Gosforth Nature Reserve Management Plan

2021 to 2031




GNR is managed by the Natural History Society of Northumbria to contribute to its vision that '*Nature is protected, restored and celebrated through greater awareness, understanding and enjoyment by people in North East England*'.

Date adopted	27/10/2020
Dates reviewed	

Natural History Society of Northumbria

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Summary of Objectives and Management Priorities

Objective 1 Retain designation of favourable condition for the SSSI and Local Wildlife Site by 2031

- Priority 1a Protecting and increasing the overall biodiversity of the Reserve
- Priority 1b Supporting native species partly by controlling non-native species
- Priority 1c Adopting an approach to manage deer grazing flora and limiting value to fauna
- Priority 1d Managing and mitigating issues associated with the Whitecroft Burn

Objective 2 Achieve 82 acres of deciduous woodland with 85% of native species by 2031

- Priority 2a Diversifying the woodland in structure, age and plant species
- Priority 2b Retaining high quality dead wood invertebrate habitat
- Priority 2c Controlling non-native invasive tree species including Sycamore, Beech and Turkey Oak

Objective 3 Maintain 2 acres of Scots Pine woodland by 2031

- Priority 3a Developing a healthy canopy with increased structural and age diversity

Objective 4 Maintain 13 acres of plantation with a mix of Sitka Spruce and regenerated Birch by 2031

- Priority 4a Creating new diverse mixed woodland
- Priority 4b Retaining and enhancing selected areas of Sitka Spruce and Birch

Objective 5 Maintain and enhance a site perimeter of 4 kilometres with hedge and trees by 2031

- Priority 5a Maintaining and improving boundary habitat for wildlife and site security

Objective 6 Maintain and enhance 27 acres of wet woodland by 2031

- Priority 6a Retaining the extent of wet woodland
- Priority 6b Safeguarding the Coralroot Orchid population

Objective 7 Maintain 22 acres of reedbed and open water (70% reedbed, 30% open water) by 2031

- Priority 7a Maintaining the extent of reedbed and open water
- Priority 7b Ensuring structural and composition diversity of reedbed and open water habitat
- Priority 7c Management of water levels for maintaining healthy reedbed habitat

Objective 8 Ensuring 8 wildlife-rich ponds and retaining of ditches by 2031

- Priority 8a Establishing native marginal vegetation and pond species assemblages
- Priority 8b Adopt an approach to retain water in seasonal ditches

Objective 9 Establish 3 acres of meadow by 2031

- Priority 9a Encouraging development and establishment of meadows
- Priority 9b Establish a small area of heath at southwest meadow

Objective 10 Maintain 11 existing monitoring programmes and establish programmes for 5 additional priority groups by 2031

- Priority 10a Continuing existing monitoring programmes
- Priority 10b Expanding the range of taxonomic groups comprehensively monitored
- Priority 10c Actively encourage and support researchers to undertake research projects

Objective 11 To welcome 20,000 visits per year (55 per day) by people by 2031

- Priority 11a Increasing footfall and diversity of visitors
- Priority 11b Maintaining and developing visitor facilities
- Priority 11c Increasing the capacity, capabilities and potential of the volunteer team
- Priority 11d Increasing biodiversity and public engagement beyond the boundaries of the Reserve

1. Introduction

This ten-year management plan sets out a long-term vision and the management priorities for Gosforth Nature Reserve (GNR) over the period of 2021 to 2031 along with a three-year work programme.

This Plan is a working document that will be reviewed annually in September by the GNR Management Committee to assess progress and will be updated and adapted accordingly.

The Plan was prepared in consultation with volunteers, visitors, staff and external key stakeholders. Key external stakeholders including Natural England and Newcastle City Council were consulted. NHSN Council adopted the Plan on 27th October 2020.

"[I hope that] the Reserve remains a focal point for naturalists within the North East and that the reserve is used to inspire a new generation of naturalists."
Public survey (2020)

Vision for Gosforth Nature Reserve

Key to NHSN's *Towards 2029* strategy is ensuring that the Reserve's potential for both wildlife and people is maximised through a new 10-year management plan. Central to this plan are the following visions:

- Wildlife is protected, restored and celebrated through greater public awareness, understanding, enjoyment and action.
- Our influence and nature conservation will extend beyond the current Reserve boundary into the neighbouring wildlife corridor through collaboration with surrounding landowners and residents.
- The Reserve's welcome, learning and visitor opportunities will be improved by providing more modern experiences and facilities.
- Activity at GNR is focused as a field station where people can learn, be inspired and engage in more urban wildlife research and citizen science with increased use as part of NHSN courses.

Reed Warbler © Keith Cochrane

Values of NHSN

The approach to wildlife and people embodies NHSN values meaning we are:

- Inspiring (imaginative, curious, outward and relevant)
- Welcoming (inclusive, collaborative, sociable and nurturing)
- Knowledgeable (scientific, robust and reputable)
- Professional (responsive, supportive and respectful)

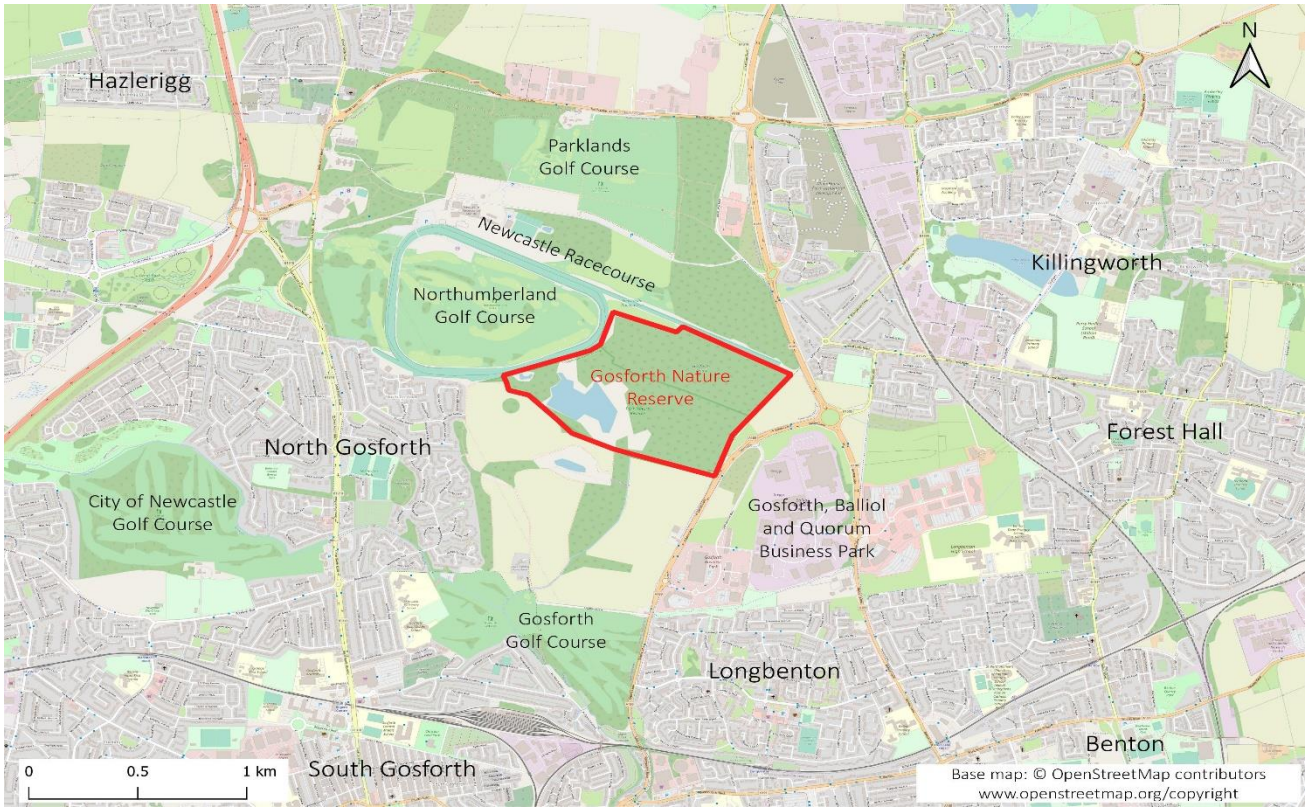
"[I hope] it will survive and remain a sanctuary for wildlife and a fantastic resource for everyone."
Public Survey (2020)

The Purpose of GNR

The purpose of NHSN is to encourage the study and protection of nature. GNR is an excellent outdoor classroom and field station for people to study nature whilst also providing a home for nature at a time when biodiversity is experiencing overall declines at a worrying rate. Providing a great visitor experience is essential because, without visitor support and NHSN membership, the Reserve would have an uncertain future.

2. General information

Managed by The Natural History Society of Northumbria (NHSN), Gosforth Nature Reserve (GNR) is a 61-hectare (150 acres) reserve comprising mixed deciduous woodland, plantation, wetland and meadow located on the northern edge of Newcastle (Map 1). One of the North East's oldest nature reserves, the Reserve is home to a variety of woodland, wetland and meadow wildlife including regionally and nationally uncommon species. In recognition of the Reserve's wildlife value, the southern section of the Reserve is designated as a Site of Special Scientific Interest and the entire area is designated as a Local Wildlife Site. Access to NHSN members, volunteers and visitor pass holders provides a unique experience of observing and studying the natural world in the heart of an urban area. The Reserve is also a rich educational resource and scientific research is carried out each year by volunteers and local university students.



Map 1. Surroundings of Gosforth Nature Reserve

Reserve Size	61 hectares (approximately 150 acres)
Location	• Gosforth Park, Newcastle upon Tyne (3.5 miles from city centre) • NZ 2599 6987 (entrance); NE3 5EP (Lake Lodge)
Local Authority	• Newcastle City Council • Land immediately east of the Reserve falls under North Tyneside Council
Designations	• Site of Special Scientific Interest (southern section, 37.3ha) • Local Wildlife Site • Tree Preservation Order
Access	• Access to members, visitor pass holders, educational groups and volunteers • One entrance and exit via Lake Lodge. Two main paths within Reserve.

Environmental information

Climate

The climate in the Newcastle upon Tyne locality is warm and temperate, with an average annual temperature of 8.5°C; the highest monthly average is 14.5°C in July and the lowest in January at 3°C. The average annual rainfall is 655mm, with the highest monthly rainfall in August (71mm) and lowest average in February (44mm). The Reserve Warden has also collected monthly rainfall measurements at the Reserve for the past two years.

Geology and soils

The bedrock is classified as Pennine Middle Coal Measures formation, which consists of interbedded mudstone, sandstone and siltstone. In and around the lake are Lacustrine deposits of clay, silt and sand, forming fine-grained and thin beds. The major soil type is classified as slightly acid, base-rich loam and clay soil, that is slowly permeable and seasonally wet.

Land to the south of the Reserve is underlain by extensively worked coal seams. Mining subsidence is a potential issue, but the effects can be highly localised and difficult to predict. Sometimes a land surface can fall in response to mine working collapse, but on the other hand, the surface may rise after mine water ingress. Anecdotal evidence suggests that the land to the south of the Reserve has become more susceptible to seasonal flooding. (Derek Teasdale, pers. comm.)

Long-term urban spread to the north of Newcastle upon Tyne has impacted on drainage in the catchment. Naturally low-lying boggy areas have been drained for farming and built over, reducing their ability to act as storage ponds during extreme rainfall events. Increased run-off from built-up areas can increase the likelihood of sudden flood events. Models of future climate change for the North East predict more frequent occurrences of high rainfall during future winters, when the ground will already be saturated. (Derek Teasdale, pers. comm)

Hydrology and drainage

Whitecroft Burn

The Whitecroft Burn is the main watercourse in the Reserve that enters from the north via a culvert and flows into the east of the wetland. This stream originates in High Gosforth Park, flows east under the A189 carriageway before flowing south towards the Reserve. In the past, it flowed around the wetland, through a culvert and exited the Reserve near an old Victorian sluice. Since changing its course, it now flows into the wetland although some water does still enter the culvert.

Sluices

Water from the wetland discharges into the Whitecroft Burn which eventually joins the Ouseburn downstream. Water levels in the wetland is in part controlled via an adjustable sluice ('New Sluice'); the old Victorian sluice no longer serves this role but does discharge water during periods of high-water levels.

Drains and Sustainable Urban Drainage Systems (SuDs)

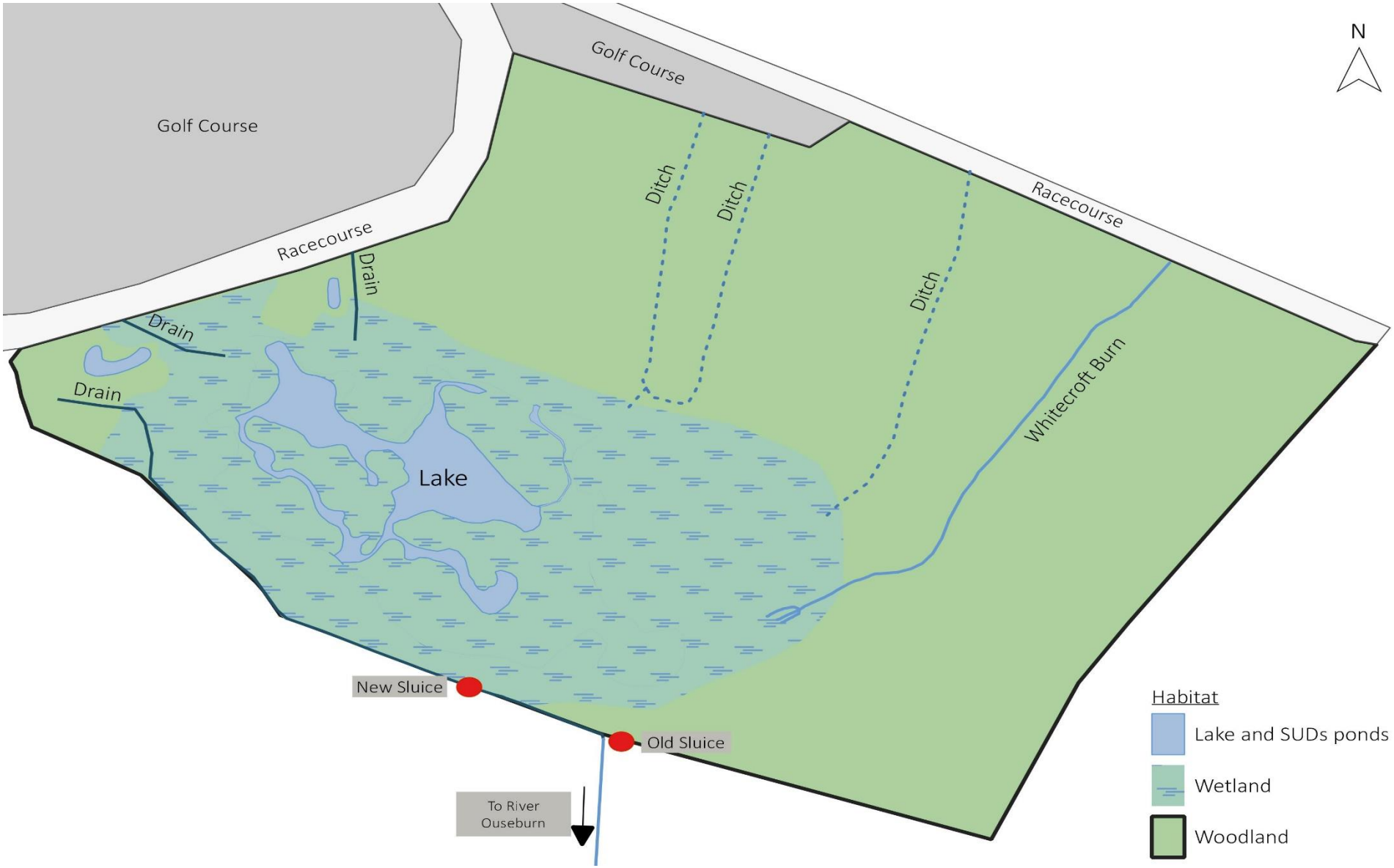
There are three drains originating from the Racecourse, flowing into the west and southwest of the Reserve. Following the creation of an all-weather racing track in 2015-16 by Newcastle Racecourse, two SUDs ponds were created in the Reserve to attenuate and clean water run-off before entering the SSSI.

Ditches

There are a number of small seasonal ditches that have flowing water during prolonged wet periods and flash flooding events. These drain from the Racecourse and Golf course.

Please see Map 2 on Page 8 for locations of the above water sources.

Map 2. Watercourses at Gosforth Nature Reserve



Tenure

The Natural History Society of Northumbria lease Gosforth Nature Reserve from landowners Arena Racing Company. The lease was renewed in 2015 as a 30-year contract. NHSN has held a series of leases since 1929 and Arena Racing Company must agree to any significant works or changes carried out in the Reserve. NHSN purchased Lake Lodge in 1970 to provide accommodation for an onsite Reserve Warden which also includes the surrounding garden and land up to the access gate.

Site management

Natural History Society of Northumbria

The NHSN Council of trustees are the accountable body for the Reserve, the management and wellbeing of wildlife, visitors, staff and volunteers.

GNR Management Committee

Meeting several times a year to discuss matters affecting the Reserve, the Committee includes NHSN Director, Reserve Warden, trustees, and members who have specific expertise on the Reserve. The Committee report risks and make recommendations to NHSN Council who have ultimate responsibility for the Reserve.

Reserve Warden and Volunteers

Reserve Warden Paul Drummond has resided in Lake Lodge since 1990 and is responsible for daily monitoring of the Reserve, carrying out management tasks and sits on the GNR Management Committee. The vast majority of habitat management work is led by Paul and work party volunteers. Monitoring of the Reserve is also greatly assisted by a team of Volunteer Rangers to ensure the safety and security of the Reserve.

Natural England

For the SSSI section of the Reserve, Natural England must give permission for any works that may damage the notified features of interest. These works were identified upon designation as Operations Likely To Damage.

Site history

The Reserve has a long history of varied land use that, in part, explains the features of the Reserve today. The habitat of the general area was lowland heath, indicated today by the remnants of heather in the Reserve and adjacent Racecourse and nearby place names such as “Heathery Lane” and “West Moor”.

The Reserve lies within the land of Gosforth Park, an area that was greatly changed through landscaping during the 19th century while under the ownership of the Brandling Family. Historic maps indicate the Reserve’s lake was created between 1810-1820 and much of the woodland was planted during the mid-19th century. Lake Lodge, the boathouse and old sluice were all constructed during this time. The wider area was also formerly an area of mining activity which may explain the land subsidence in and around the Reserve today.

The site first gained a form of protection in 1924 when NHSN Council member and ornithologist, Mr W.E. Beck, leased the shooting rights for the lake and surrounds to protect wildlife, marking the beginning of ‘Gosforth Park Bird Sanctuary’. These rights were then passed onto NHSN Honorary Secretaries in 1929 and the Reserve has been managed by NHSN ever since, later to be named ‘Gosforth Park Nature Reserve’ in 1966 and ‘Gosforth Nature Reserve’ in 2019.

> *“I am quite certain that if the lake and surroundings were made into a Bird Sanctuary, it would become an interesting acquisition to the ornithological features of Northumberland."*
>
> **Mr W.E. Beck reporting to NHSN Council (1919)**

3. Policy and legislation

Site of Special Scientific Interest

The southern half of the Reserve, covering approximately 37.3 hectares and excluding the property of Lake Lodge, is designated as a Site of Special Scientific Interest (SSSI, Map 3). Legally protected under the Wildlife and Countryside Act (1981), SSSIs are statutory-protected areas for their biological and/or geological interest. First notified in 1970, the area is designated for the reedbed, open water and invertebrate assemblages associated with dead wood of the mixed deciduous woodland. The citation document further details the features of interest. Upon assessment by Natural England in 2010, notified features were regarded to be in 'favourable condition'.

Local Wildlife Site

The Reserve is designated as a Local Wildlife Site (LWS). The wider LWS boundary also encompasses land to the north of GNR owned by Newcastle Racecourse (Arena Racing Company). LWSs are selected for holding important, locally distinctive and threatened species or habitats according to set guidelines. The Local Sites Partnership (Newcastle, North Tyneside and Northumberland Council and organisations such as Natural England, Northumberland Wildlife Trust and Northumbrian Water) are responsible for the selection of LWSs in the area. While not afforded legal protection, Local Wildlife Sites are recognised in local plans and can promote protection, mitigation or compensation. In 2017, the local wildlife site was re-assessed and the following features were determined to retain its status:

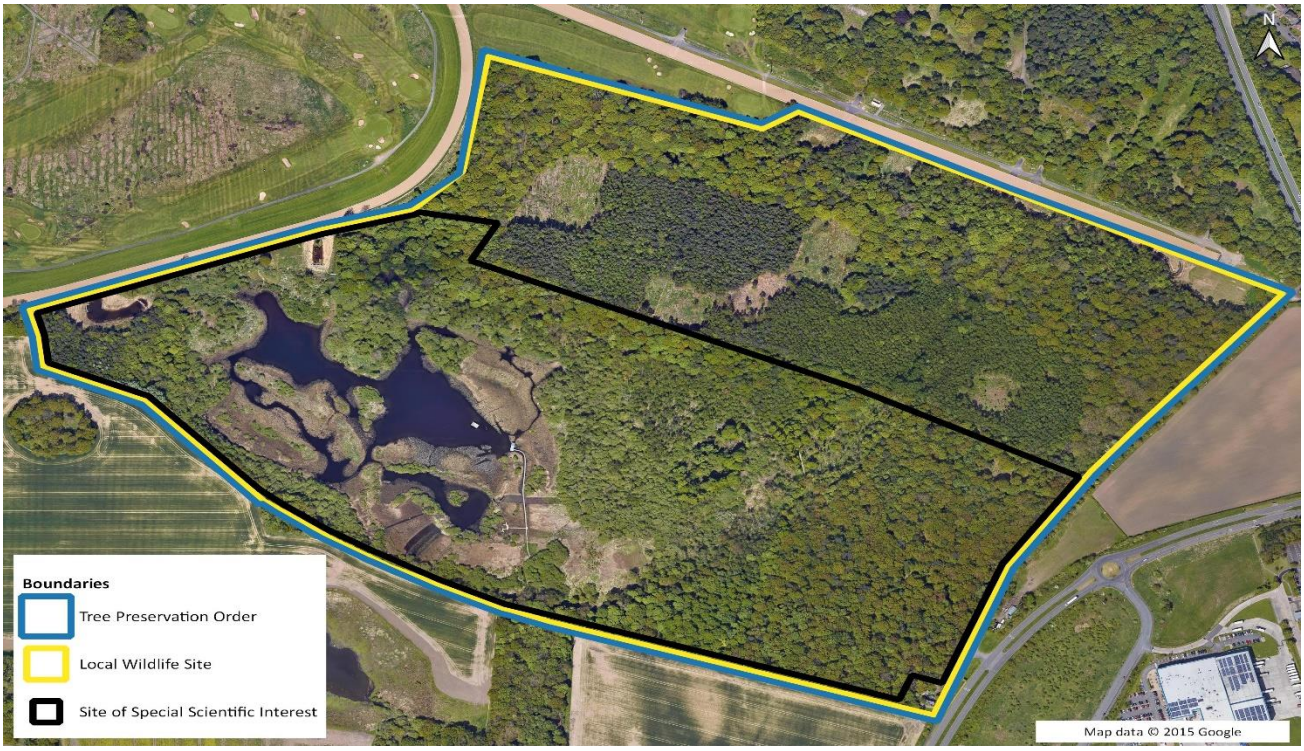
Habitats	Species
Lowland acid grassland	Bats
Lowland heath	Great Crested Newt
	Butterflies including Purple Hairstreak
	Dragonflies
	Woodland birds

Tree felling works

The Reserve is blanketed under a Tree Preservation Order (TPO) by Newcastle City Council. This makes it an offence to fell or damage mature trees covered under the Order without the consent of Newcastle City Council. A felling licence is a separate requirement from the TPO application and is granted by the Forestry Commission. A 10-year felling licence has been applied for to support woodland management work throughout the period of this plan.

Higher Level Stewardship Scheme

Granted by Natural England until 2022, this funding allows for woodland and reedbed management work and education payments enable free educational group visits to the Reserve. Following the departure from the European Union, these funding schemes may change; once the situation has been clarified, future funding possibilities will be explored.



Map 3. Designations of Gosforth Nature Reserve

Relationship with local strategies

Newcastle City Council Core Strategy Plan (2010-2030)

This Plan guides development in Newcastle to 2030. The protection, enhancement and management of green infrastructure including designated sites falls under Policy CS18 in addition to improving connectivity between them. SSSIs are regarded as the most important ecological sites in the locality (12.47) with Local Wildlife Sites representing a key asset due to their importance for local biodiversity (12.48). The Tyne and Wear Green Belt forms a wide band of protected land around Newcastle which is to be protected in accordance with national policy and the Reserve falls within this band (Policy CS19). The Newcastle Green Infrastructure Framework identifies actions guided by these policies: GNR sits within an identified strategic corridor and is considered Newcastle's most important wildlife site. Adopted in June 2020, the Development and Allocations Plan (2015-2030) protects locally and nationally designated sites under Policy DM29.

North Tyneside Council Local Plan (2017-2032)

The eastern boundary of the Reserve is adjacent to the local authority of North Tyneside Council. This Plan sets out the Council's policies to guide planning decisions and sustainable development of North Tyneside. The protection, enhancement, extension and creation of green infrastructure in and adjoining the Borough is outlined under Policy S5.1 and development proposals within a wildlife corridor must protect and enhance the quality and connectivity of the wildlife corridor. North Tyneside's Green Infrastructure Strategy (2015) identifies a strategic wildlife corridor between the two local authorities through High Gosforth Park.

Local Biodiversity Action Plan (2012-2022)

Approved in 2012 by Newcastle City Council and North Tyneside Council, this is a 10-year vision translating the objectives and targets of the national Biodiversity Action Plan into a local context. Listed habitats and species are targeted as priorities for conservation and contribute to guidelines in designations such as Local Wildlife Sites. The Reserve contains a number of BAP habitats and species and so is a key conservation site for many of the priority species noted within the plan. The plan is due for revision in 2021-22.

4. Current opportunities and challenges

Opportunities

Wildlife conservation

The Reserve conserves habitats and species that are regionally, nationally and internationally important. There is the opportunity to further enhance the Reserve's biodiversity and habitats. To inform management, wildlife monitoring schemes can be built upon and the range of species recorded and monitored increased. Citizen science and research projects with local university students can also be further developed.

Connectivity

The Reserve sits within a network of important wildlife sites including Local Wildlife Sites and Sites of Local Conservation Interest as well as forming part of a designated strategic wildlife corridor (Map 4). Directly adjoining the southern boundary of the Reserve is Black Wood LWS and its associated subsidence pond. This provides connectivity for species using the Reserve and forms a critical part of a wildlife corridor between Gosforth Park and Jesmond Dene. Establishing connectivity is also important with surrounding greenspace including residential gardens, school grounds, road verges, pocket parks, commercial land and brownfield sites.

Educational opportunities

NHSN's purpose is to encourage the study and protection of the natural world and GNR is a critical vehicle to achieve this purpose. One of GNR's assets is being able to demonstrate a variety of habitats in a relatively small area. GNR as an educational resource can be enhanced through reaching different ages and groups, improving facilities and increasing accessibility. With surrounding housing estates, GNR can provide an educational resource and base for outreach into local communities for residents, inspiring local action to conserve wildlife.

Social and wellbeing benefits

Spending time in places of nature such as nature reserves is linked to improved physical and mental health. The Reserve together with outreach not only provides opportunities for people to experience the natural world, but also the opportunity to volunteer and be involved in nature-related activities. These include weekly conservation work parties, the roles of educational and volunteer ranger, and open day events held at the Reserve each year. These benefits will be extended to a wider range of people by reaching out to a diverse range of groups, increasing access for ethnic minorities and increasing disability access.

Challenges

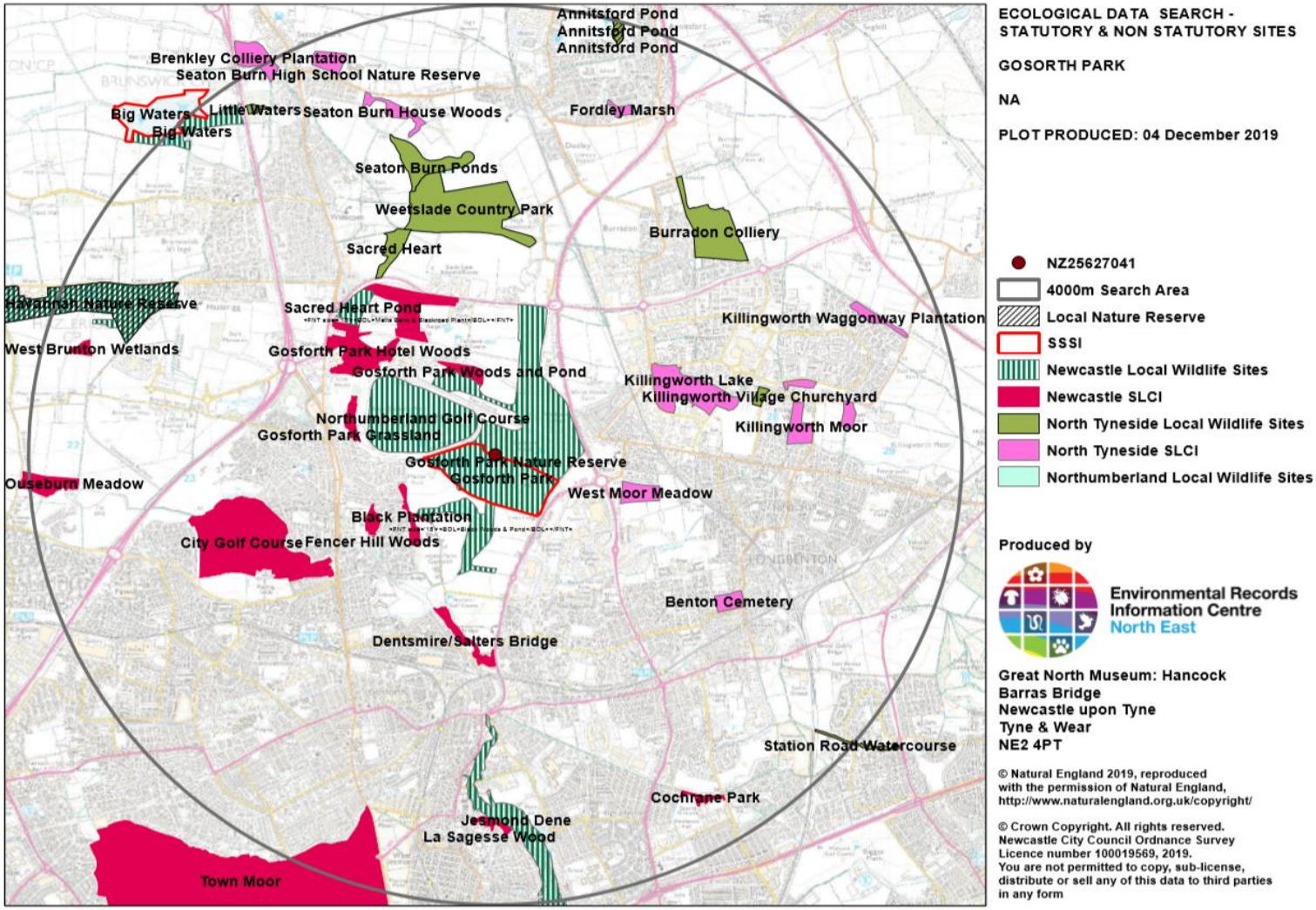
Climate Change

NHSN acknowledges the need to plan and adapt management objectives for climate change as it could have serious implications for the habitats and species in the Reserve and in turn, influence the management required. Natural England has developed a manual of guidance for adapting to and mitigating impacts of climate change on specific habitats. The management objectives of the Reserve will help address these key adaptations.

Urbanisation and development

Situated in an urban area, the Reserve needs to manage unauthorised access and its associated issues including disturbance, vandalism, fire and domestic pets that put both habitats and species at risk. Future developments could potentially amplify such issues. Protecting the Reserve from over-development is critical and this is a key aim. Upstream watercourses that run through the Reserve have also caused incidents of litter, siltation and pollution entering the Reserve. GNR is a no-dog site and will be maintained and rigorously enforced.

Map 4. Designated wildlife sites within 4000m radius of Gosforth Nature Reserve



5. Key Ecological Features

Woodland

The 19th century mixed woodland is predominantly Oak and Birch, with an understorey represented by Holly, Hawthorn and Hazel while the woodland floor is dominated by ferns and dead wood including plants of botanical interest such as Broad-leaved Helleborine. The woodland is a critical part of the SSSI, providing dead wood and wildflowers for notified dead wood invertebrate assemblages. Two smaller areas of coniferous plantation - Scots Pine in the south west and Sitka Spruce in the north – were planted in the 1970s.

Collectively, the Reserve's woodland supports breeding birds including a heronry, mammals (Red Squirrel, Roe Deer, Badgers and eight species of bat), invertebrates, bryophytes and fungi. Over 200 beetle species have been recorded predominately in the woodland, including those locally or nationally notable (Luff 2011).

Wetland

The reedbeds and lake support a great variety of resident and breeding waterbirds and is an important wintering site for species including Bittern, Wigeon and Teal. The reedbed is of regional and national importance, being one of the largest in the North East, as a habitat of conservation priority and a notified feature of the SSSI. Species such as Otter, Water Vole and Water Shrew also depend upon the interconnected channels and pools. The surrounding wet woodland, comprising predominately Willow and Birch, is a rare habitat locally and nationally, and supports specialist species such as Coralroot Orchid, Willow Tit and *Sphagnum* mosses. A number of ponds also provide habitat for invertebrates, including 16 species of dragonfly and damselfly as well as breeding populations of Common Toad, Frog and Smooth Newt.

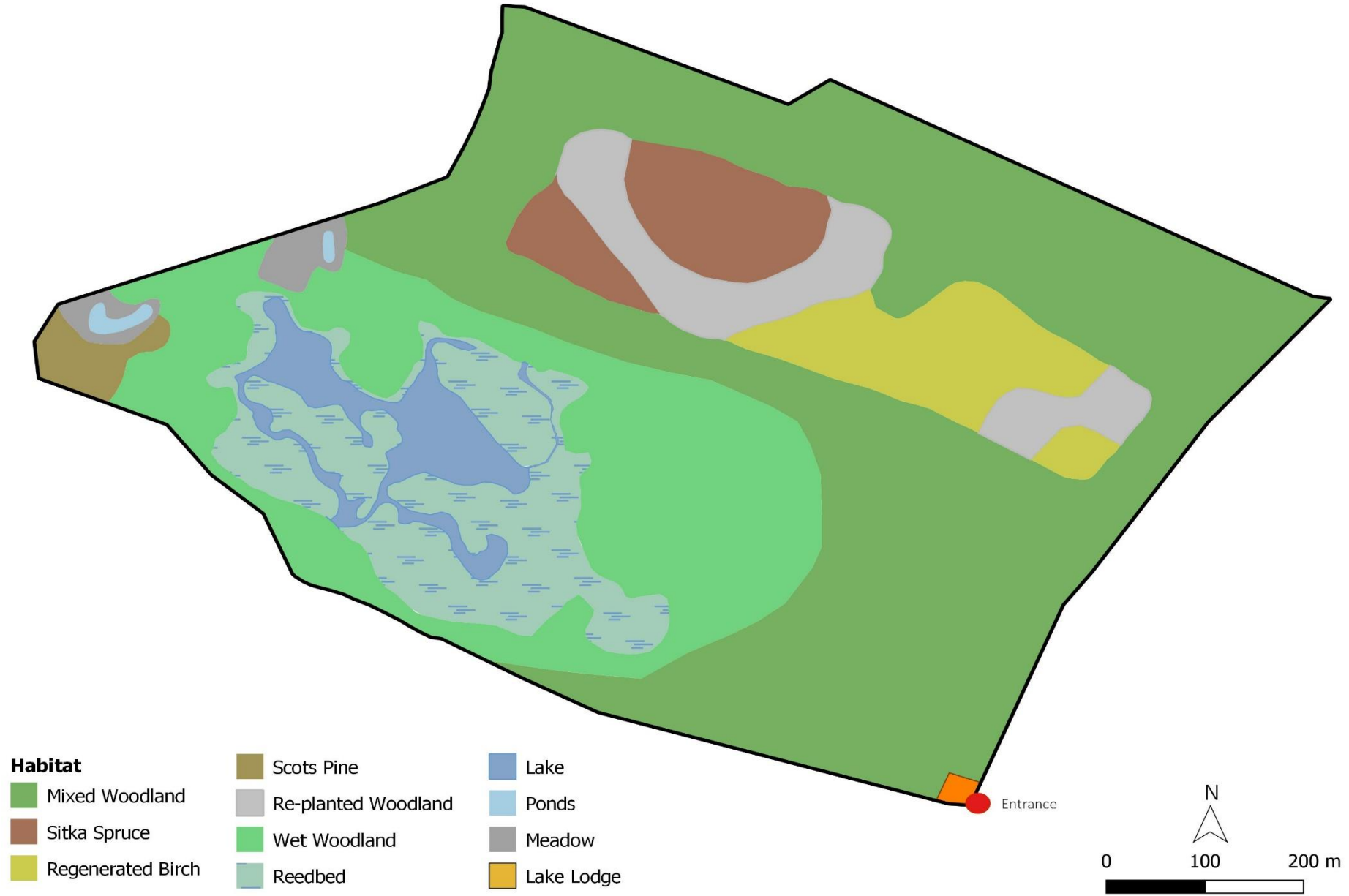
Meadow

There are three areas of meadow in the Reserve; two in the west and southwest of the Reserve while more recently, a wet meadow has been developed in a section of reedbed. Wildflowers, both natural and sown, support a range of invertebrates by providing rich sources of nectar and pollen during spring and summer. The meadows are hotspots for invertebrates including 19 species of butterfly.

Wildflowers include Devil's-bit Scabious, Meadow Vetchling, Yellow Rattle, Common Spotted Orchid and Northern Marsh Orchid among other sources of nectar and pollen for invertebrates.

Please refer to Map 5 on the following page for a habitat map of Gosforth Nature Reserve. Graphs on species diversity can be found in Appendix 2.

Map 5. Habitat types at Gosforth Nature Reserve



6. Key Ecological Priorities

These ecological priorities have been shaped from key opportunities and challenges across the Reserve. To achieve these priorities, there are practical conservation practices proposed within each set priority. Further priorities for each habitat are outlined in the following habitat sections.

Objective 1 Retain designation of favourable condition for the SSSI and Local Wildlife Site by 2031

Priority 1a Protecting and increasing the overall biodiversity of the Reserve

The reedbed, lake and dead-wood invertebrate assemblages present in the mixed deciduous woodland are notified features of the SSSI. Priorities set within these habitats will ensure that targets by Natural England are met to maintain the SSSI in 'favourable condition'. The habitat and species assemblages of Local Wildlife Site interest will be protected and enhanced.

- Maintain and enhance both the habitat and native species assemblages of the Reserve;
- Maintain and expand upon species recording and monitoring programmes at the Reserve.

Priority 1b Supporting native species partly by controlling non-native species

Invasive non-native species can have a detrimental impact on native species through competition for resources, predation and disease. Non-native species are monitored and controlled in the Reserve in order to protect and conserve native species.

- Continue with active control programme of Grey Squirrel and Mink;
- Monitor and control presence of invasive non-native plants;
- Continue collaboration with regional red squirrel schemes.

Priority 1c Adopting an approach to manage deer grazing and limiting value to fauna

A key priority is to increase the diversity and structure of the woodland. The impact of Roe Deer grazing on the Reserve's flora diversity and composition has yet to be properly quantified and established. As surrounding habitat becomes increasingly unsuitable, the density of deer – and the impact on flora - may increase in the Reserve.

- Quantify and establish impact of deer grazing through development of a trail camera project;
- Discuss and adopt a strategy of protective options to allow the regeneration of flora such as fencing of selected areas.

Priority 1d Managing and mitigating issues associated with the Whitecroft Burn

The Whitecroft Burn that enters from the north is a source of flash-flooding as well as pollution, silt and litter that risks entering the woodland and wetland. Since changing its flow, an area of woodland has become a lot wetter causing tree die-back and the population of Red Data Book Coralroot Orchid is in decline.

- Seek advice and liaise with knowledgeable bodies including the Environment Agency, Northumbrian Water and botanical experts to develop and progress proposals for infrastructure options. This includes installation of a gabion dam and creation of an inundation pond in an area of failed plantation (Map 6);
- Gather baseline data of parameters present in the Whitecroft Burn through water quality monitoring in collaboration with Newcastle University.

Map 6. Proposed area for felling of regenerated Birch to create an inundation pond and install a gabion dam across the Whitecroft Burn.

7. Woodland

Woodland accounts for 80% of the Reserve's total area. The woodland objectives and priorities form part of a 10-year woodland management plan to be approved by the Forestry Commission. Please see Appendix 1 for details of tree felling and thinning proposals.

Mixed Deciduous Woodland

Planted in the 19th century, the oldest trees are around 200 years old. The canopy is predominately Oak and Birch, together with trees such as Ash, Common Lime, Scots Pine, Horse Chestnut, Beech and Sycamore. The understorey is largely represented by Holly, Hazel and Hawthorn while the ground flora dominated largely by ferns with Primroses dominant in spring and in summer, wildflowers including Foxglove, Enchanter's Nightshade and Broad-leaved Helleborine. In 2019, 2000 plug plants of woodland wildflowers were planted in the northern section to increase the diversity of ground flora. The southern section of this woodland falls within the SSSI boundary and is essential in supporting the notified dead-wood invertebrate assemblages through the large quantity of dead wood. The northern section of this woodland has a greater density of Sycamore and Beech.

Purple Hairstreak *Favonius quercus* © Paul Drummond. Relies on Oak as a larval foodplant.

Tree Sparrow *Passer montanus* © Chris Wren. Found breeding in nest box in 2019.

Beetle *Sinodendron cylindricum* © James Common. A beetle dependent on dead wood.

Key features and opportunities	Key issues
• Feeding and breeding habitat for mammals including Roe Deer, Badgers and 8 species of bat, and breeding birds including a heronry. • Large amount of dead wood supporting cavity-nesting birds, fungi and specialist invertebrates. • Supports uncommon species including Purple Hairstreak, Tree Sparrow and Red Squirrel. • Bird boxes, bat boxes and a bird-feeding station further support woodland species. • Non-native trees can be selectively thinned to open up the canopy for native trees, shrubs and ground flora. • Increasing area and age extent of mixed deciduous woodland through selective felling of plantation and re-stocking.	• Understorey and ground flora is limited, particularly under heavy canopy shade and impact of Roe Deer grazing. • Non-native trees such as Sycamore, Beech and Turkey Oak shade and compete with native trees, with the potential to spread and dominate areas. • Potential for tree diseases and their impact on the woodland have been assessed according to Forestry Commission guidance. • Addressing resilience to climate change through increasing diversity of woodland in structure, age and species.

Vision

Diverse in structure, age and species, the woodland will provide valuable nesting, breeding and foraging habitat for woodland species. A well-developed understorey and a floor rich in ground flora will be established. Dead wood, both on the floor and as standing, will be retained. Retaining its SSSI status, the woodland will provide high quality dead wood invertebrate habitat from the high abundance and continuity of dead wood and provision of nectar and pollen sources.

Management Priorities

Objective 2 Achieve 82 acres of deciduous woodland, with 85% of native species by 2031
Priority 2a Diversifying the woodland in structure, age and plant species
• Increase area, age extent and species diversity of woodland through re-stocking of cleared plantation areas and promoting natural regeneration of native trees; • Increase cover and diversity of native ground flora and understorey through selective thinning of non-native trees to increase light, allowing natural regeneration and where appropriate, planting. • In cleared and re-planted areas, maintain more open areas where heathland flora has naturally regenerated and encourage establishment.
Priority 2b Retaining high quality dead wood invertebrate habitat
• Retain all dead wood where possible – fallen, on living trees and as standing. Abundance is scored as 'good' when at least one large mature tree and plenty of 5-50cm pieces are visible at a sample point; • Ensure continuity of deadwood by providing a diversity of tree ages including retaining mature trees, planting and promoting natural regeneration of native trees; • Increase floristic diversity and cover to provide abundant nectar and pollen sources for adult flower-visiting invertebrates. This includes maintaining and creating more open areas through thinning, planting where appropriate and the creation of a southern boundary woodland meadow. • Conduct specialist surveys to identify and monitor the species assemblage present.
Priority 2c Controlling non-native invasive tree species including Sycamore, Beech and Turkey Oak
• Thinning of selected non-native trees to aid growth of native trees; • Retain larger mature specimens in recognition of wildlife value and suitable dead wood in time; • Ensure specimens do not invade or dominate areas, particularly when more manageable to control; • Long-term phased ringbarking of selected non-native trees to increase their wildlife value, provide standing deadwood and open the canopy allowing light to the woodland floor.

Conifer Plantations

There are two areas of coniferous plantation in the Reserve, both planted during the 1970s.

Scots Pine

This plantation is situated in the southwest section of the Reserve within the SSSI boundary. The canopy provides shelter and additional forage and nesting habitat for mammals and birds while the cones also provide a source of food.

Characteristic of Scots Pine plantations, there is limited understorey and ground flora due to low light intensity and a deep layer of needle litter. As some of the canopy is thinned, it will become more open to allow the development of an understorey layer with added wildlife value.

Key features and opportunities	Key issues
• Shelter, food and nesting habitat for mammals and birds. • Selective thinning will allow development of a shrub layer and potential natural regeneration of Heather.	• Limited age and structural diversity together with trees growing too closely together. • Limited understorey and ground flora. • Invasion of Sycamore, with potential to further spread throughout plantation.

Vision

Retained in extent and thinned within, the Scots Pine plantation will be enhanced for wildlife and increased light will support the natural regeneration of Heather.

Management Priorities

Objective 3 Maintain 2 acres of Scots Pine woodland by 2031
Priority 3a Developing a healthy canopy with increased structural and age diversity
• Approximate 30% thin of selected Sycamore and Scots Pine - where growing too close together - to allow more light into the canopy; • Promote natural regeneration of flora including Heather and where appropriate, planting of native shrubs to develop an understorey. • Retain felled wood where appropriate and feasible.

Sitka Spruce and Birch

Cleared area with retained Sitka Spruce in the background.

An area of Sitka Spruce plantation forms a dense canopy in the northern section of the Reserve with little understorey and ground flora. Where the plantation has failed, Birch has naturally regenerated to form a dense area to the east of the plantation.

The area of Sitka Spruce and Birch has undergone a phased felling and re-planting project since 2012-13, with the aim to create and increase the area and diversity of mixed woodland in the Reserve. In young re-planted areas, heathland plants including Heather, Heath Wood-rush, Tormentil and Heath Bedstraw have naturally regenerated and established.

Retained areas of Sitka Spruce and Birch over this 10-year Plan will continue to provide shelter and foraging opportunities for birds that favour this woodland including Goldcrest, Coal Tit, Sparrowhawk and Barn Owl along with winter flocks of Siskin and Redpoll.

Key features and opportunities	Key issues
• Shelter and foraging habitat for birds known to favour this habitat. • Whilst not native, it has value to show to educational groups including demonstrating differences in habitat. • Phased felling of selected areas will create and increase the area of diverse mixed woodland.	• Canopy is monospecific and even aged with limited structural diversity. • Little understorey and ground flora due to heavy shading.

Vision

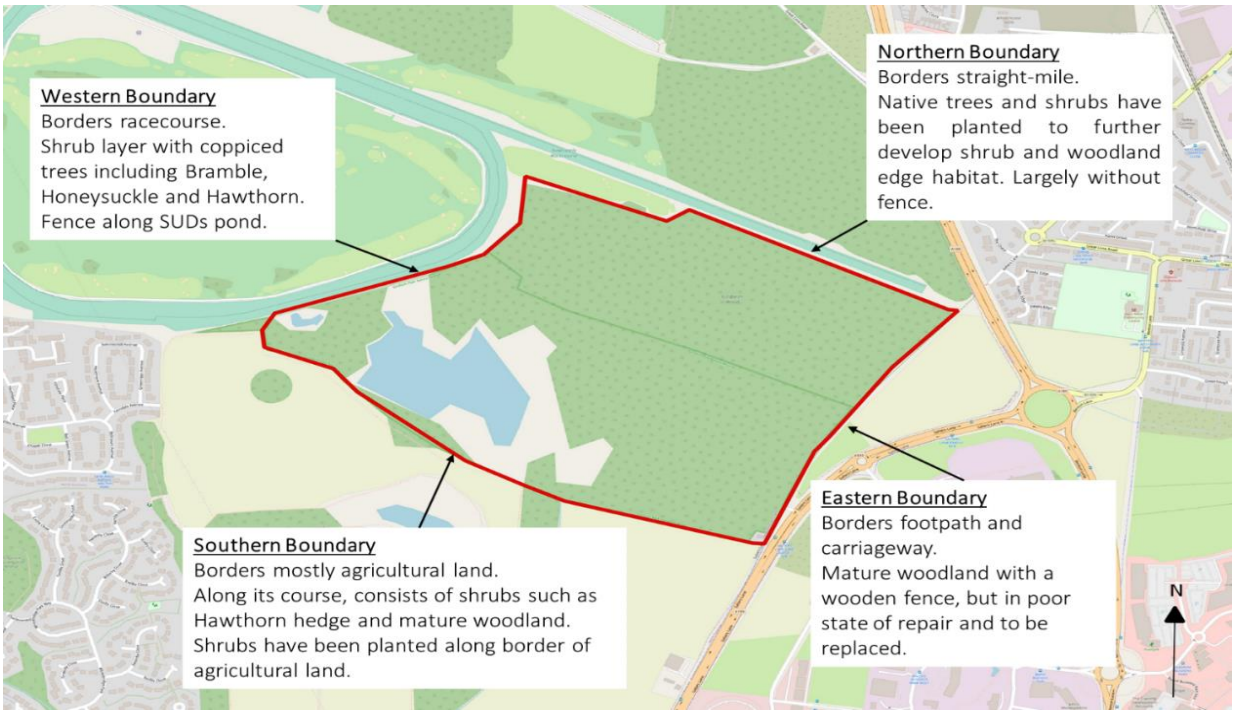
Re-planted areas of cleared Sitka Spruce and Birch with native trees and shrubs will add diversity to the age, structure and species of the woodland. Selected small areas of Sitka Spruce and Birch, thinned and retained, are healthier canopies providing additional habitat and shelter for species and educational opportunities.

Management Priorities

Objective 4 Maintain 13 acres of plantation with a mix of Sitka Spruce and regenerated Birch by 2031
Priority 4a Creating new diverse mixed woodland
• Three selected areas are to be cleared and re-stocked with native trees and shrubs over 10-year period; • Encourage spread of existing woodland flora into cleared areas; • Maintain more open areas where heathland flora naturally regenerates.
Priority 4b Retaining and enhancing selected areas of Sitka Spruce and Birch
• Small retained areas of Sitka Spruce and Birch are to be thinned; • Long-term ring-barking of selected Sitka Spruce to provide dead wood over time and reduce shading; • Scalloping of northern Sitka Spruce to provide an open area and aid growth of adjacent native Oak.

Boundaries

The boundaries of the Reserve total an approximate 4km which border Newcastle Racecourse, agricultural land and the A189 carriageway (Map 7). Boundaries provide the opportunity to maintain and enhance habitat for both wildlife and the security of the Reserve.



Map 7. The boundaries of Gosforth Nature Reserve

Key features and opportunities	Key issues
• Woodland edge and hedging provides habitat and connectivity for species. • Opportunity to further develop hedging for both species and for security of the Reserve.	• Fencing in poor state of repair in some areas and to be replaced. • Gaps in boundary hedges encourage unauthorised access.

Vision

A well-developed woodland edge and shrubby habitat will provide valuable habitat and connectivity for wildlife whilst increasing the security of the Reserve.

Management Priorities

Objective 5 Maintain and enhance a site perimeter of 4 kilometres with hedge and trees by 2031
Priority 5a Maintaining and improving boundary habitat for wildlife and site security
• Encourage development of hedge and woodland edge habitat with native shrub planting where appropriate; • Maintain fences in good state of repair; • Replacement of roadside boundary fence, funded by Section 106 monies from nearby Whitehouse Farm development in Killingworth.

8. Wetland

Wet Woodland

Predominately Willow and Birch with Alder, forming wet woodland around the reedbed. The ground flora includes Reed-canary Grass, rushes and sedges, Meadowsweet, Yellow Iris and Marsh Pennywort, with the high humidity and dampness also supporting five species of *Sphagnum* bog moss. This rare habitat supports a number of specialist species: it provides feeding habitat for reedbed-nesting birds such as Reed Warbler, supports a population of Red Data Book Coralroot Orchid, and Willow Tit, a red-listed bird of wet woodland. This habitat falls within the SSSI boundary and is a priority habitat for conservation locally and nationally. This habitat is also a site of the constant-effort bird-ringing programme at the Reserve.

Coralroot Orchid © *Yo-hin Wong*. A Red Data Book species that depends on a mycorrhizal relationship with the roots of Birch.

Willow Tit © *James Common*. One of UK's fastest declining birds. Excavate their nests in decaying wood.

Five species of *Sphagnum* bog moss have been recorded © *Brian Eversham* 'Living carpets' that hold large quantities of water.

Key features and opportunities	Key issues
• A rare habitat and identified as a habitat of conservation priority both regionally and nationally. • Tree, shrub, ground cover and decaying wood provide shelter, forage and breeding habitat for species. • Supports specialist and rarer species including Willow Tit, Coralroot Orchid and reedbed-nesting birds. • High humidity and decaying wood support specialist bryophytes and invertebrates.	• Loss to encroachment of dry woodland species such as Beech, Ash and Sycamore without management. • Encroachment of wet woodland into reedbed without management. • Changing flow of Whitecroft Burn has made this area wetter, causing die-back of Birch, invasion of *Phragmites* reed and a declining population of Coralroot Orchid.

Vision

Retained in extent, the wet woodland will provide shelter, forage and breeding habitat for species including those species specialist to this habitat. With implementation of a water management strategy, the Coralroot Orchid will be safeguarded, and its population restored.

Management Priorities

Objective 6 Maintain and enhance 27 acres of wet woodland by 2031
Priority 6a Retaining the extent of wet woodland
Wet woodland is a transitional habitat that requires active management to prevent its loss to drier woodland and its encroachment into reedbed. • Periodic coppicing to prevent its loss to succession and prevent its encroachment into reedbed. • Removed and dead wood to be retained; • Retain appropriate water levels to maintain wet ground; • Prevent invasion from trees such as Beech, Ash and Sycamore by removal of saplings and selective thinning of small trees. • In consultation with botanists, research and develop a plan for reintroduction of wet woodland plant species that were once present in the region.
Priority 6b Safeguarding the Coralroot Orchid population
Safeguarding the Coralroot Orchid population forms part of the key water management priority. Found around the base of Birch trees, this species depends upon a mycorrhizal relationship with Birch for its survival. The increased wet conditions in this area is causing Birch to die-back. Research also shows that the Orchid is also intolerant to prolonged wet conditions and has particular requirements regarding the level of water table. It is a combination of these factors that are believed to be causing the declining population at the Reserve. • Develop a water management strategy and source experts to discuss potential infrastructure options to i) to slow flash-flooding events from upstream in the Reserve and ii) re-instate the channel of the Whitecroft Burn. • Continue progressing and implement the proposal to install a leaky gabion dam across the Whitecroft Burn and create a retention pond in an area of felled regenerated Birch. • Continue to annually count and monitor population.

Reedbed and Lake

Together, the reedbed and lake are notified features of the SSSI status. The shallow lake contains raised islands with interconnected pools and channels fringed by reeds. The reedbed is one of the largest in the North East, comprising of Bulrush, Common Reed and herb-rich vegetation including rushes, Meadowsweet and Yellow Iris. The Reedbed supports breeding birds including Reed Bunting, Sedge and Reed Warblers, Water Rail and Little Grebe, and wintering species such as Bittern and passage Marsh Harrier. Otters are resident along with Water Shrew, with healthy breeding populations of Frogs, Toads and Smooth Newts. The open water supports resident bird populations including Little Grebe, Grey Heron and Kingfisher as well as attracting large numbers of wintering populations including Wigeon, Teal, Gadwall, Shoveler and Pochard. An artificial breeding platform in the lake supports Common Terns and Black-headed Gulls.

Tern Breeding platform *© Mike Reid*

Otter *© Mark Bowen*

Wintering Bittern *© Charlie Syme*

Key features and opportunities	Key issues
• Designated SSSI feature of the Reserve and local and national priority habitat for conservation. • Provides feeding and breeding habitat for resident waterbirds including reedbed specialists such as Reed Warbler. • Attracts large numbers of wintering birds including notable species such as Bittern which could potentially re-colonise and breed. • Pools and channels support Otter, Water Vole (rediscovered in 2019) and healthy breeding populations of amphibians and Smooth Newts.	• Successional loss of reedbed from encroachment of wet woodland. • Successional loss of open water to reedbed encroachment. • Wooded vegetation on islands can shade and encroach the reedbed and open water. • De-siltation of the Lake required in the long-term. • Increased urbanisation a source of pollution, siltation and litter into the reedbed via Whitecroft Burn. • Greater extremes in water levels due to more extreme rain and drought conditions under climate change.

History

The reedbed and lake underwent a large-scale restoration programme from the late 1980s to early 2000s. In 1981, the lake was drained to fix wider drainage issues in Gosforth Park, resulting in the deterioration of the lake and reedbed, and in turn, the loss of birds in subsequent years. This involved excavation of the lake to create raised islands with interconnected channels and pools. This work was followed by a reedbed regeneration project including rhizome planting and establishing a cutting regime. This was a huge success; birds returned to reside and breed and the reedbed area increased by 100% between 1988 and 2005. Over this time, the lake has also been re-stocked with fish to attract and support fish-eating species.

Vision

Open water will be maintained in extent and fringed by a reedbed diverse in age and structure to support a rich assemblage of wetland species. A greater understanding of the aquatic plant and invertebrate life of the open water will be achieved through comprehensive surveys and monitoring.

Management Priorities

Objective 7 Maintain 22 acres of reedbed and open water (70% reedbed, 30% open water) by 2031
Priority 7a Maintaining the extent of reedbed and open water
• Retain extent of reedbed area by preventing encroachment of woody vegetation by coppicing of encroaching trees. The cover of scrub within the reedbed should be less than 10%; • Ensure healthy reedbed regeneration by rotational cutting of sections, with the main focus on drier parts of the reedbed where most required; • Monitor the encroachment and shading of woody vegetation on raised islands and cut back when necessary to reduce shading on reedbed; • Negative indicator species such as invasive non-natives should be absent or controlled if present; • De-siltation of the lake will be required, though likely after the duration of this plan.
Priority 7b Ensuring structural and composition diversity of reedbed and open water habitat
• Create and maintain a number of narrow channels and pools within the reedbed to increase structural diversity and reed edge habitat; • Create and maintain a 'mosaic' of successional stages and age including maintaining a number of early-cut wet meadow areas. • Ensure at least current aquatic plant composition and structure is maintained in the lake, with baseline surveys carried out to establish this extent; • Monitor the presence of non-native Canadian Pondweed and its impact on native vegetation.
Priority 7c Management of water levels for maintaining healthy reedbed habitat
Appropriate management of water levels is required in order to prevent the reedbed from dying out and invasion of wooded vegetation. In 2016, an adjustable sluice was installed with a water depth marker to allow more accurate monitoring and control of water levels. • Continue with a natural water regime of higher winter levels and draw down in depth in late summer. • Variation in landform and heights will ensure that a variety of conditions and refuge areas from flooding or fluctuating levels are available; • Water should be of good quality with low levels of pollutants. As part of the key water management strategy, a proposal to prevent polluted water from entering the reedbed via the Whitecroft Burn is to be established and implemented.

Ponds and Ditches

SUDs Ponds

In 2015-16, two large attenuation ponds were created in the Reserve as part of the drainage system for an all-weather track on the adjacent racecourse.

These ponds provide valuable feeding and breeding habitat for invertebrates, particularly dragonflies and damselflies of which 16 species have been recorded here.

Woodland Ponds

A number of small ponds have been dug in the woodland as fish-free ponds, providing valuable foraging and breeding habitat for amphibians and invertebrates.

Left: Work party volunteers creating woodland pond by the woodland bird-feeding station in front of Lawrence Hide.

Ditches

There are a number of ditches in the Reserve that are seasonal, containing water in periods of high rainfall.

Vision

Surrounded by a diverse assemblage of marginal vegetation, ponds will provide valuable breeding and forage habitat for healthy populations of amphibians and invertebrates.

Management Priorities

Objective 8 Ensuring eight wildlife-rich ponds and retaining of ditches by 2031

Priority 8a Establishing native marginal vegetation and pond species assemblages

- Encourage the establishment of native marginal vegetation and species assemblages;
- Monitor for presence of non-native invasive aquatic plants and control if species become present;
- Regular monitoring of ponds to assess their condition and species assemblages.

Priority 8b Adopt an approach to retain water in seasonal ditches

- Explore opportunity to reduce variation in water levels and retain water within seasonal ditches through liaising with the Environment Agency and potential development of wetland vegetation.

9. Meadows

Western Meadow

A highly successful meadow, supporting an array of wildflower species, both from the natural seedbank and sown. Wildflowers include Knapweeds, Bird's-foot Trefoil, Ox-eye Daisy and Devil's-bit Scabious. Remnants of Heather are present and in wetter areas, Northern Marsh Orchid and Common Spotted Orchid are found. This area attracts a diverse range of invertebrates and is the most productive area for butterflies. The Dingy Skipper has recently established in response to increased availability of its larval foodplant, Bird's-foot Trefoil.

Southwest Meadow

Adjacent to Scots Pine woodland, this meadow surrounds the SUDs pond. A diversity of wildflower species both from the natural seedbank and sown, with scattered Gorse.

Wet Meadow

A small area of reedbed has been recently managed to establish a wet meadow with wildflowers including Ragged Robin, Yellow Iris, Marsh Bedstraw and Meadowsweet.

Common Spotted Orchid *© Chris Castling*

Ragged Robin *© Olive Taylor*

Tufted Vetch *© Ryan Clark*

Vision

A diverse assemblage of wildflowers, providing breeding, foraging and overwintering habitat to support a diversity of invertebrates.

Management Priorities

Objective 9 Establish 3 acres of meadow by 2031
Priority 9a Encouraging the development and establishment of meadows
• Maintain a staggered cutting regime of Western and Southwest meadows in late summer, leaving selected sections uncut to provide overwintering sites for invertebrates; • Maintain early cut (Feb - March) of reedbed meadow to encourage establishment. • Control of invading scrub species and tree saplings; • Creation of woodland meadow along southern boundary ride (approx. 1 acres) through selective thinning of non-native trees, with potential to scatter cuttings from existing meadow and planting of native wildflower bulbs in more shaded areas;
Priority 9b Restore a small area of heath at southwest meadow
• Pilot seeding of locally sourced heather on one bank of the meadow to create a small area of heath.

10. Ecological Monitoring

The Reserve is one of the most well-studied sites in the North East with over 130,000 wildlife records (Appendix 2) on the Environmental Records Information Centre (ERIC) North East database, a number of university research projects and monitoring programmes undertaken each year, most of which feed into regional and national schemes. Volunteers are at the heart of ecological monitoring at the Reserve and data gathered would not be possible without their tireless dedication and enthusiasm.

Monitoring activity	Description
Constant-effort bird ringing (British Trust for Ornithology, BTO)	• Started in 1988. Mist nets in reedbed and wet woodland are placed out throughout the breeding season, monitoring changes in bird populations and productivity each year. • Monthly ringing at the bird-feeding station in winter. • BTO winter 20-21 ringing pilot – twice monthly ringing at bird-feeding station.
Wetland Bird Survey WEBS (BTO)	• Started in 1966. Monthly counts of non-breeding waterbirds at the lake, providing trends in abundance and distribution of birds at a local and national level. See annual counts here.
Nest boxes (BTO)	• Since 2009, nestlings and parenting adults have been ringed in nest boxes designed for tits, sparrows, spotted flycatchers, owls, kestrels and stock doves. • Since 2016, breeding success has been more closely monitored.
Bat boxes (Northumberland Bat Group)	• Since 2013, bat boxes are checked for presence or signs of roosting bat species during the summer season.
Butterfly transect (UK Butterfly Monitoring Scheme)	• Since 2014, weekly recording from April - September recording the abundance and number of butterfly species, monitoring changes in populations and phenology.
Camera-trapping	• Since 2014, volunteers have regularly set up camera traps along trails and water channels to capture activities and locations of small and large mammals and birds.
GNR moth group	• Since 2019, fortnightly trapping from March-October led by the Garden Moth Scheme North East Coordinator with ad-hoc trapping prior to this. The trap is set in the reedbed and woodland edge.
Sightings logbook	• Since 1965, recording sheets have been available to visitors on site. To date, records submitted to ERIC NE via the record book have generated over 104,000 records dating from 1997 to present day.
Plant monitoring (Botanical Society of Britain and Ireland)	• A comprehensive plant monitoring programme was initiated in 2020 by local botanists, gathering more precise records of species distribution and abundance at a habitat level, including monitoring changes in vegetation in cleared woodland areas over time.
Annual plant counts	• Annual counting of Coralroot Orchid and Broad-leaved Helleborine to gather population numbers over time.
Annual 'bioblitzes' and 'biohunts'	• Held each year at the Reserve with the aim to record as many species as possible during the events. NHSN section leads, volunteers and visitors are central to the success of these events with their expertise and enthusiasm.

Vision

There is great opportunity to build upon and broaden wildlife recording at the Reserve to comprehensively monitor a greater range of groups. Near ninety-percent of the Reserve's records on the ERIC NE dataset are of birds, demonstrating that many groups are under-represented (Figure 2; Appendix 2). Monitoring increases understanding of how species are faring at the Reserve, informs management and allows us to review the success of habitat management. Central to the visitor experience, the Reserve will give every visitor the information, tools and confidence to be a wildlife recorder wherever they are.

Volunteer Philip Jordan checking bird boxes

Management Priorities

Objective 10 Maintain 11 existing monitoring programmes and establish programmes for 5 additional priority groups by 2031

Priority 10a Continuing existing monitoring programmes

- Continue to support volunteers to undertake existing wildlife surveys;
- Recruit and train more volunteers to support existing surveys;
- Continue annual bioblitzes with local experts;
- Provide visitors with the information, tools and confidence to regularly record wildlife at the Reserve;
- Establish a method to formalise and collate visitor sightings at the Reserve.

Priority 10b Expanding the range of taxonomic groups comprehensively monitored

- Establish priority groups to survey and record including:

  Priority invertebrates: Dead wood invertebrates are a notified feature of the SSSI but are not formally monitored and it is a target set by Natural England for surveys to be undertaken at least every six years.

  Aquatic species: As a group, aquatic species are not well understood or monitored at the Reserve. Surveys are to be conducted for fish, plants, invertebrates and amphibians including Great Crested Newts that were once present in the Reserve. The water beetle assemblage was also formerly considered notable but there have been no recent surveys.

  Priority mammals: After an absence of 10 years, a Water Vole was sighted in 2019; further surveys would increase understanding of how this species uses the Reserve. The Roe Deer population is yet to be quantified; a trail camera project would enable an estimation of numbers.

  Priority birds: Tree Sparrow, Willow Tit and Green Woodpecker.

  Fungi and bryophytes: Recording of these often-overlooked groups can be built upon.

Priority 10c Actively encourage and support students and researchers to undertake projects

- Develop a more structured programme of topics for local university projects such as environmental monitoring projects including pollution and water quality;
- Further develop engagement and links with specialist and expert groups for specialist surveys.

11. Providing a Great Visitor Experience

Gosforth Nature Reserve provides a unique place to observe, study and connect to the natural world in the heart of an urban area. Volunteers are the beating heart in creating a great visitor experience.

Visits to GNR will '*encourage the study and protection of the natural world*' because that has been the purpose of NHSN for almost 200 years; and by people of 'all classes' as it was termed in 1929[1]. This demonstrates for how long it has been NHSN's intention to engage the widest number of people in natural history.

For example, prior to 1900 NHSN was one of the first museums in the UK to be open to the public, welcomed orphanages to 'Lantern-lit nature talks' and held 'touch sessions at the Museum' for charities for the blind. Inclusion is in NHSN's DNA.

Families learning about aquatic invertebrates at a public Open Day

"[I hope] for the Reserve to develop as a centre of education to promote interest in wildlife amongst the local community."
Public survey (2020)

"[I hope] that the successes at the Reserve are shared and celebrated by local communities."
Public survey (2020)

Key features and opportunities	Key issues
• Volunteers lead on providing a great visitor experience their role and numbers will be enhanced. • Visitor welcome area can be modernised to be more welcoming and appropriate for the Reserve's setting. • Viewing hides and seating can be upgraded to meet growing demand. • Paths and signage can be improved, with accessibility a priority. • Improved facilities to ensure Reserve is more accommodating for group visits including a multi-use room, changing room and toilets. • Inclusion and neighbourliness will be improved through collaborations and engaging with neighbouring communities.	• Monitoring visitor numbers has not been routine. • Accessibility within the site is unusually limited for an urban site and an audit for improvements will be undertaken. • Security of the site will be resolved with improved fencing, volunteer rangering and camera monitoring. • Welcome facilities are unusually basic for an urban site and will be improved. • Opening hours have been informal historically resulting in 'loan key' arrangements for hides and toilets, which will be phased out and formal hours introduced. • Schools are discouraged from visiting because of limited indoor facilities and toilets. • Insufficient use is made for adult learning.

[1] NHSN Biography Goddard (1929)

Current Visitor Facilities

Map 8. Current visitor facilities at Gosforth Nature Reserve Base map © OpenStreetMap contributors

Facility	Description
Lawrence Hide (1)	Dedicated to Geoff Lawrence, a long-standing supporter, trustee and committee member of the Reserve. Situated in the woodland by the entrance, this hide is accommodated with a bird-feeding station and provides close views of woodland birds. Approximate capacity of 10.
Ridley Hide (2)	Dedicated to Matthew Ridley, a former President and supporter of NHSN. Built in 2015, the two-tiered hide provides views of the reedbed and lake wildlife with space to accommodate groups. Approximate capacity of 20.
Pearce Hide (3)	Dedicated to Roy Pearce, a dedicated member of NHSN. This hide provides alternative northward views of the reedbed and lake. Approximate capacity of 3. This is to be replaced by a new larger hide (the Beck Hide) and relocated elsewhere in the Reserve.
Information Hut	Situated at the Reserve entrance, the hut provides information about the Reserve's wildlife and contains a logbook to record sightings.
Paths	There are informal paths in the Reserve, with boardwalks and informal surfacing where crossing streams and particularly wet ground.
Viewing screens	A viewing screen overlooks the reedbed and lake from the meadow area. A temporary platform for Coralroot Orchids is installed for safe viewing and a badger-watching hide.
Eco-toilet	Installed in 2016, the eco-toilet is situated along the southern boundary path.

Vision

To 'study & protect' all aspects of natural history provides the focus for every visit to GNR. Every visitor will be valued for what they can observe, record and share both environmentally and experientially; NHSN considers this their 'Visiting Naturalist Model'. This means the NHSN visitor experience will involve:

- Nurturing every visitor to recognise their role as a visiting wildlife surveyor; to observe, record and share wildlife at GNR. This benefits GNR and also encourages people to survey wildlife more beyond GNR;
- Capturing the social and cultural aspects of natural history at GNR by encouraging people to share moments, memories, art, poems; this helps create to reflect and peoples' connection with nature at GNR;
- Motivating people to deepen their appreciation of natural history through NHSN and other opportunities so they know how they can provide moral, practical, political and financial support for the natural world.

Discovering moths at a public Open Day

Management Priorities

Objective 11 To welcome 20,000 visits per year (55 per day) by people by 2031
Priority 11a Increasing footfall and diversity of visitors
• Increasing learning visits for all ages and abilities with emphasis on natural history field studies; • Increasing visits by community groups; • Increasing visits by local residents and from further afield in the region; • Improving physical, sensory and neurological accessibility; • Maintaining three public open days; • Increasing and developing self-guided activity and guided activities focusing on the 'Visiting Naturalist Model'.
Priority 11b Maintaining and developing visitor facilities
• Installing a welcome hut to welcome and introduce visitors to the Reserve; • Installing a multipurpose indoor space for natural history activities, courses and learning; • Creation of a new Reserve entrance to lead to the welcome area; • Increase size and accessibility of wildlife hides including replacement and relocation of the Pearce Hide; • Maintaining and repairing hides and paths; • Installing site wide accessible-designed seating with distance markers; • Increase toilet provision with at least one accessible toilet; • Implementing a wheelchair accessible route to one or more viewing hides; • Consider re-routing and improving paths and boardwalks that become wet and unsafe for visitors; • Implementing accessible directional markers, routes and a sensory trail; • Routinely monitor and maintain overgrown or dangerous vegetation to keep path routes safe.

Priority 11c Increasing the capacity, capabilities and potential of the volunteer team

All

- Develop role descriptions and establish into a self-supporting team;
- Provide feedback opportunities for volunteers

Welcome Team (Volunteer Rangers & Education Rangers)

- Implementing a 365-day presence at the Reserve entrance;
- Delivering quarterly team days and training sessions;
- Maintaining a rota of Volunteer Rangers with inductions and six monthly refresher inductions;
- Providing part time staff presence to supervise volunteers and develop neighbourhood outreach;
- Encouraging and improving educational visits by schools, universities and community groups;
- Introducing technology for membership recruitment and publication sales;
- Providing basic refreshments for visitors.

Practical Conservation (Conservation & Monitoring Volunteers)

- Maintaining weekly conservation work parties and monthly Saturday parties;
- Developing practical conservation sessions with local businesses, schools and community groups;
- Providing tools and welfare facilities.

Priority 11d Increasing biodiversity and public engagement beyond the boundaries of the Reserve

The Reserve has seven neighbouring wards, totalling a population of 70,000 and around 50% of the area falls within Council-adopted wildlife corridors. There is great opportunity to increase public engagement and promote conservation of biodiversity beyond the boundaries of the Reserve through partnership, collaboration and engagement (Map 9).

Local residents and public

- Developing outreach activities within local communities through consultation with residents;
- Promote a vision of a wildlife-rich corridor, bringing benefits to people and wildlife;
- Use of digital engagement e.g virtual tour of the Reserve and live-streaming webcams;
- Engaging with new residents on newly-built estates;
- Development of a local citizen science project such as recording GNR-ringed birds in gardens;
- Provide opportunities for those with broader interests such as incorporating nature and art e.g artist in residence and local art exhibitions with local students and artists.

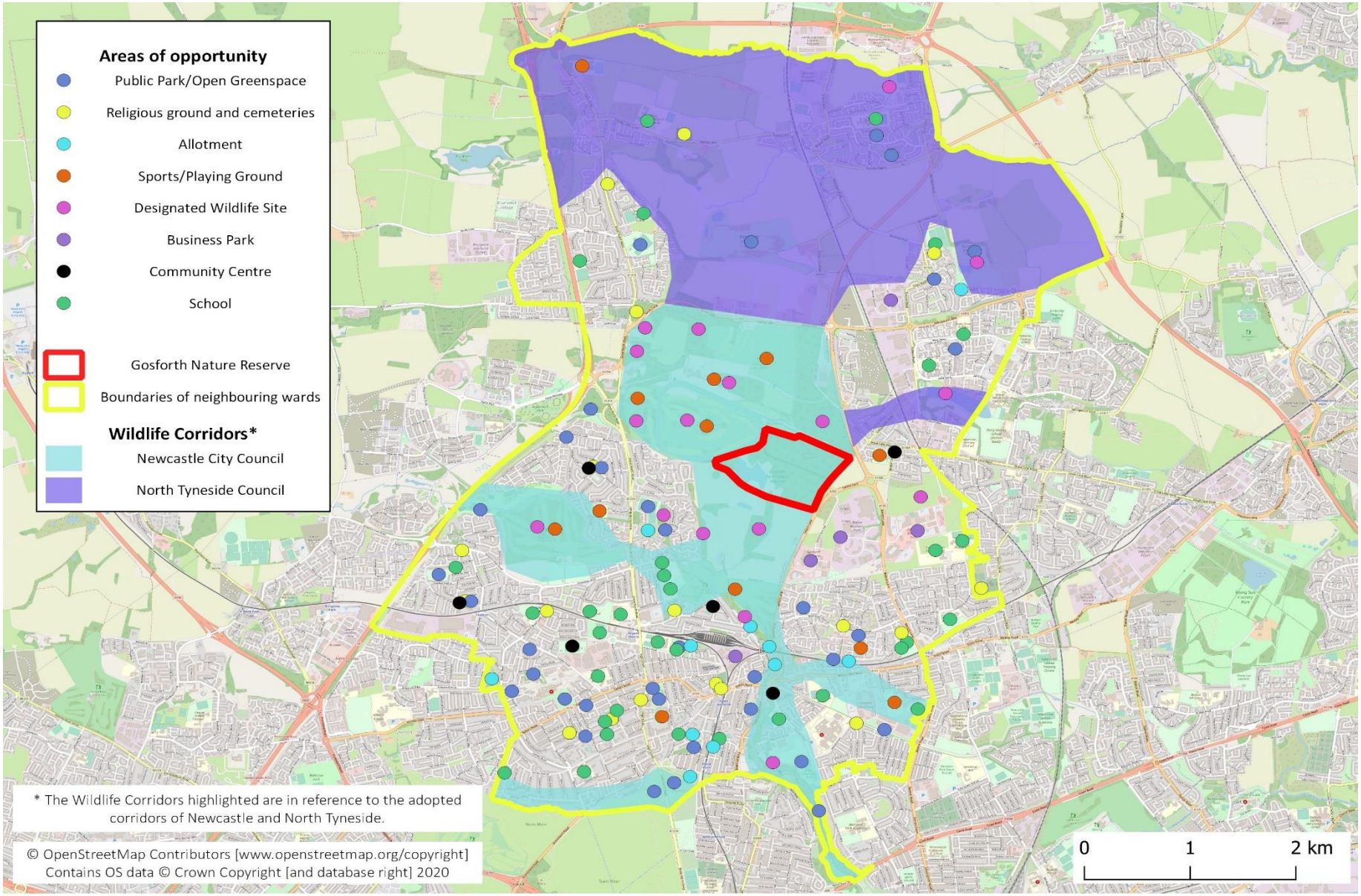
Authorities and landowners

- Working with Councils, neighbouring land managers and owners in developing the biodiversity of wildlife corridors such as wildlife verges and hedgehog corridors.
- Provide advisory visits to land managers to increase biodiversity, encourage monitoring and develop wider non-native species control programmes;
- Explore the possibilities of extending the area of Gosforth Nature Reserve.

"Engaging local people and schools is key to the future of the Reserve. Local people need to be on board with appreciating the importance of the Reserve."

Visitor Survey (2020)

Map 9. Areas of opportunity for engagement within the seven neighbouring wards of Gosforth Nature Reserve. The residential areas (in grey) are also key areas for engagement.



12. Monitoring and Review

Progress of the delivery of the Management Plan is to be reviewed by the Gosforth Nature Reserve Management Committee annually in September meetings, who will formally report key milestones and risks to NHSN Council.

The reference list of measurable objectives and associated priorities, works and projects will be used to assess progress made each year.

The Woodland Management Plan to be approved by the Forestry Commission [submission by Spring 2021] is also to be reviewed comprehensively at Year 5 (2025-26) in order to assess progress made towards woodland management objectives and priorities.

13. Additional Resources Available

NHSN Archive Collection: Gosforth Nature Reserve (originally G Park NR) Archive

The Natural History Society of Northumbria Archive houses a comprehensive collection of material dealing with the management and conservation of Gosforth Nature Reserve dating from 1929 when the lease was first acquired by NHSN. The collection includes:

- Manuscript and printed plans and maps of the lake and reserve
- Manuscript committee books and published reports
- Manuscript and typescript bird and vegetation surveys including the diaries of Charles Gent (1928-1987) which contain some of the earliest nature notes recorded in the reserve.
- Papers, projects and dissertations including Dr Colin S Pittendrigh's *Gosforth Park: A Naturalist's Guide*
- Visitor Sightings Record Books from the 1980s to present day
- Collections of photographs, dating from 1924, which capture the landscape of the reserve, people, plants, various events and include a large selection of aerial views. The photographic archive also contains contemporary digital images of animals taken by members.

Explore the online Archive here: https://collectionssearchtwmuseums.org.uk/. Find out more by contacting Archivist June Holmes at: June.holmes@ncl.ac.uk. Public viewing of the Archive in the library of the Great North Museum: Hancock can be arranged by appointment.

History of Gosforth Nature Reserve Timeline

To be made available for viewing online or contact nhsn@ncl.ac.uk

14. Acknowledgements

The enthusiasm and dedication of volunteers, NHSN members and supporters ensures that Gosforth Nature Reserve is protected, conserved and enjoyed. The tireless efforts of volunteers and members since 1924 have helped shape the Gosforth Nature Reserve that we visit and enjoy today.

It was Mr W.E. Beck, a NHSN Council member and keen ornithologist, who marked the beginning of 'Gosforth Park Bird Sanctuary' in 1924 by leasing the shooting rights for the lake and surrounds. Ever since, the Reserve has been managed and protected for wildlife by NHSN with volunteers and members at the very heart of its conservation, management and protection.

A huge thank you to the following individuals and organisations who contributed to the development and production of this plan and provided comments during consultation:

250 respondees to GNR Visitor Survey (2020)

80 respondees to GNR Educational Group Survey (2020)

Chris Avanti (Volunteer)

Tony Baines (Northumbrian Water)

Julia Black (Chair of GNR Management Committee)

Sarah Bolton (Natural England)

Bill Burlton (NHSN Botany Group member)

Robert Carr (Environment Agency)

Mima Cattan (Volunteer)

James Common (NHSN Communications and Engagement Officer)

Paul Drummond (Reserve Warden)

Sacha Elliot (Member)

Clare Freeman (NHSN Director)

Jonathan Hewitt (Chair of NHSN Council)

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Chris Metherell (Trustee and botanist)

Oliver O'Doherty (Volunteer)

Neil Pont (Volunteer)

Gordon Port (Vice-chair of NHSN Council, NHSN Invertebrate Section Lead)

Lynn Preston (Northumbrian Water)

Sarah Radcliffe (Forestry Commission)

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Derek Teasdale (Trustee, Earth Sciences Section Lead)

Annie Tindley (Trustee)

Michael Turner (Trustee)

Graham White (RSPB)

Mark Whittingham (Newcastle University)

Chris Wren (GNR Management Committee, Volunteer)

Rinke Vinkenoog (Trustee)

David Williamson (Newcastle Racecourse)

14. Developmental Projects 2020 to 2023

Priority	Lead	Budget	2020/21	2021/22	2022/23
1b Supporting native species partly by controlling non-native species					
Wider Red Squirrel and Mink project in collaboration with surrounding landowners	D	Ext £		X	
1c Adopting an approach to manage deer overgrazing flora and limiting value to fauna					
Trail cameras to monitor Roe Deer	V	Ext £	X		
Fencing for selected areas	W	Core £		X	X
1d Managing and mitigating issues associated with the Whitecroft Burn					
Installation of water monitoring devices with Urban Observatory and lab analysis	D	Ext £	X		
Installation of water management infrastructure (gabion dam and retention pond)	D	Ext £		X	
Explore channel works or possible diversion of Whitecroft Burn	D	Ext £		X	
2a Diversifying the woodland in structure, age and plant species					
Tree-planting (stock/shelter/stakes)	D W	Ext £	X	X	X
Native bulb-planting after pilot success	W	Ext £		X	X
5a Maintaining and improving boundary habitat for wildlife and site security					
Tree-planting (stock/shelter/stakes)	D W	Ext £	X	X	X
New fence along eastern boundary from Whitehouse Farm funding (S106 monies)	D V	Ext £	X	X	
8b. Retaining of water in seasonal ditches					
Explore approach to retain water in seasonal ditches	D	Ext £		X	
9a Encouraging the development and establishment of meadows					
Meadow creation along southern boundary ride woodland	W V	Ext £	X	X	
9b Restore a small area of heath at southwest meadow					
Seeding of locally-sourced heather on bank	W V	Core £		X	
10a Continuing existing monitoring programmes					
Establish an approach to collate and formalise visitor sightings	PO CE SL V	Core £	X	X	
10b Expanding the range of taxonomic groups comprehensively monitored					
Terrestrial and aquatic invertebrate specialist surveys	V SL	Ext £	X		
Great Crested Newt survey	V SL	Ext £	X		
Priority birds: Tree Sparrow, Willow Tit and Green Woodpecker	V SL	Core £		X	
Otter (water networks/urbanisation)	V SL	Core £		X	
Water Vole survey	V SL	Core £	X		

10c Actively encourage and support students and researchers to undertake projects					
Develop a structured programme for university research projects	D SL	Core £	X	X	
11a Increasing footfall and diversity of visitors					
Initiative to increase footfall and diversity of visitors	D PO	Ext £	X	X	
11b Maintaining and developing visitor facilities					
Welcome hut including accessible toilet	D GA W	£5,000	X		
Electricity to welcome hut	GA	£700	X		
Multi-use Learning Room	D	£62,500	X		
Boardwalk for new reserve entrance	D GA	Ext £	X		
Tool storage	GA	£5,000	X		
Seating	GA	Core £	X	X	X
Ridley Hide interpretation (wetland habitats)	D PO	Ext £	X		
Replacement of Pearce Hide	D GA V W	£17,500 Ext £	X		
Upgrade Lawrence Hide	D PO	Ext £			X
ICT: Installation of WIFI and onsite sales	GA	£4,000	X		
Improved car parking feasibility	D	£20,000		X	X
11c Increasing the capacity, capabilities and potential of the volunteer team					
Project Officer to coordinate visitor experience improvements and volunteer support	GA	Ext £	X		
Walkie Talkie radios	PO	Ext £	X		
11d Increasing biodiversity and public engagement beyond the boundaries of the Reserve					
Trail cams (e.g from Ridley Hide) for remote viewing	V	Ext £		X	
Developing biodiversity projects with neighbours and strategic decision-makers	PO	Ext £		X	
Virtual tour of GNR	CE V	Ext £	X		
Wilder Gosforth Project Assistant	D	£10,000	X	X	X

Key to Who

D-Director **GA** –GNR Assistant* **W** –Warden **V** –Volunteers **CE** –Communications and Engagement Officer **PO** –Project Officer* **SL** –Section Leads

*supported by external funding

Key to Budget

Ext £-Externally funded **Core £** -Core GNR expenditure budget

15. Work Programme for Volunteers 2020-23

Task	Who	Frequency	Autumn			Winter			Spring			Summer		
			Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
ACROSS THE RESERVE														
Priority 1b Supporting native species partly by controlling non-native species														
Grey Squirrel and Mink control	W + trained V	Throughout year	X	X	X	X	X	X	X	X	X	X	X	X
Himalayan Balsam removal	W + V	Each summer									X	X	X	
Priority 11b Maintaining and developing visitor facilities														
Repair and maintenance of paths, boardwalks and bridges	W + V	As necessary												
Repair and maintenance of hides and huts	W + V	As necessary												
Priority 1a Protecting and increasing the overall biodiversity of the Reserve														
Removal of litter including watercourses	W + V	Weekly	X	X	X	X	X	X	X	X	X	X	X	X
Maintenance and repair of nest boxes	W + V	Annual inspection												
MIXED DECIDUOUS WOODLAND														
Priority 2a Diversifying the woodland in structure, age and plant species														
Native bulb-planting in northern area	W + V	2021	X	X										
Native tree- and shrub-planting where areas thinned and in cleared Sitka and Birch areas	W + V	Each winter		X	X	X								
General maintenance for visitors and safety														
Clear overhanging/fallen vegetation	W + V	Regular inspection	X	X	X	X	X	X	X	X	X	X	X	X
SCOTS PINE PLANTATION														
Priority 3a Development of healthy canopy with increased structural and age diversity														
Pulling of saplings where encroaching into meadow	W + V	Regular inspection												
Pulling of Sycamore saplings within woodland	W + V	Reg. insp.												
Potential shrub planting after thinning works	W + V	2021-22+		X	X	X								

Task	Who	Frequency	Autumn			Winter			Spring			Summer		
			Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
SITKA SPRUCE AND BIRCH														
Priority 4a Creating new diverse mixed woodland														
Removal of brash from cleared Sitka Spruce area (Compartment 1d)	W + V	2021		X	X	X	X							
Planting of native trees and shrubs from cleared Sitka Spruce area (Compartment 1d)	W + V	2021		X	X	X	X							
Removal of brash from cleared Sitka Spruce area (Compartment 1b)	W + V	2022		X	X	X	X							
Planting of native trees and shrubs from cleared Sitka Spruce area (Compartment 1b)	W + V	2022		X	X	X	X							
BOUNDARIES														
Priority 5a Maintaining and improving boundary habitat for wildlife and site security														
Planting of native shrubs where necessary to fill gaps	W + V	Each year		X	X	X	X							
WET WOODLAND														
Priority 6a Retaining the extent of wet woodland														
Removal of invading tree saplings	W + V	Regular inspection												
Cutting back of encroaching Willow	W	Each year			X	X								
Priority 6b Safeguarding the Coralroot Orchid population														
Counting of flowering spikes	W + V	May/June									X	X		
REEDBED AND LAKE														
Priority 7a Maintaining the extent of reedbed and open water														
Cutting and raking of reedbed sections	W + V	One strip each year	X	X	X	X	X	X						
Cutting of invading reedbed to maintain channels and pools	W + V	Each year	X	X	X									
Monitoring for negative indicator plant species	W + V	Regular inspection												
Cutting of reedbed meadow	W + V	Each year						X	X					

Task	Who	Frequency	Autumn			Winter			Spring			Summer		
			Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
MEADOWS														
Priority 9a Encouraging the development and establishment of meadows														
Removal of invading scrub and tree saplings	W + V	Regular inspection												
Cutting of selected areas of meadow	W + V	Each year	X											X
Native bulb-planting along southern boundary	W + V	2021/2022	X	X										
Priority 9b Restore a small area of heath at southwest meadow														
Seeding of locally-sourced heather on one bank and monitor establishment	W + V	Pilot 2022	X	X										
PONDS														
Priority 8a Establishing native marginal vegetation and pond species assemblages														
Condition monitoring including for presence of non-native invasive aquatic plants	W + V	Regular inspection												
ECOLOGICAL MONITORING														
Priority 10a Continuing existing monitoring programmes														
Bird-ringing	V	Each year	X			X	X	X	X	X	X	X	X	X
Wetland Bird Survey	V	Each year	X	X	X	X	X	X	X					
Bird nest boxes	V	Each year	X							X	X	X	X	X
Butterfly transect	V	Each year	X							X	X	X	X	X
GNR moth group	V	Each year	X	X					X	X	X	X	X	X
Plant monitoring programme	V	Each year	X						X	X	X	X	X	X
Bat box monitoring	V	Each year	X	X						X	X			X
VISITOR EXPERIENCE														
Priority 11b Maintaining and developing visitor facilities														
Maintaining and repairing of hides and paths	W + V	As necessary												
Installing of informal seating	W + V	Start 2020						X	X					
Creating soft surface, boardwalk or re-routed paths	W + V	Start 2020	X	X	X	X	X							

Appendix 1: Tree-felling proposals

Map 8. Proposed felling works to be approved by Forestry Commission and Newcastle City Council

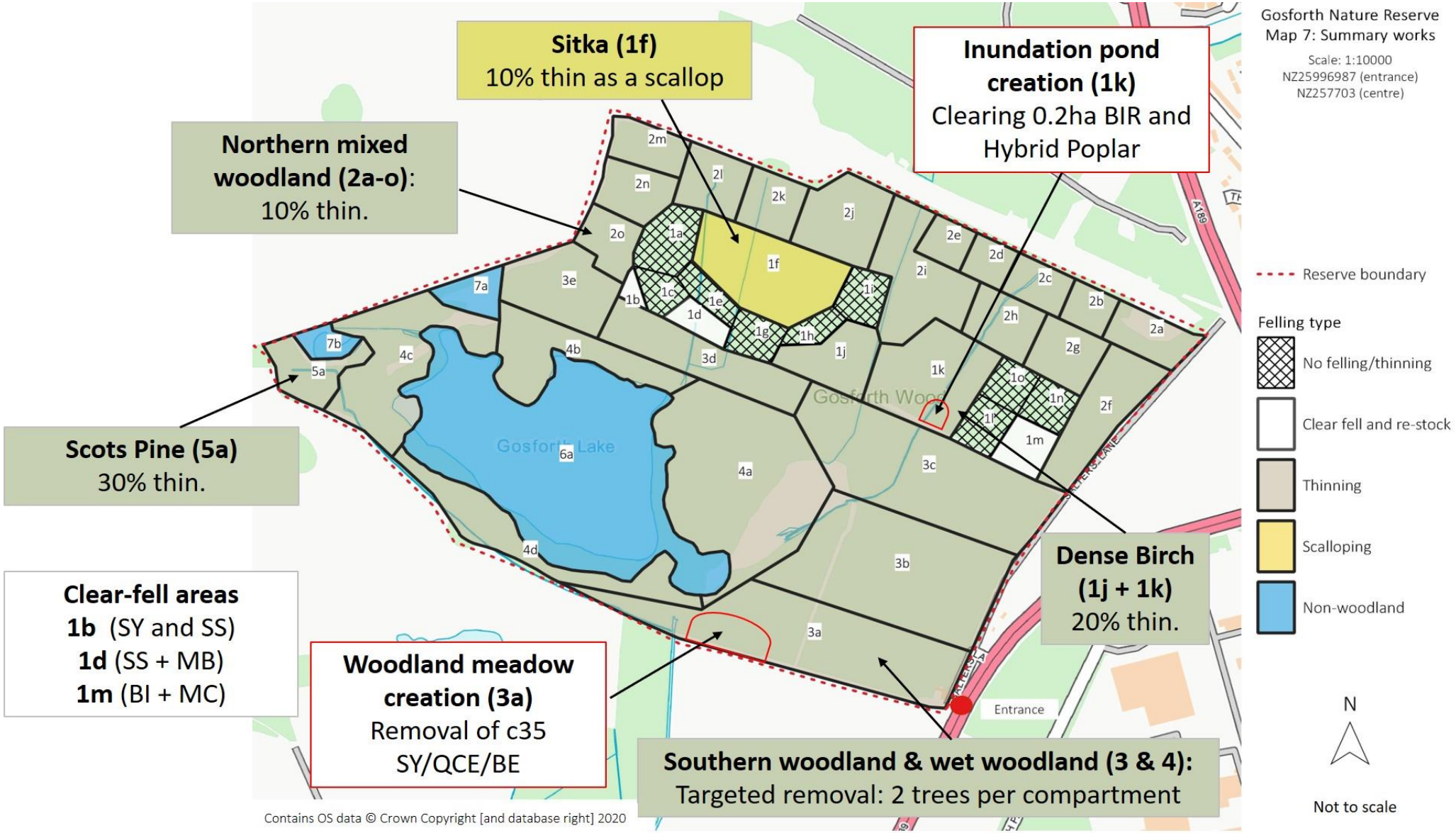

Table 1. Proposed tree-felling work programme 2021/22 - 2023/24 to be approved by the Forestry Commission and Newcastle City Council

Habitat	Compartment number	Year	Proposed works
Sitka Spruce	1d	2021-22	Clear-fell and re-stock with native trees and shrubs
Scots Pine	5a	2021-22	30% thin of Sycamore and Scots Pine
Mixed Woodland	2f	2021-22	10% thin of non-native trees
Regenerated Birch	1k	2021-22 +	Clearing of selected 0.2ha section to create inundation pond
Sitka Spruce	1b	2022-23	Clear-fell and re-stock with native trees and shrubs
Sitka Spruce	1f	2022-23	Scalloping of Sitka Spruce
Mixed Woodland	2a + 2g	2022-23	10% thin of non-native trees
Wet Woodland	4a	2022-23	Targeted removal of non-native trees with obvious impact on native trees
Mixed Woodland	3a	2022/2023	Removal of approx. 35 non-native trees to create a woodland meadow along southern boundary
Mixed Woodland	2h	2023-24	10% thin of non-native trees

Appendix 2: Species

Figure 1. Species recorded at Gosforth Nature Reserve on ERIC North East database (downloaded 20/03/20). Proportions represent the number of species for each taxonomic group. Permission granted to use data © ERIC North East

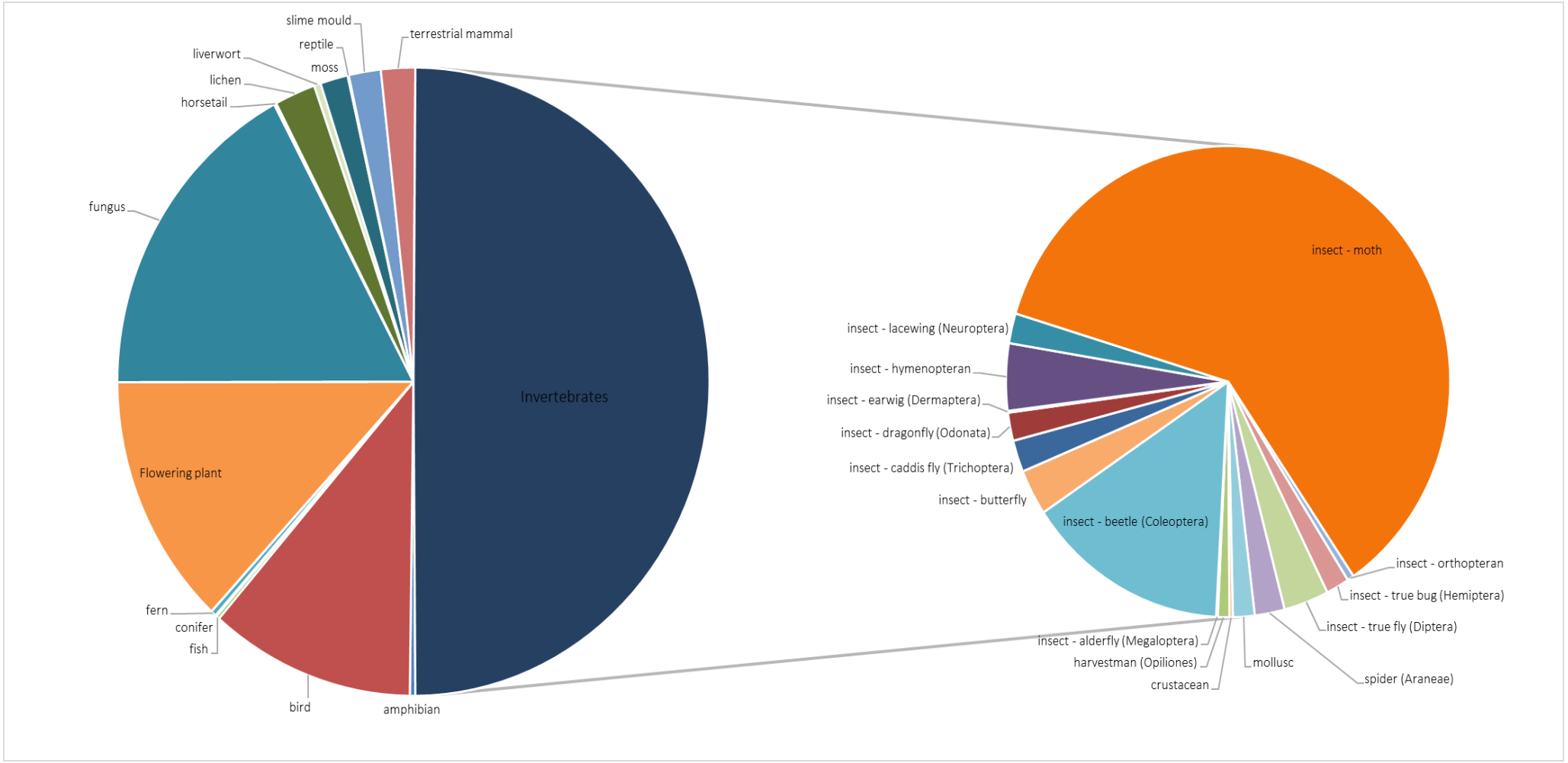

Figure 2. Number of records from Gosforth Nature Reserve on ERIC North East database (downloaded 20/03/20). Proportions represent the number of records for each taxonomic group and equivalent percentages are displayed. Percentages of each invertebrate group relate to overall number of invertebrate records. Permission granted to use data © ERIC North East

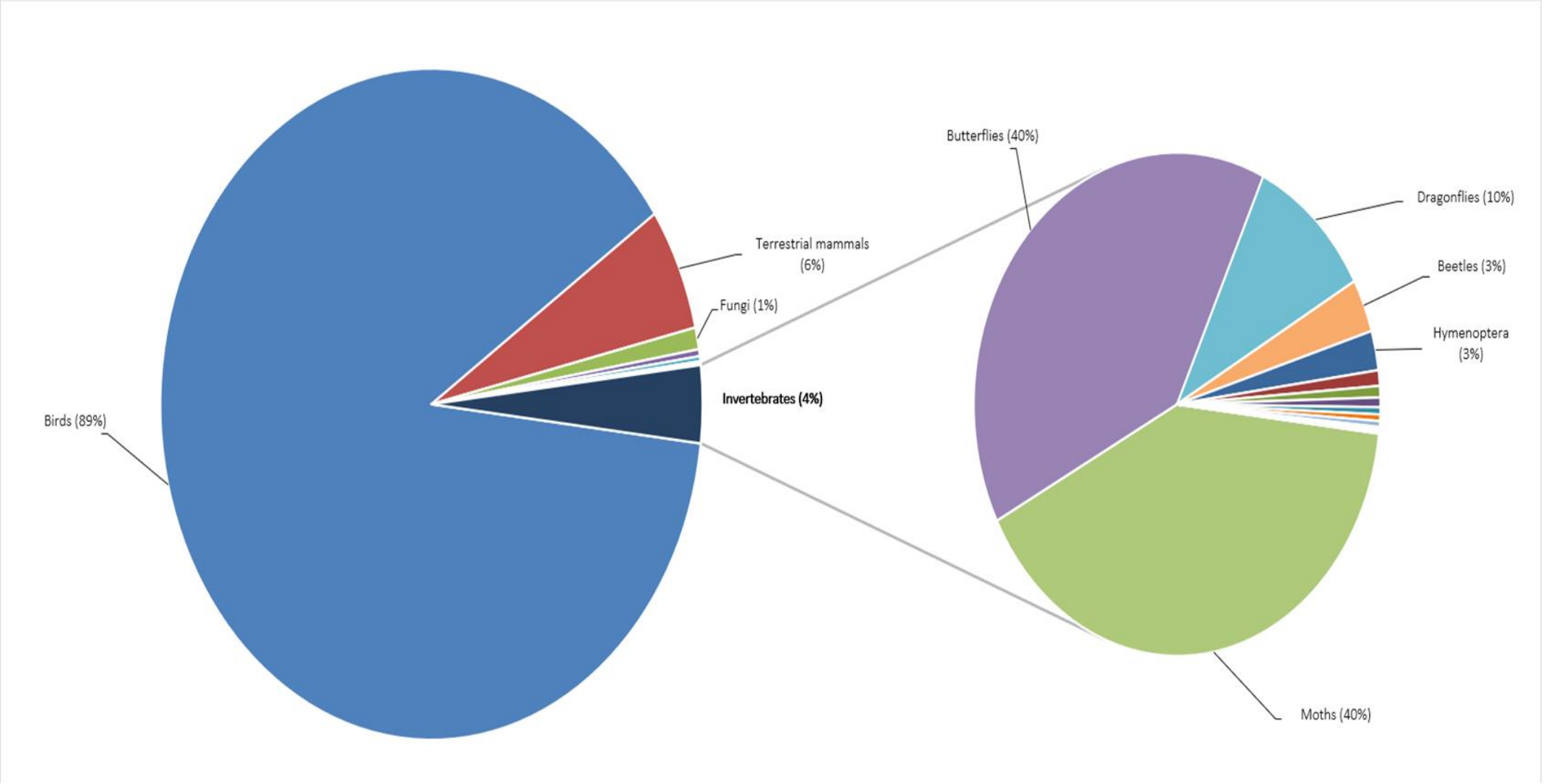

Table 2. Non-native invasive plant species to monitor and control

Scientific name	Common name
Acer pseudoplatanus	Sycamore
Fagus sylvatica	Beech
Quercus cerris	Turkey Oak
Rhododendron ponticum	Rhododendron
Cotoneaster horizontalis	Wall Cotoneaster
Cotoneaster simonsii	Himalayan Cotoneaster
Buddleja spp.	Buddleia
Ribes uva-crispa	Snowberry
Narcissus spp.	Cultivated Daffodil
Impatiens glandulifera	Himalayan Balsam
Hyacinthoides hispanica	Spanish Bluebell
Elodea canadensis	Canadian Pondweed
Species recorded within 1km of reserve	
Acaena novae-zelandiae	Pirri-pirri bur
Myriophyllum aquaticum	Parrot's-feather
Crassula helmsii	New Zealand Pigmyweed
Crocosmia x crocosmiiflora	Montbretia
Fallopia japonica	Japanese Knotweed
Hydrocotyle ranunculoides	Floating Pennywort
Rhododendron ponticum	Rhododendron
Impatiens glandulifera	Himalayan Balsam
Buddleja spp.	Buddleia

Get Involved at Gosforth Nature Reserve

Practical Conservation Volunteering

We have friendly volunteer work parties at Gosforth Nature Reserve where you can help us improve wildlife habitats and learn about how we manage the reserve for wildlife. Volunteers can train to be a Volunteer Ranger, Education Ranger with opportunities to become involved with the NHSN Bird-ringing Group and GNR Moth Group. Valuable wildlife records from Gosforth Nature Reserve can also be inputted into a regional database to inform monitoring and conservation efforts.

School and University Visits

Gosforth Nature Reserve is a fantastic learning resource for young children, students and educational groups. For Key Stage 1 through to A-Level, there are a range of activities designed to align with the national curriculum. The Reserve is a fantastic and unique resource to learn about and experience a diversity of habitat and species in the heart of an urban area. Our volunteer Education Rangers can also lead on providing inspiring and educational visits for groups.

Student Research Projects

Local university students can undertake their undergraduate and postgraduate research projects at Gosforth Nature Reserve. The Reserve is a fantastic outdoor field station for research on species, habitats and environmental monitoring.

Student Naturalist Awards Scheme

Our Student Naturalist Awards Scheme aims to support the next generation of naturalists through the development of key skills and provision of practical experience in multiple aspects of conservation, including field experience, research, rangering and communications. It is a tiered system which allows students in higher education to accumulate points based on the successful completion of activities and entrants will receive a formal certificate upon completion.

Outdoor events

As part of NHSN's activities programme, we hold a number of member and public events each year at Gosforth Nature Reserve. These include the highly popular Open Day 'bioblitzes' and 'exploration days', small-mammal trapping, moth-trapping sessions and tree walks led by the Reserve Warden.

To find out more about getting involved, please contact NHSN at nhsn@ncl.ac.uk

The Natural History Society of Northumbria

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