively managed for nature by 2030, consistent with national and international environment targets."

Within the Somerset State of Nature report, where possible we have highlighted trends in the abundance and distribution of species and habitats, and identified the key pressures that wildlife is facing. The report takes into account global and national declines in biodiversity, and clearly demonstrates that this impact is also being felt dramatically across Somerset. It identifies both positive and negative trends, provides case studies of where success has been achieved and where we must improve our approaches in order to restore Somerset's natural environments in the face of the known and emerging challenges it faces.

This is the very first report of its kind for the county and as such provides the foundation upon which we must build going forwards, both in terms of our knowledge, data and evidence and - with the support of wider stakeholders across the county - devising a shared, meaningful plan to deliver our 30 x 30 goals. It is only by working in partnership that we can have the impact we need for people and wildlife, and adapt to the changes in our natural environment brought about by climate change.

The headlines and key findings reported here are a call for action, and the overwhelming message from within these pages is clear; in spite of significant efforts, we haven't done enough. We must act faster and deliver at a bigger scale than ever before to meet our 30 x 30 target.

Somerset's changing landscapes

Despite a relatively low population and the perception that Somerset is a green county, it has nevertheless been impacted by huge declines in biodiversity, and will continue to be impacted by the effects of climate change. Somerset is particularly vulnerable given the extremely low-lying nature of the Somerset Levels and Moors, where hard engineering and coastal barriers, which are currently the first line of defence, will come under increasing pressure as our climate continues to warm. This decline in biodiversity also has profound implications for the long term livelihoods, health and wellbeing of the rich and vibrant communities that call Somerset home. The causes of decline in biodiversity are well documented. The evidence shows that over the last 80 years the way we live, and the changes in how we manage our land and seas, alongside

increased development and infrastructure have had a drastic and damaging impact on the natural world around us.

There is now a growing understanding and recognition amongst policy makers and communities, both nationally and locally, of the huge value of nature and how by restoring it, we can address biodiversity loss and use it as a positive step to tackle climate change. Nature can provide the answers and, to meet its targets under the Global Biodiversity Framework, the UK Government has to be bold and ambitious. Resourcing needs to be carefully targeted to enable nature recovery. There is currently a £56bn gap to achieve government targets (Finance Earth 2022) and to secure that investment we need an evidence-led approach. The Somerset State of Nature report is a key step to providing that much needed evidence.

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Why is the Somerset State of Nature report important?

The Somerset State of Nature report is a platform upon which a wide range of nature stakeholders across the county can come together and create meaningful plans to protect, restore and enhance the county's amazing natural capital and make a measurable progress in achieving the county's own 30 x 30 target as well as making a significant contribution to national targets. In order to understand how nature is faring across Somerset, and to see if we are meeting our targets of 30 x 30, it's vitally important that monitoring, surveying and the collection of data is prioritised. It is only through the collection of this data that we can begin to pull together a strong evidence base that enables us to show long term trends, patterns and distribution.

What this first report shows is that a lack of data and evidence - much like the situation across the country - has hindered our ability to report on changes in the past ten years. Evidence must be central to strategies to restore Somerset's nature and resourced appropriately. The next Somerset State of Nature report must be underpinned by a far more comprehensive evidence base.

Moving forward, the Somerset State of Nature report will also provide the evidence needed

when making the case for prioritised restoration actions, as well as demonstrating the success or failure of the actions we collectively take. With emerging green markets and new government led schemes such as Biodiversity Net Gain, data collection and verification will form a core part of the validation of success measures.

This report has been prepared alongside the development of the Local Nature Recovery Strategy (LNRS) for Somerset. LNRSs are a new system of spatial strategies for nature that have been mandated in 38 authorities in England by the 2021 Environment Act. Somerset Council is the responsible authority for the development and review of the LNRS and is working closely with the Local Nature Partnership to ensure that the consultation on priority outcomes for nature recovery and the actions needed to deliver them is fully inclusive. The LNRS will provide an invaluable resource to planners, environmental organisations, landowners and managers, local communities and other interested stakeholders to help map out action for nature in Somerset. The Somerset State of Nature report and its future iterations will help identify LNRS priorities and support monitoring and review of the outcomes.

Where does this data come from?

The Somerset State of Nature report uses the latest and best available data from biological monitoring and recording schemes, collated by the incredible work of hundreds of skilled people, many of whom are volunteers, to provide a benchmark for the status of our wildlife.

Our sources include:

- **Somerset Environmental Records Centre (SERC)**; SERC collects, manages, analyses and supplies data on wildlife and the surrounding environment.
- **Data and evidence** provided by partner organisations that has been collected to inform their own environmental and nature conservation work.
- **Citizen science**; The huge amount of information provided and collected by dedicated and incredibly knowledgeable volunteers, specialist groups and interested individuals who, for decades, have provided the backbone of data collection across the country and who will continue to provide that core source of data in the future.
- **Scientific and academic papers** and research.
- **Local case studies** and publicly available reports and documentation.

Taken together, these sources of information build a picture of what is happening in Somerset. To bring together vast sources of information requires a huge resource and, as such, it is not possible to provide evidence on every species or habitat. We know there are inevitably gaps in our data and knowledge that we will seek to fill as we develop the Somerset State of Nature report. We are confident that the evidence presented in this report is reliable and gives a sound baseline that can inform decision making and delivery.

The Somerset State of Nature report is not intended to be a static document. Future reports will be further improved and redefined as new data becomes available and new and/or improved monitoring techniques, research and data analysis systems and methodologies are developed.



What is 30 x 30?

According to the Kunming-Montreal Global Biodiversity Framework (Dec 2022) lobbied for, and signed by, the UK Government it means – “Ensure and enable that by 2030 at least 30 per cent of terrestrial and inland water areas, and of marine and coastal areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed

through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, recognizing indigenous and traditional territories, where applicable, and integrated into wider landscapes, seascapes and the ocean,”

This target has been adopted by the UK Government and subsequently across the country, including in Somerset.

This target has been adopted by the UK Government

How is it measured?

When the UK Government initially announced the target in September 2020 they applied a very wide definition of how much land would be included, assessing that 26% of land in England and 40% of the ocean was already in good recovery for nature.

In their assessment of land that was already under protection and where nature was in recovery, they included existing National Parks, Areas of Outstanding Natural Beauty and other protected areas to arrive at their total of approximately 26% of land in England. However these were included in the absence of any real or recent measure of whether nature was in fact recovering in those areas. From the 26%, an additional 4% – over 400,000 hectares, the size of the Lake District and South Downs National Parks combined – was to be protected to support nature's recovery. In July 2023 the Environment and Climate Committee warned that at best 6.5% of England is effectively protected for nature.

There is currently no guidance from Defra or Natural England as to which areas of land or sea can be included in the target. In the absence of official guidance, Somerset Wildlife Trust is currently of the view that we follow the example led by the Wildlife and Countryside Link (WCL) which has taken the wording and spirit of the Kunming-Montreal Framework. By their definition, according to the latest 2023 report, England's land area is at 3% and our oceans are at 8%.

The key phrase in all this is 'effectively conserved and managed' and how this is evidenced. For

example, the Government's ocean figure of 40% is based around all the areas designated as Marine Protected Areas, even though most of these are not effectively managed, our local Bridgwater Bay being a good example of this.

"The global ambition towards achieving protection and conservation of at least 30% of the planet by 2030 will require significant focus, energy and skill from across non-government and government bodies, landowners and managers, and local communities." – Dr James Robinson. Chair of IUCN UK National Committee's Protected Areas Working Group. In order for Somerset to meet its 30 x 30 goals it's critical we measure and monitor our progress in a meaningful way. The Somerset State of Nature Report forms a critical benchmark - one that we will return to at regular intervals - that will help us collectively assess the impact of our work. It is from here that we will be able to track trends of change, both positive and negative, for the quality, quantity, distribution, connectivity and resilience of our habitats within the wider nature recovery network, alongside the resilience of those habitats. It will also enable us to assess the bio-diversity and bio-abundance of species that are both at risk and 'common'. It is from here also that we will be able to demonstrate how well Somerset's Local Nature Recovery Strategy is being implemented.



How does Somerset currently score?

There is still a long way to go in a short time. Under the WCL definitions for Somerset we estimate that just 9.15% of our land area is currently part of the 30 x 30 target largely due to our large number of SSSIs, 76% of which are thought to be in favourable or recovering status and are being managed for nature. We recognise that many of these sites have not been effectively monitored, some for over ten years, and that there is still more evidence to gather from eNGO

colleagues to check if they have any managed for nature areas that are not already SSSIs that we can add. It is estimated that this might add in the region of 1-2% to the total area.

At this stage we have taken the decision to include the intertidal habitat of Bridgwater Bay SSSI as part of our land definition. However, since we have no evidence that our local Severn Estuary Special Protection Area and Special Area of Conservation are managed for nature, our ocean score is currently 0%.

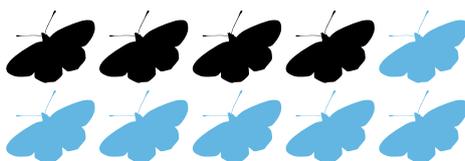


Highlights

- Somerset Environmental Records Centre has over **2.4 million records**, from **15,775 species** over **150 years**. Out of these species, at least 313 of them are currently on the IUCN Red List and 37 are considered invasive species to the UK. A large majority of the species do not have enough regular recording data for population trend analysis, however in this report we've focused more on species distribution than abundance.
- In line with national trends, **climate change**, **land development**, and **pollution** have all impacted Somerset's ecosystems. Invasive species, including introduced diseases, are an additional threat.
- Terrestrial insects are faring particularly badly within Somerset, with **butterfly distribution declining by 874km²** over 30 years. Fritillary butterflies have suffered drastically with a 60% decline in distribution from 1990-2021; the marsh fritillary butterfly is now considered extinct from Somerset.
- **Common mammal species** are seeing a decline in reporting, such as the European rabbit and red fox. Analysis of hazel dormice records in particular, indicate a reduction in the probability of seeing a dormouse, suggesting a decline in the population.
- In the latest ecological assessments of river catchments (2019), 'Poor' classifications have remained at around 25/30 sites over the last 10 years, with '**Good**' **decreasing** from 38 to 21 catchments.
- Somerset has the second highest number of Local Wildlife Sites in the UK but has still seen a **loss of 48 sites**.
- **Some mammal species are thriving**. The return of beavers in Somerset has been a success, and wetland bird populations have seen increases in recent Somerset projects.
- We have found that non-native **invasive species cover has increased by 260%**, from 354km² to 923km², between 1990-2021.
- Somerset habitats have also seen **declines in species richness**, as well as quality and quantity. Somerset has **lost 201.94km² of grassland** in 25 years, a 5.75% loss on top of previous already significant declines. This land has now been taken up by agriculture and urban areas; the **population in Somerset has risen 36.9%** since 1981.
- **Priority habitats are increasing**. The Somerset Wetlands 'super' NNR has brought together nature-managed land in the Somerset Levels and Moors, including nature reserves in the Brue and Parrett Valleys, Bridgwater Bay and Steart Marshes, increasing the original NNR footprint by 56% to an amazing 6,000ha - the third largest NNR in England. This year, the Mendip 'super' NNR was announced, meaning Somerset is the only county in England that hosts two.
- Out of the 420km² of Sites of Special Scientific Interest (SSSI), just under 90km² of the land is in '**unfavourable declining**' condition.

Invasive species cover has

**MORE THAN
DOUBLED**



60% DECLINE

in **distribution** of **fritillary butterflies** from 1990-2021

The **population** in Somerset has

**RISEN 36.9%
SINCE 1981**



A global picture

The decline of global biodiversity has reached unprecedented levels, as indicated by the 2020 Living Planet Report created by the World Wildlife Fund (WWF) and the Zoological Society of London (ZSL).

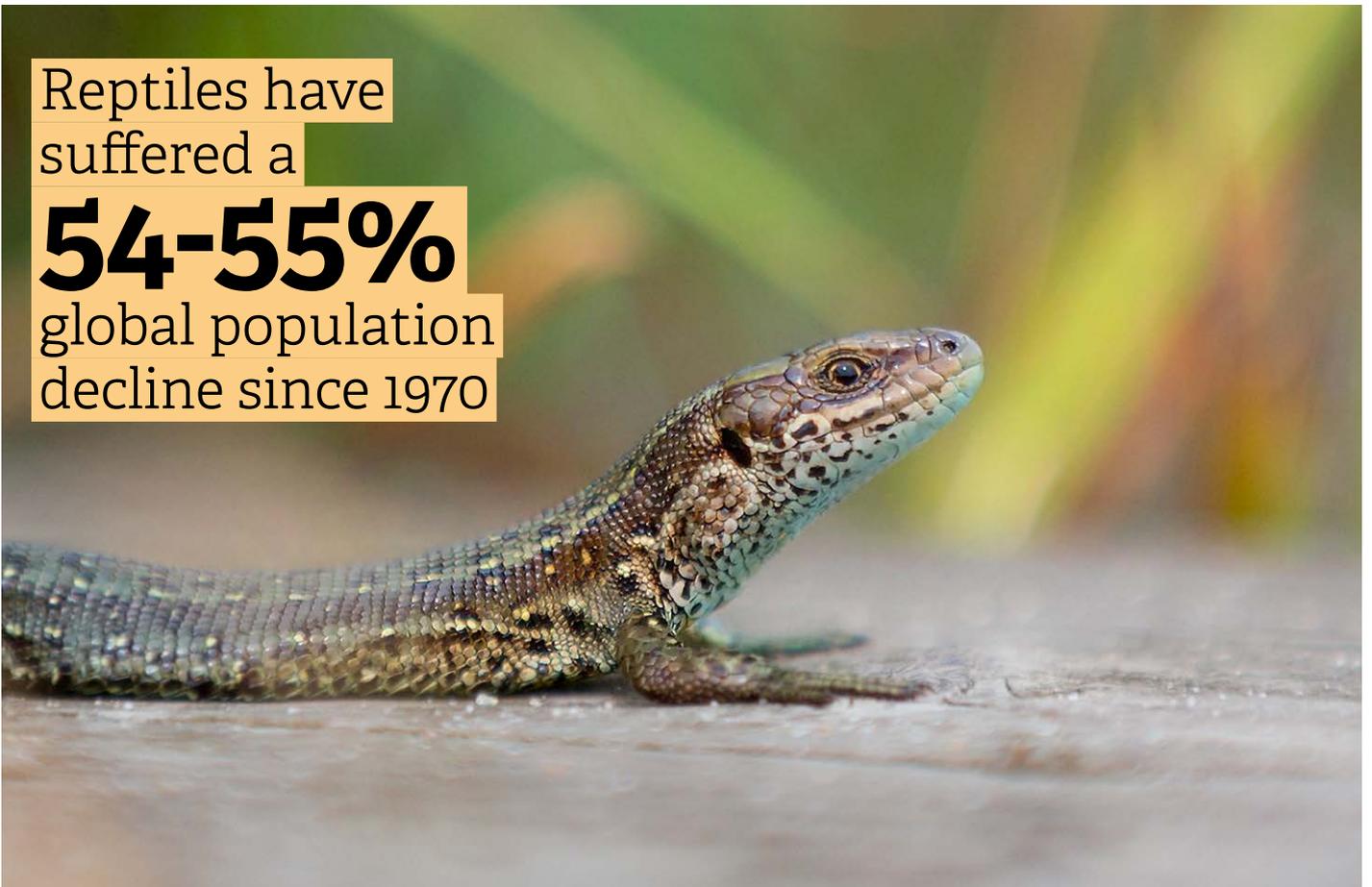
The report reveals an alarming average 68% decrease in populations of mammals, birds, amphibians, reptiles, and fish between 1970 and 2016 (Lambertini, 2020). This decline is primarily attributed to human activities, including habitat degradation, land use changes, and exploitation (IPBES, 2019; Lambertini, 2020). Freshwater megafauna have suffered an immense 88% decline, with almost a third of freshwater species facing extinction threats. Approximately 50% of habitable land is currently dedicated to agriculture, posing a threat to around 24,000 species on the International Union for Conservation of Nature (IUCN) Red List (Ritchie, 2020).

Diverse taxonomic groups are experiencing population declines. Grassland species have seen a 74% decline (Rosenberg *et al.*, 2019). Terrestrial species globally have dwindled by around 41%, while vertebrates in forest habitats have declined by 53% (Green *et al.*, 2020). Insects, reptiles, and mammals

display negative population trends. Insects, in particular, are at risk, with one in three species facing extinction (Sánchez-Bayo and Wyckhuys, 2019). Reptiles have suffered a 54-55% global population decline since 1970, and nearly one in five reptile species is threatened (Böhm *et al.*, 2013; Saha *et al.*, 2018). The IUCN reports over 1,300 mammal species are currently at risk of extinction, a number that has risen by 195 species in the past decade (IUCN, 2021).

Plant species have also been severely impacted, with plant extinctions estimated to be twice the combined number of mammals, birds, and amphibians (Lambertini, 2020). On average, two plant species have gone extinct annually for the last 250 years (Humphreys *et al.* 2019), and currently 22% of plant species are threatened with extinction (Lambertini, 2020). Even many, once common and abundant species, are now becoming a conservation concern.

Reptiles have
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decline since 1970





Drivers of change

The main drivers of global biodiversity loss are the destruction of habitats, including land use change, climate change and over exploitation (IPBES, 2019). This loss of biodiversity affects the natural environment, wildlife and human populations. Issues include damage to ecosystem health, reduction in food quality and production, as well as alteration to ecosystem service function (Inger *et al.*, 2015). Ecosystem services are described as benefits that people obtain from ecosystems (Alcamo *et al.*, 2003), which include food and water, recreational and cultural services, flood and disease control and nutrient cycling (Alcamo *et al.*, 2003). The causes of species declines are numerous, complex, and often interlinked, and there is some discrepancy in defining the most impactful drivers. But unsurprisingly, habitat loss (Brodie *et al.*, 2021) and climate change (Spooner *et al.*, 2018) have been identified as key causes of mammal population decline.

The causes of species declines are numerous, complex, and often interlinked

These global trends are reflected here in the UK as well as at a local level in Somerset. These are some of the key drivers which, historically, have had a negative effect on the natural diversity of the county:

- Direct **habitat loss** and **fragmentation** due largely to **development** and farming and **agricultural activities**, along with the **infrastructure** required to support those things – transport infrastructure, education, health and social care and community facilities.
- Lack of appropriate **management** and the **overexploitation** of biological resources for food and building materials including aggregates for example. A **growing population** leads to increases in demand for food, water, and materials, but **intensive food production** and farming practices in particular, including the use of **chemical fertilisers** and **pesticides**, place further pressures on the land. Without improvement to land

management and/or changes in the buying habits of the average consumer, we will see further **degradation of soil** quality and productivity due to nutrient overload, erosion and compaction, and **further losses** of birds, mammals, butterflies and other insects.

- From noise to light to chemicals, **pollution** takes many forms and contaminates the air, water, and soil. It affects the health of living organisms and their habitats. In Somerset in particular the most widespread current harm is from the excessive **phosphate** load in our waterways.
- **Climate change** and associated loss of land through **sea-level rise**, changing **temperature**, rainfall and **weather pattern** changes, and other environmental factors that alter habitat composition, seasonality of ecosystems and species movement and survival.
- **Invasive species** and **disease** that compete with, prey on, or infect native species have impacts beyond the species they directly attack.
- **Lack of investment** and a drop in public sector expenditure on biodiversity. In the UK, as a proportion of GDP, has **fallen by 42%** since a peak in 2008/9.

Many of the challenges associated with these factors are being addressed at a national level through government policy, but it will be necessary to respond locally to policy such as the Environment Act 2021 and make it work on the ground. This will require working in partnership with the widest group of stakeholders possible to achieve the change that's needed to meet the demands of the county and at the same time, safeguard the future of our wildlife and habitats upon which the county depends.

As the Dasgupta review *Economics of Biodiversity* states, "We rely on Nature to provide us with food, water and shelter; regulate our climate and disease; maintain nutrient cycles and oxygen production; and provide us with spiritual fulfilment and opportunities for recreation and recuperation, which can enhance our health and well-being. We also use the planet as a sink for our waste products, such as carbon dioxide, plastics and other forms of waste, including pollution. Nature is therefore an asset, just as produced capital (roads, buildings and factories) and human capital (health, knowledge and skills) are assets".

UK state of nature

The recent UK State of Nature report highlights concerning declines in species abundance and distribution over the past half-century. The study reveals that 41% of species have experienced reduced abundance, with distribution decreasing by 27%, figures that worsen when considering the last two decades, reaching 44% and 37% respectively (Hayhow *et al.*, 2019). These declines are attributed to various factors, with the most significant being land use changes, agricultural practices, and climate change, according to the IPBES (IPBES, 2019).

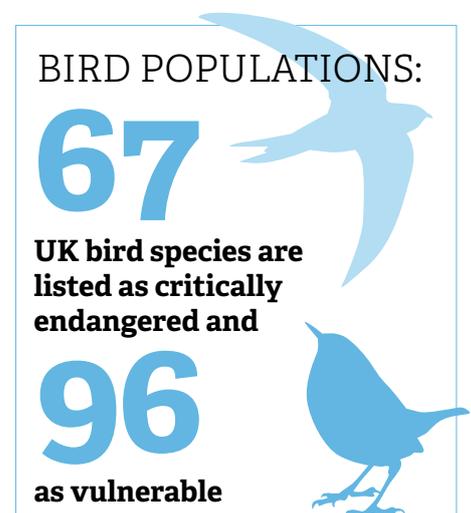
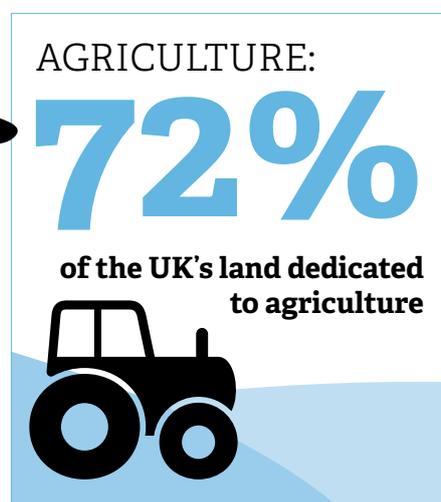


With 72% of the UK's land dedicated to agriculture, intensive management has significantly impacted wildlife across 75% of the country (Hayhow *et al.*, 2019). Notably, farmland birds, once common, are among the declining bird populations. The IUCN Red List, crucial for gauging global biodiversity health, designates 67 UK bird species as critically endangered and 96 as vulnerable (Eaton *et al.*, 2015). European bird populations have also suffered, with a loss of around 421 million individuals between 1980 and 2009 (Inger *et al.*, 2015). This trend is mirrored in the UK, which has seen a loss of about 40 million birds in the last 50 years (RSPB, 2020).

Insect populations in the UK face severe decline, with 60% of species affected, making it the most affected in temperate regions. For example, the carabid ground beetles have drastically declined over 15 years, particularly smaller, daytime-active species (Sánchez-Bayo and Wyckhuys, 2019).

Researchers at the Natural History Museum highlight the UK's nature depletion, with a 'Biodiversity Intactness Index' positioning it among the bottom 10% globally, and only surpassing Ireland and Malta within the EU (Davis, 2020; Purvis *et al.*, 2020). The concern for UK biodiversity is underscored by increasing numbers of species entering the IUCN Red List. Notably, 11 out of 47 native mammal species are at risk of extinction (Mammal Society, 2020), alongside 23 bee species (Horsley *et al.*, 2013).

Habitat destruction significantly drives species declines, with the loss of 97% of meadows since the 1930s, leaving only 1% of the UK's land covered by species-rich grasslands (Plantlife, 2020). Furthermore, of the 91.5% of non-developed land in England, 62.8% accounts as agriculture (Ministry of Housing, Communities & Local Government, 2018). Despite rising government expenditure on biodiversity, public sector spending on conservation has fallen by 42% from its peak in 2008/9 to 2017/18 (Hayhow *et al.*, 2019). More needs to be done across the country.



South-West biodiversity change

Although there is a limited amount of scientific evidence on the state of nature in the south-west of England, there are several notable exceptions. Cornwall's recent State of Nature report reveals that in the last 30 years, almost half of breeding birds, three-fifths of butterflies, and nearly half of terrestrial mammals have declined. Additionally, 12% of Species of Principle Importance (SPI) face local extinction threats. Exmoor, which straddles both Somerset and Devon has seen a decline in lichen species, with 31% recorded pre-industrial species missing since 1960, indicating increased air pollution (Yahr *et al.*, 2014). The recent BSBI Plant Atlas has found species of coniferous woodlands have increased but this has led to declines of specialist plants of heathlands and bogs in the west of Britain (Walker *et al.*, 2023).

Studies from 1977 to 1987 on Somerset's shoreline demonstrate biodiversity declines, with all wader species showing reduced abundance, particularly snipe (68.5%) and lapwing (54.3%). Biodiversity declines progressively from west to east across Somerset's coastline and is influenced by tidal range and turbidity (Crothers and Hayns, 1994).

Land management and designation of sites has increased quality habitat across the south west. The unique Somerset Levels and Moors, shaped by water management, grazing, and peat extraction, provide vital ecological services. A study spanning over 80 years shows that sites with a SSSI designation in Dorset maintained habitat quality, whereas 69% of partially protected sites exhibited altered habitat quality (Ridding *et al.*, 2015). Evidence suggests that local environmental management, including agri-environmental schemes, has positively impacted floral decline in Somerset (Swetnam *et al.*, 2004).



All wader species are showing reduced abundance particularly snipe and lapwing

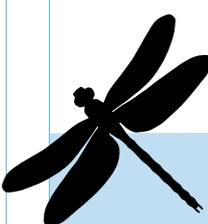
HABITAT LOSS:

97%
of UK meadows have been lost within a century



INSECT POPULATIONS:

60%
of the UK's insect species in decline



GOVERNMENT:

public sector spending on conservation has fallen by
42%
from its peak in 2008/9 to 2017/18



2

The state of Somerset's nature



An overview of species in Somerset

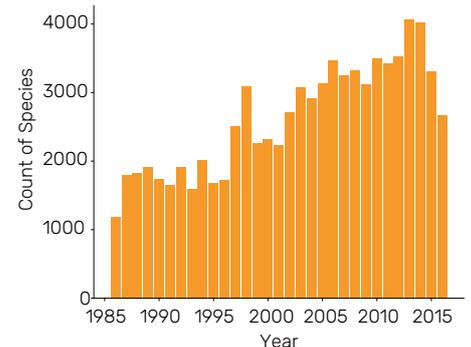
Somerset has a wide variety of species and taxon groups. Somerset Environmental Records Centre (SERC), has records for 15,775 species from 72 taxon groups, over the last 150 years. The highest recorded taxon groups in Somerset are flowering plants, butterflies, moths, and birds, all with over 100,000 records. It's also worth noting that 2,915 of these species have one data entry and 7,726 have ten or less. Due to this disparity in recording, there are certain taxon groups and species that we simply cannot comment on in any depth or draw truly meaningful conclusions on their populations. The species with the most consistent monitoring data, enough to draw abundance conclusion, is the hazel dormouse. There are more complex methods for calculating population trends over time, such as that shown in the work on weasel populations within the UK (Coomber *et al.*, 2021), however, it has not been possible to reproduce these in such a short period of time, with the weasel study taking approximately two years and a dedicated research team (F Coomber 2022, Personal communication

6th Jan). Therefore, the majority of this report focuses on species distribution changes across the years 1990-2021, drawn from presence records.

As seen in figure 1, species records are continuing to grow. We intend to continue to monitor data entry and eventually apply more detailed analysis to species trends.

When it comes to surveying, the majority is done on nature reserves which naturally creates a disparity in the spread of data across Somerset. SERC has also relied heavily on committed volunteers, who have collected and submitted species data over the last 80 years. SERC receives a large amount of data from a range of other different sources; partners, staff, and ecologists - all submitted in their own unique formats. Without a standard reporting template for data, it has been challenging for SERC to collect either full or partial records into a singular format appropriate for holistic analysis. It is hoped that plans to standardise data entries going forwards will mean that all data can be used and analysed within later versions of the Somerset State of Nature report.

Figure 1: Graph to show the number of species recorded per year, since SERC was founded in 1986 to 2016.



Notable species trends include:

- **Beavers are back** in Somerset and multiplying, with the first kits being recorded in Somerset this year.

- **313 species** are on The International Union for Conservation of Nature (IUCN) **Red List**.

- Somerset contains 60% of Great Britain's nationally **scarce spider species**.

- There are **37 invasive species** that have been recorded in Somerset and their distribution has expanded by **260%** since 1990.

- **Butterfly** distribution in Somerset has **declined by 874km²**. For fritillary butterflies this decline is 233km², a decline of 60%.

- **Great white egrets** in Somerset are reaching **record numbers**, 37 breeding pairs were recorded last year (2022).

- Other species doing well in Somerset include **wasp spiders, cinnabar moths, four-spotted chasers, orange-tip butterfly, buzzards, great spotted woodpeckers** and **goldfinches**.

The highest recorded taxon groups in Somerset are flowering plants, butterflies, moths, & birds



Changes to the distribution of Somerset's County Notable Species

The County Notable Species system has been in use by the Somerset Wildlife Trust and Somerset Environmental Records Centre since 1988 (Large, 2000) and was designed to facilitate targeted evaluation of species that were uncommon, rare or of ecological importance (Large, 2000). It incorporates species that are highlighted by national and international law and that also appeared on the then UK Red Data notable species list and Local Biodiversity Plan (LBAP) list (Large, 2000).

Somerset has recorded 1,966 County Notable Species (through all classifications), 188 of those are

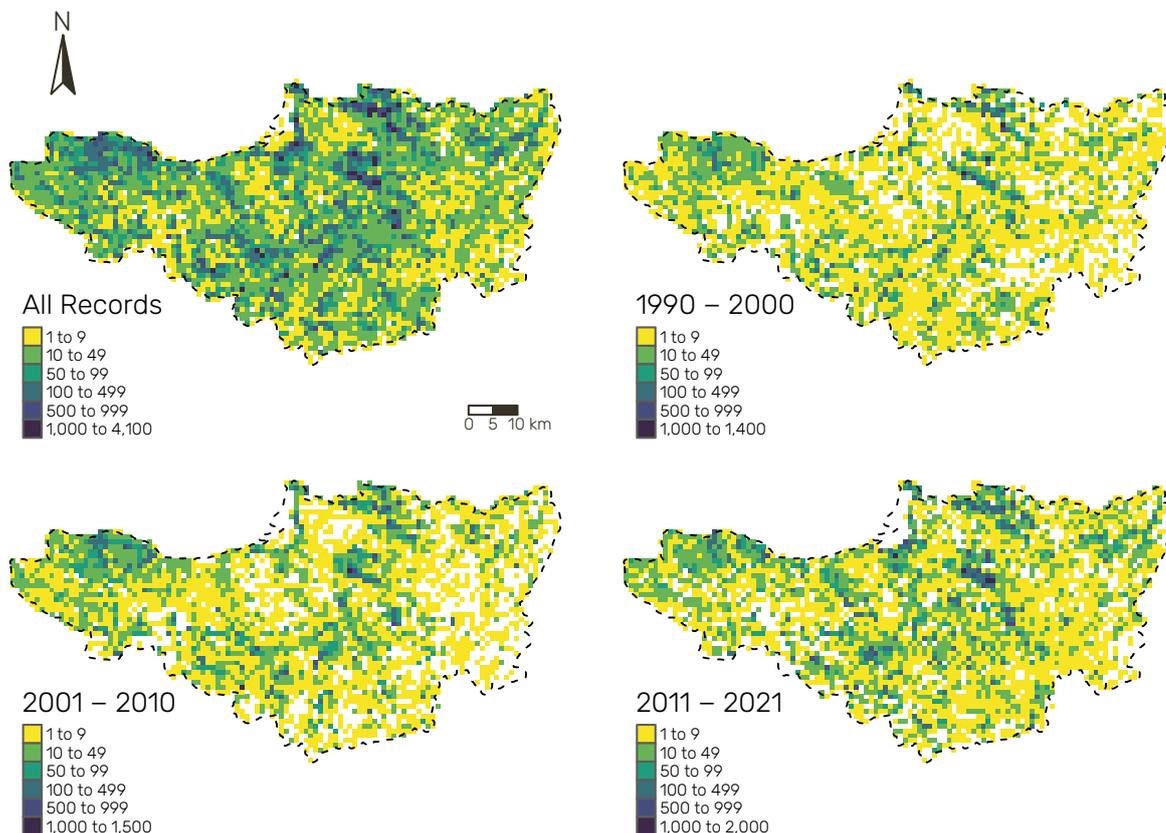
recognised as a 2007 Biodiversity Action Plan (BAP) species and 243 are Red Listed in the IUCN. There have been 284,014 records with the earliest records dating to 1888 and the latest species recorded in 2021 (records after 2021 have been received but are not within the data set used for this report). The most frequently recorded notable species are hazel dormouse and silver-washed fritillary.

The distribution change of Somerset County Notable Species from 1990 – 2020 has increased overall from 2968km² to 3123km², an 155km² change over 30 years. However, within this timeframe,

distribution dropped to 2,890km² from 2000-2010 - most likely due to species decline and significantly reduced recording effort, and then increased again from 2010-2020 likely due to the classification of BAP species. BAP species were created between 1995-1999 with 577 species selected, a new list was created in 2007 but in total, 123 species no longer met the criteria for selection, and were therefore de-listed.

County Notable Species are present in habitats across the whole of the county, so it's vital that we continue to take a landscape-scale approach with our conservation work.

Figure 2: Map showing the distribution of County Notable Species across Somerset and how this has changed from 1990-2021



Red List assessment of Somerset's species



Red List birds & flowering plants are most prevalent in Somerset compared to other taxons

IUCN and UK Red Lists offer some of the best approaches for assessing a given species threatened status. There have been 313 Red Listed species recorded in Somerset since SERC records began. Between 1950-1975 the average Red Listed species recorded, per year, was 20; from 1976-2000 it rose to 96 species per year and in recent years, from 2001-2020, it has risen to 114 (data numbers decrease from 2016 so this number is likely higher as 2001-16 the average is 134). Some of these classifications are backdated as the IUCN Red List data was not created until 1964, however the increase of Red List species in Somerset mirrors the increase of Red List species across the UK and this is of serious concern.

Red List birds and flowering plants are most prevalent in Somerset compared to other taxons. One of the taxons to recently have an update to their UK Red List is butterflies. SERC's most recorded Red List species is the meadow brown butterfly. This is now of least concern due to increased numbers, as reflected in SERC records. The black-veined white butterfly is now regionally extinct and last recorded in Somerset in 1996. Another regionally extinct species is the large tortoiseshell - last recorded in Somerset in 2017.

Threats to species come in many forms, but habitat destruction is one of the front runners for species loss. Other threats are the spread of invasive species and their ability to adapt and overtake native species. Climate change and disease also contribute, changing the diversity and nature of ecosystems.

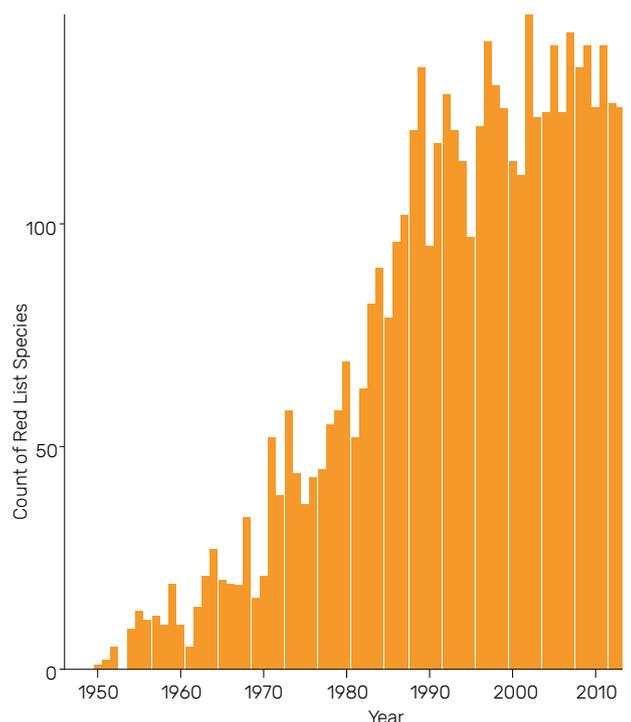
Although extinctions from Somerset are few, there are species that have not been recorded for several years. 9 species of spider are missing*, and the marsh fritillary is considered extinct from Somerset.

*Missing spider species - *Saloca diceros*, *Trichonchus Saxicola*, *Walckenaeria incisa*, *Marpissa muscosa*, *Cicurina cicur*, *Centromerus cavernarum*, *Araniella inconspicua*, *Araniella displicata*.

Shifting baselines

In the absence of past environmental information, members of each new generation accept the situation in which they were raised as being normal. Younger generations accept an environment that seems degraded to their parents and grandparents. Shifting baselines affect our perception of environmental damage and, crucially, lower our ambition about what is possible in terms of nature recovery. When looking at the data and information in this report, we should keep in mind that we are looking at information from a relatively limited time span.

Figure 3: Graph showing the number of IUCN Red List species recorded each year within Somerset





Species richness assessment for Somerset

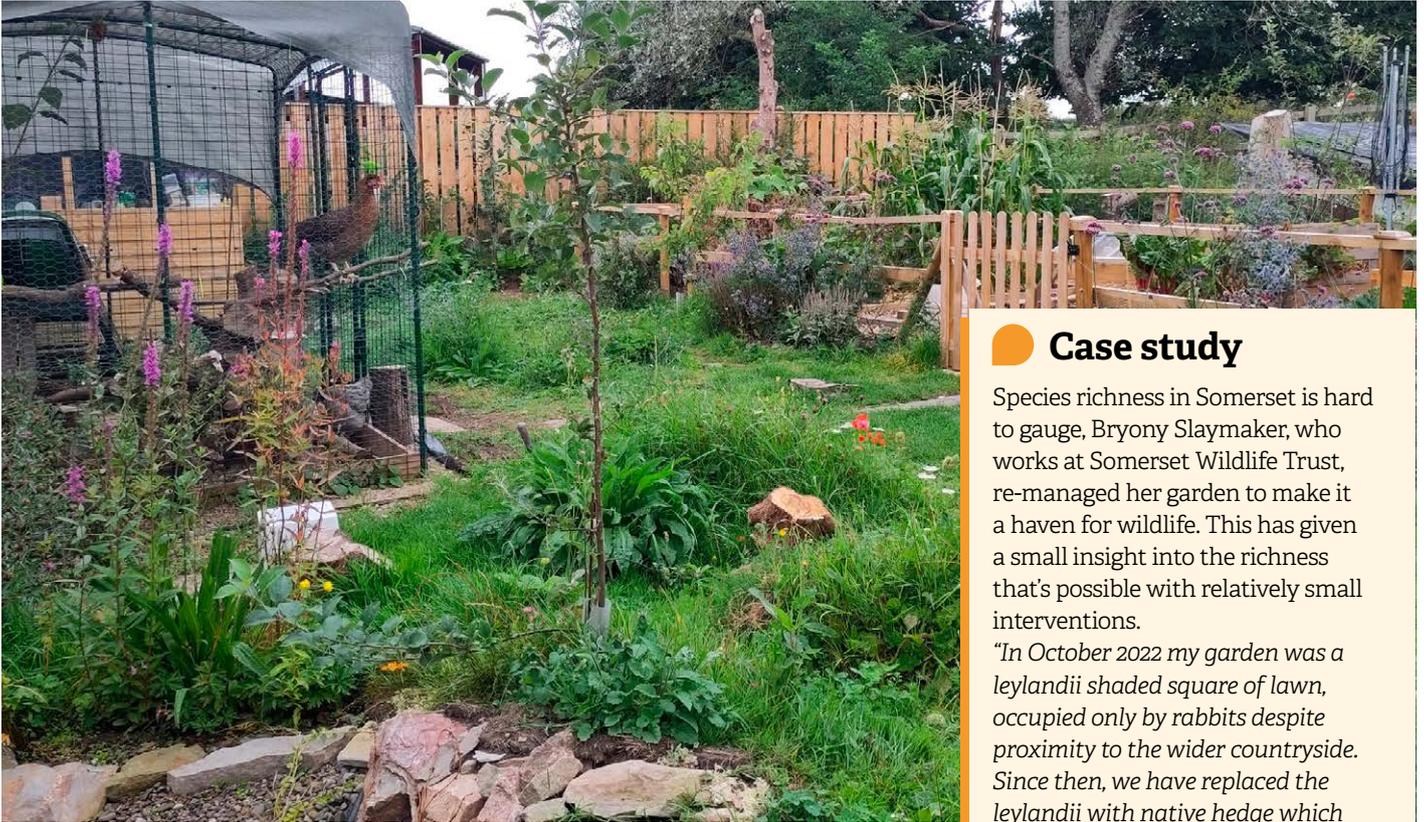
The recording of species richness in Somerset has been challenging owing to the inconsistency of recording effort over time, and the distribution of effort across the county. This has impacted on the number and type of species records being collected and thus our ability to draw meaningful conclusions and present trends and change with a high degree of confidence. In some areas in the county over 1,000 have been recorded, however, the majority has below 200 species (based on km² squares, see table 1). Overall, we currently have records from 71 different taxon groups, at least 60 have been recorded within the last 23 years, SERC has recorded just over 15,775 species with records up to 150 years old. Across Somerset, looking at iNaturalist data, 5,397 species recorded over 91,000 observations.

SERC's main challenge with assessing species richness accurately is the large recorder bias it has with species records. The disparity can be seen in the table to the right. It has more data for selected species, this means it cannot draw full richness assessments due to risks of misrepresentation.

Table 1: Looking at the comparison between number of records and recorders per taxon group within SERC's data.

Taxon Group	No. of records	No. of recorders	No. of recorders with 1000+ data entries
Flowering Plants	562,740	1,194	54
Butterflies	294,225	1,647	72
Moths	290,243	525	37
Birds	130,034	1,550	11
Amphibians	2,544	314	0
Mammals	40,073	1,624	3
Reptiles	1,866	390	0
Fungi	12,547	320	3

Extensive areas of ash trees are infected with Ash dieback



Case study

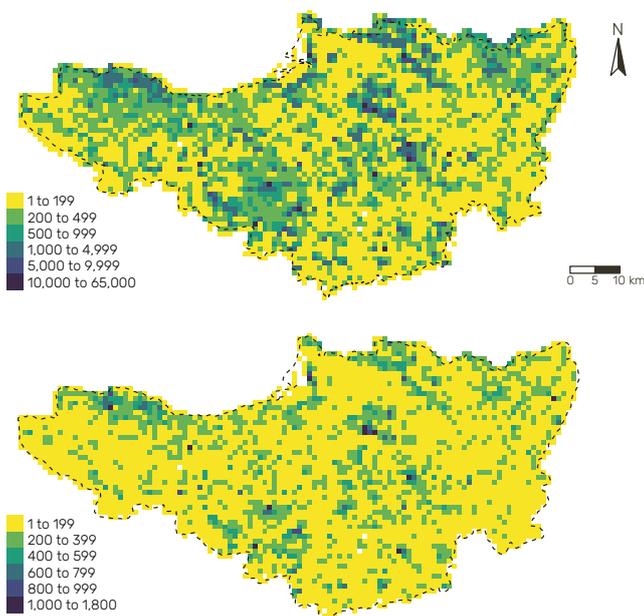
Species richness in Somerset is hard to gauge, Bryony Slaymaker, who works at Somerset Wildlife Trust, re-managed her garden to make it a haven for wildlife. This has given a small insight into the richness that's possible with relatively small interventions.

"In October 2022 my garden was a leylandii shaded square of lawn, occupied only by rabbits despite proximity to the wider countryside. Since then, we have replaced the leylandii with native hedge which provides continuity with the neighbouring farmland, installed a pond and bog area, replaced the rye lawn with meadow mix which has taken well, planted pollinator-friendly species in the beds which have been humming with bumblebees and the new kitchen garden is no-dig organic and heaving with worms."

In less than a year we've gone from recording almost nothing to:

- **51 moth species**, captured in June.
- **3 species of toad**, a **frog** and **newt** species.
- **10 species of butterfly** including comma, peacock, gate keeper and holly blue.
- **7 species of dragonflies and damselflies** including brown hawker, ruddy darter, black tailed skimmer and southern hawker.
- **Lots of birds**, blackbirds, a robin, wood pigeon and wren all nested in or bordering the garden plus the usual garden species (sparrow species, tit species).
- **A variety of plants**, lots of garden species but in the new lawn we've now got yarrow, knapweed, bird foot trefoil etc. And the hedge is 10+ natives including some ramblers.

Figure 4: Top - The number of records recorded by SERC per 1km square. Bottom - The number of species recorded per 1km square.





Birds

Bird populations have been used as indicators for the overall state of nature due to their occupation of a wide range of habitats and their response to environmental pressures. Across Europe many species have shown marked changes in distribution since 1980, in the European Breeding Bird Atlas project, 'change was assessed for 407 native species; of these, 187 showed an increase in distribution, 135 a decrease, and 85 species showed no change or an uncertain trend.' (Keller *et.al*, 2020). This variation in species has been supported by recent projects, British Trust for Ornithology (BTO), Royal Society for the Protection of Birds (RSPB), and the Joint Nature Conservation Committee (JNCC) discovered that the all-species index in the UK was 15% below its 1970 value. However farmland birds have seen the greatest decrease, 60%, and wintering waterbirds saw an 88% increase in 2021/22 when compared to 1975/76 (National Statistics, 2023)

SERC has recorded at least 343 species within Somerset and as a collective bird recording distribution has grown by 452km², a 30% increase in cover since 1990. The current distribution of SERC records is 1,938km². Individual species distribution relies on further long term monitoring, however ongoing projects across Somerset are showing encouraging signs that conservation effort has resulted in increasing populations of certain species. The Somerset Levels are seeing population success stories within wading bird species. The 2021 report of the New Colonists Monitoring Group shows the Avalon Marshes are being newly colonised by purple herons, black-crowned night herons and glossy ibis, all of them are least concern on the Red List but their populations are decreasing. The great white egret has become the first of the potential new wetland colonists to breed on the Avalon Marshes and results show they are thriving.

Breeding Bird Survey

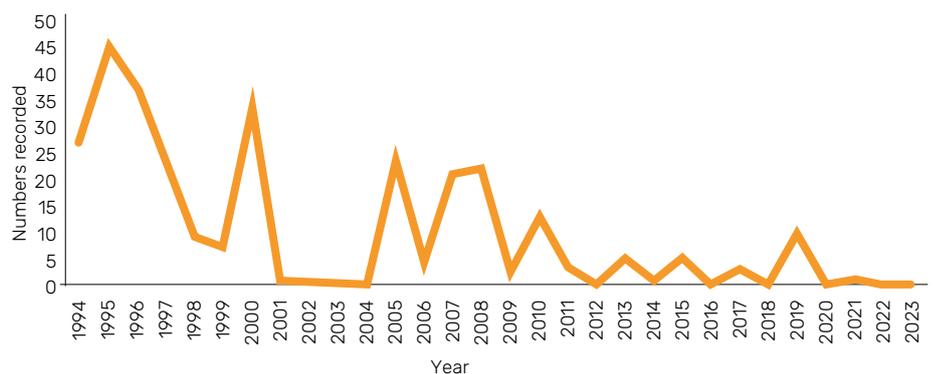
The Breeding Bird Survey (BBS; run by the British Trust for Ornithology in conjunction with the RSPB and JNCC) was launched in 1994; volunteer birders carry out standardised annual bird counts on randomly located 1km² (tetrad) sites. Each tetrad is visited twice each spring to record the presence of adult birds, giving an estimate of which species are breeding in that tetrad. Comparing these annual counts enables the monitoring of population changes of over 100 bird species. In Somerset, 36 tetrads are currently surveyed by BBS volunteers; this is approximately 0.1% of all tetrads in Somerset. The tetrads include various habitat types and are deemed to be representative of Somerset's countryside.

Since 1994, BBS volunteers in Somerset have recorded 118 bird species as possibly breeding; some many times, others just once. The most commonly recorded species is the rook (17,138 records); not too surprising as this is a colonial species. wood pigeon have been recorded 13,556 times, followed by carrion crow (11,633), blackbird (10,706) and house sparrow (10,172). At the other end of the table, water rail, woodcock and jack snipe have all been recorded just once.

Such a long running survey allows the analysis of long-term population changes. Although these are not currently available for every county, they have been published for South West England, including details of those species whose populations have changed significantly (95% confidence limits). Woodpigeon have increased by nearly 50%, with stock dove doing well too (c.35%). Interestingly, great spotted woodpecker records have increased by c.145%, blackcap by c.153%, nuthatch by c.83% and goldfinch by c.121%; raising speculation that the winter survival of these species has been affected by the increase in garden bird feeding. The most notable species for whom records have declined are swift (c.-70%),



Figure 5: Lapwing BBS records from Somerset



cuckoo (c.-80%), lapwing (c.-81%), house martin (c.-60%), willow warbler (c.-67%), and spotted flycatcher (c.-68%).

All but lapwing migrate to the UK to breed, so their populations are affected by factors far from their breeding sites.

BBS volunteers in Somerset have recorded lapwing from 13 tetrads since 1994, but individuals were recorded

in only 20 of those years. There was a mean of 9.8 birds per year. In those years when lapwing were recorded, the mean was only exceeded in half of the years. Figure 5 shows BBS lapwing records from 1994 to 2023; the decline in records is clear. This suggests that over time, the availability of suitable breeding habitat for lapwing has reduced in Somerset.

Case studies

Great white egret

Forty years ago, there was only two species of heron in the whole of the UK. Today, an incredible **seven species can be found on the Avalon Marshes** on the Somerset Levels. Grey heron, cattle egrets in flocks, little bittern, night heron to name just a few can be found in this rich wetland landscape. But in terms of sheer size, nothing is more spectacular than seeing a great white egret take to the skies for the first time. Considered an exotic visitor to British shores, in the 1970s as few as 150 pairs of great white egret were recorded across the whole of Europe. Fast forward to 2020 and more than **8,000 sightings** were reported in almost every part of England and Wales according to Bird Guides (birdguides.com), which also declared it as the 'most common rare species reported in 2020'. This has led to a change in the bird's status.



The Somerset Levels were home to the UK's **first breeding pair of great white egrets** in 2012. Since then numbers have **increased year on year** and in 2021 there were 27 known nests and a total of 50 chicks were successfully fledged. In 2022/23 this population has grown dramatically: an incredible **48 nests** were found across the **Avalon Marshes**, with four on **Westhay Moor National Nature Reserve** - the first time the reserve has seen more than two nests.

The success is thought to be down to the impact of **warmer winters** and the incredible amount of **habitat restoration and creation** that has been achieved by a range of conservation organisations as part of the Avalon

Marshes Landscape partnership, including Somerset Wildlife Trust. Great whites, and other herons, are spoiled for choice when it comes to finding feeding, breeding and nesting grounds as the Avalon Marshes offers an amazing mosaic of reedbed, fen, open water, ditches, wet grassland, wet woodland and scrub to choose from – all with reduced risk from ground predation and humans.

We need to be able to track these changing populations, which is why, early in 2023, Somerset Wildlife Trust facilitated qualified bird ringers to ring the chicks at Westhay Moor so we can follow them as they spread out into the wider landscape.



168
were recorded
in one day on
Westhay Moor

Bearded reedling

As recently as 10 years ago the total number of bearded reedlings in the whole of Somerset was probably only around 20 birds and it identified as one of the **country's rarest birds** and a target for special conservation effort.

The birds are very particular about where they live. They are only found in reedbeds, where they nest among the reed stems and feed on reed seeds and reedbed insects. **Shapwick Heath National Nature Reserve** was one of only a handful of places in the south west where the sparrow-sized birds are found and may have been attracted by the mosaic of rich wetland habitat that has been created.

A Natural England report in 2014 reported only around **600 breeding pairs in the UK in 2014** but, at the same

time however, thanks to extraordinary efforts by local volunteers, a site survey at Shapwick recorded a total of more than **170 bearded tits** or 'bearded reedlings' over a 4 week period - with over **70 birds recorded on one day alone**.

Scroll forward another five years, and **168 bearded reedlings were recorded on one day** as part of the 2019 Wetland Bird Survey just on Westhay Moor, with an overall total of **422**, testament to the enormous focus on reedbed management, habitat creation and expansion work undertaken by Somerset Wildlife Trust and all those within the Avalon Marshes Landscape Partnership. Further connection of these sites and others within the wider Somerset Wetlands National Nature reserve will hopefully see this positive picture continue.



Marsh harrier

Made **extinct in Britain by persecution** in the 19th century, the current UK population of this majestic bird has grown from a single breeding group in Suffolk in 1971. In the last fifty years, the species has **doubled the extent of its breeding range**, extending north and west with occasional pairs reaching Scotland. **590 UK pairs** were recorded in 2016. (From: marsh harrier | BTO - British Trust for Ornithology). In Somerset, although a scarce and localised breeder, numbers have been increasing for many years across the Somerset Levels generally and the Steart Peninsula.

The Avalon Marshes area however is really the county's breeding stronghold. The extensive **restoration and creation of reedbeds and wetlands** here has been a key factor in the recovery of the marsh harrier, especially by the Avalon Marshes Landscape Partnership, creating wide

areas for the species to breed and roost, feeding on small waterbirds and mammals. Counts over years by local surveyors have charted the **recovery of this species on the Avalon Marshes** nature reserves. In 2018, seven males bred with eight females to successfully raise **18 young to fledging** (Somerset Birds 2018). Five years on, at least **12 males and 15 females** were confirmed to be breeding, **11 nests** were successful, fledging a minimum of **26 young**, the highest number so far recorded (from Jeffrey Holmes' marsh harrier breeding report 2023). Two breeding pairs were recorded at **Westhay Moor** fledging three and one chicks respectively.

Conservation work to connect and create more suitable habitats as part of the **Somerset Wetlands NNR**, will hopefully help to secure the species for many generations to come.

590
UK pairs of
marsh harriers
were recorded
in 2016

61%
increase in
booming bitterns
from 2014 - 2022

Bittern

Bitterns became **extinct in the UK** at the turn of the 20th century through habitat loss, and after making a recovery in the 1950s, they were nearly lost again locally in the 1990s, due to deep drainage for **peat extraction**. They are classified in the UK as **Amber** under the Birds of Conservation Concern 5: the Red List for Birds (2021) and **protected in the UK** under the Wildlife and Countryside Act, 1981. They are also a **priority species** under the UK Post-2010 Biodiversity Framework. A second extinction was averted through concerted conservation work, led by RSPB's Bittern Recovery Project, to create and restore reedbed habitats from these worked-out peat areas, especially in the **Avalon Marshes**. This area now boasts one of the **biggest populations of bitterns in the UK**, with

regular sightings at **Ham Wall** (RSPB), **Shapwick Heath** (Natural England) and **Westhay Moor** (Somerset Wildlife Trust).

Annual bittern surveys have been conducted in Somerset for over 10 years, and feed into the national figures. These have shown encouraging increases. The 2023 count saw 38 bitterns recorded on the Avalon Marshes, and 39 in total in Somerset. In 2014, 141 bitterns were recorded at 62 sites nationally, compared to 2022 which found a minimum of **228 booming bitterns** recorded at **107 sites**. This is a **61% increase** in booming bitterns and **72% increase** in sites. This is a huge success in the growth of this species and, given the increasing number of successful nests reported across the country, it is increasingly likely that sites will become occupied by bitterns in the near future.





Mammals

The UK is home to many wild mammals, ranging from small mice to large deer. However many species have become extinct already, particularly our woodland mammals. Lynx, bears and wolves all used to roam our woodlands but are all now extinct from Great Britain. Beavers and pine martens, previously regionally extinct have, thanks to extensive conservation work, now been introduced back into England in recent years. But our current mammals are not safe. The UK State of Nature report 2023 concluded that 16% of the species studied (more than 1 in 6) are at risk of becoming extinct in the UK. However for terrestrial mammals, this figure is much higher – a hugely concerning 26%. Research led by the Wildlife Trusts indicates there has been a 30% decline in water vole populations since 2006 and hedgehogs have also

declined by an estimated 66% over the past 13 years. These declines are due to habitat loss and fragmentation, intensified agriculture and urbanisation as well as pollution, including pesticide usage. Within Somerset, common mammals are not well recorded and we lack long term data to comment on significant trends, however, average records show the potential for declined populations within the county.

The south west has seen a decline in more common species such as the red fox and european rabbit. Using SERC's recorded data, the average records per year for rabbits between 2000-2009 was 33.6; however, the average from 2010-2019 was 14.4. For red foxes this average goes from 47.2 between 2000-2009, to 22 in 2010-2019. This supports a downward trend of sightings within Somerset in the last decade.

Average rabbit records have fallen from 33.6 in 2000-09 to

14.4
in 2010-19

Case studies

Beaver

A key positive is the **return of beavers** to Somerset. Beavers are a **keystone species** which, through their ability to significantly alter their surrounding environments means that they can play a crucial role in **positively improving how an ecosystem functions**. Successful projects in Cornwall and Devon have shown the positive cost benefits to introducing beavers, based on their natural flood management and ability to restore wetlands that provide essential habitat for a wealth of plants and animals. Somerset's beaver population has seen success come in the birth of **three kits** within the Holnicote Estate in Somerset, which has experienced a remarkable change in water levels since the introduction.

In recent years there has been an increasing number of beaver sightings in the **Avon and Frome River catchments** and beyond. Successful management and integration of this population further into Somerset, requires an understanding of the distribution and number of beavers present. To provide this, Natural England commissioned a baseline survey of the beaver population on the Avon

771
beaver signs
were found on
a 2022 Avon and
Frome survey

and Frome Rivers. Surveys took place between January and March 2022 and covered over **280km of river channel**.

This survey found - A total of **771 Beaver signs** (food caches, burrows, dams, canals, sent mounds, trails and tracks, and beaver sightings) - **13 lodges**, **four burrows** and **20 dams**, although burrows will be under-recorded as the entrances are usually below the water level - an estimated **13 established territories** exist, with an additional six individual beavers who have not yet formed a mated pair - The Avon and Frome sub-catchments contained the most signs. This gives the area an estimated population of **50 beavers**,

excluding kits, with beaver territories occupy **4-11%** of available bankside and are around **7.8km** in length.

The increased populations of beavers has identified the need to develop a **Somerset-wide Beaver Strategy**; to guide and coordinate the future management of beavers across the county. This proactive strategy will ensure that all interests and impacts are properly considered to optimise the benefits that beaver activity can offer, whilst mitigating potential damage and conflicts.

The strategy will be developed through local partnership and will be launched in 2024.



Harvest mouse

In Spring 2023 we discovered **22 maternity harvest mouse nests** on Catcott - the last record of harvest mice on the reserve was in 1997

Hazel dormouse

Hazel dormouse is the only species undergoing regular monitoring that allows a more accurate estimate of species distribution. Figure 6 shows a slight change in distribution, the areas inhabited have become **more compact**. There is a clear divide from the **northeast populations** to the **southwest populations** and further distribution within the southwest area of Somerset.

Not only has distribution changed in recent years but **number of sightings has reduced**, figure 7 shows the average sighting of an individual per survey conducted throughout each year. This indicates a reduction in the probability of seeing a dormouse during a survey, with a drop in population that then stabilises. Since 2016 **sightings have fluctuated** and further analysis is needed to see if the likelihood of sightings is increasing.

Fragmented habitat causes distribution challenges. Hazel dormice are considered a rare and vulnerable species due to a decrease in the quality and extent of suitable habitats, development and the building of more roads which they cannot cross easily. To help address this, Somerset Wildlife Trust have partnered with National Highways to launch a new project, **Dormouse Reconnected**, part of the Network for Nature programme that will improve habitats across England, benefiting people, nature and wildlife. They are working with Animex International to pilot the installation and use of **wildlife bridges along the M5** near Taunton, to help reconnect isolated populations of **critically rare hazel dormice** with wider populations towards the Blackdown Hills.



The number of dormouse sightings has reduced

Figure 6: Map showing the distribution change of hazel dormouse data between 1990-2021.

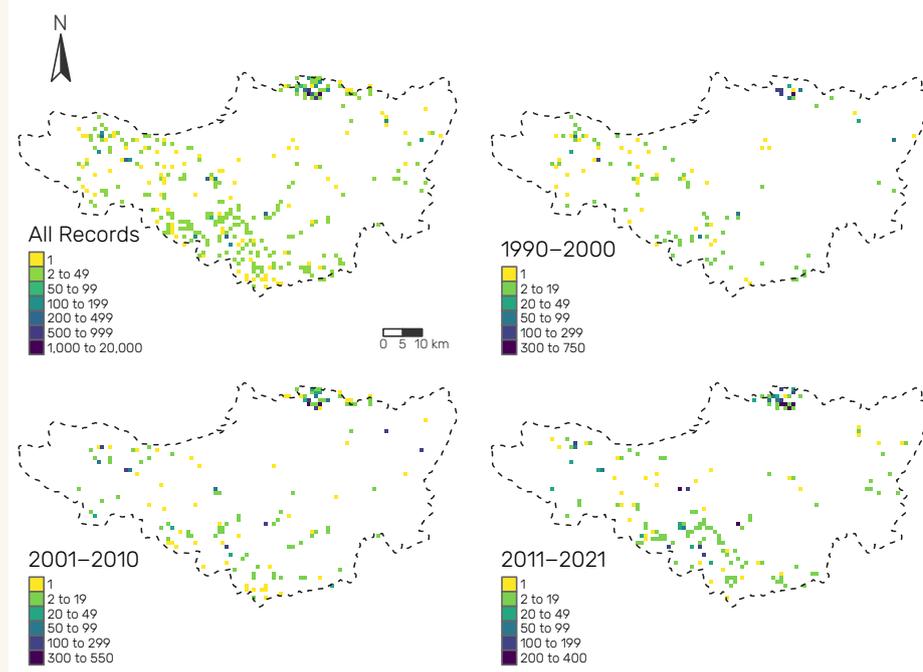
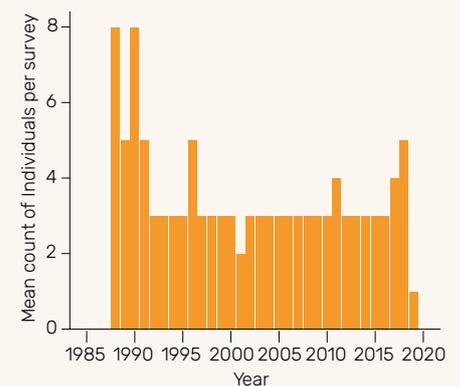


Figure 7: Mean count of individual hazel dormouse sightings per survey, per year.



Bats

Somerset is home to **16 of the 18 species of bat** resident in Britain making it one of the best counties for these mammals. These include the **grey long-eared bat**, **lesser horseshoe** and **greater horseshoe**. Bat data is difficult to gather as species are difficult to determine without proper equipment or specialist help while surveying, therefore a large majority of data received has unspecified classifications of 'bats', 'unidentified bat' or 'bat species'. This makes exact species numbers difficult to determine. The species with the most records within Somerset is the **lesser horseshoe** bat closely followed by the **common** and **soprano pipistrelle**.

Lesser and greater horseshoe bat distribution has been analysed and in 1990-2000 their distribution was **145km²** across Somerset. Within the next 20 years, this distribution has **expanded to 329km²**, more than doubled. There has been more survey effort recently for horseshoe bats but their increased presence across Somerset has positive connotations and further long-term analysis can draw on this.

Two Special Areas of Conservation (SAC) for horseshoe bats have been designated on Mendip. These are the **Mells Valley SAC**- selected on the basis of its exceptional greater horseshoe maternity roost, which comprises approximately **12% of the national population**. A proportion of the population also hibernates at the site. The second is the **North Somerset & Mendip SAC** designated for greater and lesser horseshoe bats. There is also some sign of the greater horseshoe extending their range in the county with more turning up in the south away from their main strongholds in the Mendip Hills. The success of the larger species does however have a detrimental effect on their smaller cousins at a roost level.

Grey long-eared bats are migrating across the south of England - SERC have 21 records over the last 60 years. A new study by the Somerset Bat Group, with support from SERC and Somerset Wildlife Trust, is set to determine the extent of this species distribution and population within Somerset.

PROTECTING SOMERSET'S BAT POPULATION -

Changes in **land use** over the past few decades such as **development**, more **intensive agriculture** and changes to **farming practices**, have led to impacts on bats through **habitat loss, fragmentation**, the **destruction of roosts** and **pesticides**.

Supporting bat populations by creating **grassland habitats** that can be grazed well by cattle is vital. **Cattle dung** attracts important food sources such as **dung beetles** – the larvae of which are particularly important for young bats that are making their first feeding flights. **Hedgerows**, which act as linear route maps, need to be improved to enable bats to hunt for food and conserve and enrich our woodland habitats, such as by regular coppicing work and maintaining rides and glades.

Protecting our **urban bat populations** is just as crucial as those in more rural areas. **Taunton** plays host to significant populations of common species such as pipistrelles, but it also has a confirmed population of the **Leisler's** bat, thanks to better identification techniques, and also lesser seen species such as the **serotine** bat. Working with planners and developers to ensure that bats can navigate safely across the town to feed and breed is as important as **connecting the town's green spaces and waterways** and creating and enriching habitats to host healthy urban bat populations.



New roosts of both **bechsteins** and **barbastelle** bats have been uncovered by survey work related to the proposed A358 expansion, but some are likely to be impacted by the same road building

Reptiles and amphibians

All native British amphibian and reptile species have previously been assessed as 'Least Concern' on the IUCN Red List, on both global and European scales. However, a recent report by Amphibian and Reptile Conservation has discovered that 4 out of 13 species (31%) of Great Britain's amphibian and reptile species are threatened with risk of

extinction. These taxon groups are smaller and less well known than mammals and birds, but, are still experiencing the same declining trends. Those at risk include even common species, common toad populations have declined across the UK by 68% over the past 30 years and adders are also experiencing significant declines.

Case studies

Adders

Adders are generally **uncommon** in Somerset and believed to be declining. There is a plethora of anecdotal evidence, within living memory, of adders occupying sites across the county where they can no longer be found. Today there are three areas of the county where significant numbers can still be found, the **Mendip Hills**, **Quantock Hills** and **Exmoor**.

On the Mendip Hills adders are relatively abundant at a number of sites on the western end of the range within the Mendip National Landscape including on a few sites west of the M5 motorway, but despite anecdotal evidence of populations on the eastern end of the Mendips they are, at best, exceptionally rare anywhere east of Shepton Mallett.

While not as abundant as they are on the Mendips, adders can be found on the Quantock Hills, primarily on the heathland habitat covering the plateau of the Quantock Common and the western slopes. In his book 'British Serpents' published in 1901, Gerald Leighton refers to a labourer who claimed to have killed as many as fourteen adders in a single day on the Quantocks. It is improbable that anyone could find such numbers of adders anywhere on the Quantocks today.

As well as these three sites there are also small numbers of adders on the **Blackdown Hills**. Most of the favoured south facing slopes of the Blackdowns lie over the county boundary in Devon, so suitable habitat is limited in that part of the Blackdowns lying in Somerset. Consequently, populations are small and there is some evidence that they are declining.

From the locations mentioned you could be forgiven for thinking that adders are specialists of high ground. That is not the case and there would once have been populations of adders occupying suitable sites in the lowlands of Somerset. These populations are now all but gone, most displaced by **intensification of agriculture**. The only potentially viable lowland population known in Somerset now resides in the Brue Valley.

Prior to commercialisation of **peat digging** there would have been extensive suitable habitat for adders in the fens, mires and wet heaths of the peat moors. These have now been replaced with large water filled diggings managed as lakes and reedbeds, which do not provide suitable habitat, yet still adders persist. The population in the Brue Valley is



highly fragmented, but small numbers of adders can be found in

Shapwick Heath reserve, **Ham Wall** reserve, **Street Heath reserve** and **Westhay Moor** reserve. Sadly there have been no sightings of adders at **Catcott Heath** for more than a decade, and the largest hibernaculum in the valley, located within Shapwick Heath reserve, appears to have been abandoned within the last few years. This is probably the most threatened population of adders in the county and if it is to remain, urgent conservation action will be needed.

Periodically, adders are reported from other lowland sites around the county. Some of these are impossible to verify and may be the result of misidentification, but occasionally genuine sightings occur in parts of the county where adders are not expected to be found. Adders are long-lived, so some of these may represent the relic of a population that once existed on or near the site, or alternatively, they may represent a functioning population that has not yet been discovered. However, the lack of suitable habitat across the lowlands of Somerset makes the latter explanation unlikely.

Great crested newt

Nineteenth century naturalists described the great crested newt as 'common in ponds and ditches in Somerset'; a description that would not be accurate today largely due to the rapid loss of ponds across the landscape during the twentieth century. Nevertheless, the species is still **widespread across most of the county** and although their distribution is **localised and patchy**, where they do exist they are sometimes found in significant numbers. There are however parts of the county where they are absent.

They are entirely **absent from the far west of the county**. There is a boundary to their westward distribution that runs north/south approximately between Wiviliscombe and Watchet. The furthest west we have found them is at Kittisford in the south of the county and Willett further north. While their absence from Exmoor is not entirely unexpected, the species being better adapted for lowland conditions, this boundary **continues southwards through west Devon** excluding the species from the **entire South West peninsula**, which is curious.

The species is frequently encountered in the Vale of Taunton, the Yeovil Scarplands, and the mid-Somerset hills, wherever suitable ponds exist, and are particularly abundant on the coastal clay belt around Bridgwater, where many are currently getting displaced by extensive development.

They are not as common as might be expected on the wetlands of the Somerset Levels and Moors, across the central part of the county, largely because the connectivity between the watercourses, together with the propensity for flooding, facilitates dispersal of fish, leaving few water-bodies fish-free. **Predatory fish** will often exclude great crested newts from ponds.

In the east of the county the species is still relatively abundant throughout

Selwood, wherever agriculture is not too intensive and habitat offers good foraging opportunities.

Extensive surveying on the Mendip Hills has demonstrated that populations of great crested newts are **fragmented** into small isolated pockets too far distant from one another for any **interaction** to occur between them. To aggravate their isolation, these populations are often reliant on just a **single suitable breeding pond**, greatly increasing the probability of local extinction.

These circumstances are likely to be replicated in many parts of the county as ponds that provide natural stepping stones between populations have been lost.

In the Mendip Hills, work is underway to reconnect these isolated populations by **restoring derelict ponds** to create a network across the landscape. Ponds drying out during occasional **drought** years may be beneficial to stem predatory fish populations, if it does so too regularly this creates an

300
ponds have
recently been
created in
the county

additional problem - something that will undoubtedly become of greater concern as we face more **disrupted weather patterns** and **extreme weather events** - so creating that network is increasingly important. A new offsetting scheme, administered by Natural England, has seen the recent creation of over **300 ponds** in the county, which may provide a boost for great crested newts in several regions, to mitigate for populations lost to development elsewhere in the county.



Terrestrial invertebrates

Invertebrate taxon groups contain a wide variety of important species, many of which are indicators for habitat quality and overall species ecosystem. Insect data is the most detailed data within SERC as they are surveyed more than other species/taxon groups. Many insects have their own specialist recorders, for example the Somerset Moth Group and Somerset Butterfly Group. Having more data on certain groups therefore presents a discrepancy when looking at this group as a whole.

Insects have some of the largest disparities when it comes to recording numbers, this is spread through all orders. Within the SERC data, table 2 shows how there are significantly more species with over 250 records within the Lepidoptera order.

62%
of the terrestrial
invertebrate species
have under
10 records

There are a significant number of species with below 10 recordings, 62% of the terrestrial invertebrate species have under 10 records. For some of these species, this is because they are rare, but for most we don't know their status due to lack of recording and monitoring. For this reason, we've chosen to focus on spiders and butterflies specifically within this section.

While insects are doing appallingly in general, the places we find good results are where a concerted conservation effort has gone into saving a particular species or where a species benefits from this effort. For example, the large blue butterfly on the Polden Hills has done well since funding and effort has been dedicated to its reintroduction and the restoration of its short grassland habitat. The rugged oil beetle in turn has benefitted from the same, short, grassy conditions and is being increasingly found where grassland is managed in this way.



Table 2: Spread of invertebrate data across SERC and the variation between order data and species recording.

Order	No. of species	No. of species with <10 records	No. of species with >250 records
Coleoptera (Beetles)	894	693	9
Lepidoptera (Moths)	1511	650	251
Lepidoptera (Butterflies)	59	12	38
Diptera (Fly)	1411	993	5
Hemiptera (True Bugs)	243	180	1
Hymenoptera (Insects)	549	367	13
Odonata (Dragonflies and Damselflies)	34	8	11

Case studies

Shrill carder bee

The shrill carder bee (*Bombus sylvarum*) is one of the UK's **rarest bumblebees**. Once widespread throughout Southern England, it is now restricted to just **5 populations** in England and Wales, one of which is South Somerset. Historically pre-2010 the Somerset population was centred around the **Avalon Marshes** complex, but it has not been recorded there for many years. Records from 2012 – 2022 show the core population has retreated to the **South** of the county to an area between Ilminster-Yeovil-Somerton-Castle Cary. Scattered records have been found across this area, suggesting a relatively extensive distribution but a very **low population density**. This is in comparison to other populations in the Thames Estuary and South Wales that are thriving. The total record numbers for Somerset show a worrying **decline**, with a peak in numbers in 2015 of around **140** individuals to just **7** individuals in 2022. It is possible that limited monitoring, however, is partly responsible for the low number of records.

The shrill carder, like other bumblebee species, rely on a mosaic of **diverse hedgerows and field margins, species rich meadows, clover filled pastures** and



flowering ditch banks to provide all the life cycle requirements (foraging, nesting, hibernation) for resilient populations. Loss of these habitats due to **changes in land use**, the rise in **improved grasslands** for silage and grazing, and changes in **traditional management practices** have had a big impact. The shrill carder is particularly affected due to the **timing** of their peak activity in July and August

coinciding with harvesting, grazing, and verge and hay meadow cutting, resulting in a huge loss of forage all at once. Bumblebees are affected by **pesticide** use and loss of **genetic diversity** when populations become small and isolated from each other. **Climate change** is also likely to have an impact as bumblebees cannot forage in extreme temperatures, and prolonged flooding effects their nests which are at ground level.

The Bumblebee Conservation Trust launched a new 'Save our Shrills' Somerset Project in 2023. The project aims to help landowners and farmers create, restore, and maintain flower rich habitats that are connected across the landscape to support rare bumblebees. The project will also be monitoring the shrill carder population and working on engagement and training opportunities with local communities.

Record numbers for Somerset show a worrying decline

Large marsh grasshopper

The large marsh grasshopper is the biggest and **one of the rarest** grasshoppers. The degradation and loss of their preferred habitat, fens and peat bogs, has **constricted their range** considerably. Until recent years, it was thought to survive almost exclusively in the valley mires and wet heaths of the New Forest and Dorset. However numbers of individuals have been recorded in the mires and wet grasslands of Somerset,

more specifically in the **Avalon Marshes** at Shapwick NNR, Westhay Moor NNR, Westhay NE land, Tadhams NE and SWT land. This is not surprising as the **wet communities** they inhabit in Somerset have a similar soil moisture levels to the mires and bogs of Dorset and the New Forest – winter flooding is a requirement for the eggs. They have also been recorded at Priddy Pools in the **Mendip Hills** and on Ringdown on the **Blackdown Hills**.

A number of individuals have been recorded in Somerset

● Rugged oil beetle

The rugged oil beetle is a **nocturnal insect**, active in the autumn and winter and known for its extraordinary lifecycle. Its first stage larvae climb up flower stems and lay in wait in a flower for passing solitary bees. They then attach to the bee with a special hook on their front legs and hitch a ride to the bees' nest where they feed on the stored pollen intended for the bees' young, emerging when they are developed. Sadly nationally this beetle has been experiencing a **dramatic dip in its population** due to the **decline in bee populations** and calcareous flower rich **grassland** being used for **agricultural** purposes.

Somerset Wildlife Trust's Poldens grasslands are managed carefully for a range of species, including butterflies and other invertebrates, so it was pleased at the end of 2021 to discover the **first rugged oil beetles ever recorded in the Polden Hills** on its Green Down reserve. Prior to 2021, the only known population in Somerset was in Bruton. The survey group found a healthy population of over **50 adult beetles**. These, and those from another survey conducted in the Mendip Hills which counted **20 adults**, represent the largest number of recorded adults for many years in the county.

The survey group found a healthy population of over **50 adult beetles**



● Spiders

138 rare species and species of conservation interest have been recorded in Somerset. It has **18 species** of spider that are **Vulnerable to Critically Endangered** under the IUCN, and contains **60%** of Great Britain's **nationally scarce** spider species. Within Somerset **97 species** of spider are **nationally scarce** and **22 rare**.

Their distribution is varied through Somerset, however, rarer species have been found across the Somerset Levels and Moors, Exmoor and the Blackdown Hills. One special area that should not be overlooked is the **tidal river habitat**, e.g., the Parrett and Tone, as it holds several rare species. A species whose occurrence in several wetland sites on the Somerset Levels and Moors, that is worth highlighting, is **Gongylidellum murcidum**. It has now been found at so many local sites its status is changing and the Somerset population now stands out on the national map. Away from the Somerset Levels, Exmoor

and the Blackdown Hills, there are two other habitats important to the spider species in Somerset. The first is the Berrow Dunes where the sand dune habitat holds several special species, the second is short, turfed limestone grassland like Mendip and the Poldens. The only critically endangered species, *Typhocrestus simoni*, has been found on Mendip and the Poldens.

Somerset contains **60%** of Great Britain's nationally scarce spider species



Butterflies

This document highlights the worrying declines in our butterfly populations. **80% of the UK's butterflies have decreased** in abundance and/or distribution since the 1970s. The groups most reliant on specific habitats to complete their lifecycles are the ones to have declined the most. The habitat specialists are the ones that have declined the most. As a group, have seen their **abundance decline by over one quarter (27%)** and their **distribution decline by over two-thirds (68%)** since 1976.

Butterflies are sensitive to environmental changes and make a good indicator group for ecosystem quality assessments. Since 1990, based on the survey range, total butterfly distribution in Somerset has **declined by 874km²**, habitat destruction, fragmentation, and poor-quality impact butterfly populations. Survey's there have shown a **general move north-eastward** and clustered populations forming. Although overall data entries for butterflies are increasing, the mean number of individuals sighted per survey has been decreasing. Between 2011-2016 the average sighting was 4 individuals per survey, when data entries for these years all exceeded 15,000 records.

Fritillary butterflies have been declining throughout Britain, three species are considered endangered, three vulnerable and one is near threatened (Fox and Dennis, 2021). Our results confirm these findings are also seen within Somerset; **fritillary species combined have seen a 60% (233km²) decline** in distribution since 1990. Mean individuals sighted per survey has also fluctuated within the past 20 years but generally is seeing a downward trend. The marsh fritillary butterfly was last recorded here in 2016, its absence in seven years could imply extinction from Somerset.

However, there are some success stories. **Large blue** butterfly populations trends in the Polden Hills have been increasing. The large blue IUCN status has improved dramatically, with its status changing from **critically endangered to near threatened**. Somerset's work on this species has contributed to this change in classification.

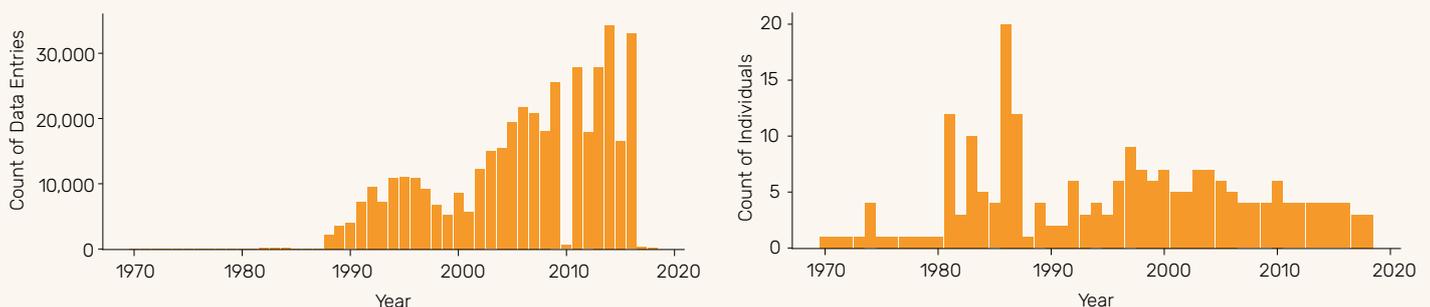
To track populations of butterflies further, consistent species monitoring needs to be done not just across the reserves and designated sites but the whole of Somerset. **SERC has recorded**

Of the species recorded within Somerset, **4** are endangered, **11** are vulnerable and **3** are near threatened

almost 250,000 butterfly records, from at least **59 different species**, within iNaturalist there are currently (Oct 2023) **5,968 records** from **41 species**. Of the species recorded within Somerset in the last two decades, based on the revised Red List of British Butterflies, **4 are endangered, 11 are vulnerable** and **3 are near threatened**.

We've highlighted some species that long term monitoring and further survey effort would be beneficial for.

Figure 8: (left) Count of SERC butterfly records (all species) between 1970-2018. (right) Average number of individual butterfly sightings per survey, per year between 1970-2018.



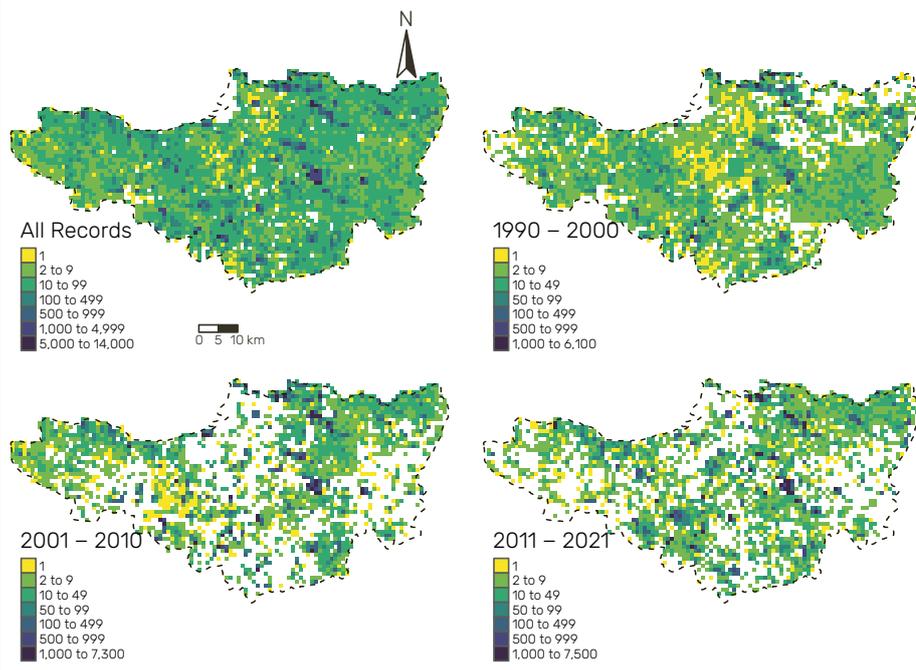


Grizzled skipper (*Pyrgus malvae*) – This species is county notable to Somerset, is a UK priority species and a species of principal importance. Somerset records have fluctuated between a low of 40 records and high of 170 between 1999-2016, with a peak in 2011 (this seems to be down to increased survey effort in this year). Their distribution trend since 1970's is -53%, they are now found mostly within the south of the UK so it's important to find out how key Somerset is for this rare species. iNaturalist data in Somerset shows 2 individuals have been recorded this year (2023), both on the Mendip Hills.

Wall brown (*Lasiommata megera*) – This species, is of principle importance under the NERC Act in England, is a UK priority species and Butterfly Conservation has labelled it priority as high. The wall brown butterfly has moved from Near Threatened to Endangered status, thus making the Somerset populations vital to the survival of the species. SERC have 1689 records, between 49-168 records per year between 1999-2016. In 2023, using iNaturalist, this species has been recorded in Minehead Exmoor (x2), Quantock Hills National Landscape (x2), Mendip Hills National Landscape (x2) and Bridgwater (x1), specifically Pawlett (x2) and Wells (x1). This is the highest year of recording wall brown on iNaturalist.

80%
of the UK's
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or distribution
since the 1970s

Figure 9: Map showing the distribution change of butterfly data between 1990-2021.





Large blue The large blue had become extinct in the UK by 1979 despite 50 years' of conservation efforts, but was successfully re-introduced from 1982 onwards, once ecological research had identified the key driver of decline (specificity to the red ant *M. sabuleti*, which was disappearing due to agricultural changes) and how to rectify this (Thomas, Simcox & Hovestadt, 2011). It was successfully re-introduced to Green Down in 1992 using caterpillars translocated from Sweden. The butterfly is now well established across the East Polden hills, arriving on sites either through further reintroductions or natural colonisation.

The success of the re-establishment of the butterfly is due to a long-term, harmonious collaboration of a wide body of conservationists and scientists, supported by many committed volunteers. The population in Somerset is fairly stable. However, there are

some significant cyclical fluctuations in the population, influenced primarily by the weather. In peak years, large numbers of large blue caterpillars will deplete their host ant population, often leading to a population crash the following year. The population will then build up again over the next few years. 2018 was a notable peak year with 251,961 large blue eggs counted on Green Down. There is scope for the population to expand in Somerset by bringing more suitable calcareous grassland habitat into prime condition, both in the Poldens and in other parts of the county.

The large blue population is monitored using a method of counting eggs laid on their food plants, wild thyme and wild marjoram. Large blue females lay an average of about 51 eggs. The core sites are monitored annually, with additional sites being monitored as resources allow.

The large blue population is monitored using a method of **counting eggs** laid on their food plants

Brown hairstreak The largest of the five British hairstreak butterflies, the brown hairstreak, *Thecla betulae*, is declining across the UK. These elusive butterflies are priority species listed in Section 41/42 of the Natural Environment and Rural Communities Act (2006) and are protected under the Wildlife and Countryside Act, 1981. Monitoring them has proven difficult due to them flying high in the canopy or hidden within hedgerows. As adults are so rarely seen the best way to monitor them is to count the eggs in winter - a painstaking task but one that does the job and helps track the fortunes of this beautiful butterfly.

These tiny 0.6mm eggs are evolved to withstand the harshest of winter conditions and shelter the developing larvae within, by late April they are

tiny caterpillars and complete their metamorphosis in late July, emerging as beautiful brown-winged adults with spectacular orange patterned undersides with delicate white lines.

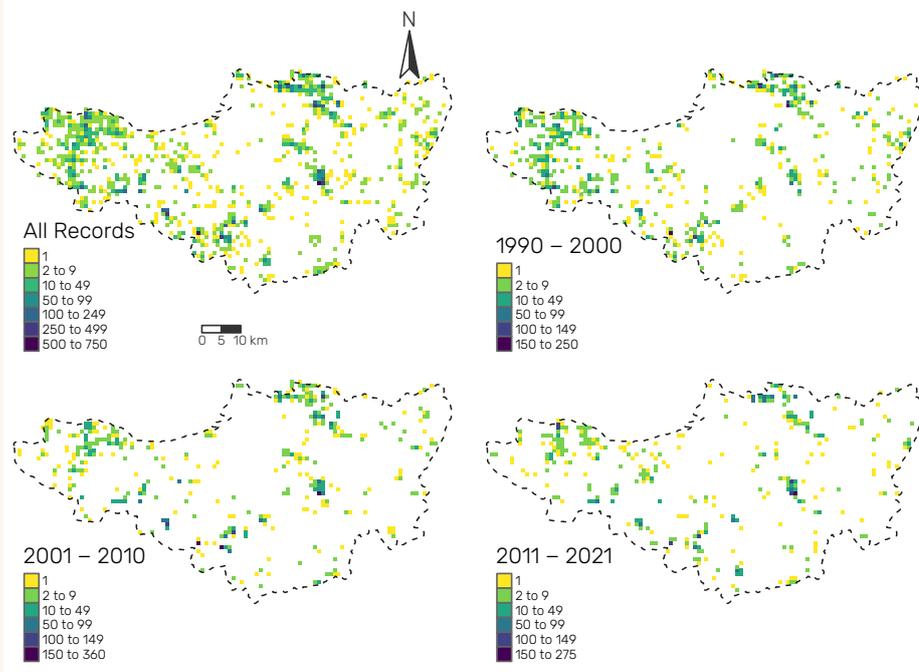
Owned and managed by Somerset Wildlife Trust and Somerset County Council, Netherclay Community Woodland is a Local Nature Reserve. Thanks to years of dedicated care and management, coppicing and the planting of native broadleaf trees and shrubs including oak, ash, wild cherry, blackthorn, hazel and field maple this 24.4 acres of former agricultural land became the best site in Somerset for the brown hairstreak. Work at our Jan Hobbs Nature Reserve has also seen signs of positive population increases of this rare invertebrate. The last few years however have



been poor years in terms of numbers and an egg count of just 88 eggs was recorded at Netherclay in 2021. This is likely to be due to the extremes of weather we have experienced due to the impacts of climate change.

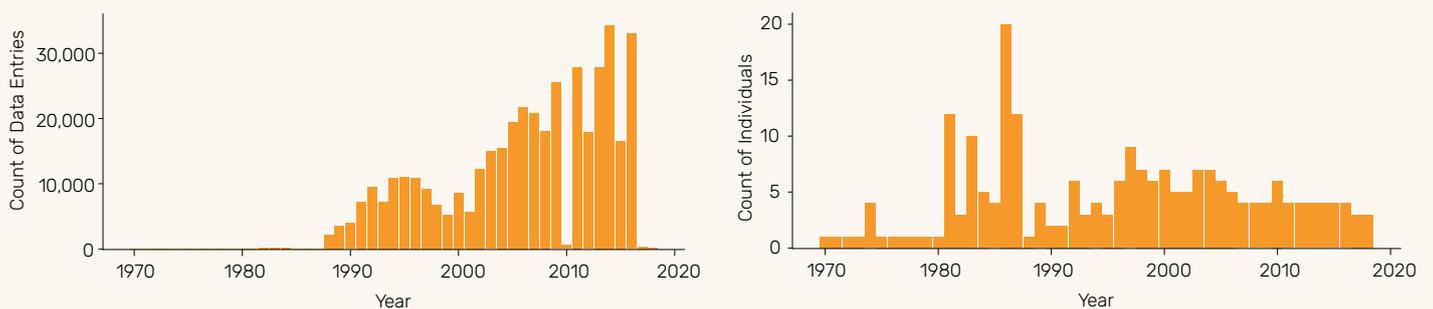


Figure 10: Map showing the distribution change of fritillary butterfly data between 1990-2021.



Fritillary species combined have seen a **60%** decline in distribution since 1990

Figure 11: (left) Count of SERC fritillary records between 1970-2018. (right) Average number of individual fritillary sightings per survey, per year between 1970-2018.





Flowering plants

Somerset has a wide variety of flowering plant species. There have been over 2,185 species recorded by SERC, 59% of these have fewer than 10 records. The five species with the highest number of records are common nettle, hawthorn, ribwort plantain, white clover and creeping buttercup all with over 5,000 records. Frequent monitoring

There have been
over 2,185
species recorded
by SERC

of flowering plants has become increasingly difficult due to lack of resources over recent years.

'Britain's Changing Flora, A Summary of the Results of Plant Atlas 2020' states that over recent decades some plant species in southern Britain are expanding their ranges northward due to habitat loss and the reduced frequency and severity of winter frosts (Walker et al, 2023). Climate change is becoming an ever greater factor in the change of flora across Britain. This has been seen recently in a study conducted by Simon Leach and the Somerset Rare Plant Group during the Covid-19 pandemic. They found that in the spring of 2020, 'first blooming dates were, on average, c. 4 weeks earlier than those recorded by Somerset botanist Walter Watson almost a century ago, and

c. 2 weeks earlier than those recorded in the Taunton area during the decade 2008-2017' (Simon Leach, 2023).

Plant species have also been severely impacted, with plant extinctions estimated to be twice the combined number of mammals, birds, and amphibians (Lambertini, 2020). On average, two plant species have gone extinct annually for the last 250 years Humphreys *et al.* (2019), and currently 22% of plant species are threatened with extinction (Lambertini, 2020). Even common and abundant species are facing conservation concerns.

More work needs to be done on consistent widespread monitoring of flowering plants so that distribution and abundance can be analysed across Somerset.

Case study

● Corn buttercups

18,000 corn buttercups were found on one of the Fivehead Arable fields during a rare arable plant survey training day by Plantlife. They are critically endangered and found in **fewer than 30 fields** in the UK and are at **risk of extinction**. Fivehead is host to many nationally rare and endangered arable plant species including the corn buttercup and spreading-hedge parsley, broad-fruited cornsalad, broad-leaved spurge and shepherd's needle.

Corn buttercups
are found in
fewer than
30
fields in the UK



Fungi and lichens

SERC has 1,424 species of fungi recorded, however 77% of species have fewer than ten records, with waxcap species being the most frequently recorded. More work is being done within Somerset Wildlife Trust to help increase data on fungi. The iNaturalist Big Count project from 2022 and 2023 has brought in more observations for species we have little data on. This year in June, 154 records comprising of 54 species of fungi were added to Somerset's data due to the initiative.

On Exmoor, 31% of lichen species recorded during its pre-industrial period had not been recorded since 1960, with up to 38% of species inferred to be lost. Lichens are a valuable species as they are indicators of habitat quality.



Coastal species

The marine, intertidal and coastal fringe habitats have been less surveyed or monitored than other habitats and this affects the species records within these areas. However, from 2018, thanks to several grant funded projects, Somerset Wildlife Trust has been able to carry out a detailed biotope survey of intertidal habitats along the coast. It is continuing to map and record these diverse and important habitats with the help of a number of trained volunteers as part of the national Wildlife Trust national Shoresearch survey programme, and sea mammals in conjunction with the Sea Watch foundation. It is vital that this work to build up baseline data continues so we have the data we need to make the best decisions for Somerset's coast. This survey recorded sightings anemones, sea squirts, sea mats (bryozoans) and sea firs (hydroids). Somerset's coast is home to the stalked jellyfish, a new species for Somerset and one of conservation importance nationally. Many crab species have been recorded, although only the common

shore crab is found abundantly along the whole coast. This infers a reduction in coastal habitat quality. To help monitor this, Somerset Wildlife Trust have selected three target species to monitor to aid a more accurate representation of the conditions of coastal species and habitats.

It's vital that this work to build up baseline data continues





Common/Toothed/Thick Topshell (*Phorcus lineatus*) - In Somerset this is **one of the commonest gastropods** at our more westerly rocky shores (Porlock Bay) but as you go eastwards it numbers drop significantly and is absent from most easterly sites (Brean Down). It can be easily counted, measured, and approx. aged so growth rates can be calculated. Its range/abundance may be affected by **sea temperature** and possible **sea level rise**, other abiotic factors (silt load, light levels, salinity) also affect it.



Pacific oyster (*Magallana gigas*) - This species is a major problem as an **invasive species** in Cornwall and Devon but is far more prevalent in Somerset than previously thought. Current monitoring of their distribution and size will ascertain if they are on the **limit of their ecological range** in the Bristol Channel, or, whether they are increasing and may become a problem in the future.



Honeycomb reef worm (*Sabella alveolata*) - A segmented worm that builds tubes from sand or shell fragments, this species has built extensive reefs all along Somerset coast (Minehead to Hinkley), mapped as **key habitat** as part of the biotope surveyed, we carried out in 2016-18. They were a BAP species and their reefs are a **good habitat for other species**.

Eels

This once abundant fish has **declined by 90-95%** since the 1980s across the Somerset Levels and Moors due to **over-harvesting, poaching** and **physical water control structures** such as tilting weirs and tidal barriers stopping them from moving upstream and are classified as 'critically endangered' on the IUCN Red List of Endangered Species. **Industrial chemicals** such as PCBs accumulating in their fat stores, parasites, viruses and diminished fat stores due to lack of food may also contribute towards lower survival.

Eels lead one of the most remarkable lives of any of Somerset's fishes. They migrate downriver into the open ocean to breed 6,000 kilometres away in the Sargasso Sea. Larvae then move on the Gulf Stream and North Atlantic Drift towards the UK over eight to nine months metamorphosing into glass eels and head up the Severn Channel and Estuary into

Somerset's rivers where they mature into an adult eel (up to 20 years) when

they leave and travel back to the Sargasso to breed.

Somerset Wildlife Trust identified the main barriers to eel movement, allowing it to prioritise the water control structures which need fitting with **eel passes** to allow their movement through our reserves. In 2014 **millions of glass eels were released**, and in 2018 the Trust worked with the Westcountry Rivers Trust to survey its reserves to check their progress. Many of the eels caught were the size expected, suggesting that Somerset Levels reserves can support good yellow eel populations. Sensitive **habitat management** and the creation of scrapes enhances the aquatic habitats that yellow eels need to thrive. Additionally three culverts were replaced at Catcott and 20,000 elvers released in 2019/20 to boost eel populations

The Somerset Eel Recovery Project (SERP) is a more recently funded research project and the result of a collaboration between Green Wedmore



and the Sustainable Eel Group. **29 water samples** were taken in March 2023 from a number of sites around Wedmore with a connection to the River Axe and eDNA results showed that eel presence was **absent or in very limited numbers** in many of the local Axe Valley watercourses indicating that the eel population was probably not as abundant as it once was. Further work is needed to identify key areas of focus to ensure this incredible fish is able to complete its amazing journey in the future.



3



An overview of habitats in Somerset

The greatest area of habitats in Somerset currently are grassland habitats, though they are not as prevalent as 30+ years ago. As well as the UK wide decline in grasslands of 97%, Somerset is seeing continued decreases of its species-rich grassland habitats and has lost 201.94km² of grassland in 25 years - a -5.74% change. The district with the most drastic decline has been the Mendips, where it has seen an 11.5% decline. 74% of land in Somerset is currently used for agriculture. Somerset Wildlife Trust is working with 76 farmers to manage over 64km² of farmland to ensure better quality habitat for nature.

The county had the second highest number of Local Wildlife Sites (LWS) across the UK in 2009/2010 (Gov.UK., 2023) - and currently stands at approximately 2,000 which is the highest number of LWS based on available data in 2022. Somerset also has around 200 Geological Wildlife Sites; these are mostly quarries. An update to date analysis on the condition of these sites is being carried out by SERC and Somerset Wildlife Trust and will be made publicly available when completed.

Although Somerset has many protected and designated sites, this report has found that the quality of some of these habitats are unfavourable and not up to designation standard (when last surveyed). Out of the 128 SSSI sites, only 46 are in 100% favourable condition; 13 sites are in 99-100% 'unfavourable declining' condition, significantly affecting nature recovery success in these important areas. Riverways have also not met quality standards, where most rivers are in moderate condition. Under 15% of rivers in Somerset are in 'Good' ecological condition.

The majority of habitats in Somerset currently are grassland habitats



GRASSLAND:

5.74%

reduction in 25 years



FARMLAND:



74%

of Somerset's land cover

RIVERS:

Under 15%

of rivers in Somerset are in 'Good' ecological condition

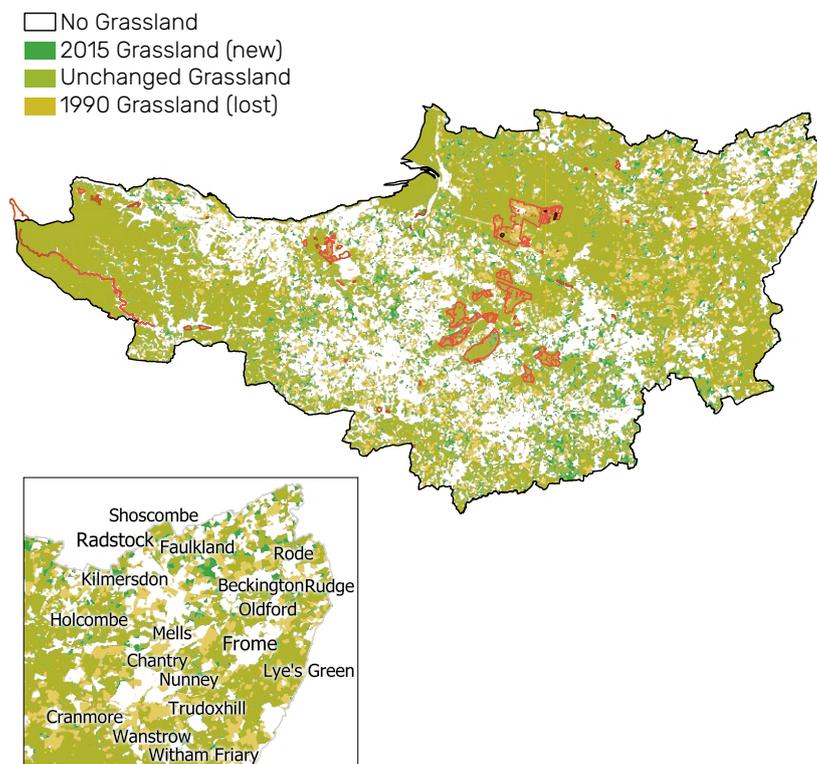


Priority habitats

Priority habitats have been identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan and subsequent UK Post-2010 Biodiversity Framework. There are now over 65 priority habitats included. When compared to other counties in the region (using data from a regional project) Somerset is 15-60% more diverse in its priority habitats. Somerset has over 20 different classification of priority habitat within its boundary, the most frequently occurring habitat being coastal and floodplain grazing marsh. In Somerset there are over 30,000 km of hedges of which 84% are considered priority habitat. Both the white and brown hairstreak butterflies are closely associated with hedges. Given the enormous reduction in hedgerow habitat, species-rich hedgerows becoming priority habitat will help conserve populations of these butterflies.

Priority grassland within Somerset comes in many types, including calcareous, acid and neutral; both species rich and poor as well as improved and unimproved. Priority grassland has been lost within the 202km² total reduction of grassland between 1990-2015 across Somerset, in particular in Mendip.

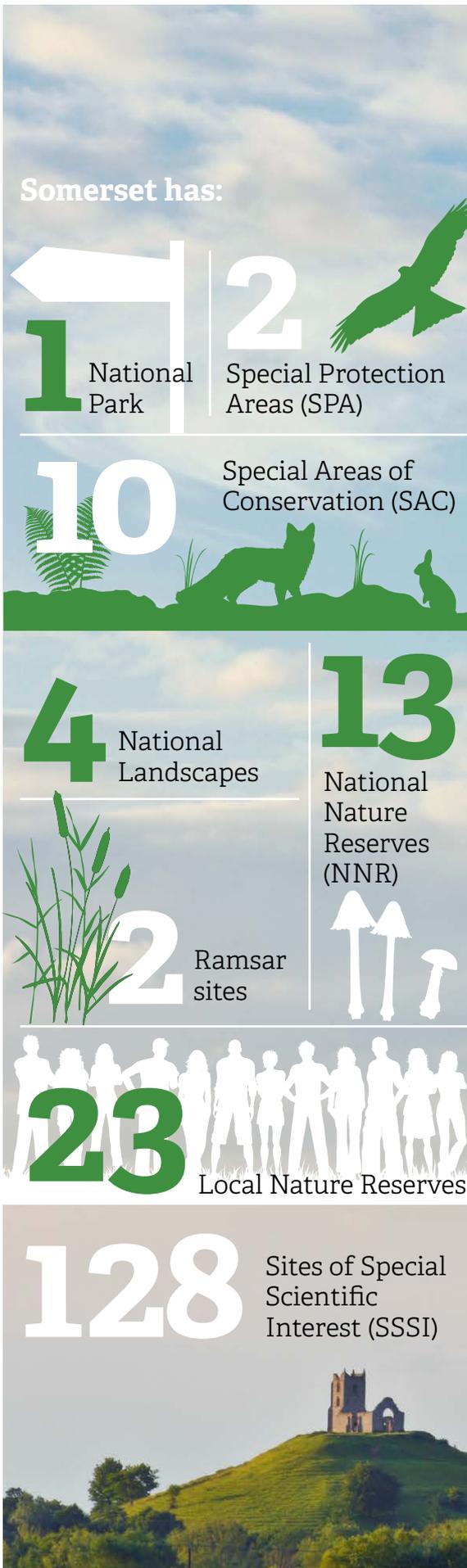
Figure 12: Map showing the grassland areas lost and gained between 1990-2015.



Case study: Skylark in grasslands

The skylark is one of 19 species that make up the UK Farmland Bird Indicator and, as a group, these species are sadly amongst our most declining birds. The UK breeding population of skylark specifically has seen a 15% decrease (1995-2020) (BTO) and continues to decline. Reasons for their decline are wide ranging; however general habitat reduction, intensification of agriculture and changes in seasonal management regimes to grasslands, have all brought about changes in their preferred habitat and food supply, and shrunk the windows for breeding and nesting. This has resulted in a dramatic reduction in the number of chicks raised each year. This iconic bird is very much at risk of disappearing from the county.





Somerset's peatlands

Peatlands are amazingly wild places, home to rare and unusual plants, birds and insects. Peat forms at an incredibly slow rate, accumulating on average only 1mm a year - that means it takes 1,000 years for one metre of peat to form. Globally **peatlands cover just 3% of land area** but they hold **30% of all soil carbon**. In a healthy state, peatlands can be amazing carbon sinks, but there is even more to peatlands, as they help to **alleviate flooding**, by slowing the flow of water, filter water, making it cleaner when it comes to our water processing plants - and eventually into our taps, with **70% of drinking water coming from upland areas dominated by peat**.

In May 2021 the Government launched the England Peat Action Plan recognising the importance of protecting and restoring our peatlands. The Plan committed to restoring **35,000ha of peat** by 2025 and also to consult on **banning the sale of peat products** in the amateur sector by 2024 after a series of failed voluntary targets which date back to 1999. The Government consulted in 2022 and the response to the consultation was clear, with over **95% of respondents calling for a ban** on the sale of bagged peat compost by 2024. The UK Government has since committed to this, but has yet to introduce legislation to implement this ban. The ban on the sale of retail peat however **will not end peat extraction**. Professional growers will continue to use peat, exports will still be possible and any ban wouldn't come into effect immediately. Peatlands are **extremely important habitats** for

wildlife and **store vast amounts of carbon**, however, they actively **emit carbon when they are drained** of water and dug up for use as a growing media.

Somerset has a long history of peat mining and today is one of the **last two counties** in England where commercial extraction is still taking place. An estimated **1million tonnes of carbon** is stored in the county's peat and the Somerset Levels and Moors cover an area of 60,000ha. This is equivalent to **10 years' worth of the county's emissions**.

Four main peat producing companies continue to mine peat in this area. Whilst Somerset Council, the Minerals Planning Authority, are aware of how many licenses are in operation, however the total volume of peat that will be extracted when they are complete is unknown. There is no publicly available map of peat extraction sites. **No Review** of Minerals Planning Conditions have taken place on sites that have been dormant between 1943 and 1982 (one such site has begun to be extracted opposite Somerset Wildlife Trust's Honeygar Farm in the last 18 months), nor a periodic review for permissions that will last many years. The licenses for around **500ha of extraction will last until 2042 unless revoked**. Whilst the government is investing tax payers money into peatland restoration through the Peatland Grant, this money is being spent on restoration right next door to sites that are extracting peat. It is vital that we do all that we can to keep Somerset's peat wet and in the ground in order to meet our climate targets.

Somerset's woodlands

Ancient woodland inventory

Ancient woodlands are areas of woodland that have persisted since 1600. These woodlands have grown and adapted with native wildlife, yet what remains **only covers 2.5% of the UK**. It is classified into two main categories, these are:

► **Ancient semi-natural woods** - woods that have developed naturally but were used by humans for timber or other industries. They have had woodland cover for over **400 years** and still retain the character, soil composition and indicator species that are characteristic of natural ancient woodland, such as bluebells, wood anemone, wild garlic, guelder rose, service tree and spindle.

► **Plantations on ancient woodland sites** - woods that have been felled and replanted with non-native species, typically including conifers, beech,

red oak, and sweet chestnut. These woodlands still have the complex soil of ancient woodland, and are considered to contain evidence of the woodland specialist species that previously inhabited it.

During the 1980s only woodlands **larger than two hectares** were surveyed in Somerset, missing many of the **smaller yet valuable** examples. In 2022, a Natural England project began to update the country's Ancient Woodland Inventory. With the help of volunteers the project began surveying smaller woodlands that are less than two hectares in size, they found **10% of Somerset is now woodland**, of which almost **one third is ancient** woodland, however the split between category type is not yet known. This project is set to be completed 2024/2025.

Temperate or Celtic rainforest

Rainforests of the British Isles are **temperate rainforests**, they grow in areas of **high rainfall and humidity**, and low annual variation in temperature. They are also known as **Atlantic woodland** or **Celtic rainforest**. This beautiful habitat now only remains in isolated fragments, covering **less than 1% of Britain**, with Culbone Wood - a strip of woodland located west of Porlock and on the steep, north coast of Exmoor - being Somerset's only remaining fragment.

Tree species in these unctious, rich habitats include sessile oak, birch, rowan, holly, alder, willow and hazel. They are home to a **myriad of species** including stoats and threatened birds like wood warblers, redstarts, and pied flycatchers. Wet conditions support an abundance of mosses, liverworts, lichens, and ferns - many of which grow on the trees or cover boulders and ravines. The dampness is ideal for fungi - which play a hidden, but vital role in our woodland ecosystems.

Enriching our woodlands

The restoration and expansion of this precious habitat as part of a wider strategy for **renewing, expanding and connecting** our woodland habitats across the county and beyond, and alongside protecting our ancient trees, is crucial both in terms of biodiversity - providing **safe habitats** for wildlife in time of nature crisis - but also as a **nature-based solution to storing vast amounts of carbon** and enabling adaptation to climate change, reducing threats from extreme heat, flood and drought and provide cleaner air and water and reduced risk from flooding. Worth noting, that Somerset's tree cover by area is below the national average (8%) according to the Somerset Tree Strategy 2023.

Somerset Wildlife Trust has become a partner of the **Two Moors Pine Marten Project**.

The south west has been identified as the **highest priority region** for exploring potential **pine marten reintroduction**, according to the long-term strategic recovery plan for pine martens in Britain (2021), published by Vincent Wildlife Trust, with the support of Natural England and NatureScot. There have been occasional sightings of pine martens in Somerset already and reintroduction seems highly likely but **connectivity** between woodland habitats in Somerset needs to be increased.

Pine martens are important to ecosystems, their presence in woodland



habitats can be used as **indicators for woodland quality** due to their preference of ancient woodlands. They have also been identified as a **valuable part of ecological systems** through their **predation of non-native**, invasive species such as the grey squirrel. As a result, occupancy of the native **red squirrel has been positively correlated** to increased pine marten presence.



Somerset's coastal and marine habitats

The Severn Estuary is one of the UK's most **iconic and significant marine environments**. It's of global importance for nature and one of the most protected and unique marine/estuarine environments in the UK. It's a Special Protection Area, Ramsar wetland site of international importance, Special Area of Conservation, Site of Special Scientific Interest, National and Local Nature Reserve. Directly connected to the Irish Sea and Atlantic Ocean; its influence has massively shaped the geography and societal shape of the county. Its vast and significant expanses of carbon rich **saltmarsh, offshore sand banks** and **intertidal habitat** support a huge array of wildlife, including nationally important **fish stocks** and providing feeding grounds for hundreds of thousands of **wetland birds**, including shelduck, gadwall, brent geese, dunlin,

Somerset's
73km
coastline is
facing significant
pressure

avocet, sanderling, redshank, knot and curlew to name just a few, some coming from as far away as the Arctic. Other species undertake similar epic migrations, such as young **European eels** migrating in their millions from the Sargasso Sea, and its mudbanks are comparable in bio abundance to some of our most important global rainforests. A natural and healthy functioning estuary brings a huge wealth of **natural and economic benefits** to society.

Climate change and **rising sea levels**, the need for reinforced **coastal flood defences, tidal and nuclear energy** generation, alongside the conversion of coastal habitats to accommodate **tourism** and other development, are just a few reasons why, despite its national and international protected designations, Somerset's 73km coastline, and the species that call it home, are facing significant pressure. Not only do the impacts of these threats **disturb habitats and species** along the coast, there are wider implications for the Somerset Levels and Moors, the biodiversity of which could be particularly impacted by **flood defence schemes**. In addition, much of the Somerset coast, especially at the eastern end in Bridgwater Bay, is dominated by **soft shores of mud, silt and sand** fringed by in places by **salt marsh** (e.g. Steart) and **sand dunes** (e.g. Berrow) which are crucial and increasingly threatened

habitats in their own right – offering important ecosystems services as **carbon sinks** and **natural barriers to coastal erosion**. A bold vision is required to urgently protect, enhance and realise the potential of Somerset's brilliant coast and a unified voice and support and commitment from all stakeholders to ensure we can deliver quickly.

The marine, intertidal and coastal fringe habitats have historically been **less well surveyed** or monitored than most of Somerset's terrestrial and freshwater habitats, especially in recent years. Since 2018, through several grant funded projects, Somerset Wildlife Trust has begun to **map and record** these diverse and important habitats. A baseline of data is now being established in which changes can be effectively monitored on our shores and sea moving forward.

The survey highlighted the **variety of habitats** Somerset has on its stretch of coast, including many types of rocky shores dominated by **seaweeds** such as wracks. The seaweed cover is interspersed with barnacles, limpets (*Patella* spp) and **gastropod molluscs** such as littorinid winkles and topshells. At the western end of the coast at Porlock Bay, where the waters are less turbid, there is an extensive **kelp forest** which is inhabited by a high diversity of intertidal animals from across a wide range of phyla.

Rivers



Rivers and other waterways such as **canals**, **ditches** and **rhynes** form unique and fundamental components of Somerset's landscape. They form an important **network of connectivity** of specific importance to aquatic, bird and even some marine species (e.g. eels). Given that many of these waterways were created in line with agricultural expansion, they are directly affected by activities on the land through which they intersect. Maintaining **good water quality** is key to ensuring a broad range of species that rely on the waterways for **food**, **shelter** and **habitation** can survive and thrive.

Freshwater ecosystems are **in crisis globally** and Somerset is no different. Using data from the Environment Agency's (EA) General Quality Assessment scheme (GQA), river water quality has been ranked from 'Good' to 'Bad', presenting rankings across a range of biological, physical and chemical indicators.

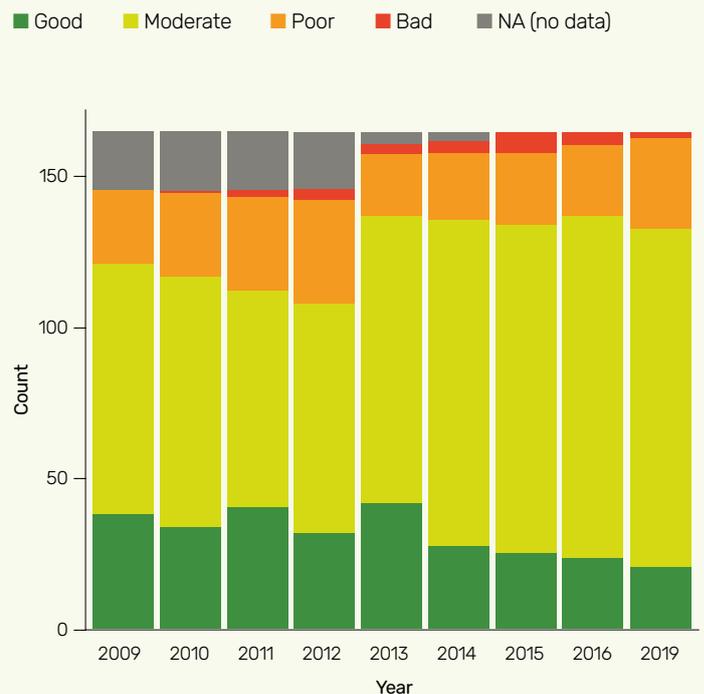
Looking at the data between 2009 to 2019, Somerset has **no 'High' quality** river catchments and **'Good'** quality rivers have **decreased** from 38 to 21, the lowest it has been in 10 years. On the other hand, **'Bad' quality** rivers are also at their **lowest number** and this classification only applies to a couple rivers across the county. However, **most rivers are 'Poor' or 'Moderate'** quality, these are still not classifications the county should be happy with. Poor classifications have continued to stay around 25/30 sites over these 10 years and moderate increased from 83 to 112 from 2009 to 2019.

This implies these rivers are **not in a condition to be positively affecting their surrounding ecosystems**. Broad-scale issues such as the historical **artificial re-routing of waterways, draining of the land, pollution**, alongside policies driving more **intensive farming** leading to issues with water quality (e.g. phosphate loading) are all likely contributors to this overall picture.

Table 3: Ecological Status Definitions for river catchments used by the Environment Agency

State	Definition
High	Near natural conditions. No restriction on the beneficial uses of the water body. No impacts on amenity, wildlife or fisheries.
Good	Slight change from natural conditions as a result of human activity. No restriction on the beneficial uses of the water body. No impact on amenity or fisheries. Protects all but the most sensitive wildlife.
Moderate	Moderate change from natural condition as a result of human activity. Some restriction on the beneficial uses of the water body. No impact on amenity. Some impact on wildlife and fisheries.
Poor	Major change from natural conditions as a result of human activity. Some restrictions on the beneficial uses of the water body. Some impact on amenity. Moderate impact on wildlife and fisheries.
Bad	Severe change from natural conditions as a result of human activity. Significant restriction on the beneficial uses of the water body. Major impact on amenity. Major impact on wildlife and fisheries with many species not present.

Figure 13: The ecological status of Somerset's main river catchments



Local Wildlife Sites and Local Geological Sites

The Local Wildlife Sites (LWS) classification provides a means of identifying and safeguarding some of the county's best sites for wildlife. These sites rely on the landowners for their conservation management; therefore we are not up to date with the conditions of each site and current numbers in 2023. SERC and Somerset Wildlife Trust hopes to monitor and survey these sites more going forwards to better understand their condition.

Since recording started in 2008/9, we have lost 48 sites - the current number is 2099. These sites equate to 7.03% of Somerset encompassing

important habitats such as flower-rich meadow and pasture, ponds, wetland, heathland, and ancient broadleaved woodland. Having these sites labelled LWS help protect the habitat for the wildlife within them, they are important to link between other designated sites.

The Local Geological Sites (LGS) classification provides a means of identifying and safeguarding some of the county's best sites for geology, these help to preserve the county's varied geological heritage. There are just under 200 currently in Somerset, a 12% decrease since recording began.

Classification provides a means of identifying & safeguarding







Designated sites

National Park

Exmoor National Park comprises a rich variety of moorland, woodland, valleys, and farmland. This park is mostly free from intrusive developments and supports a great diversity of wildlife including herds of wild red deer, rich lichen communities and rare butterflies. A significant amount of work by a range of conservation bodies has been invested into restoring and maintaining this park. SERC's records show 19% of North Exmoor is in favourable condition and 77% is recovering from being previously unfavourable – testament to the impact of a positive partnership approach and demonstrating the enormous conservation success over the last century.

Special Protection Areas (SPA)

SPAs are selected to protect one or more rare, threatened, or vulnerable bird species listed in Annex I of the Birds Directive, or certain regularly occurring migratory species. Somerset Levels and Moors is designated for its importance for wintering wildfowl and waders, as previously mentioned, its already showing positive impacts on population numbers. The Somerset Levels and Moors consists of low-lying organic peat soils sitting on top of marine silts and clays, and form in effect an impermeable bowl (Stratford and Acreman, 2014). This unique habitat allows for storage of water and creates a prime wetland habitat.

Sites of Special Scientific Interest

From Natural England: A Site of Special Scientific Interest (SSSI) is the land notified as an SSSI under the Wildlife and Countryside Act (1981). SSSI Units are divisions of SSSIs based on habitat, tenure and management, and are the basis for recording all information on SSSI condition and management. SSSIs are the finest sites for wildlife and natural features in England, supporting many characteristic, rare and endangered species, habitats and natural features. Each SSSI unit is condition assessed using state definitions.

National Nature Reserve (NNR)

The Somerset Wetlands 'super' NNR has brought together nature-managed land in the Somerset Levels and Moors, including nature reserves in the Brue and Parrett Valleys, Bridgwater Bay and Steart Marshes, increasing the original NNR footprint by 56% to an amazing 6,000ha - the third largest NNR in England. It is managed by Natural England, the Environment Agency, National Trust, RSPB, Somerset Wildlife Trust and new partners, The Hawk and Owl Trust and Wildfowl and Wetlands Trust. This year, the Mendip 'super' NNR was announced, meaning Somerset is the only county in England that hosts two.

The Somerset Wetlands NNR is important to Somerset as it is home to a third of the UK's bittern population and is designated as a 'Merited Site of National Importance' by the British Dragonfly Society. It is also home to the rare carnivorous plant, the round-leaved sundew, and Westhay Moor NNR has the largest surviving fragment of lowland acid mire in the South West.

Table 4: Site of Special Scientific Interest (SSSI) State Definitions.

State	Definition
Favourable	The SSSI is being adequately conserved and is meeting its 'objectives'.
Unfavourable Recovering	Often known simply as 'recovering', SSSI units are not yet fully conserved but all the necessary management measures are in place. Provided that the recovery work is sustained, the SSSI will reach favourable condition in time.
Unfavourable No Change	The special interest of the SSSI unit is not being conserved and will not reach favourable condition unless there are changes to the site management or external pressures. The longer the SSSI unit remains in this poor condition, the more difficult it will be, in general, to achieve recovery.
Unfavourable Declining	The special interest of the SSSI unit is not being conserved and will not reach favourable condition unless there are changes to site management or external pressures. The site condition is becoming progressively worse.
Part Destroyed	Lasting damage has occurred to part of the special conservation interest of an SSSI unit, such that it has been irretrievably lost and will never recover. Conservation work may be needed on the residual interest of the land.
Destroyed	Lasting damage has occurred to all the special conservation interest of the SSSI unit, such that it has been irretrievably lost. This land will never recover.



Upon initial designation, SSSIs are in favourable quality, so any reduction in their state indicates a deterioration in habitat and likely negative consequences for the species that reside or rely on services provided by that habitat. In Somerset we currently have 128 sites, 10 of which we do not have information for regarding their condition and size. Out of the 128 SSSIs in Somerset 46 were last assessed as 100% favourable, where all the land within the site is favourable condition. Although this number is a significant amount, SSSI designated sites are the peak of habitats and should be in the best condition for the wildlife they are protecting. It is then an issue that 13 of the SSSIs are in 99-100% unfavourable declining condition.

Bridgwater Bay is the second biggest SSSI in Somerset, after North Exmoor, and is in a largely favourable condition. Out of 420km² of SSSI land, just under 90km² is in unfavourable condition. However, the other 150km² of unfavourable recovering condition shows that things are improving and with conservation effort and management, these unfavourable sites can become favourable. Reassessment of the conditions will further help to determine the sites that need more management.

Figure 14: Map showing where the SSSI sites are in Somerset and their condition.

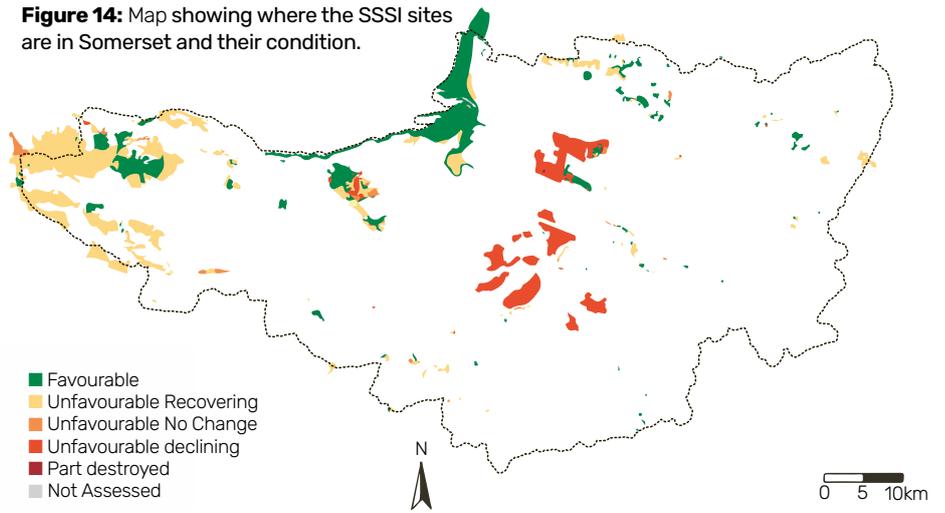
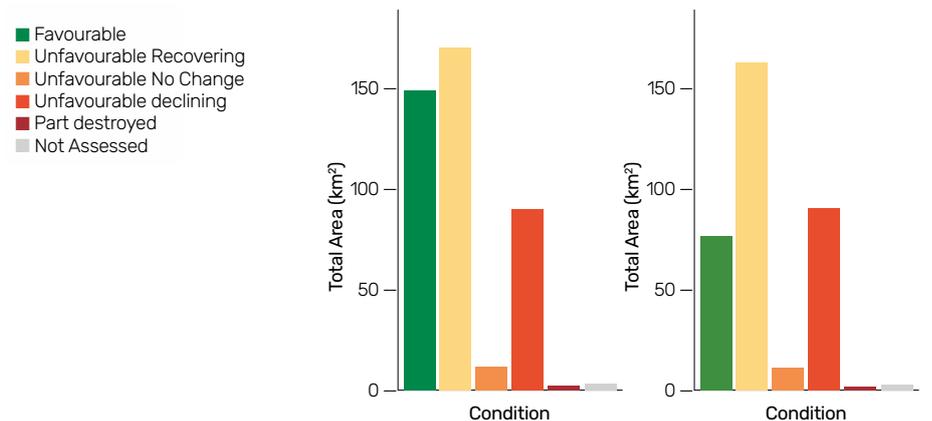


Figure 15: The condition of SSSIs based on area, once Bridgwater Bay has been removed from the data (left bar graph), the results show a bleaker outlook.



Somerset landcover change

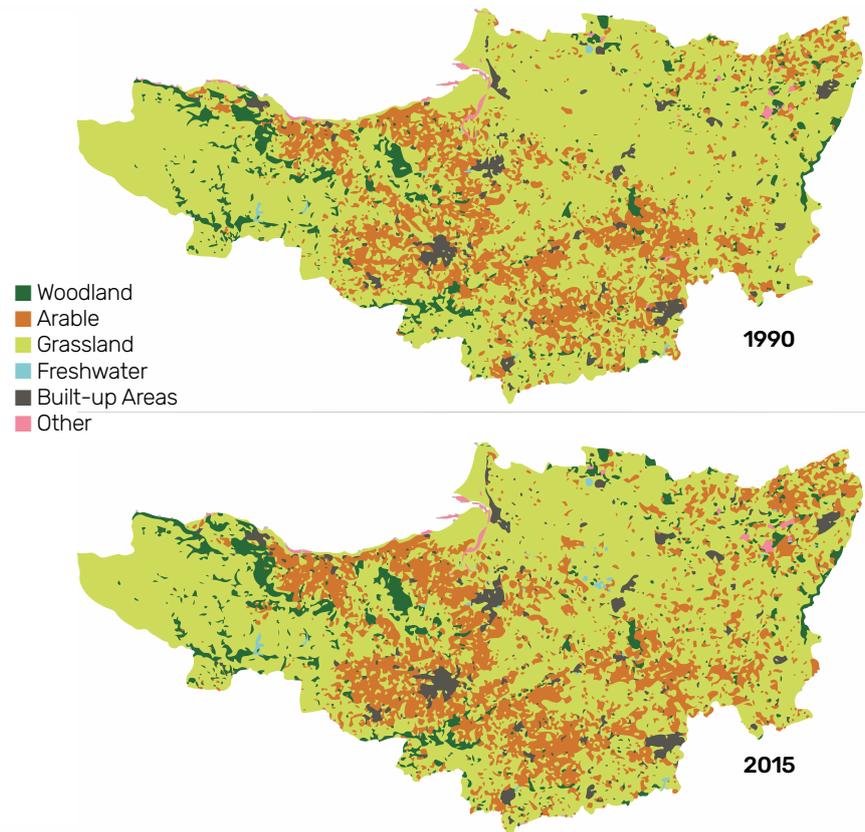


The Centre for Ecology and Hydrology (CEH) have produced landcover datasets for the UK at several points in time. One such dataset looks at comparable land cover change between 1990-2015. The datasets are provided grouped into broad habitats. For example, grassland is an amalgamation of improved grassland, neutral grassland, calcareous grassland, acid grassland and others.

Although on the face of it, relatively small proportions of land have changed over the 25-year period between 1990-2015, there are still issues for the ecological function and wildlife within Somerset. In 1990, grassland was the most frequent habitat across Somerset, taking up 68.79% of Somerset; although this is still the most frequent, Somerset has lost a further 5.74% of its grassland over 25 years - additionally to the 97% of species-rich grassland lost across the whole of the UK.

The land types that are increasing are agriculture and built-up areas (Figure 16). Arable, in 2015, took up 23.15% of Somerset and built-up areas increased by 1.14% from 1990-2015.

Figure 16: Landcover within Somerset in 1990 & 2015



Whilst the loss of woodland tree cover due to Ash dieback can bring about opportunities in terms of increased light levels for ground flora or increasing deadwood habitats for invertebrates, it's really important that we enable natural regeneration wherever possible in affected areas to improve future woodland resilience, as well as looking at targeted replanting to supplement this where necessary, for example by increasing tree species diversity.

A recent study in Germany has revealed that, when moving from semi-natural to agricultural environments, total richness declined by 29% and the richness of threatened species declined by 56% (Uhler *et al.*, 2021). This would support the negative impact this landcover change has had on the SSSI conditions.

Further work needs to be conducted to establish the management of land at finer scales, and identify those areas beneficial to wildlife, and those that could be improved while remaining economically functional to the farming system.

Wilding, as defined in Somerset Wildlife Trust's Wilder Somerset 2030 vision, is "managing land in a way that mimics how nature works when left uninterrupted." This process is slightly different to rewilding; rewilding is the restoration of an area of land to its original natural processes can take place. Wilding is a spectrum. It can be delivered at all scales, with varying degrees of required intervention from humans, depending on the space available for nature. These range from your back garden to National Nature Reserves. This conservation method differs from the Trust's usual reserve management, land used for wilding is usually poor quality for biodiversity to begin with and the focus is on restoring an ecosystem, compared to usually a surviving remnant of good quality habitat that is to be protected in order to save an assemblage of species at risk.

Somerset Wildlife Trust's first wilding project is transforming a former dairy farm, Honeygar, into a haven for wildlife. The site comprises



of 81 hectares of formerly intensively grazed farmland. Wildlife Trust staff, supported by specialist volunteers from the Somerset Botany Group and Recorders of the Avalon Marshes (RoAM), have captured a vast and valuable baseline of data to understand what species we already have on site. We are also trialling audio sensors to

record wildlife 24 hours a day on site in partnership with Wilder Acoustics. A 50 year management plan has been developed and over time, we hope it will become a place which inspires those who visit, whether other landowners, local people or visitors from further afield, about the power of wilding on the environment.

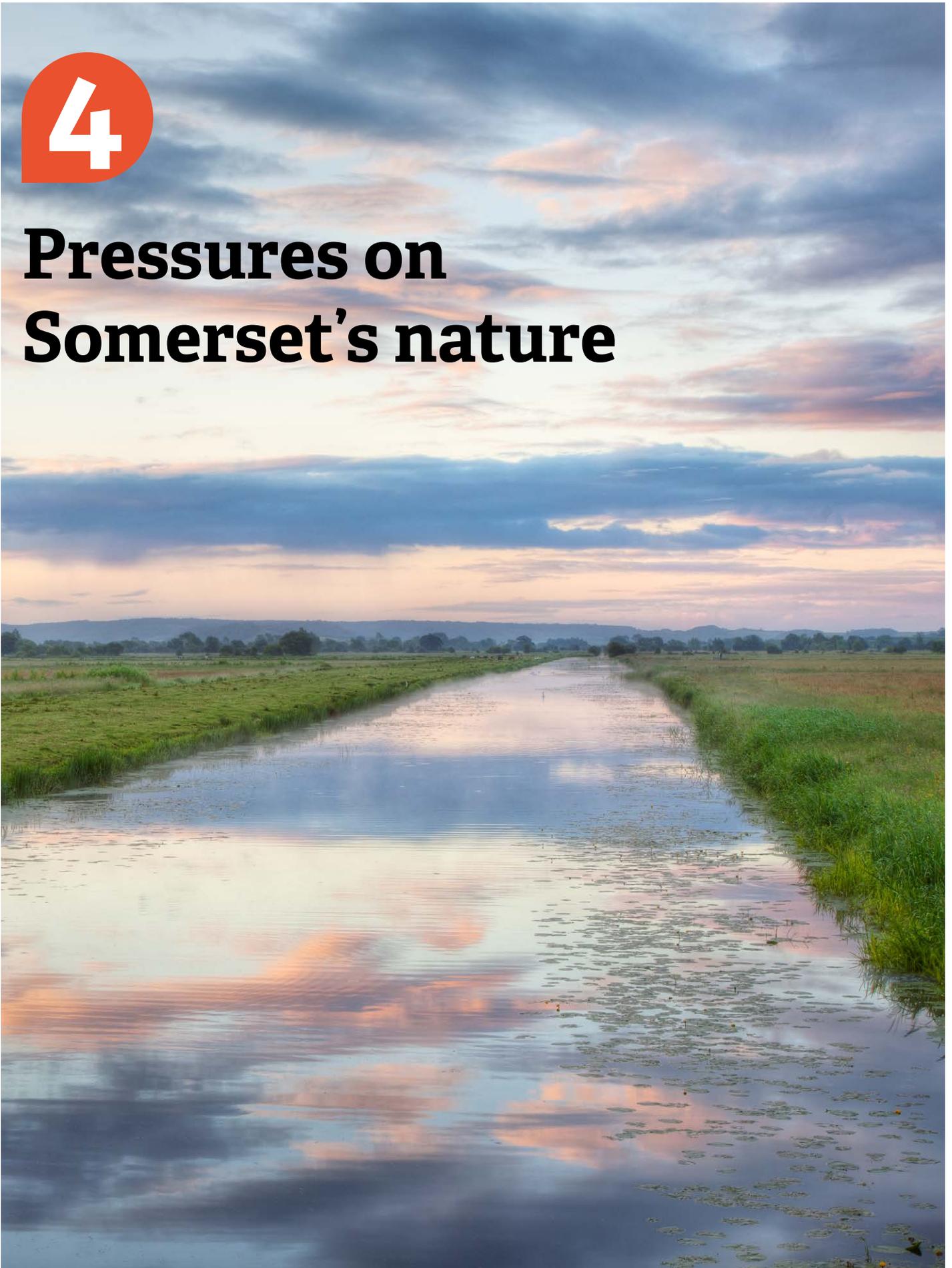
Table 5: Changes in landcover types between 1990–2015

Class	1990 (km ²)	2015 (km ²)	1990 proportion (%)	2015 proportion (%)	Change proportion (%)
Woodland	248.24	276.60	7.05	7.86	0.81
Arable	685.58	815.00	19.48	23.15	3.67
Grassland	2421.18	2219.24	68.78	63.05	-5.74
Freshwater	6.95	12.71	0.20	0.36	0.16
Built-up areas	137.5	177.62	3.91	5.05	1.14
Other	20.34	18.63	0.58	0.53	-0.05



4

Pressures on Somerset's nature



Agriculture

Agriculture and food production are crucial to the economy and environment of Somerset, employing over 10,000 people across the county, with 275,000ha of land being farmed. With a range of landscape types, Somerset has traditionally supported a range of farming types including arable. The predominant farm type is dairy and grazed livestock, with dairy the largest contributor to the southwest economy with the contribution listed as just over £1bn.

The narrative around farming and food security is one of complexity which is further impacted by climate change; rising temperatures, changing rainfall patterns and variations to atmospheric CO₂ concentrations will impact operations and productivity, as well as pest prevalence within the UK. Agricultural policy requiring ever increasing outputs to meet excessive consumer demand has resulted in practices intensifying over recent decades resulting often in the creation of large monoculture fields requiring high inputs of pesticides and fertilisers, loss of hedgerows and field margins, and pollution of water courses. On the Somerset Levels and Moors, an increase in the amount of maize grown for winter cattle feed, has led to increased erosion, diffuse water pollution and a drying of the soils. With 74% of Somerset land in agricultural use, the impacts of these changes has been significant for wildlife.

There is huge scope for positive change within the UK agricultural sector, securing nature and climate recovery – but it requires system change and an approach to the food environment which sees farming and the environment as mutually beneficial and interdependent. So a high level of ambition and transparency to deliver nature-friendly farming is needed within regenerative, agroecological systems, alongside fair deals for farmers to provide public goods such as nature

restoration, carbon sequestration and public engagement and increasing the demand for locally grown sustainable grown food across Somerset.

Some farmers and landowners may be in the position to deliver additional services from their land and to create new incomes, for example, providing flood storage or by exploring green finance mechanisms such as Biodiversity Net Gain (BNG) or nutrient and carbon trading- but there is a need for investment in infrastructure, capital items, skills and software tools to support this transition and the delivery of public goods that will benefit the health of Somerset's landscape, wildlife and residents.



So far, since
2005 Somerset's
CO₂ emission
has reduced by
34.6%

Case study: Ebbor Gorge Beef

Neil Tustian and Lottie Sweeney took over their 186-acre farm in 2018, which wraps around the top of Ebbor Gorge. The farm had previously been intensively grazed, ploughed, slurried and sprayed, creating a monoculture of rye grass and soils in poor health. Now organic, they are restoring the farmland and building up a stock of hardy, traditional 100% pasture-fed ruby-red cows that do well outdoors all year round. Wildlife is returning. Fields once used for growing high-yield crops are showing signs of recovery: wildflowers, whose seeds had remained in the soil, have begun to grow again including bird's-foot trefoil and field scabious. Waxcap mushrooms are returning, a sign of healthier soil as fungi, bacteria and more help bind and reconnect the soil so nutrients can be better recycled.

They use mob grazing to improve soil and pasture biodiversity. This means stocking smaller paddocks at a high density for short periods of time with long rest periods between. Taller vegetation resulting from the long rest periods, means the soil is kept cooler in the summer and warmer in the winter, which conserves water, leading to more biological activity in the soil in the summer and extends the growing season in the winter. Skylarks, meadow pipits and hares also love the taller vegetation.

They've planted thousands of trees dividing fields into shelter belts which shelter their cows in the winter so they don't need to be expensively housed and provide shade in the summer. They also provide a corridor for bats and birds, linking Ebbor Gorge with other parts of the farm, allowing them to commute, feed and connect with other suitable habitats.

Climate



Case study: willow warbler

The willow warbler has **declined by 67% in the Southwest of England** between 1995-2021. The British Trust for Ornithology has found that these birds are doing better in Scotland, where average temperatures are cooler, than the UK. There has been an **77% increase in Scotland**. This study found these population trends are more likely to be linked to climate change than habitat change and further adds to the evidence of impact of climate on ecosystems.

There is no escaping the reality that our climate is rapidly changing. We are experiencing its predicted effects that impact our health, our day to day lives, the prices we pay for food, as well as Wildlife populations. This is just the start. The future impacts of climate change across Somerset will be considerable. Coastal and low-lying communities in the Somerset Levels are at high risk from coastal and river flooding as sea levels rise and storms worsen. Sea levels are predicted to rise from 0.27m to 1.13m by 2100 (currently Somerset coasts can protect us up to 1.10m). Heatwaves and droughts will bring water shortages and reduce water quality even more than they are already.

It is essential we adapt how we live and how we restore nature. In theory a community or a habitat which is totally adapted to future climate shocks has no need for resilience since a drought, flood or heatwave will not affect it. It can take place at different scales, from a garden water butt to a reconnected flood plain, and it's a conversation we must have at all

levels in our society. Mitigation, through reducing our emissions as quickly as possible, is also vital to limit the impacts we will face. Climate adaptation and mitigation must go hand in hand.

One way we can adapt is by employing nature-based solutions. These often have multiple benefits, for example, planting trees can provide shade and absorb water helping us to adapt to extreme heat and flooding. They also capture carbon and provide excellent wildlife habitat if planted in the right place.

The Sedgemoor and Somerset West and Taunton State of Nature reports helped these two former district councils declare an Ecological Emergency. This also meant that all five former Somerset local authorities had declared a Climate and Ecological Emergency by 2022. This move was underpinned by the UK Government's publication of 'Net Zero – The UK's Contribution to Stopping Global Warming' in May 2019, aiming for Net Zero by 2050.

The new Somerset Council has inherited the old council's Climate and Ecological strategies which set ambitious

goals to become Net Zero by 2050. So far, since 2005, Somerset's CO₂ emissions have reduced by 35%, though this is largely due to the decarbonisation of the electricity supply similar to the rest of the UK.

What is our wildlife doing in response to our change in climate?

Some wildlife is adapting to our changing climate, although for many species we do not know how our warming world will affect them. While climate change is a huge game changer for how wildlife exists in Somerset, it is happening alongside other challenges such as reduced connectivity between habitats, habitat fragmentation and loss and pollution to name a few. While some species may not be able to adapt at all or quickly enough, others will benefit from climate-related adaptations alongside wildlife-friendly farming and the creation of wildlife-rich habitats and connecting corridors, across towns, villages and the wider countryside. We may lose some species and gain others.

Invasive species

The number of invasive species has risen since 1990, with some fluctuation but a general increase. Invasive species presence across Somerset has increased from 354km² to 923km² from 1990-2021. That's an increase of 260% in 30 years, a drastic change. One of these is the canada goose which, in 'The Breeding Bird Survey 2022' written by the BTO, found a 237% increase of population when studying a sample size of 57 from 1995-2021 in the southwest region (BTO, 2022).

The number of records of invasive species has also been on an upward trend. Although this could be down to recording effort, the fact these numbers are not stabilising or decreasing implies these species aren't being managed. The most frequently recorded invasive species in Somerset are american mink,

canada goose and turkey oak. Our rocky shore habitats have also been colonised by invasive species in recent decades including the australian star barnacle (*Austrominius modestus*) which is now the commonest barnacle species on Somerset shores and the pacific oyster (*Magallana gigas*) which we have just started monitoring methodically to ascertain if it is spreading and increasing in abundance.

Invasive non-native aquatic plant species, such as floating pennywort and water fern (azalea), exacerbated by nutrient overloads, are of considerable concern and significantly reduce water quality and habitat availability for native flora and fauna alongside increasing the risk of flooding, damaging infrastructure and are a public health risk.



Invasive species presence across Somerset has increased from **354km²** to **923km²**

Figure 17: Invasive species distribution change from 2015-2021

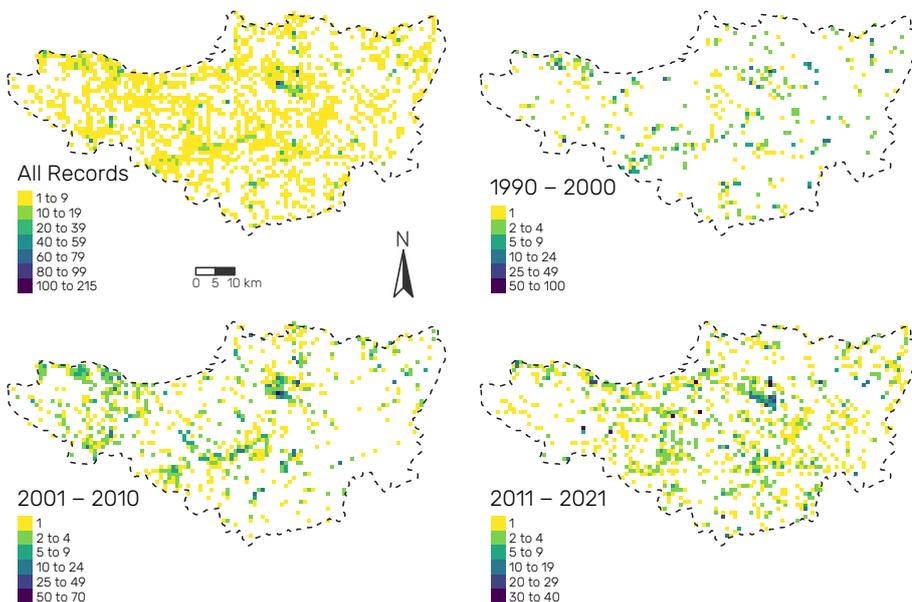
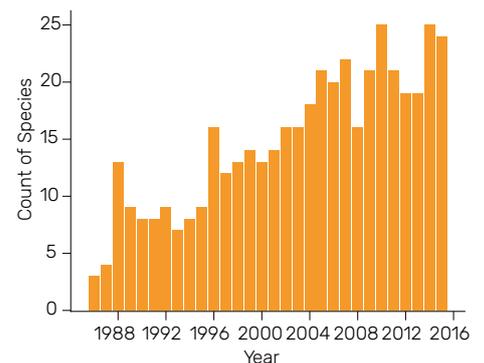


Figure 18: Invasive species numbers per year between 1986-2015



Development

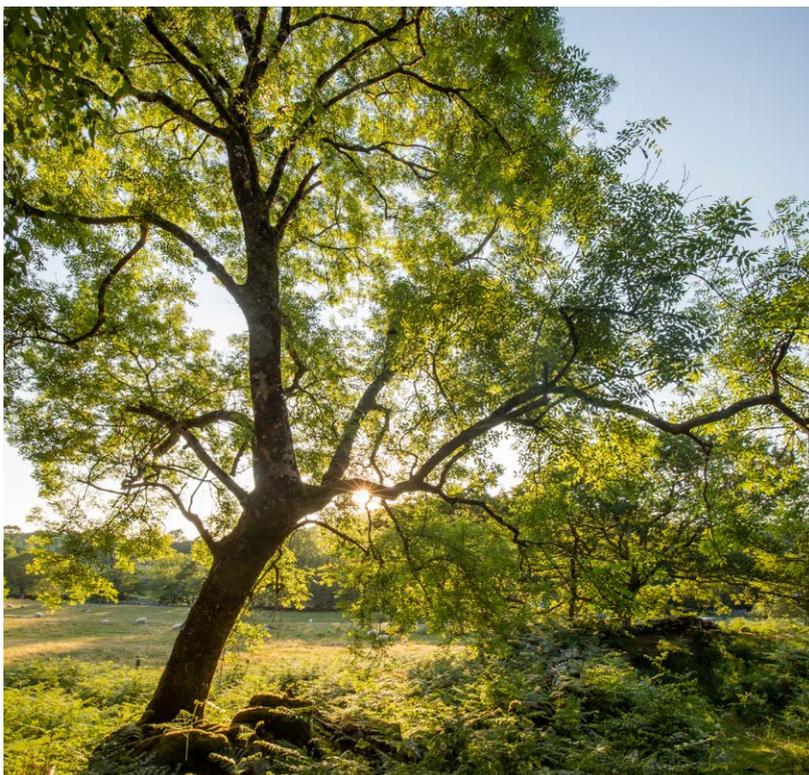
The UK government has a target of 300,000 houses to be built each year putting pressure on local planning authorities to find available spaces, seeking to amend planning policy to remove hurdles. The recent census, June 2022, states Somerset has a population of 571,600 people. This is an increase of around 41,600 people, 7.8%, since 2011 and a rise of 36.9% in 40 years since 1981 (Office for National Statistics, 2021). The increased demand for housing and development within Somerset can be seen in the landcover change, where built up areas have increased by 1.14% in 25 years, which amounts to just over 40km² of land.

Mandatory Biodiversity Net Gain (BNG) comes into play shortly. It does not replace existing requirements for developers to avoid impacts to wildlife, nor does it give developers free rein to damage habitats on a promise

that harm can be rectified elsewhere. But where, as a last resort damage to habitats cannot be avoided, developers will legally be required to deliver at least 10% biodiversity gain in addition to the required compensation as a way to contribute to nature's recovery and leave a positive legacy for people and wildlife. This will be achieved through the enhancement, restoration or creation of new habitats, with an obligation to ensure these gains are managed and maintained for at least 30 years. This is particularly critical for the better management of vulnerable habitats such as the important wetlands of the Somerset Levels, where nutrient pollution is of significant concern, but they need to be adequately resourced with the right skills and capacity to oversee the BNG process, from scrutinising BNG assessments to monitoring and enforcing delivery.

Somerset's population has increased by **36.9%**

In addition, over the next decade or so there will be major infrastructure developments with plans to spend £15m on significant transport projects announced in Sept 2020. The Heart of South West LEP has aggressive economic growth and productivity targets. Energy generation and transmission is likely to change with the prospect of offshore wind farms along the Coast, and the Hinkley Point C development continues with damaging ecological plans.



Ash dieback

Ash dieback is widespread and has had a significant impact. Assessments of affected woodlands have shown extensive areas of ash trees are infected by the disease. Between winter 2020 and March 2023 Somerset Wildlife Trust felled heavily infected and dead ash trees that were assessed to be of high risk to safety over a 19ha area spread across 14 reserves. The problem affects the whole county but is most prevalent on and around the Mendip Hills where the proportion of ash is particularly high.

Although the management has been drastic in places, the impact on wildlife and the environment has been minimised by felling outside of the bird nesting season and specific tree species have been added. Tailored management that opens rides and glades will bring more light to the forest floor, so we may see more butterflies, orchids and other species benefitting longer term. All areas will be restored through natural regeneration where there are enough other canopy species to support this, or by carefully selected replanting where this is not possible. Recovery will be a slow process.

Pollution

Pollution is having an immediate impact on habitats, which is evident on the Somerset Levels and Moors. Its SSSI condition was downgraded to 'Unfavourable Declining' in 2021 due to poor water quality, mostly associated with phosphate concentrations and associated duckweed and filamentous algal blooms. The poor quality of our rivers and waterways, particularly those infected by bacteria from sewage pollution, poses significant human health risks, impacts agricultural productivity, cause damage to soils and ultimately

reduces biodiversity and habitat, with the loss of many native species. An increase in air pollution is highlighted due to the loss of lichens, an indicator species to determine air quality, across Somerset. Specifically, 38% of lichen species are inferred to be lost since 1960 in Exmoor.

Although specific data isn't available, there are many inferences we can make from increased pollution. For example, studies have shown increased light pollution, due to increased development and urban areas, can affect bat and bird habits and populations.

38%
of lichen species
are inferred
to be lost
in Exmoor



5

The future



The evidence we've provided in the Somerset State of Nature report is stark, and a clear indicator of the perilous position we find the county's biodiversity in.

Whilst the picture is bleak, we must reach beyond despondency. The report highlights the importance and need for policy makers, stakeholders and communities across the country to work together to halt and reverse the declines we have seen across the county, so it is upon this we must focus. The report highlights very clearly that where there is concerted effort, landscape-scale vision and collaborative and cohesive partnerships, success is possible. There are already a large number of positive case studies across the county from which we must take inspiration and hope for future nature recovery. The recently established Somerset Wetlands and Mendip Hills 'Super' National Nature reserves are examples of where organisations coming together with a common cause has been a powerful catalyst for positive action within those landscapes.

Somerset Wildlife Trust and Somerset Environmental Records Centre, along with our peers in the Local Nature Partnership; Somerset Catchment Partnership, Exmoor National Park, Forest of Selwood Partnership, Bumblebee Conservation Trust, RSPB, Forestry Commission, Somerset Council, Somerset Rivers Authority, The Somerset Drainage Boards Consortium, Woodland Trust, Marine Management Org, Natural England, FWAG SW, Quantock Hills National Landscape, Mendip Hills National Landscape, Blackdown Hills National Landscape, Duchy of Cornwall, National Trust, the Hawk & Owl Trust and Wildfowl and Wetlands Trust are working more closely together to take on the challenge and to define a nature recovery strategy for the county.

We need to build on this body of commitment, bring others on Somerset's journey to 2030. Not only this, we must also expand on the growing number of private landowners already managing their land for nature conservation and

looking for opportunities to enable wider recovery, and work closely with new and emerging organisations in the county such as Heal Rewilding and Somerset Wildlands who are, not only delivering nature recovery, but also increasing wider public awareness of the issues we face.

This, along with the developing Local Nature Recovery Strategy and support from new government initiatives such

Where there is concerted effort, landscape-scale vision and collaborative and cohesive partnerships, success is possible

as ELMS and Biodiversity Net Gain, will hopefully see a halt in the loss of our best habitats, and a significant increase in the funding to land managers for restoration and rehabilitation of large tracts of land. With so much support and with all of us combined in a focused way, we will help drive Somerset towards achieving the goal of 30% good quality habitats across land and sea by 2030. But we must also remember that our overall aim should be that biodiversity and bioabundance is improving everywhere and that every individual and community in the county can play their part, connecting with nature and contributing to species and habitat restoration targets.

The Somerset State of Nature report is the vital foundation for supporting this work. With this first report, we set a baseline and create a better idea of what we need to be evaluating, and structuring our recording efforts to answer those questions. Future editions of the Somerset State of Nature will gradually incorporate those answers. It is important to remember that it's not too late to act, and that we can, collectively, deliver the impact we need for nature to recover.



Key recommendations

from the Somerset State of Nature Report 2023

- **Encourage everyone** across Somerset to help deliver the **Local Nature Recovery Strategy**. For the strategy to be truly effective it needs adoption by **all communities** and must ensure that all **individuals and landowners**, and not just decision and policy makers, have shared ownership and take on responsibility for its delivery.
- **Share case studies and stories** to inspire and demonstrate how we can deliver nature recovery.
- **Provide greater support** for, and encourage greater **collaboration** between, **landowners, communities and individuals** to deliver nature recovery at scale.
- There are clear gaps in **key evidence** and the required funding to support structured and **effective monitoring** of **species abundance, distribution** and **change**. We must work together to create a plan to **address this funding gap**.
- Through the LNRS ensure **targeted investment** into species and landscape-scale **nature recovery programmes**.
- **Build on** our current **recording expertise and knowledge**, through **targeted citizen science** activities and nature counts like the Great Somerset Wildlife Count and the **development of new and widely accessible monitoring** and online recording systems.
- Encourage a much **wider range of academics, organisations and citizen scientists** to record, monitor and share information.
- The Somerset State of Nature report must be a 'live' report. We must **continue to improve our knowledge and understanding** of impacts and pressure on the natural environment and use that knowledge to **shape future delivery of nature's recovery**.



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The Somerset State of Nature 2023



Naturally Somerset
Somerset Local Nature Partnership

In collaboration with the Somerset Local Nature Partnership

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