Stratton St Margaret Parish

Biodiversity Action Plan



To protect and care for Stratton St Margaret's wildlife

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Foreword

Our planets natural environment and wildlife are highly valued commodities, not just for economic reasons but also for the cultural services they provide. From recreational walks in the countryside with the family to the fuel that powers our homes and cars; nature provides us with a multitude of beneficial resources. However, in the face of the current global ecological crisis, the biodiversity that we depend on is being diminished at an alarming rate. Globally there has been a decline on average by 68% in mammal, bird, fish, reptile, and amphibian populations since 1970[1]. Climate change, pollution and urbanisation are examples of some of the biggest contributors to this huge loss to the natural world. This is not just a global issue, but one that can also be felt at a more local scale.

Here at Stratton St Margaret parish council, we are committed to protecting our local green spaces and wildlife to better protect and nurture our environment. For example, Claridges Park, a small tranquil space off the busy Swindon Road, is home to a variety of bird species due to its range of aquatic and terrestrial habitats. Not far away, Church's Park is home to a Great Crested Newt population. This European protected status species shows just how special these green spaces in Stratton St Margaret are to maintaining wildlife populations.

This Biodiversity Action Plan (BAP) was made in accordance to the UK government's response to the Convention of Biological Diversity (CBD (Rio Earth Summit in 1992)), which led to the generation of Local Biodiversity Action Plans (LBAP) across different regions of the UK. Within Swindon, green spaces are under strain from continual development. For example, there are plans to expand the east of Swindon with up to 8,000 new houses on green land as part of the new Eastern Village project[2]. This project is not unique with residential areas expanding both within and around the town. With this and the CBD in mind, this BAP intends to help safeguard green spaces and local biodiversity to be enjoyed now and for many years to come.

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Key Words & Abbreviations

	Meaning
BAP	Biodiversity Action Plan
Biodiversity	Defined by the CBD as "*variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems"*[3].
CBD	Convention on Biodiversity, which took place at the Rio Earth Summit in 1992.
Ecology	This is the study of the relationship between organisms and their physical environment.
Ecosystem	A system which consists of all the organisms and the physical environment with which they interact[4].
Ecosystem Services	Refers to the benefits humans gain form natural capital, or from healthy ecosystems across the planet. The Millennium Ecosystem Assessment popularised to concept into conservation policy. *Examples include: climate regulation, fuel, food and pollination*.
GCN	Great Crested Newts, are a species of Amphibian that have been labelled a protect species under the UK under the Wildlife and Countryside Act, 1981 as well as internationally under Annex IV of the European Habitats Directive[5].
ICUN	International Union for Conservation of Nature is a membership union of government and civil society work to advance sustainable development and conserves nature[6].
Keystone Species	A keystone species is one that has strong ecological interactions with other species within an ecosystem relative to their abundance.
LBAP	Local Biodiversity Action Plan.
MEA	Millennium Ecosystem Assessment, between 2001-2005, assessed ecosystems across the planet and the need to conserve and use ecosystem services sustainably.
NERC	Natural Environment and Rural Communities Act of 2006.
Species Abundance	Refers to the abundance/ or number of individuals within each species in a given ecosystem.
Species Richness	Refers to the number of species within a given ecosystem.
SPI	Species of Principle Importance.

Table 1 List of key words and abbreviations used throughout the report.

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Section 1: Introduction

Biodiversity

In recent years, biodiversity has become a buzzword used by both professionals and environmental novices alike and across a variety of sectors. The definition, however, can range from referring simply to "wild places", "abundance of species"[7] or to more complicated definitions including genetic diversity amongst organisms. In 1992, the CBD was signed by 150 government leaders, all dedicated to achieving conservation and sustainable use of biological diversity[8]. The legal framework defined biodiversity as *"variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems"*[3]. In other words, biodiversity refers to the existence of variety within the same species, between different species and the habitats in which organisms are found. This understanding of biodiversity is what has influenced the methodology of this report.

Local Biodiversity

Stratton St Margaret is home to some great green spaces that are enjoyed, not only by the local human population but also by the area's amazing fauna and flora. The area has a range of different habitats including: grassland, woodland, wildflower meadows, allotments, urbanised habitats, seasonal/non-seasonal ponds and even a river ecosystem. Nature can be found and observed in pockets all around the parish, from Non-Governmental Organisation (NGO) ran sites, including Stratton Wood (Woodlands Trust), to residential private gardens and parks. From Common Oaks (*Quercus robur*) dotted around the parish, Yellow Rattle *(Rhinanthus minor)* at the park near Merton Avenue, and Great Crested Newts (GCN, *Triturus cristatus*) at Church Park, Stratton St Margaret has a rich variety of organisms from mammals to invertebrate and lots in between. Stratton St Margaret certainly has plenty of biodiversity of its own.

Figure 1: Yellow rattle surveyed amongst the wildflower meadow at the park near Merton Avenue, Stratton St Margaret. For more details on this species see section (*3, Wildflowers*).

(Bailey,2022)

The Importance Of Biodiversity

Human populations rely heavily on natural resources or 'natural capita' *(E.F. Schumacher, 1973[9])* for essential services from the food we eat to the air we breathe. To maintain these resources, biodiversity is key to support and sustain the healthy ecosystems from which we withdraw them. The Ecosystem Approach is a concept popularised by the Millennium Ecosystem Assessment (MEA) in the early 2000s, that provides a useful tool to assess the state of ecosystems through their many and varied benefits to humans. The MEA splits the types of ecosystem services into the following: provisioning regulating, cultural and supporting **(Figure 2).**

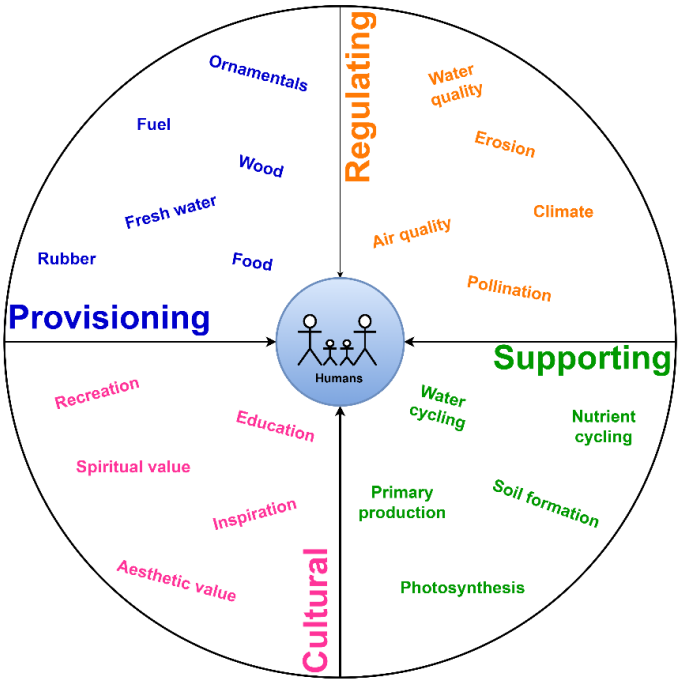

Figure 2: Diagram displaying the four ecosystem services as described by the MEA: Provisioning, Regulating, Cultural and Supporting.

Within each segment examples are given of what benefits can arise from each service. In the center the sketch of a family represents how these services are used by humans, clearly indicating why protecting biodiversity is so important.

(Bailey,2022)

Provisioning services are those which provide **material benefits obtained from natural ecosystems**. Agricultural crops and livestock provide the food we eat. Coal, wood and a variety of other natural sources provide the fuel we use to power almost every aspect of modern life. A lot of western medicine derives from plants. With only 5% of global plant species have been identified and ¼ of these species threatened by extinction[10], it is imperative to protect biodiversity to preserve this potential reservoir of resources.

Regulating services provide benefits from the **regulation of the natural environment**. For example, climate is a regulating service. Climate affects numerous aspects of our lives, including pest and

disease control as well as agriculture. Another example is pollination, a vital service performed by pollinators such as bumble bees (*Bombus)*. Pollination enables crops to reproduce and genetic exchange to take place maintaining the variety and abundance of all plants on Earth.

Often overlooked are the **supporting services**, which are those that are **required for all the other services**. Services, such as nutrient cycling, are going on in the background recycling nutrients in the soil enabling the production of agricultural crops, livestock to feed, and ornamental garden plants to grow. In addition, key services such as photosynthesis and primary production are responsible for maintaining all life on Earth as we know it. These services support all other ecosystem services that allow us to survive and enhance our lives, and therefore can be considered essential.

Conversely, **cultural services** are more widely well-known and appreciated. Although biodiversity's role in providing these services is often underrated. These services include the **recreational, educational and sometimes spiritual benefit humans get from the natural world**. A local example would be a recreational walk with the family around Church Park **(Figure 3)**. Since February 2021, 33% of people surveyed were visiting parks and green spaces more regularly[11]. This shift in dynamic is associated with the Coronavirus pandemic where restrictions limited our ability to spend time in nature leading to a new appreciation for its benefits. In fact, 9/10 people in the UK in 2020 agreed that natural spaces are important for their mental health and in 2021 41% attributed nature to improving their personal wellbeing[11].

Figure 3: Church's Park on Church Street, Swindon. Situated close to Stratton St Margaret Church.

(Bailey, 2022)

Biodiversity underpins all of these services. Without species richness and abundance, as well as varied habitats, these services wouldn't exist. Productive ecosystems falter when variety is removed and vice versa. Hence the need to protect biodiversity globally to maintain this balance. There is interdependency between all organisms and the natural world. Human populations are not an exception. We rely on natural resources for our survival, however our actions, such as deforestation, can upset the natural balance causing resources to diminish. To maintain a harmonious relationship and allow the ecological life supporting services to continue, biodiversity must be protected to preserve our greatest resource. Nature.

The Threat To Biodiversity

Globally, biodiversity is declining at an unprecedented rate. This loss can mostly be attributed to anthropogenic impacts including excessive agriculture, industrialisation and pollution. In 2019, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) reported alarming statistics with a 20% reduction in native species in land-based habitats and the extinction of 680 vertebrate species since the 16th century[12]. From 1970 there has been a 24% decline in biodiversity across Europe and central Asia alone[1]. These findings are reflected nationally with the UK National Ecosystem Assessment (NEA) in 2011 concluding that over 40% of priority habitats and 30% of priority species were declining[13]. With this decline comes the potential loss of numerous valued resources.

A Call To Action

Internationally, numerous agreements, including the CBD, work towards the protection of global biodiversity through commitments towards a more sustainable future. One such commitment is the implementation of National Biodiversity Action Plans (NBAP)[14]. For the UK, a NBAP as well as LBAP's across the different regions have been created to meet with this international agreement to protect biodiversity. The framework for these plans is based on the 2006 Natural Environment and Rural Communities Act (NERC), which placed the duty of biodiversity conservation to local authorites[15]. The main goal of LBAP's is to conserve the biodiversity at a local scale[15] by surveying local wildlife and working with the community to preserve, raise awareness and protect local biodiversity.

Figure 4: Common Oak found along Watermead Close and Brookes Close. One of the tallest oaks in the parish.

(Bailey,2022)

The creation of a BAP for Stratton St Margaret parish was established within the Strategic Plan (2021-2026) for the local area, hence this report. The report will identify and create an action plan to protect the areas key green spaces and species. Additionally, Stratton St Margaret Neighbourhood Plan further acknowledges the need for sustainable management of local biodiversity and green spaces. The plan has placed the protection of these spaces into local policy with major housing developments, being required to ensure the upholding of the standards set out. For example, the protection of open spaces biodiversity and the preservation of ecologically important trees and hedgerows **(Figure 4-**

***Common Oak*)**. The aim of this BAP is to investigate Stratton St Margaret's local biodiversity and create a plan of action to protect these species and green spaces. With Swindon's development ever encroaching its border further across the landscape, the protection of Stratton St Margaret's biodiversity has never been more crucial. There is an urgency to prevent this development forcing out nature from the local area. To maintain and preserve the parish's natural landscapes and species, a plan of action is required.

Section 2: Stratton St Margaret

History of the parish

Stratton St Margaret is now a suburbanised area in the north-eastern part of Swindon. However, it was once a village whose name Stratton (*Latin* for "street") derives from the former Roman road (Ermin Street) which traverses the parish from north to the south[16]. In fact, some locals still refer to Stratton as "the village" even today. The parish was once much larger than current day, with areas like part of the Penhill housing estate once being fields that formed part of the parish[17]. The same year, 1891, a parish council for the area of Stratton St Margaret was formed[16].

The parish has long historical roots with the village being mentioned in The Domesday book in 1086[16]. Back then the parish was recorded as the toponym Stratone. Stratone was held by the physician to William the Conquer[16]. At the time, the village consisted of three hamlets: The Street (the area around Green Road and Dores Road), the few houses at Kingdown and Stratton Green (near Tilleys Lane)[16]. These hamlets were joined by footpaths and coffin-ways and had a small population recorded at 24 villagers[1]. Land was divided between meadows and pasture land[18].

The Church of England's Saint Margaret's church was built in the 13 century with additions being added later on in the 1840s and 20th century[16] **(Figure 5)**. A Norman door is still preserved at this historical building[16].

Figure 5: Stratton St Margaret Church situated on Church Street, Swindon.

(*Bailey, 2022*)

As a quickly developing area, the borders of Swindon soon reached Stratton St Margaret by the mid-19th century causing the area to lose its separate identity[16]. Then in 1974, the familiar form of the Stratton St Margret Parish council was formed[16]. The area known as Nythe was dropped from the parish in 2015 and now forms part of Nythe and Eldene Parish[19].

Present Day

Today, Stratton St Margaret is located in the north-eastern part of the large town Swindon. The population has dramatically increased from the 24 villagers mentioned earlier to approximately 23,000 residents[20]. The western border of the parish is surrounded by urbanised areas such as Pinehurst, Gorse Hill and Walcot as well as industrial areas such as Kembrey Park. On the North-East border, however, the parish is surrounded by the beautiful grounds of Stanton Park leading out to beautiful open countryside creating an open green corridor into the parish for wildlife to cross into the parish. To the south the parish is bordered by the urban villages of Covingham and Nythe.

The pattern of spatial development of the area includes a quarter of the parish as commercial space and the rest as residential areas that are intermixed with green spaces[16]. Open green spaces in the area are appreciated by local residents for their recreational uses as well as for the benefits nature brings to our mental health. This BAP should enable businesses and service users alike to better understand and protect in the future the biodiversity and wildlife that enables the green spaces to thrive.

Section 3- Habitats

Allotments

Stratton St Margaret parish council manages two allotment sites within the area: the White Hart allotments (Lower Stratton) and St Philips Road allotments (Upper Stratton, **Figure 6**)). Allotments are a widely enjoyed resource providing an oasis of nature within urbanised areas, such as Swindon. According to the National Allotment Society, benefits of allotment gardening go above and beyond food production alone. There are many benefits that stem from allotments including providing a supportive community that helps to tackle issues such as loneliness, and improving participants mental and physical health[21]. Despite this, the number of allotments within the UK has reduced from over 1 million in 1950 to just 250,000[22].

Figure 6: St Philips Road Allotments.

This is one of two allotments sites managed by Stratton St Margaret Parish Council.

(Bailey, 2022)

This figure is disappointing not just for us but also for wildlife populations. Allotments are fantastic urban environments, often acting as wildlife corridors within urbanised areas connecting farms, parks and hedgerows. These corridors are important to help alleviate the fragmentation of habitats caused by urbanisation. The wildlife you can find are varied including small mammals, insects, birds and amphibians. As agricultural knowledge has increased so has the use of chemicals, such as pesticides and herbicides, even at allotment scale gardening. These chemicals are often damaging for local wildlife as they often indiscriminately remove pests as well beneficial wildlife such as pollinators. Without beneficial wildlife, allotments will lose their naturalistic qualities and homogenise to the man-made monoculture that is industrialised farming.

With all of this in mind, Stratton St Margaret Parish Council recognise the importance of these spaces both culturally and environmentally. The mature hedgerow that runs along the edge of the St Phillips Road allotment is an important ecological habitat that must be maintained. Hedgerow offer useful resources and shelter to many species (*see section, Hedgerows pg.17*). We already have in place regulated cutting schedules to avoid bird nesting seasons and aim to do more in the future to protect this wildlife encouraging habitat within our allotment. In addition, at the White Hart allotments a dedicated wildlife zone has been marked out and progress is on its way towards making this space as ecologically friendly as possible to attract more wildlife into the allotment. From a dedicated bee keeping area to a medium sized pond and wildlife friendly planting *(see section, Action Plan)*, this space will encourage more wildlife and provide a calming naturalistic aesthetic to the site.

Hedgerows

Hedgerows are a staple to the Great British countryside and often seen marking the boundaries of farms, private land and are often found in urban parks. Hedges are strips of woodland edge habitats[23] composing of hedge, banks, and trees. A few hedgerows within the UK are linear remnant of ancient forest from the Iron Age and most were in existence by the Norman Conquest[23]. Most were planted by humans to mark parish boundaries, land ownership and to enclose livestock[23]. An estimated 40% of UK hedges are ancient and or described as species rich habitats[24]. Their ecological importance is notably shown through the number of native plant and animal species with 'hedge' in their names. These include: Hedgehog, Hedge Sparrow and Hedge Bedstraw[23]. These structures provide 21 ecosystem services[25] including: providing historical boundaries between land (cultural service), stock proof barriers (cultural service) and are a widespread priority habitat for many species[26] (provisioning service).

As the most widespread semi-natural habitat within the UK[25], hedges provide numerous benefits for wildlife. Hedges provide great shelter for birds, small mammals and insects, the composition of which depend upon size, species makeup and health of the hedge. For example, hedgehogs and harvest mice use them for shelter[24]. Their flowers, berries and nuts are an important food source[24], especially during the winter months. Hedgerows also act as important wildlife corridors[24], especially in urban environments helping to alleviate population isolation and total fragmentation of the environment. In fact, bats are known to use hedgerows for commute routes as well as foraging and roosting[24]. Those hedgerows which include mature trees are especially beneficial helping to provide a vertical aspect to the environment. In fact, 130 action plan species for the UK are closely associated with hedges[24]. In addition, hedgerows are also speculated to play an important role in carbon storage and the provision of a renewable fuel source: firewood[25]. It is thought that a new hedgerow could store up to 600-800kg of Carbon Dioxide equivalent per year per KM for up around 20 years[25]. For urban areas such as

Stratton St Margaret, these habitats therefore provide numerous ecosystem services including: climate control (regulating service), proving wildlife (provisioning/cultural service), adding greenery to urban areas (cultural service) and sustainable urban drainage (provisioning service)[25]. It is therefore imperative to maintain these structures in our local area for the benefit of local residents and the wildlife who have made the parish their home.

These habitats vary in structure and size depending on their location, age and natural additions to the hedge. Rural hedges tend to be a mix of shrub and tree species such as: Hawthorn, Blackthorn and Ash. Whilst urban hedgerow is more likely to include: Box, Yew and Holly[24]. Wildflowers, like Cow Parsley *(Anthriscus sylvestris),* often grow naturally at the foot of the hedge[27], providing an important source of nectar for pollinators. At St Phillips allotments, a wildflower strip alongside the long dense hedge that runs along one side of the allotment would be useful to extend this habitat and provide an extra food source to nesting birds through the attraction of insect species. Another factor influencing these great habitats is their management. Left to grow naturally these structures can become dense and provide excellent nesting sites for numerous bird species. However all too often indiscriminate flailing, often required for neat upkeep of the hedgerow can create holey hedges[23]. Furthermore, agricultural chemicals can reap havoc damaging these structures and in doing so, the local wildlife that depend on them[27]. Around 118,000 miles of hedgerow has disappeared since 1950 due to agriculture and urbanisation[24]. This action plan aims to protect the ~2 miles of hedgerow within Stratton St Margaret.

Grass Verges

Grass verges within all urban areas are a common sight acting as small spots of green within an otherwise often dull landscape. These small spaces are found scattered through Stratton St Margaret found often along the sides of roads and paths. Often these spaces are sterile neat manicured lawns of grass. However, within these spaces trees can also be found creating avenues. Trees add a vertical aspect to an otherwise dull landscape. These spaces are common within the parish although most aren't being utilised to their full potential.

Figure 7: Grass verge alongside the River Cole and Covingham Drive. A wildflower meadow seen in this image is an example of the improvements that can be made to these spaces to boost wildlife presence.

(Bailey, 2022)

Although not currently hotspots for biodiversity, often only providing brief refuge for insect species within urban areas, these small spaces have large potential for improving wildlife in the area. Grass verges on the side of roads and paths have the potential to be hotspots for biodiversity through the planting of wildflowers and trees providing refuge for pollinators and birds. Leicestershire County Council have launched their own scheme to improve roadside grass verges within their area through their 'Develop your own wildlife area' scheme[28]. This scheme encourages parish, town, borough, and district councils the opportunity to turn urban roadside verges into dedicated wildlife verges through the planting of wildflowers[28]. Since the 1930s, 97% of UK meadows have been destroyed, making road verges an important refuge for pollinators as well as other wildlife[29]. By planting native wildflowers on grass verges throughout the parish these small spaces can make a big difference together in creating species rich hotspots. Species rich verges are able to support more wildlife, enhance ecological connectivity, improve ecosystem services such as pollination and cultural services by enhancing local character and improving wellbeing[29]. By working with local residents to support this idea, these small spaces can make a big difference to local biodiversity.

Trees

Within the UK, forests currently cover 13.2% of our land area[30]. As urbanisation and development have advanced, space for trees has reduced. However, these pillars in our landscape provide numerous benefits to humans, wildlife and the environment. Trees provide many ecosystem services for us including: climate regulation by reducing the temperature in urban environments by up to 7°C, boost local housing prices and economy, provide educational opportunities, some have medicinal properties (Birch bark has antiseptic qualities) and relieve stress[31]. For the environment, trees act as climate regulators by soaking up CO2 and storing the carbon within its wood. Trees also help protect soil from erosion helping to maintain healthy fertile soil for vegetation and crop growth. In terms of the benefits to wildlife: trees provide habitats and shelter for a wide range of organism from mycorrhizal (fungi) underground networks to tawny owls within their trunks[31]. In fact, the common oak tree is able to host ~500 different species[31] making it, and many other trees like it a keystone species.

Stratton St Margaret has a wide range of species of tree within the parish from towering Giant sequoia (*Sequoiadendron giganteum*), keystone species like the Common Oak (*Quercus robur),* to decorative ornamentals such as ornamental Cherry Blossoms. After the 2020 global Corona Virus (COVID-19) pandemic, a cherry blossom tree in three parks dotted around the parish were planted to commemorate those who lost their lives to the outbreak. These trees not only provide a habitat for birds and other wildlife, but also act as a beautiful reminder of loved ones who are no longer with us.

Oak Tree *(Quercus robur)*

Quercus robur, or the 'Common Oak' as it is otherwise referred to, is a species of deciduous trees commonly found within the woods of southern and central Britain[32]. These native trees are a national favourite with the tree being the national emblem for strength[32]. These trees can grow up to 20-40m tall and have distinctive round lobed leaves and short leaf stalks[32] **(figure 8)**. These lobed leaves arrive in around the middle of May and often grow in bunches[32]. Long yellow hanging catkins distribute pollen into the air for reproduction[32] and acorns form and fall to aid seed dispersal.

Mature Common Oak is capable of supporting more wildlife compared to any other native tree within the UK[32]. It is because of this that these trees are described as keystone species. They can support an abundance of invertebrate species and several hundred moth species feed on their leaves[33]. Even in death the Oak tree is capable of supporting life with the Stag Beetle *(Lucanus cervus)* using the fallen leaves a s a habitat and supporting Oakbug Milkcap *(Lactarius quietus)* fungi amongst the leaf mould[32]. Birds are able to nest amongst its branches and use the inhabiting insects as a food source[32]. Squirrels' and Deer feed of the acorns in the autumn months and the catkins act as a food source for the purple hairstreak butterfly *(Favonius quercus*)[32]. Although described as 'common' the Common Oak is extremely useful asset to help improve biodiversity.

Figure 8: The 'Common Oak' or Quercus robur can be easily identified through its lobed leaves. *They are a common sight throughout the UK landscape.*

(Bailey,2022)

Although the Common Oak has numerous ecological benefits, it also has a lot of historical value (cultural services). Married couples in England during Oliver Cromwell (year) times got married under

these trees and the Tannin found in the bark has been used in leather tanning since the Roman times[32]. Despite its usefulness, decline of mature Oaks has been a concern since the 1920s with acute Oak decline caused by changing environmental conditions as well as pests including, Oak Processionary Moth, causing damage and premature death amongst common oak populations[32]. These trees have and will continue to play an important role culturally and environmentally so long as action is taken to protect these majestic trees.

Horse Chestnut (Aesculus hippocastanum)

Horse Chestnut trees, although not often found in woodland, are common within urban parks, gardens and streets[34]. They were introduced to Britain in the 16th century from Turkey[34]. When mature, these trees can reach a staggering 40m in height and can live for up to 300 years[34]. These trees are beloved by all due to their numerous cultural services, especially the historical game of Conkers. The game, which was first recorded in 1848 [34], remains a favourite autumn game amongst children. These trees, when mature, are also extremely valuable to wildlife. Their beautiful white and pink flowers provide a rich source of nectar and pollen for pollinating insects, particularly bees[34]. Species such as the Triangle Moth (*Heterogenea asella*) feed on its large palmate leaves[34]. The trees conkers, are also enjoyed by deer and other mammals as a source of food[34].

Figure 9: The flowers and leaves of a local Horse Chestnut tree.

(Bailey,2022)

Unfortunately, Horse Chestnut trees faces a number of threats. These include, fungal diseases such as Bleeding Canker and also are open to attack from Horse Chestnut Leaf Miners', which in large numbers can cause the trees foliage to brown[34]. Residential and commercial development is also listed as one of the top threats facing this species according to the International Union for Conservation of Nature (ICUN)[35]. With the potential of such a long-life span, these trees can provide a source of food and shelter for many other species over an extended period of time. It is therefore disappointing that these trees are facing a population decline globally and also now listed as vulnerable on the global IUCN Red List of Threatened species (2017)[35]. For these trees to be continually enjoyed by future generations to come, recognition and appreciation of this species is necessary to ensure their protection.

Waterbodies

Church Park Pond

Figure 10: Pond in Church's Park, just off Church's Lane.

Close to Stratton St Margaret Church, the pond is nestled amongst residential housing surrounded by shrubs and trees.

(Bailey,2022)

Figure 11 Hibernaculum created by the council from old logs, timber and stones collected from around the parish.

(Bailey,2022)

Within the park there is an elliptical pond approximately 18m in diameter with water levels of ~1m in the winter. The pond is almost dry throughout the summer months. The pond is surrounded by native vegetation amongst which a hibernaculum has been created through the use of old timber, leaves and rocks from around the parish. This hibernaculum is nestled amongst the shrubs on the bankside of the pond. Hibernaculum's provide hibernation, shelter and breeding sites for many different species of insects, newts, amphibians and reptiles[36]. This is especially important to have at Church Park due to the medium sized population of Great Crested Newts (GCN)[37] found within the pond. Other invertebrate, such as the Great Diving Beetle, have also been recorded[37], showing the popularity of the pond to invertebrate species. The pond was recognised in in a study by *Wildwood Ecology Limited* in 2018 as a GCN breeding ground with the aquatic vegetation providing ample protection for eggs to be laid[37] and the hibernaculum perhaps providing an extension of this to the bankside. The pond can therefore be considered an

important site for local biodiversity with GCN being marked as a protected species internationally. However too much aquatic vegetation and low water quality caused by the build-up of silt within pond meant that the pond only scored an 'Average' using the Habitat Suitability Index in 2018[37]. Action was taken in 2021 by the council, overseen by an ecological clerk to ensure the protection of GCN, with the pond being dredged to remove this build up in order to improve the suitability and aesthetics of the pond.

Issues concerning the pond include the dumping of litter in the area. Litter can be very damaging to local wildlife, which is especially concerning when the pond is the habitat of a Species of Principal Importance (SPI) in England (GCN)[38]. These organisms are protected by law due to the decline in their populations within the UK and Europe[38]. It is therefore not only important from an ecological standpoint but also legally to maintain their habitat. Another concern often raised amongst locals is the natural drying out of the pond in the summer months. However, this process is natural and to change this by artificially filling the pond ourselves would cause a shift in the ecological dynamics of the area. For example, some species actually benefit from the seasonal changes. Newts can benefit from the reduction in the number of predators in the pond and the exposure of muddy areas provides a habitat for insects[39]. Therefore, it is better to allow nature to take its course to avoid upsetting the ecological relationship between the pond and the species that inhabit it.

Claridges Pool

Claridges Pool is a large pool found within Claridges park. Situated along the busy Swindon Road, the pool offers a secluded spot away from the busy streets. The pool was once an old pit that was left over from a brick factory ran by the Clardiges family, hence the name. Management for the pool was reassigned to the parish council in 2016, after having asked to take over the site to improve the pool and park for local residents. The area has great biodiversity potential and offers a number of cultural services for the local population. In fact, the pond has been fished in by locals for approximately 60 years[40] and is a popular sport for Claridges Pool Angling Society members, who act as stewards for the pool.

In 2021, the parish council funded an ecological survey into the invertebrate biodiversity of Claridges Pool in response to the Neighbourhood Plan for Stratton St Margaret (2019-2026). From the study, 10 invertebrate taxa were identified with most species identified as midge-like species of flying insects typically found in pools[41]. However, this study has highlighted the need for the enhancement of biodiversity in the pool with similar natural structures often supporting a wider range of invertebrate species including macroinvertebrate[41]. These results are thought to be due to the fish stock within the pond. An example includes Carp, a top predator, which is thought to be putting high predatory pressure on lower trophic levels[41] i.e., the invertebrates, frogs, and toads within the pool. This imbalance in the food chain is likely the cause of low biodiversity levels within the pool.

Figure 12: Claridges Pool, just off Swindon Road.

(Bailey,2022)

The pool and surrounding green space provide an urban oasis for many different bird species, most notably the Mallard Duck *(Anas platyrhynchos)* and the Canada Goose *(Branta canadensis).* Both are a common sight within UK towns and countryside and are adept at living amongst human populations. Both are wild birds protected by The Wildlife And Countryside Act 1981, in which the hunting and killing of these species is restricted[42]. Despite their commonality, Mallards are actually on the Amber List for UK birds (2015), perhaps due to a moderate decline in their non-breeding population numbers by 38%[43]. Their population numbers are displaying warning signs within the UK for the need of greater protection of these well-loved waterfowl. On the other hand, the introduced Canada Goose is often considered a pest as they can flock in large numbers in public parks, cause damage and can exhibit territorial behaviour when they feel threatened[44]. However, within Stratton St Margaret their population numbers appear to not be causing a problem.

Issues facing these waterfowl species within Claridges Park include the dangers of incorrect litter disposal and incorrect diet. Feeding wild birds, such as ducks and geese, is a great way to connect with nature. In moderation, bread is fine for water birds, however too much can cause developmental problems in offspring[45]. It is often safer to stick to other food sources including: chopped green vegetables, wheat grain and seeds[45]. In addition, food for the birds has been found on the banks of the pool and on fishing stations. This has encouraged rat activity in the park, ruining the beauty and

safety of the spot. It is therefore important to limit the food being left on the ground to prevent these vermin populating the space. Having said that, high levels of food being left in the water can actually cause excessive nutrients causing algae blooms to grow[45]. This can cause eutrophication impacting the inhabitants of the pond through the slow stagnation of the water. These issues prompted a sign to be erected in the park to notify users the effects of certain behaviours when feeding the wild birds within the space.

Merton Fields Attenuation Pond

During year, the park near Merton Avenue, also known as Millennium Park, flooded. To manage future flooding the parish council took action by digging an attenuation pond towards the direction end of the park. An attenuation pond is a type of flood prevention method by capturing rainwater and reduce water runoff. The pond dries out in the summer months however fills up during the winter months. Predictions of increased heavy rainfall within the UK due to climate change[46] show the importance of management techniques like this for the future.

Although the pond is useful culturally in providing a flood prevention strategy to the local area, it also provides many other benefits. From an environmental perspective, the pond and vegetation that surrounds it provides a habitat, shelter and food for local wildlife (provisioning service). The pond area has been fenced off for safety reasons, to prevent small dogs enjoying the park from getting trapped in the pond. Beyond the fence, the open space has been allowed to grow wild, with the exception of some native trees planted near the pond. Lush native vegetation, including Meadows Cranes-bill (*Geranium pratense)*, flourish in this space providing colour and nectar attracting local pollinators. The space is surrounded by native tree plantations and mature hedgerow likely making the space popular with birds and insects alike.

In the future, plans to deepen the pond as part of the action plan of this BAP, to widen the scope of species that are able to use the pond is on the cards. However, a survey would be required, both within the winter and summer months, to identify the species using the pond and surrounding space.

River Cole

The river Cole (**Figure 13**) flows along the Southern edge of the parish. The river enters the parish in a westerly direction from the Walcot area. Most of its upper course has been built over, however, it can be seen east of the Greenbridge industrial estate. After which it turns south-east skirting the Coleview estate before flowing out of the parish boundaries through Covingham and on to Oxfordshire. The River Cole, is a main river and under the protection of the parish council.

Figure 13: The River Cole as it passes along Covingham Drive.

In the spaces where the River Cole is exposed, the waterbody is surrounded by natural vegetation, trees and grass verges. This vegetation provides riparian shade, which helps keep the river cool, especially important due to climate change[47], as well as providing cover for prey species within the river from aerial attack. Nestled amongst this vegetation, however, is Himalayan Balsam. This invasive species can outcompete native species[48]. Thankfully the species' invasiveness is currently being kept in check by thick layer of vegetation surrounding the river along Covingham Drive and so no action is currently required to deal with this invasive species. Identifying and managing invasive species is carried out by Stratton St Margaret council across the parish and so the presence of *H. Balsam* by the River Cole will continue to be monitored in the future.

Unfortunately, the river Cole faces a number of issues. Access to the river is limited with parts of the river being completely covered over to make room for new developments and industrial estates like Greenbridge. This has led to straightening of the river as well as fragmentation of this habitat causing a decline in biodiversity. The Department for Environment Food and Rural Affairs (DEFRA) found between 2017-2019 the river had high levels of pollutants such as copper, zinc and a high pH[49]. It is therefore unsurprising that in 2022, the ecological classification of the river was listed as only 'moderate'. Macophytes and Phytobentos species were classified as 'poor' (2016)[49], which is concerning as these organisms are used as ecological indicators, whilst invertebrates were listed as 'good' within the study helping to boost the rivers ecological status. Litter is also a concern with plastic bottles and other rubbish appearing in the surrounding vegetation and the river itself. Not only does this ruin the natural beauty of the river but can also be damaging to local wildlife with organism getting entangled in the rubbish or consuming plastics allowing these to enter the food chain.

South Marston Brook

This main river encompasses parts of north-east Swindon, including Stratton St Margaret. The waterbody has a catchment area of 12.309km² and a length of 5.072km[50], offering an aquatic habitat for local wildlife alongside the River Cole. In fact, the brook runs south-east from South Marston Industrial estate to Nightingale Wood where is eventually joins the River Cole downstream[51]. Overall, in 2019, the brook achieved a moderate ecological status, having improved from 2014 when this was poor[50]. This moderate status is thought to be caused by phosphate pollution thought to have derived from transport drainage and sewage discharge. Levels of invertebrate in the brook as of 2019 were 'good' however levels of Macrophytes and Phytobenthos were only 'moderate' [50]. Despite this, the brook provides an aquatic habitat within the parish with the potential to bring in more species in the future. It is therefore important to protect out waterbodies from pollution and enhance their ecological capacity where possible.

Wild Flower Meadows

Figure 14: Wildflower meadow found along the grass verge between the River Cole and Covingham Drive. Examples of wildflowers/ grasses found within this meadow include: Oxeye daisy, Meadow buttercup, Rough kawkbit, Common bent, and Sweet vernal grass.

(Bailey,2022)

Now a popular trend within scientific literature and land management proposals, wildflower meadows have grown in popularity in recent year due to their ecological benefits, not to mention their natural beauty. Wildflower meadows are essentially areas of open grassland which are dominated by grasses[52]. However, they also include: wildflowers, other non-woody plants and on occasion the odd tree or shrub[95]. Since the 1970s, 97% of wildflower meadows have been lost due to agriculture[52] and urban development. As cities and towns, such as Swindon, have expanded these great habitats have been swallowed up. Now a days most meadows are manmade and require careful management to ensure these areas do not return to the original woodland[52] they once were before they were cleared for agriculture. If left unmanaged, eventually more robust flowers and grasses would dominate lowering the species diversity of these habitats[52].

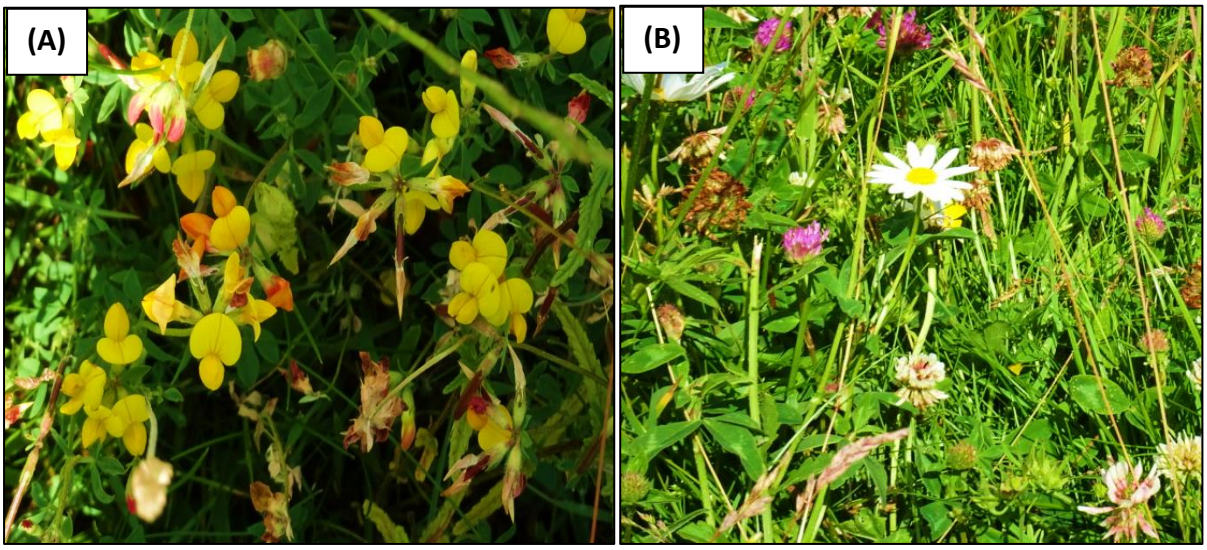

Figure 15: (A) Birds Foot Trefoil *(Lotus corniculatus).* (B) Oxeye Daisy *(Leucanthemum vulgare)*

(Bailey, 2022)

Within the UK, wildflower meadows have the potential to have a high species diversity, with hundreds of species of plants, invertebrate, mammals, birds and fungi all calling these spaces home[52]. For example, Skylarks *(Alauda arvensis)*, commonly spotted in Swindon, use these habitats for nesting whilst small mammals such as Voles take shelter amongst the grasses[52]. What comes to mind the most, however, when discussing wildflower meadows is the pollinators. Pollinating insects are of vital importance to agriculture, gardening and the cycle of life by pollinating plants and crops alike (regulating service). With bees and other pollinators currently in decline[53], it is important to create habitats like wildflower meadows to help support their populations. Wildflowers such as: Oxeye Daisy *(Leucanthemum vulgare)*, Musk Mallow *(Malva moschata)* and Birdsfoot Trefoil (*Lotus corniculatus*) all entice bees[53] with their bright colours and scents. Furthermore, the more species diversity amongst the wildflowers and grasses the larger the array of pollinators and other organisms that are attracted to these habitats. Another important aspect to remember with these habitats is the use of native

grasses and wildflower species. Native wildflowers and grasses have deep set ecological roots with other native organisms as well as being more robust towards pests, making them the ideal choice. With all this in mind, at Stratton St Margaret Council we have planted numerous wildflower meadows within parks, open spaces and grass verges within the parish to encourage more biodiversity and beauty within the local area. We have sown wildflower and grasses mixes of native species, including the bee favourite species mentioned above and intend plant more of these in the future as part of this BAP. The full list of wildflower and grasses species used is included in the Appendix of this report *(see section- Appendix).*

A survey of Greenbridge Recreation Ground and the park near Merton Avenue's wildflower meadow in June 2022 showed promising results, with an array of wildflowers and grasses having established in these meadows. One noteworthy species spotted in the survey was Yellow Rattle (*Rhinanthus minor*). This beautiful yellow flower brightens up most meadows and grasslands across the UK. Its name derives from the seeds contained in brown calyxes on the plant which give a distinctive rattle[54]. These flowers were once used as an indicator species of poor grassland by farmers, as the plant parasitically feeds off the nutrients in the roots of nearby grasses[54]. However, now this feature is used to transform grasslands back into meadows with the plant feeding off grass species enabling more delicate and pollinator friendly wildflowers to grow[54].

Figure 16:Yellow Rattle (Rhinanthus minor).

(Bailey,2022)

Since the 1980s, the UK government has issued grants under Agri-Environment Schemes to farmers to manage, restore and create wildflower meadows to encourage local wildlife[55]. More recently these schemes include the Higher and Mid Tiers of Countryside Stewardship, which provides funding to improve local environments through restoring habitats and creating woodlands[56]. This goes someway to showing just how important ecologically these habitats are. Although these habitats help facilitate an important regulating service, they are also enjoyed culturally due to their colourful aesthetics and floral scents. We therefore feel it is essential, with the support of the local community, to do our bit and embrace these habitats.

Woodland

Stratton Wood

Close to the Northern parish boundary, Stratton Wood remains a quiet broadleaved woodland retreat. The site is managed by the Woodland Trust, who acquired the site in 1994[57]. The site was once arable farmland which was transformed with the help of volunteers into 54 hectares of native broadleaved woodland[57]. Stratton Wood is a Country Wildlife Site, which is a UK designation referring to the sites value for wildlife, planted as part of the Great Western Community Project[57].

As a habitat, Stratton Wood is home to a wide range of both plant and animal species. This can be attributed to its range of habitat types including: mature native broadleaved woodland, seasonal ponds and meadows. For example, Woodpeckers and Robins can be found throughout the woodland whilst the wildflower meadows attract pollinators and other insects[57]. Larger mammals including Roe deer can also be spotted roaming the site[57]. Stratton wood has a variety of native broadleaved trees and shrubs with mature hedgerow suitable for nesting birds[57]. In fact, the site is also home to several large Ash trees[57], which are currently threatened by Ash Dieback disease. Stratton wood is therefore a valuable site for Stratton St Margaret's wildlife through providing: a habitat, carbon storage, sources of food and acting as a green corridor from the surrounding countryside into Kingsdown Crematorium and Swindon's urban environment. Stratton Wood provides many ecosystem services, and a few examples of these are listed below (**Table 2**).

	Examples
Provisioning Service	• Food source for wildlife • Materials (timber)
Regulating Service	• Carbon storage • Cleaner air • Flood management • Pollination
Cultural Service	• Physical and mental health • Knowledge and learning • Recreation • Inspiration
Supporting Service	• Photosynthesis • Space for Wildlife

Table 2: Ecosystem services provided by Stratton Wood, Swindon.

(Bailey,2022)

Although under the management of the Woodland Trust, Stratton Wood remains an important aspect of this BAP due to its numerous benefits both to wildlife and the local community. We hope to be able to work with this amazing organisation in the future to continue to enhance Stratton St Margaret's biodiversity.

Section 4- Residential Areas

With Swindon's urban development continuing to expand to meet housing demands, protecting biodiversity within the parish has become more important. Stratton St Margaret has some great open spaces which are mostly amidst within residential areas. This is great for local residents as it offers close by green spaces helping to relive stress, provide space for outdoor activities and help add interest to the urban environment. The wildlife potential of open spaces within residential areas are often forgotten or unrealised. With ample opportunities for wildlife corridors and spaces to be created, it is important that these spaces are not neglected and are included in future plans to maintain biodiversity in the local area.

Church Yards/ Crematoriums

Stratton St Margaret Parish council manage two cemeteries: Green Road and Upper Stratton and Lower Stratton at Stratton St Margaret Church. Kingsdown Crematorium is also within the parish boundaries however is under the management of Swindon Borough Council. These spaces are a special place where we bury and visit loved ones and so we have a dedicated team who tend and care for these spaces. However, crematoriums and church yards can also provide a home and green corridor for our local wildlife. For example, Stratton St Margaret Church yard is home to a number of very mature beautiful trees. These trees not only provide a vertical habitat for nesting birds and insects but also have historical value (cultural service) with some having lived for decades. Furthermore, deer and other small mammals travel the short green corridor from Stratton Wood into Kingsdown Crematorium and can be spotted in the day amongst the trees. The flowers left by the public, especially during the winter when resources are scarce, provide a food source to these beautiful stoic creatures. Whilst this can often seem more of an irritation, understandably, it is also important to recognise the service the deer provide to us helping to create a natural quiet haven away from the bustling town. The sound of birdsong in these sombre places can help lift spirits and provide comfort to loved ones. It is therefore important to manage these spaces with wildlife in mind.

Private Gardens

Private gardens within Great Britain are estimated to cover around 10 million acres, or in other words, a space larger than all the nature reserves in the country[58]. Although often small, these green spaces

provide links through countryside and towns acting as wildlife corridors enhancing ecological connectivity, especially within urban habitats. Encouraging wildlife into our gardens by taking a step away from traditional neat borders and mowed lawns would provide numerous benefits to local wildlife and inadvertently to ourselves.

In recent years, gardening as a hobby has boomed, perhaps due to the recent Coronavirus pandemic with lockdowns making us appreciate our outside spaces and nature a whole lot more. In fact, it is estimated that 3 million new gardeners emerged during lockdown according to The Horticultural Trades Association[59]. This new zest for gardening has also been encouraged as the latest wellness trend with vitamin G as the new buzzword describing the physical and mental health benefits of just being out in green spaces. Plenty of recent research has indicated that just being out in nature and interacting with wildlife can lower stress[60]. This and the physical excursion often involved in many gardening activities including weeding, are making gardening a go to recreational form of fitness with the same benefits as having an allotment *(see section 3-Allotments)*. For many, our gardens are an oasis, a place to escape from the hustle and bustle of everyday life.

Current gardening trends include the growing of fruit and vegetables as well as creating wildlife friendly spaces. Bucket ponds, bug hotels (figure) and planting pollinator friendly plants including: Lavender *(Lavandula)*, Foxgloves *(Digitalis)* and Primroses *(Primula vulgaris)*, are all excellent ways of encouraging wildlife into your garden[61]. Unfortunately, since 1900, 13 species of bee have been lost and currently nearly 1/10 of Europe's wild bee species are facing extinction[60]. Urban development and intensive agriculture are big contributors to this decline[60]. The humble bee is responsible for 80% of Europe plant pollination[62], including plants such as squashes and apples[62], popular choices in many gardens. Other animals found commonly in our gardens including hedgehogs, sparrows and song thrushes are all declining in the UK[63] making private gardens a valuable resource to help protect these creatures. With these alarming figures in mind, our gardens could act as a mosaic of green spaces ready to give nature a home within the urban landscape of Stratton St Margaret.

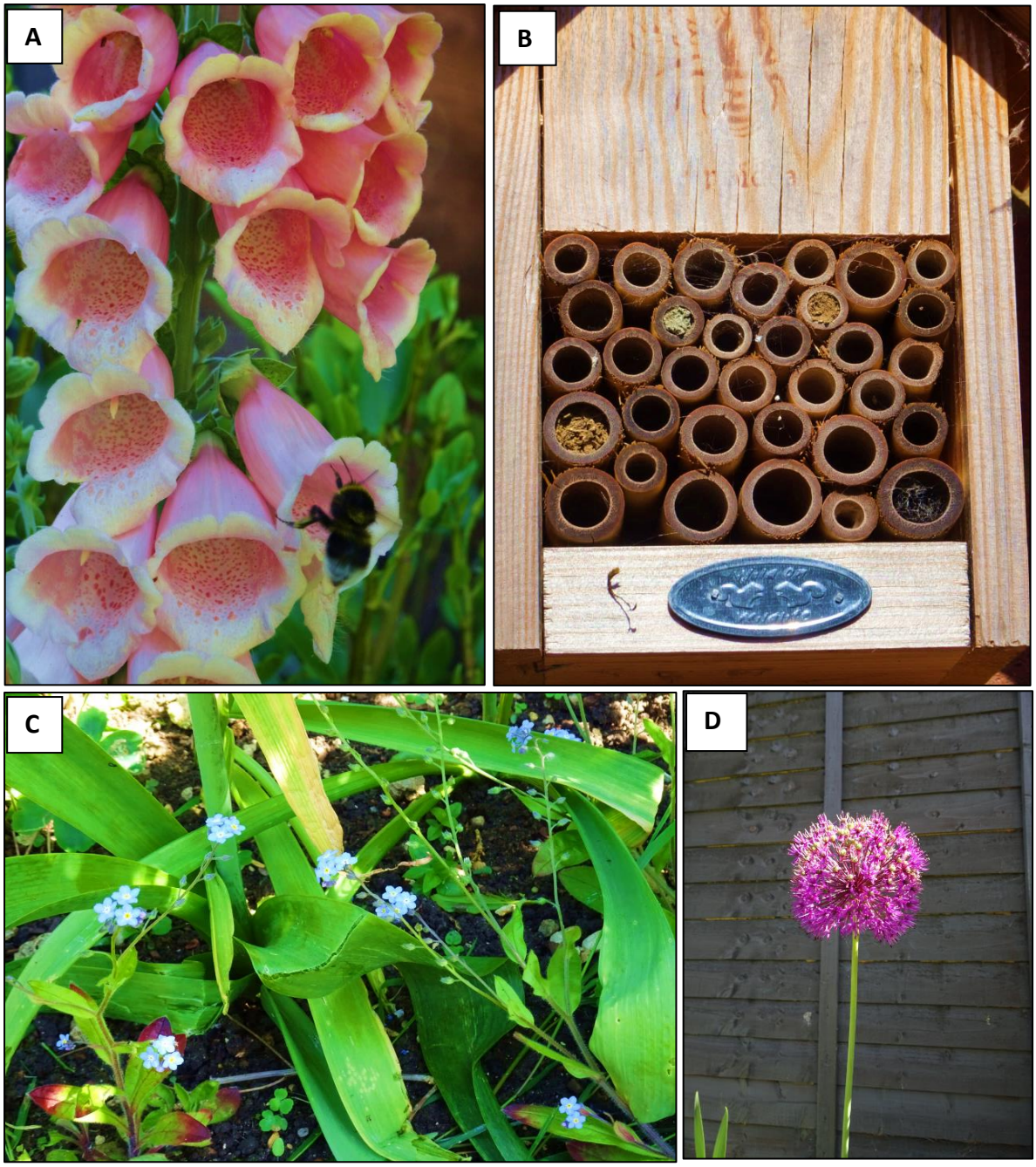

Figure 17: (A) A bee visiting a Foxglove, (B) Bug hotel, (C) Garden border Forget-me-not's, (D) Garden border purple Allium.

(Bailey 2022)

(A) Pink Foxglove *(Digitalis)* found within a local back garden attracting a bee (Bombus) to feed on its nectar, aiding pollination of the plant.
(B) A bug hotel which provides shelter and a habitat for local invertebrate.
(C) Forget-me-not *(Myosotis)* are a favourite with bees due to their bright petals and accessible nectar.
(D) Alliums *(Allium)* are a favourite with bees, especially purple Alliums as bees can see purple better than any other colour.

Section 5- Industrial Areas

Often neglected when creating environmental plans are the industrial areas that help make up towns and cities. Within Stratton St Margaret parish there are several industrial areas including, Greenbridge and Kembrey Park. These areas often have a lot more potential than often considered in terms of enhancements for local wildlife. Brown sites and other industrial spaces no longer in use can be given back to nature through simple methods such as tree and hedge planting. The major difficulty in making these ideas a reality is that industrial areas are often privately owned making it more challenging to make positive changes in these spaces. Stratton St Margaret Parish Council plan to meet with stakeholders and owners to discuss the importance of the work being carried out through the BAP and engage in conversations on ways to promote wildlife in industrialised spaces.

Figure 18: (A) Welcome sign to Kembrey Park. (B) Welcome sign to Greenbridge Leisure Park.

(Bailey,2022)

Section 6- Action Plan

Using the information collected in this report, we have set out an action plan that will help to maintain and enhance the biodiversity and natural ecosystems found within Stratton St Margaret. **Table 3** gives details on the objectives set out by the council, the projected actions and outcomes of this BAP.

6.1 Table of Actions

Type of Habitat	Objectives	Plan	Responsibility	Expected Outcome
General Habitats				
Allotments	• To improve and enhance biodiversity within our allotments. • Create spaces/habitats for wildlife within our allotments. • Educate the local community on the importance of wildlife for growing plants/crops and how to better protect biodiversity in these spaces.	• Planting wildflower strips where possible to encourage pollinating insects. For example, along the hedge at St Phillips Road Allotments. • Creation of water habitats through ponds, large or small, to encourage local wildlife. For example, at the White Hart Allotment, a large pond is planned to be created in a dedicated wildlife zone. Appropriate pond planting to maintain ideal conditions and encourage wildlife into the pond will also be considered. • Hedging planting in open spaces can be planted to provide another habitat, shelter and a source of food into allotment spaces. • Existing hedgerow will be maintained to preserve these important habitats. • At the White Hart Allotment, within the wildlife zone, pollinator friendly planting and a number of bee hives will be used to make the allotment more attractive to pollinators, which will then pollinate plot holders' plants and crops. • To promote the importance of allotments for wildlife as well as pollinator friendly planting and natural defence mechanisms, the Stratton St Margaret newsletter and social media will be used.	Stratton St Margaret Parish Council with the help of the local community.	• To have created more habitats and spaces for local wildlife within our allotments. • To engage with the local community with the work of this BAP and the importance of biodiversity within our parish and for plant/crop growing purposes. • To have created more nectar/pollen/food sources for a variety of species within the parish.
Grass Verges	• To improve and enhance local biodiversity through creating more habitats for local wildlife. • To have improve the aesthetic of these often-plain spaces with seasonal	• Sowing of wildflower meadows on grass verges to encourage wildlife. • Spaced out grass cutting- allowing it to grow longer to encourage small invertebrate. • Trees to add a vertical habitat to the space.	Stratton St Margaret Parish Council.	• To enhance these spaces through techniques to encourage local wildlife and improve biodiversity within the local area. • To have created more nectar/pollen/food sources

Table 3: Action Plan

Type of Habitat	Objectives	Plan	Responsibility	Expected Outcome
	interest through planting more trees and sowing wildflower meadows.			for a variety of species within the parish. • To have created seasonal interest through planting more trees and sowing wildflower meadows.
Hedgerow	• To improve and enhance local biodiversity through maintaining existing hedgerow habitats and the planting of new ones. • To raise awareness and understanding of the importance of hedgerows and the ecosystem services they provide.	• Planting of more hedging in local parks and grass verges to provide more habitats, now and in the future, for local wildlife. • Use native plant species. • Be selective when choosing new hedge planting by selecting species with multiple benefits to other species including those with berries (such as Blackthorn and Elder) to provide a food source for other species. • Sow wildflowers along hedgerow to extend the habitat and encourage more pollinators through providing sources of nectar and pollen. • Careful management of existing and newly planted hedgerow to encourage growth and to not disturb nesting birds. • To promote the importance of hedgerow habitats and their maintenance techniques to the local community through the Stratton St Margaret newsletter and social media.	Stratton St Margaret Parish Council.	• To have protected existing habitats and provided new ones for local wildlife, encouraging biodiversity within Stratton St Margaret. • To have created more nectar/pollen/food sources for a variety of species within the parish.
Trees	• To improve and enhance biodiversity within the parish. • To provide seasonal interest and other cultural services for the local community. • To raise awareness and understanding of the importance of trees and the	• Native tree planting • Volunteer tree planting schemes to increase the number of trees within the parish. • Planting of keystone species and those which provide multiple ecosystem services, such as the provision of fruits. • Use of wildflower cuttings to use as a mulch for newly planted trees to help add moisture and nutrients into the soil to encourage growth.	Stratton St Margaret Parish Council with help from the local community.	• More trees within the local area should encourage and provide shelter and food for wildlife boosting local biodiversity. • To have created more food sources for a variety of species within the parish. • To increase the number of trees within the parish

Type of Habitat	Objectives	Plan	Responsibility	Expected Outcome
	ecosystem services they provide.			through volunteer planting schemes with the help of the local community. • To have promoted the importance of trees and the benefits they provide to both nature and ourselves.
Waterbodies	• To improve and enhance local biodiversity through protecting, maintaining and creating new aquatic environments. • To protect and create aesthetically pleasing and relaxing environments for the local community. • To raise awareness and understanding of the importance of aquatic environments in enhancing local biodiversity and how these environments services benefit the local community.	• Information boards detailing the flora and fauna species found within or close to the waterbody to raise awareness of the importance of these habitats. • Information boards detailing information on waterfowl and the best way to get involved with feeding them in a sustainable way. • Raise awareness of the issue of litter within these habitats and why this can lower biodiversity and discuss with the local community ways to prevent littering. • For the River Cole, management of invasive species such as Himalayan Balsam is necessary to ensure this species doesn't outcompete native vegetation. • Native vegetation planting around new and existing waterbodies (ponds and pools) should also include: oxygenator, marginal and floating planting. • Waterbodies should be surveyed and managed to ensure optimal conditions, prevent impurities building up and manage eutrophication. • For the River Cole, optimal riparian shade should be maintained to provide shelter for prey and keep the river cool. • Create more hibernacula using waste materials from around the parish and place around Church Park Pond to provide a habitat for wildlife, especially GCN. • Work with the Claridges Pool Angling Society to gain first hand knowledge of the environment and the	Stratton St Margaret Parish Council.	• To increase local biodiversity through providing a habitat and source of food for numerous species. • To have increased awareness of the importance of aquatic environments. • To improve the aesthetics of the local area by maintaining and creating beautiful aquatic environments.

Type of Habitat	Objectives	Plan	Responsibility	Expected Outcome
		wildlife that inhabit it and work together to better protect the space for future generations to come. • Fish free zones, especially within Claridges Pool where top predator Carp has been suggested to be outcompeting other species, would allow previously dominated prey species to breed increasing biodiversity.		
Wildflower Meadows	• To improve and enhance biodiversity within the parish. • To create habitats for local wildlife, especially pollinators. • To create a source of food for pollinating insects, such as bees. • To improve the aesthetic and seasonal interest of the parish with beautiful wildflower displays.	• Creation of new wildflower meadows/strips throughout the parish, especially within parks and grass verges. • Proper maintenance/aftercare of current wildflower meadows. Plenty of watering throughout early stages of establishment. Leave to flower during the spring/summer and take a late cut in late summer to allow the meadow to flower again in the early autumn. Remove the clippings to avoid nutrients re-entering the soil. • Preparation of land being using to sow wildflower meadows using environmentally friendly techniques (scarifying the ground, aim for around 50% bare ground: grass cover) rather than introducing chemicals into soil where it has potential to run-off. • Test soil to ensure a low nutrient content in soil to ensure good growing conditions before sowing the seeds. • Use of native wildflower and grass species. • Where grasses are dominant, use of species such as Yellow Rattle can help restore a meadow by outcompeting the different grass species. • Collect wildflower cuttings to prepare and use as a mulch elsewhere in the parish for young trees and flowerbeds to reintroduce nutrients into the soil. • Raise awareness and understanding of the importance of wildflower meadows, even when they appear untidy, to improve local biodiversity. • Help prevent the compaction of the ground in wildflower strips by sowing seeds away from public throughways and	Stratton St Margaret Parish Council.	• The sowing of more wildflower meadows throughout the parish as strips and along hedgerow will create new and extend existing habitats encouraging more wildlife into the local area. • To have created more nectar/pollen/food sources for a variety of species within the parish. • To improve the aesthetic of the parish through the introduction of seasonal interest.

Type of Habitat	Objectives	Plan	Responsibility	Expected Outcome
		by educating the local community of the damage this can cause to the meadows. • Use community sessions, social media and the Stratton St Margaret newsletter to educate the local community on the wildflowers within the parish and how this help improve local biodiversity. • Set up volunteer schemes to help run community sessions and survey wildflower meadows to monitor which species are thriving.		
Residential Areas				
Crematoriums/ Graveyards	• To encourage biodiversity within public spaces. • To raise awareness and understanding within the local community of the importance of biodiversity within these spaces. • To work with the local community using wildlife friendly actions to encourage more wildlife into these spaces.	• Sowing of wildflower seeds where appropriate, perhaps along the base of hedgerows to encourage pollinators. • Allowing certain areas within these spaces to go wild to produce a more natural habitat for wildlife. • Planting of trees and hedges where possible. • Raise awareness and work with the local community to promote biodiversity within these spaces. ➢ Promote the importance of wildlife and the services they provide (Stratton St Margaret newsletter, information boards). ➢ Encourage the use of pollinator friendly flowers/plants when visiting loved ones. ➢ Discourage the use of animal/insect repellents to protect flowers/plants. • Selective thinning, where necessary, of tree canopy in places such as Stratton St Margaret Church to allow more room for growth of important species and to allow more light to reach the floor to encourage lower plant growth.	Stratton St Margaret Parish Council with the help of the local community.	• To maintain and enhance biodiversity within crematoriums' Graveyards through working with the local community to raise awareness and understanding of the benefits of encouraging wildlife into these spaces. • To have created more nectar/pollen/food sources for a variety of species within the parish.
Private Gardens	• To encourage wildlife into local gardens. • To promote the use of natural defence/growth enhancing mechanisms	• Introduce more trees into gardens. • Encourage the sowing of wildflower areas into gardens. • Use of native planting within these spaces • Encouraging the local community to leave longer periods between cutting their lawns to help create more habitats	Stratton St Margaret Parish Council with the help of	• To have raised awareness of the importance of biodiversity within our gardens. • To have encourage more wildlife friendly planting and

Type of Habitat	Objectives	Plan	Responsibility	Expected Outcome
	rather than chemical alternatives. • To raise awareness and understanding of the importance of biodiversity. • To work with the local community to embrace nature and make our urban space more inviting to wildlife.	for wildlife and this practice helps to reduce weed growth due to reduced sunlight[64]. • Use of bug hotels and hibernacula to provide shelter/ a habitat for many different species. • Introduce a pond, big or small, to the garden to encourage local wildlife. With almost 70% of ponds in the countryside having disappeared, garden ponds have never been more important[65]. • Raise awareness and understanding within the community through the Stratton St Margaret Newsletter, social media and through community classes on the importance of biodiversity and how to encourage nature into private gardens.	the local community.	growing/defence techniques within local gardens. • To have created more nectar/pollen/food sources for a variety of species within the parish.
Industrial Areas				
Industrial Sites	• Improve and enhance biodiversity within industrial sites, where wildlife is often not encouraged. • Create habitats/ more open spaces to encourage wildlife into industrial areas. • Use nature to enhance the cultural services (including: aesthetics, recreation, stress relief…) within industrial areas.	• To communicate and promote this BAP with industrial site owners and stakeholders to discuss the work being done within Stratton St Margaret to improve local biodiversity • To help co-create and co-develop plans to improve biodiversity within industrial areas through the introduction of more habitats/open spaces for wildlife.	Stratton St Margaret Parish Council with the help of stakeholders/ area owners.	• Working with industrial land owners/ stakeholders through the BAP will lead to more habitats for local wildlife within industrial areas.

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Appendix

Wildflower Mix Seed Packet Contents:

Seed pack used by Stratton St Margaret Parish Council around the parish. All species within this mixture used are native species, helping to encourage native wildlife into the area.

Wildflowers	
Scientific Name:	**Common Name:**
Agrimonia eupatoria	Agrimony
Betonica officinalis	Betony
Filipendula ulmaria	Meadowsweet
Leucanthemum vulgare	Oxeye Daisy
Malva moschata	Musk Mallow
Primula veris	Cowslip
Ranunculus acris	Meadow Buttercup
Vicia cracca	Tufted Vetch
Angelica sylvestris	Wild Angelica
Centaurea hispidus	Common Knapweed-rayless
Leontodon hispidus	Rough Hawkbit
Lotus corniculatus	Birdsfoot Trefoil
Plantago lanceolata	Ribwort Plantain
Prunella vuigaris	Selfheal
Silaum silaus	Pepper-saxifrage

Grasses	
Scientific Name:	**Common Name:**
Agrostis capillaris	Common Bent
Festuca rubra	Red-fescue
Briza media	Quaking-grass
Anthoxanthum odoratum	Sweet Vernal-grass
Cynosurus cristatus	Crested Dog's-tail
Poa pratensis	Smooth-stalked Meadow-grass
Carex flacca	Glaucous Sedge

Survey of wildflower meadows JUNE-JULY 2022:

Site	**Wildflower/ Grasses Surveyed**
Greenbridge Recreation Ground	Selfheal *(Prunella vulgaris)*
	Oxeye Daisy *(Leucanthemum vulgare)*

	Common Knapweed *(Centaurea nigra)*
	Ladies Bedstraw *(Galium verum)*
	Birds Foot Trefoil *(Lotus corniculatus)*
	Creeping Thistle *(Cirsium arvense)*
	Yellow Rattle *(Rhinanthus minor)*
	White Campion *(Silene latifolia)*
	Yarrow *(Achillea millefolium)*
	White Clover *(Trifolium repens)*
	Red Clover *(Trifolium pratense)*
	Spear Thistle *(Cirsium vulgare)*
	Hedge Bedstraw *(Galium mollugo)*
	Common Mallow *(Malva sylvestris)*
	Smooth Sow Thistle *(Sonchus oleraceus)*
	Alps Yarrow *(Achillea millefolium)*
	Red Bartsia *(Odontites verna)*
	Common Pappus *(Asteraceae)*
	Red campion *(Silene dioica)*
	Rosebay Willowherb *(Chamaenerion angustifolium)*
Park near Merton Avenue	Common Knapweed *(Centaurea nigra)*
	Buttercup *(Ranunculus)*
	Oxeye Daisy *(Leucanthemum vulgare)*
	Red Clover *(Trifolium pratense)*
	Selfheal *(Prunella vulgaris)*
	Ribwort Plantain *(Plantago lanceolata)*
	Birdsfoot Trefoil *(Lotus corniculatus)*
	Yellow Rattle *(Rhinanthus minor)*
	Field Scabious *(Knautia arvensis)*
	Field Bindweed *(Convolvulus arvensis)*
	White Clover *(Trifolium repens)*
	Hedge Bindweed *(Calystegia sepium)*
	Ragwort *(Senecio jacobaea)*
	Yorkshire Fog *(Holcus lanatus)*
	Perennial Rye Grass *(Lolium perenne)*
	Common Rest Harrow *(Ononis repens)*