Ecological survey

Kilkenny park, Carterton

Stage 1: Preliminary ecological appraisal/Phase 1 Habitat Survey

Features of a Preliminary ecological appraisal:

- A ‘rapid’ survey was carried out to gain an understanding of the site's environment.
- An initial desktop study was carried out, so I knew where I needed to go and what the site looked like.
- A walkover survey was then carried out, so I understood what fauna and flora were there.
- I chose a smaller area of the park to survey. This has allowed me to go into detail with specific names and species and take more time looking at the wildlife which helped improve my accuracy.

Stage 1: I then identified...

- Ecological constraints, such as dogs disturbing the deer/muntjac, birds and other fragile wildlife.

- Potential opportunities for introducing new habitats, such as adding bird houses for nesting birds.

- And signs for dog owners to keep their dogs under control due to muntjac deer living in the area (Ecology By Design, 2024).

What are the hazards	Who might be harmed & how	Precautions already in place	Risk rating (high/ medium/ low)	Further action necessary	Action by who & when	Residual risk (high/ medium/ low/ trivial)
Wet grass/mud	The person walking doing the survey and anyone else in the same area. There may slip and fall. Possibly causing a fractured limb/cuts/bruises	Suitable footwear (e.g walking boots). Not walking in places beyond physical capability	Medium	Checking the weather beforehand to get and understanding of the ground conditions	The person doing the survey, a dew hours before its carried out	Low
Uneven surfaces	The person doing the survey or anyone in the same area. They could fall , causing cuts/bruises	Suitable footwear, when writing down notes the person will not walk whilst using their phone. They will remain stationary if they need to look at their phone to make sure they can see where	Medium	Maintain vigilance whilst walking, if near uneven surfaces put phone in pocket so both hands are free to assist the person if they fall or have to catch themselves	The person surveying, when they are near particularly hazardous uneven ground	Low
Poisonous plants/substances	The person who comes in contact with the poison. May become unwell. (E.g Polyporaceae fungi)	Existing knowledge about poisonous substances they may be present. Not touching/eating any plants/fungi that the person doesn't know information about.	Medium	An app pore-downloaded which can be used by uploading a picture of the plant/fungi to give advice on what it is	The person surveying when they come across the unknown plant/fungi	Low
Domestic animals such as dogs or cats	The person who comes into contact with the dog or cat may be bitten or harmed if the animal is aggressive	Not going near animals that the person doesn't know. If the dog or cat comes over to the person, the person will not provoke the animal if they seem aggressive. (E.g growling or hissing).	Medium	If the surveyor sees an animal that seems aggressive they will walk away and avoid the animal so the likelihood of harm is reduced.	The surveyor when they see an aggressive animal	Low
Sharp branches or fences	Scratches and/or cuts can be caused. This could cause bleeding if it penetrates deeply into the skin which may lead to infection if not cleaned and covered properly. This could be caused on any body part that comes into contact with the object. Such an an arm or even the face.	The person will wear long sleeves and long trousers to reduce the chance of injury. As well as hair being tied back so the person can see clearly. And suitable shoes such as walking boots or wellies. The person will not look at their phone whilst walking so they can see their surroundings clearly.	Medium	If the area is very dense, the surveyor can wear thick gloves and/or a hat to protect their hands and head.	The surveyor if they know they are going to be walking in dense woodland.	Low
Stinging nettles	The person will get stung if they touch them. Causing rashes and severe itching.	The person will not touch the stinging nettles. If they do, they should not itch it because it will make it worse. The person will wear suitable shoes such as walking bottles and long thick socks and trousers to prevent the sting.	Medium	The surveyor will stay vigilant for any stinging nettles. They will not walk through areas where the nettles are very tall and dense.	The surveyor when doing the observation.	Low
Fallen branches, stones, other trip worthy objects	The person may trip on these objects if they don't seem them. This could cause bruising, fractured limbs, cuts, or even a broken limb.	The person will not walk whilst looking on their phone so they can see their surroundings.	Medium	The person will make sure to stay vigilant all the time and if they need to use their phone they will stand still to do so.	The surveyor when doing the observation.	Low

Method

- I utilized my phone to take pictures of my findings. If I wasn’t sure what the species was then I uploaded them onto the 'PictureThis' app which identified them for me. This allowed me to refine my accuracy and detail.

- I made sure to take my time during each observation within the different plotted areas. I spent around 5-10 minutes in each area, making sure I noted down as much species as I could.

The map and plots I followed

Hedgerow, woodland and meadow

Hedgerow, woodland and meadow

Woodland & hedgerow

Meadow, hedgerow and woodland

Woodland, hedgerow and marshland

Meadow & hedgerow

Hedgerow, ornamental species

Plot 1

- Hazel
- Wild carrot
- Red osier dogwood
- Common dogwood
- Common rush
- Tufted hairgrass
- Goat willow

Plot 2

- Hazel
- Red osier dogwood
- Common dogwood
- Glaucous willow
- Red alder
- Red maple
- Elmleaf blackberry
- Common reed
- Common Ivy
- Common holly
- Orchard grass
- Great wood-rush

Plot 3

- Hazel
- Red osier dogwood
- Common dogwood
- Yellow birch
- Black birch
- Stinging nettles

Plot 4

- Wild carrot
- Common rush
- Tufted hairgrass
- Buffalo grass
- Common reed

Plot 5

- Wild carrot
- Common rush
- Tufted hairgrass
- Buffalo grass
- Elmleaf blackberry

Plot 6

- *Polyporaceae* fungi
- Elmleaf blackberry
- Gooseberry
- Wineberry common
- Common holly
- Common ivy
- Goat willow
- Red osier dogwood
- Common hawthorn
- Common hazel
- Glaucous

Plot 7

- Wild daffodil
- Ribwort plantain
- Creeping buttercup
- Cow parsley
- Snowdrop
- Common primrose
- Hazel pine
- Elmleaf blackberry
- Gooseberry
- Wineberry

Findings: trees

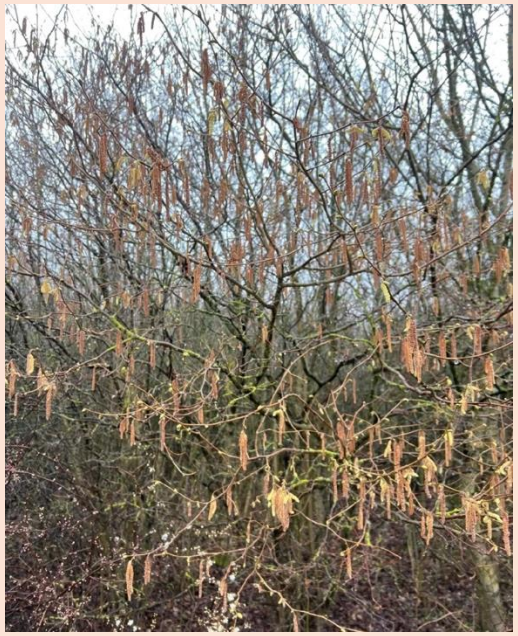
Red alder *(Alnus rubra)*

Red osier dogwood *(Cornus sericea)*

Common dogwood *(Cornus sanguinea)*

Common hawthorn *(Crataegus monogyna)*

Yellow Birch *(Betula alleghaniensis)*

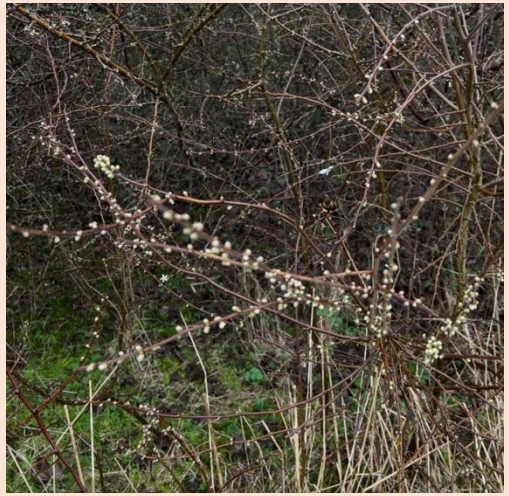


Common hazel (*Corylus avellana)*

Red maple *(Acer rubrum)*

Hazel pine *(Liquidambar styraciflua)*

Black birch *(Betula lenta)*



Glaucous willow *(Salix discolor)*

Findings: fungi

- *Polyporaceae,* family of poroid fungi.

- They are named after their fertile surface that takes the form of a layer of tubes, the mouths of which can be seen as ‘pores’ underneath the cap or shelf of the fungus.

- This mushroom is very poisonous, especially the tender nesting polypore *(Hapalopilus nidulans)* because it contains high concentrations of polyporic acid, which is a neurotoxin.

- I did not touch or eat this fungi because it would have made me unwell.

Findings: herbs

Ribwort plantain *(Plantago laceolata)*

Creeping buttercup *(Ranunculus repens)*

Great wood-rush *(Lazula sylvatica)*

Common rush *(Juncus effesus)*

Wild carrot *(Daucus carota)*

Cow parsley *(Anthriscus sylvestris)*

Stinging nettle *(Urtica dioica)*

Snowdrop *(Galanthus nivalis)*

Wild daffodil *(Narcissus pseudonarcissus)*

Common primrose *(Primula acaulis)*

Findings: vines/shrubs/grasses

Wineberry *(Rubus phoenicolasius)*

Elmleaf blackberry *(Rubus ulmifolius)*

Gooseberry *(Ribes uva-crispa)*

Common reed *(Phragmites australis)*

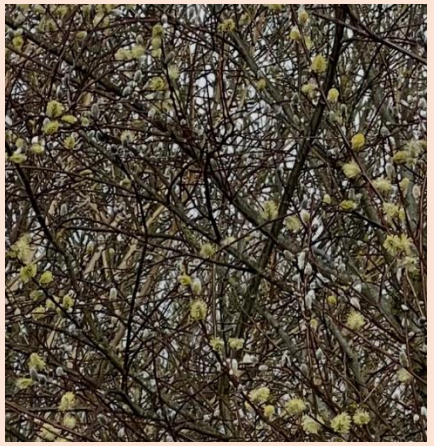
Tufted hairgrass *(Deschampsia cespitosa)*

Common holly *(Ilex aquifolium)*

Common ivy *(Hedera helix)*

Orchard grass *(Dactylis glomerata)*

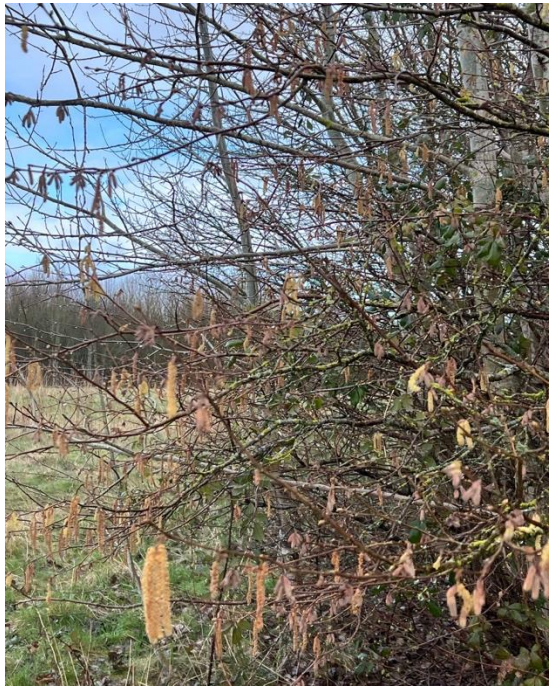
Buffalo grass *(Stenotaphrum secundatum)*



Goat willow *(Salix caprea)*





Mixed woodland/shrub

- Indicator species: Common hazel, Common dogwood, Red osier dogwood, Yellow birch, Common holly, Blackthorn, Goat willow, Great woodrush, Common ivy, Polyporaceae fungi.
- Characteristics: this habitat includes deciduous trees and shrubs. The presence of hazel, dogwood and holly indicates this part is semi-shaded with well-drained to moderately moist soils. Polyporaceae fungi indicate decaying wood, typical of mature woodlands.
- These types of plants often develop in areas with minimal human disturbance. The presence of native species like hazel and holly, alongside non-native species like Yellow birch shows there's a mix of natural woodland and possible historical planting.

Wetland/marshy areas

- Indicator species: Common reed (Phragmites australis), Red alder, Tufted hair grass, Goat willow.
- Characteristics: Common reed and Red alder thrive in waterlogged or poorly drained soils. Tufted hair grass and Goat willow also tolerate damp conditions.
- This is true because there was a water source near these species. There was multiple human and animal footprints through this area, possibly contributing as to why it gets waterlogged.

Grassland/meadow

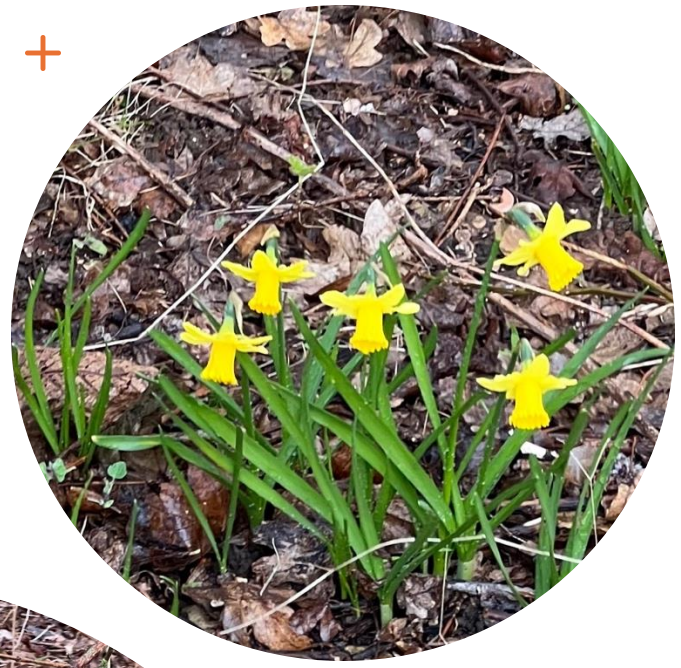
- Indicator species: Kikuyu grass, Orchard grass, Wild carrot, Cow parsley, Stinging nettle.
- Characteristics: these species were in an open grassy area in the middle of the field.
- There was a lot of wild carrot in the open area, likely maintained from seasonal blooms.
- The cow parsley and stinging nettles were hidden deep under the trees, suggesting they grow best in areas that don’t get disturbed by humans/animals.

Hedgerows/brambly scrub

- Indicator species: Blackthorn, Elmleaf blackberry, Wineberry, Gooseberry, Alpine currant, Japanese barberry.

- Characteristics: dense, thorny shrubs and brambles form hedgerows scrubby patches. Which I saw along the field boundaries and undisturbed areas. These provide cover and berries for wildlife (e.g deer, birds, foxes).

- Brambles arise from land that hasn’t been looked after properly.

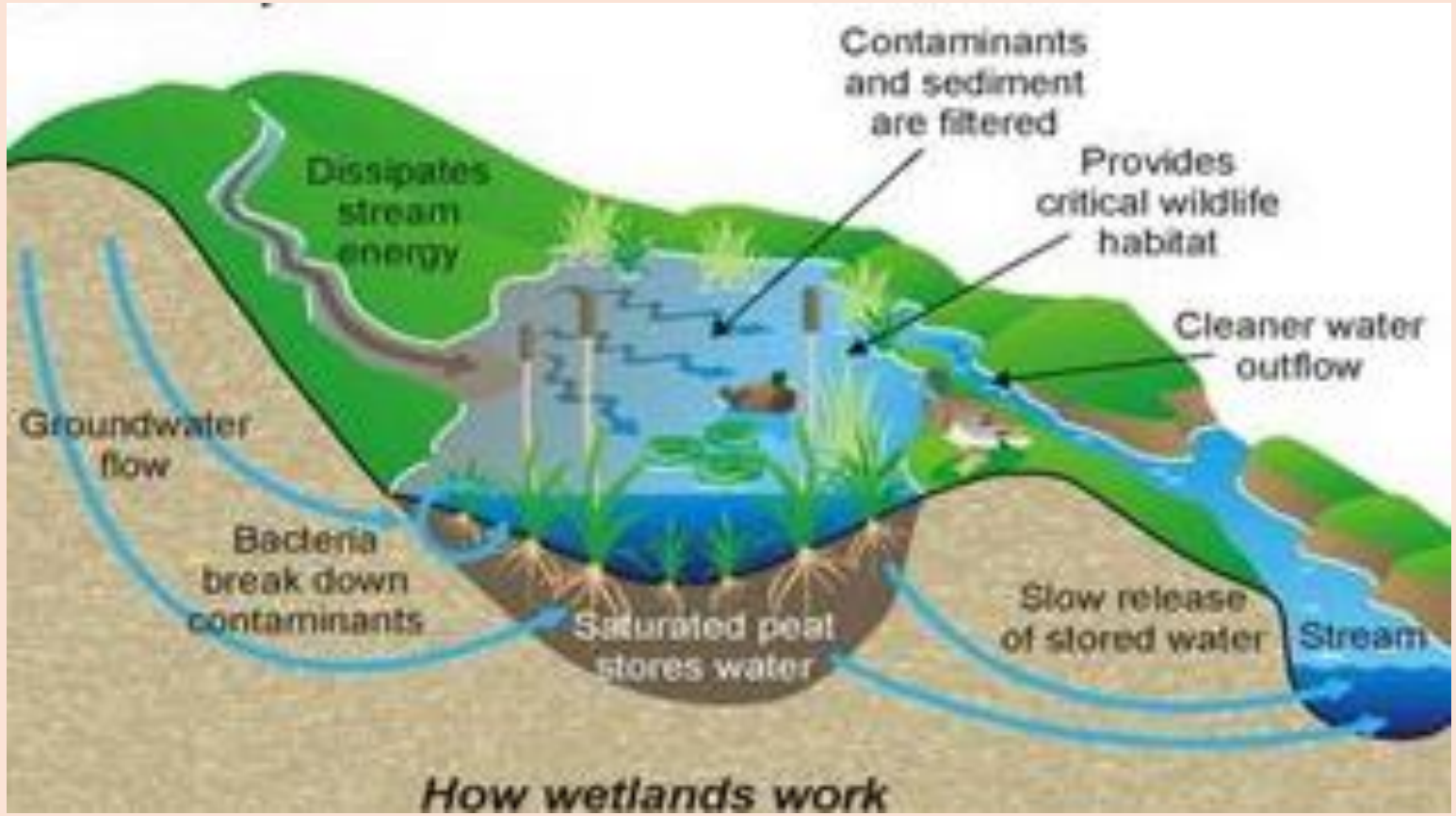


Possible ornamental species

- Indicator species: Daffodil
- Characteristics: these were at the edge of the plot area and adjacent to the housing estates. Indicating that they could have been planted by humans.
- Or, this area has been left unmanaged, allowing wildflowers and grasses to establish.
- Factors affecting this population could be that people and/or animals may accidentally step on them. Especially people because they are near houses so children running around may break the flowers and curse them to die.
- Colder seasons naturally kill these flowers. However this is a normal process and they bloom again in the spring.

Why these habitats exist

- Variations in soil type such as clay for the wetland area or loamy for the woodland.
- Topography (e.g low-lying areas in the wetland and slopes for the woodland).
- Hydrology such as streams or high groundwater create conditions for diverse plant communities.
- The presences of native species such as hazel, holly and primrose suggests long-established ecosystems adapted to the local climate and soils.



Improving the pond/wetland area

- Creating a varied depth may support a wider range of aquatic life such as frogs

- Adding new species of plants such as underwater oxygenators like hornwort (*Ceratophyllum demersum)*or water starwort (*Callitriche autumnalis*). These give larvae plenty of underwater cover from predators.

- Plants with tall stems for emerging larvae such as water iris *(Iris ensata)*. This allows dragonflies and damselflies to crawl up the stems when they are ready to leave the pond (www.rhs.org.uk, n.d.).

- Waterlilies *(Nymphaea)* because pond life can rest on these leaves, which also helps to shade the water in the summer.

- Flowering rush *(Butomus umbellatus)* and lesser spearwort *(Ranuculus flammula)* will help attract bees, hoverfies and more (Gardening , n.d.).

Importance of Hazel trees *(Corylus avellana)*

- Hazel is native to much of Europe, parts of North Africa and Western Asia. It is commonly found in the understory of lowland oak, ash or birch woodland. This makes sense because I found most of these trees near the birch trees.

- Coppiced hazel supports a diverse habitat, promoting wildflower-rich environments that attract butterflies, particularly fritillaries.

- The hazel dormice heavily relies on hazel. Hazelnuts are a crucial food source for woodpeckers, nuthatches, tits, wood pigeons, jays and small mammals such as wood mice and bank voles. I did see and hear most of these bird species that backs up this information.

- Hazel flowers provide early pollen for bees, although it is challenging for them to collect due to the non-sticky nature of the pollen.

- The trunks of hazel trees are often covered in mosses, liverworts and lichens. This contributes to biodiversity of the woodland.

- Conservation: Hazel coppicing is an essential strategy which provides an pen habitat for wildflowers.

- Hazel prefers well-drained soils and can tolerate shade, though it does thrive in open spots. It responds well to being cut back too so this allows for their height to be controlled easily (Chew, 2024).

Hazel dormice *(Muscardinus avellanarius)*

- They are protected under the Conservation of Habitats and Species Regulations 2017 and the Wildlife Countryside Act 1981.

- I saw a lot of Hazel trees which could make it more likely Hazel dormice are living in the area because they feed on the hazelnuts.

- In the future, a survey could be carried out to protect this species. For example, if there is any construction that needs to be carried out it can be monitored to protect them. Also checking the availability of foraging and nesting habitats and managing vegetation can support this species (GOV.UK, n.d.)

Dominant plants?

- Most of the trees that grew on each side of the pathways were different as I walked around each plot. I did not conclude a exact ‘dominant’ plant.

- This is because in each different plot the habitat profile changed. For example, there were no trees in the meadow because it was full of Wild carrot and an array of tall grasses. But there was no Wild carrot in the woodland because it was full of trees.

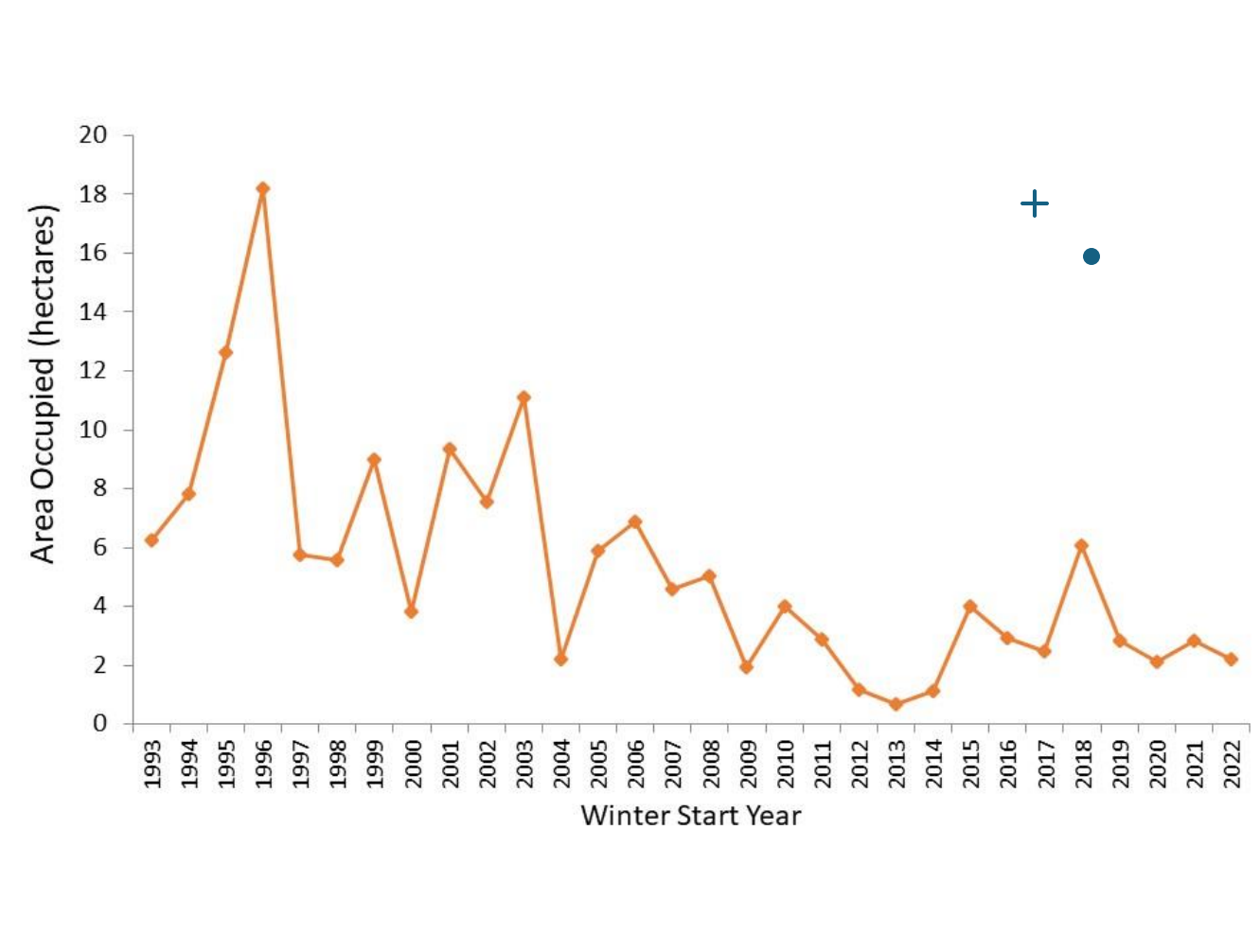
- However, in the more dense woodland areas there was more Yellow and Black birch. And on the outside areas nearer the paths there was more Hazel, Red maple and Dogwood.

British population dynamics

- The State of Nature 2019 report reveals that 41% of UK species studied have declined, 26% have increased and 33& show little chance in 1970. While 133 species assessed have already been lost from outer shores since 1500.

- Butterflies and moths have been particularly damaged with numbers down by 17% and moths down by 25%. This is why planting wild flowers will benefit them greatly and provide a good source of nutrients. As well as benefiting the bees at the same time as I explain later on...

- Pollution is also a major issue. Emissions of many pollutions have been reduced dramatically in recent decades, it continues to still have a severe impact on the UK's sensitive habitats and fresh waters. (State, 2019).



The graph shows the decline of the Monarch butterfly, indicating the importance of providing them with a source of food.

Potential animal species and their habitat associations...

Introducing bees

- Planting wildflowers such as Lilacs (Syringa spp.), Lavendar (Lavandula spp.), Wisteria, Mint (Mentha spp.), Sunflowers, Poppies (Papaveroideae spp.), Black-eyed Susan, Honeysuckle (Lonicera spp.),

- Bees are crucial in the wild due to their vital role in pollination, which is essential for the reproduction of many plants. They support the entire food chain by ensuring the production of fruits and seeds.

Because I saw a muntjac...

Impact on vegetation: because they feed on grasses, shrubs & tree saplings. Keeping fast-growing plants in check, preventing one species from dominating.

Overpopulation can increase habitat degradation, increase Lyme disease, increase vehicle collisions and reduce forest regeneration.

They are natural seed dispersers. Ingesting seeds and later deporting them elsewhere through their droppings. Aiding in the colonisation of new areas by various plant species. Contributing to forest resilience.

Managing their population with further surveys is vital to ensure the ecosystem stays healthy.

They impact other wildlife because overgrazing can reduce food and cover for smaller animals like birds and insects. However, moderate deer population can create a stable ecosystem.

Birds and deer

- Hazel, holly and ivy provide nesting sites and berries for blackbirds and robins.
- Polyporaceae fungi attract insects, a food source for woodpeckers. And dense shrubs like blackthorn offer cover for nesting birds such as thrushes. Thorns also deter predators such as dogs, making these areas ideal for nesting.
- Open areas with wild carrot and grasses support seed-eating birds like finches.
- It’s likely there is a rich bird community due to the diversity in habitats. The woodland and hedgerows offer year-round resources and grasslands offer seasonal foraging.
- During the observation I saw a muntjac deer, there are likely to have a good food source due to the vast majority of shrubs. However, this grazing may limit regeneration of young trees or shrubs.

Foxes and badgers

- Dense vegetation provides cover for dens and hunting. Berries and small mammals (e.g voles) are attracted to hazel and brambles make them easy prey for foxes. Open areas support small mammals and ground-nesting birds, which foxes prey on.

- Well-drained soils under hazel or dogwood are idea for sett digging. Polyporaceae fungi attract insects and berries from ivy and blackthorn provide food for badgers.

- Open areas support earthworms, a primary food source, especially in moist soils near wetlands (Woodland Trust, 2019)

Dead wood

- If there is no risk of trees falling on somebody, such as in an area where the public doesn't walk. Dead wood will provide food for hundreds of types of animals, fungus, lichen and moss. As well as for bats, woodpeckers and many invertebrates like beetles.

- Fungi soften the woof through decay, and the larvae of beetles start chewing it up. Providing food for woodpeckers.

- The holes that woodpeckers make provide crevices for bats and birds to roost.

European green woodpecker *(Picus viridis)* which I didn't see but it may be likely they live in the park

Ecological implications

- Biodiversity: the mix of woodland, wetland, grassland and hedgerow allows for a range of flora and fauna.
- Conservation value: native species such as hazel, holly, primrose and common reed indicates habitats of conservation importance. Possibly supporting protected species like badgers or skylarks. Even though I did not see these specific species, theres still a chance they may be present. Therefore, by assuming they are there I am able to possibly even start a new population or help an existing one. (Chew, 2024)
- Management considerations: control any non-native species, maintain a mix of habitats through selective mowing, grazing or scrub clearance.
- Monitor bird nesting and badger setts to minimise disturbance.

Why are Hedgehogs so important?

- They are important for the ecosystem because they eat insects, slugs, snails and worms. As well as providing food for other animals such as foxes, badgers and owls.

- They play a vital role in maintaining soil health. Because the invertebrates that consume play a role in decomposition and nutrient cycling.

- Overpopulation of these invertebrates can disrupt this natural process and lead to imbalances in the ecosystem. Hedgehogs regulate these populations, which contributes to a healthy and productive soil environment (Probert, 2023).

Improving their survival

- In my opinion, managing the use of pesticides and poisons should be monitored because they reduce their food supply. Or directly affect there health. Possibly signs could be placed within the park encouraging people that live near by to become more aware of how they use pesticides in their gardens. Such as making sure if they do use it that they make sure their garden is secure so no hedgehogs can enter and become unwell.

- 100,000 hedgehogs die on UK roads every year. Adding warning signs with hedgehogs on to nearby roads may encourage people to reduce their speed when driving and be more vigilant.

- Providing information on social media such as facebook about the how adding hedgehog houses into gardens can be useful too. (In gardens where pesticides are not used). These can also be placed within Killkenny park, not just surrounding gardens. This may increase the chance of survival for the hedgehogs that may exis in the area because they will have a designated place to live

- Creating a group on facebook within the Carterton community to assist with the possible hedgehog population can be impactful. Getting volunteers to provide log piles, leaf litters and wild areas can offer a suitable habitat for them in Kilkenny park.

- Having emergency numbers on signs within the park that scan direct the public to the local wildlife rescue centre or a veterinarian can be useful as well.

I chose to find conservation strategies for muntjac deer because they are a vital part of the ecosystem.

(aside from a variety of bird species)

Conservation strategies for deer

- Legislation for deer includes: The Deer Act 1991 (as amended) which regulates ownership and lawful authority to kill deer. Wildlife and Countryside Act 1981 which protects the flora, fauna and countryside. Hunting Act 2004 which legislates against hunting with dogs. Wild Mammals Protection Act 1995 which protects wild mammals from deliberate cruelty.

- Following these legislations is very important to ensure no laws are broken. Such as not allowing deer hunters into the park to hunt them with their dogs.

- Forestry England conducts culling ton protect native flora. Natural England provides licences for culling under the Invasive Alien Species Order 2019.

- They don’t have a specific season so its best to avoid shooting heavily pregnant does to prevent orphaning fawns.

Forestry England

Population monitoring and assessment

- Trial cameras can be set up and to track their activity, noting numbers, behaviour and fawn presence. This is non-invasive and effective.

- Pellet-group surveys can be used to assess density, as muntjacs produce distinct pellets.

- Working alongside The Wildlife Trusts or the British Deer Society if any further intervention is necessary.

- It’s likely the population is quite small so culling may not be needed. However, monitoring allows for an understanding on their population (The British Deer Society, n.d.).

Habitat management to reduce damage to the flora & fauna

- Making feeding zones specific for deers, this reduces browsing pressure on other areas that may be sensitive.

- If new trees are planted, it may be a good idea to put wire mesh fencing around them for protection.

- Planting lavender, garlic or rhododendrons can deter muntjacs and protect other plants that are trying to grow.

Engaging the community

- Placing engaging signs at the entrance to the parks can educate the public about muntjac ecology, habitat and diet.

- A citizen science project can be designed where locals report muntjac sighting, dam age or road accidents to a database, which helps with tracking.

- Recruit volunteers to install fencing, plant feeding areas or track the populations. Creating a training plan on wildlife friendly practices such as avoiding barbed wire.

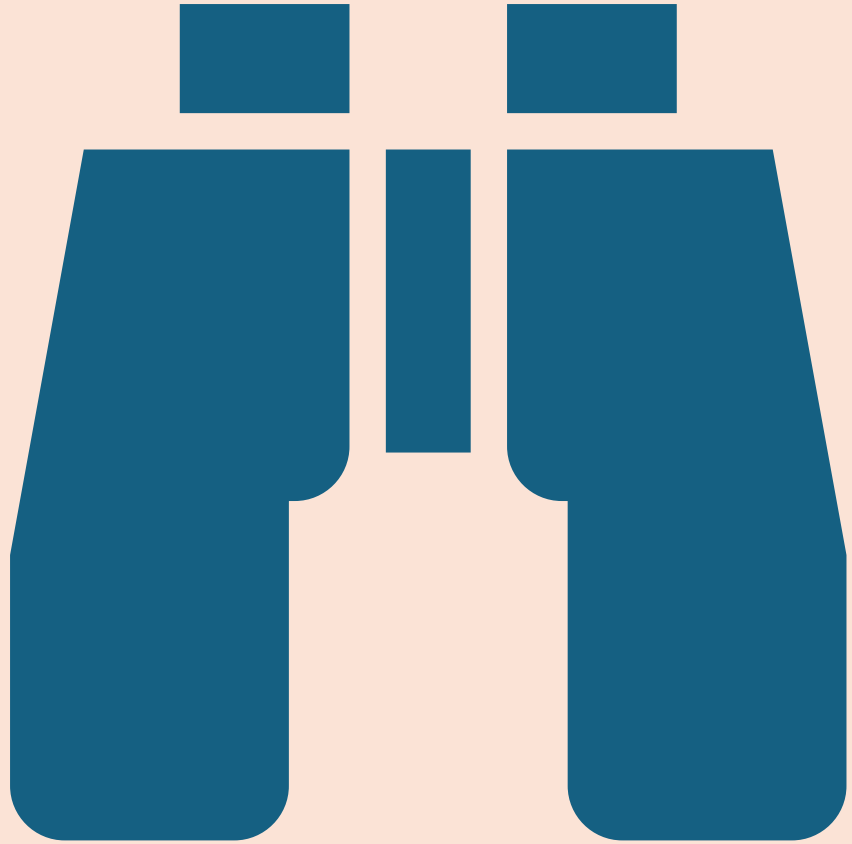
- Involving the local schools in planting plants or science and be useful because it educates children on biodiversity and invasive species.

Improvements

- I could have taken my binoculars to observe more avian species. This may have given me an indication of more species that are in the area, such as European green woodpeckers or other rarer species.

- I could have looked closer for fox or badger tracks which would have given me a clearer indication of what is living in the area. However, this may have been difficult because it was raining so the paw prints would have washed away. Maybe coming back on a sunnier day could be beneficial.

- Counting the exact amount of specific tree species I saw may have been useful. However, by just taking pictures I could get a rough idea of what was growing where so I was able to separate different habitats within each plot.



Conclusion

- The area has a lot of biodiversity, which is very beneficial for the variety of wildlife that I saw. This maintains the natural ecosystem and food chain to ensure the area can thrive.

- Introducing new species such as bees will improve pollination which will indirectly positively affect the surrounding species.

- Conducting further surveys for deer, hedgehog and other bird species will be useful for gaining an improved understanding of what species are living in Killkenny park.

- As well as gaining more data on the animals, gaining further data on the plant species will be very helpful as well. Animals and plants both directly affect each others survival

- Improving the biodiversity in the park will positively impact the ecosystem. In my opinion, the area I surveyed did have a broad range of plant species. However, adding more wild flowers for the bees will help it thrive even further.

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