



# MANGGROVES

Manchester City's biodiversity and ecology programme driving meaningful change and credible mitigation on our road to net zero – 2030

**A workbook**







# MANCHESTER CITY'S MANGROVE INITIATIVE

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**WETLANDS**

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**MEADOWS**

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**HAYFIELDS**

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**WOODLAND**

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**TREES**





# WHAT IS A MANGROVE?

Mangroves are tropical plants that thrive within and have adapted to boggy wet soil, salt water and being periodically submerged by tides or within areas of swamp lands.

Mangroves are groups of trees and shrubs that grow in the water, creating a habitat for biodiversity and protecting against tidal surges, purifying surrounding water and removing carbon dioxide from the atmosphere.

However, mangroves do not require saltwater to survive. Most mangroves can grow in freshwater habitats, although most do not due to competition from other plants.

There are more than fifty species of

mangroves found throughout the world.

Mangroves are found all over the world. Indonesia is the country with the most mangroves. Brazil, Malaysia, Papua New Guinea, and Australia also have mangrove forests.

In Abu Dhabi a new national park (Jubail Mangrove Park) has been created by the Environment Agency of Abu Dhabi. Jubail Mangrove Park is the first self-contained educational, nature and leisure destination of its kind in the Emirate of Abu Dhabi.

**The park is recognised as a haven for avian and marine species native to Abu Dhabi.**







# SO WHAT IS A MANC-GROVE?

In essence the Mancgrove initiative is the identification of local (ecology that will thrive in our city and by creating a variety of sustainable ground conditions e.g. wetland, bogs, ponds with high (CO<sub>2</sub> absorption) yield plants we can reasonable mimic the benefit derived from the most advantageous ecology.

Manchester City's Mancgrove initiative is based on local participation and collaboration to reap and maximise the benefits of local biodiversity and ecology and to realise meaningful net gain.

By developing this initiative, the aim is to significantly increase the absorption of CO<sub>2</sub> locally, to uplift environmental outlook and conditions, build positively for neighbourhood

growth and ensure the project supports physical and mental health wellbeing.

In addition, the scope of the initiative can support STEM studies opportunities in practical sessions and applied learning.

City Football Academy, a former brown field site has become a thriving, healthy corridor creating new habitat for wildlife even attracting all new species into Manchester.

**A Mancgrove is whatever we make it to be it's not a set thing it's a process and project that builds better that will help our city and communities flourish, sustainably and cooperatively.**





# THE ECOLOGY AND BIODIVERSITY OF MANCHESTER CITY

In recent years, and globally, Industries and corporations are increasingly making biodiversity a priority in business planning and operations, incorporating indicators that will allow them to redefine the concept of success beyond simply profit, and at the same time help them meet their climate action targets.

Companies engaging in this future proof thinking recognize that biodiversity is not only key to life in general, but also the success of their business.

Whilst some, or much of this is driven through government actions and legislation, forward thinking and innovative organisations have recognised that their commitments on biodiversity address environmental goals that go beyond carbon absorption. The engagement of local communities, investors (including fans) and

ensure that there is a meaningful connection and response to local climate issues and concerns that's set standards and highlight values.

These important issues are not lost on the Club Already, major investment and responsible development in East Manchester has created positive impact for the wider community and city. Measurable and active regeneration of the area has realised new opportunities from education and learning pathways to local supply chains, work, careers and health uplift.

Alongside the ambition to create and sustain entertaining football, of authenticity and tenacity empowered communities lie at the centre of the ecology and biodiversity actions building, growing and connecting.

## THE BENEFITS ARE MULTIPLE:

**Improved  
air quality**

**Greater  
security in  
ecosystem**

**Health  
uplifts**

**Better  
continuity of  
operations**

**Access  
to new  
markets**

**Enhanced  
access to  
funding**

A reputation for doing things and making change that engages people at every level – being sustainable and doing business well - providing significant business opportunities along with a myriad of benefits for our current and future generations.



““““

*The loss of biodiversity and the degradation of ecosystems pose a **major risk to human survival and development**. It falls to all of us to act together, and urgently turn the Earth into a beautiful homeland for all creatures to live in harmony.*

**Sir David Attenborough (September 2020)**







# BIODIVERSITY AND ECOLOGY FOR MUTUAL PROSPERITY

All organisations rely on nature for resources such as food, minerals and building materials in our own case for good, healthy grass surfaces and training environments.

The recognition of our own ecosystem that includes pollination of plants, water harvesting and filtration, waste decomposition/composting, CO<sub>2</sub> sequestration all leading to measurable healthy environment for our players, workforce and the wider community helping to build mutual prosperity.

The inclusion of nature within our key development strategy builds strong brand reputation, supports long term viability of business models including direct cost savings, builds positive interest in our Club and our actions and for our city, provides significant biodiversity net gain, contributes to net zero targets and actively engages people at every level.







In highlighting the benefits of actioned ecology and biodiversity in business - framing biodiversity as a national asset of significant economic value was considered the most important issue, but a close runner up was a proposition around the legacy we leave our children:

““““

*Nature has given us a world full of wealth, but the more we take from it, the less there is to nourish the next generation.*

Biodiversity provides myriad unique benefits that are critical to socioeconomic development, including:

- **Service delivery** — delivering key ecosystem services through a green, cheaper and low-energy infrastructure, e.g. pollination and water provisioning
- **Risk reduction** — including disaster and climate risk reduction in key sectors e.g. providing a diverse resource base that offers alternatives if one food crop fails
- **Direct financial value** — through certain products and species that may be tradable, e.g. medicinal plants and animals and species attractive to tourists
- **National economic diversification** — through habitat, species and genetic diversity that present options and alternatives, e.g. in tourism and forestry. Intrinsic and cultural value — related to identity, tradition, social cohesion, recreation and spirituality

**International Institute for Environment and Development  
London**





It's important that we take action wherever we can – we can all play our part for UK biodiversity:

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*Britain has lost nearly half of its biodiversity since the Industrial Revolution, and experts warn continued global biodiversity loss will lead to an irreversible ecological crisis.*

### **What is Happening?**

- The UK has lost almost half of its wildlife and plant species as a result of human and land development since the Industrial Revolution, according to a new assessment.
- The country is ranked in the bottom 10% in the world and the worst among G7 nations.
- Nearly half the UK's biodiversity has been lost over the centuries and is the worst developed country to experience such a high rate of biodiversity loss.

**Natural History Museum  
London**





# THREE MAJOR PARTICIPATIVE OPPORTUNITIES IN EAST MANCHESTER

The Club's landscapes and ecology programme across City Football Academy is has resulted in a thriving habitat – it will continue to evolve and to be enhanced – however, to grow our biodiversity gain further, locally, the wider benefits will be realized through collaboration and new community and neighbourhood schemes of work.

## Reclaiming and revitalizing safe spaces and places:

1. A school and college garden and horticulture project
2. Re-establishing much-loved and pre-loved parks
3. Creating an ecologically sound safe walking route

## With our fans, workforce, communities and city:

- Developing long-term learning and participation
- Supporting neighbourhood growth and sustainable regeneration
- Maximising our city's overall biodiversity gain
- Contributing to Manchester City's credible road to CO2 net zero - 2030







Creating wetlands in our programme will play an important part and will help absorb the highest levels of CO2:

“““

*We know that a blue environment can be as good as or even better for you than a green one: living near or visiting the coast, rivers and lakes increases people’s reported levels of mental health and wellbeing.*

**Sir James Bevan**

**Chief Executive, Environment Agency (September 2020)**

**However, it’s only part of the plan as we can create an incredible mix of options that work towards the Club’s and City’s respective net zero targets.**

MANCGROVES, therefore, is a mix of options and opportunities that aims to maximise CO2 sequestration, but equally, engages our communities in active participation across our environment so that we empower and uplift wherever we can.







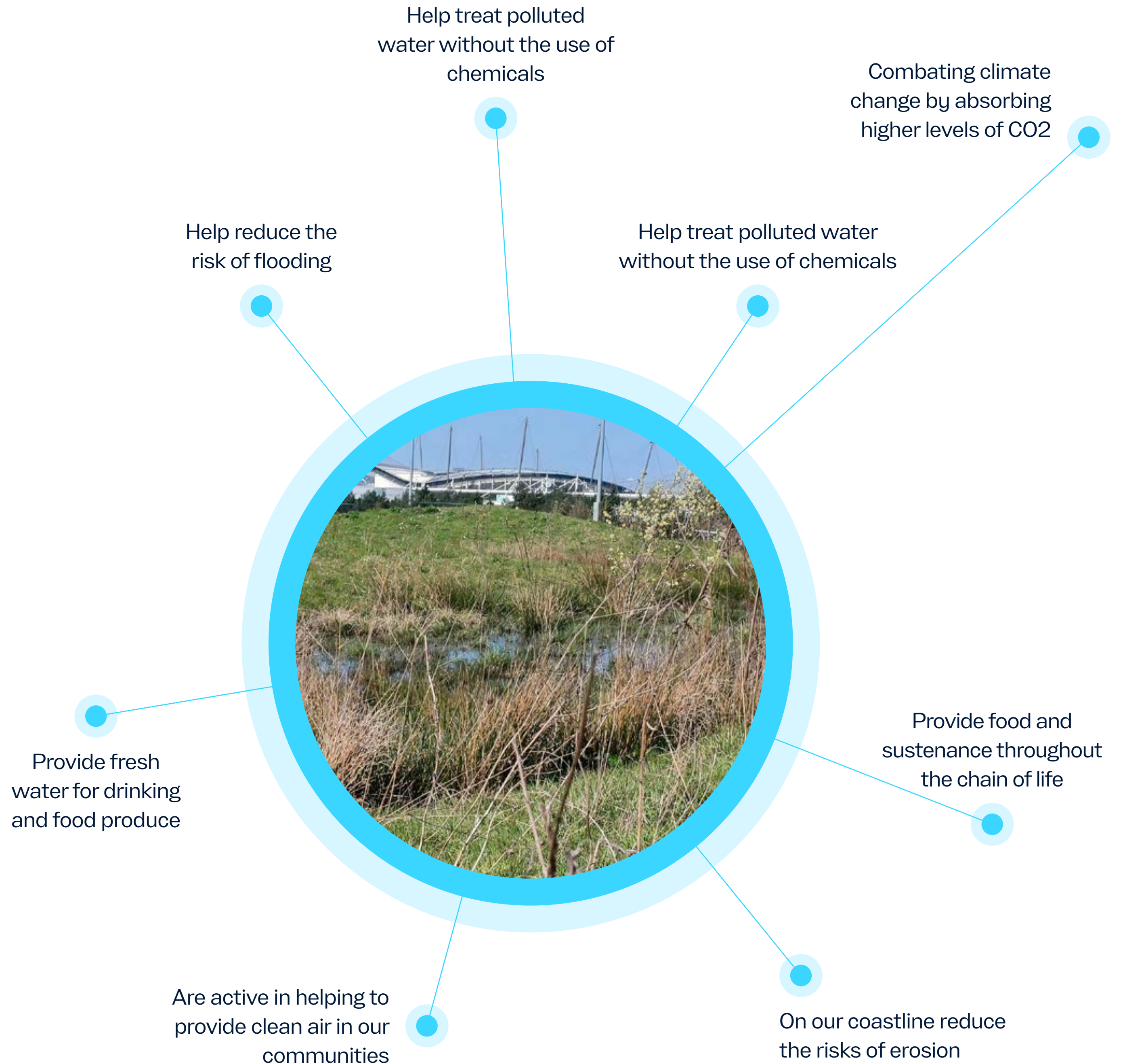
# THE BENEFITS OF CREATING WETLANDS

## Incredible things happen when land and water meet to create wetlands.

Wetlands team with biodiversity, providing homes for endangered and much loved species. Wetlands are vital 'service stations' for millions of migratory birds, enabling them to rest and refuel, and for us, they provide essential protection against the impacts of the climate crisis, floods, droughts and pollution.

# 3X

Wetlands are the lifeblood of the planet, but they need our help - they are disappearing at a rate three times faster than forests.







# FIVE SIGNATURE INITIATIVES FOR EAST MANCHESTER



**Bridge College Allotments**



**City Link Walking Route Holt Town Meadow**



- 1 City Link**  
The first and last mile walking route to and from the Etihad Campus. Safe, accessible, activated, sustainable.
- 2 Five Sisters**  
An active park opportunity for walking, health, wellbeing and fitness with riverside outlooks and opportunity
- 3 Cyrus Park**  
An old city park that hosts the most incredible trees and gardens space – easy for bringing back to life for leisure and pleasure
- 4 Holt Town (hay) Meadow**  
A riverside floodplain teeming with wildlife opportunities
- 5 Bridge College - 'Crossley's Gardens'**  
A unique and locally historical site that hosts options for active community gardens and horticulture





# EAST MANCHESTER OPPORTUNITIES

## Five Sisters

A reclaimed area of land developed in 2002 as part of the Commonwealth Games legacy – built upon a former waste tip, the site became a haven for local people and included a fitness trail, resting places and a new green space straddling the River Medlock and running up to the banks of the Ashton canal. In recent years it has become overgrown, a place for fly tipping and anti social behaviour and for many local people a ‘no-go’ area. It is formally known as the Ashton canal Park – but locals know it as Five Sisters. Sited upon the City Link Walking Route - it presents a huge opportunity.

## Cyrus

Cyrus is one of Manchester’s older parks and served the local community for decades – with population moves away from Holt Town, it has become somewhat ‘derelict’ and neglected, yet it has a series of stunning trees and spaces befitting of a ‘jewel in the crown’ status – this park can become a haven once again for local people, and wildlife, with spaces for play and recreation. It is upon a significant retaining wall adjacent to the Holt Town tram stop – this also presents options for a stunning, vertical wall garden (location proper name is Cambrian Street Park).

## Holt Town Meadow

In effect this is an existing hayfield upon a flood plan forming a falling bank to the River Medlock – with small scale interventions, the meadow would teem with wildlife and as with all the projects would support new STEM learning opportunities for local people and schools and uplift the whole gateway to our Etihad Campus as it fronts the City Link walking route.

## Bridge

This site was the home of Crossley Engines (Rolls Royce) for many years and is now the base of Bridge College and The Manchester College – existing walled gardens, allotments and meadows are in disrepair, but this gated site has the opportunity to provide an active project for local people in horticulture, biodiversity, food produce etc.





# EAST MANCHESTER OPPORTUNITIES

## City Link Walking Route

From Holt Town right into the centre of the Etihad Campus – the walking route can serve all venues including match and concert days at the Etihad Stadium and COOP Live Arena Building upon and protecting existing linear greens spaces, the route can become a safe and secure first and last ‘mile’ experience for fans of all ages whilst it will uplift active travel options for people a cross the community too.

With the River Medlock and Ashton Canal meandering alongside, this can present an incredible and unique feature of events days and help build a wider, sustainable travel option.

**All of the opportunities presented ensure that Manchester City and our Campus partners create lasting and meaningful local benefit whilst adding measurable value to each parties CO2 mitigation (MCFC being 2030) – additionally helping our city to realise net biodiversity gain and achieve its CO2 net zero 2038.**







# OTHER CONSIDERATIONS THAT MAY GUIDE US

## BIODIVERSITY IN STEM LEARNING

This topic covers the following aspects of biology:

- An understanding of the concept of biodiversity and why it has become an issue today
- The basic meanings of species, habitat and ecosystem; and basic carbon and water cycles
- Observation and recording techniques for biodiversity in a given area, through basic habitat survey and organism identification techniques, and mapping skills using keys and scales

The topic provides opportunities for students to make a survey of the plants and animals in a local area, study interesting plants and animals in that local area.

They can also investigate changes within the local area over time through local records, interviews with older people and so on.

In addition they can investigate the impact of non-native plants and animals on the local environment and study of the legislation to protect local biodiversity. After exchanging their findings and views with students in other countries, students compare and discuss the responses received from classes in other parts of the world.

## WHAT IS STEM?

STEM is an approach to learning and development that integrates the areas of science, technology, engineering and mathematics. Through STEM, students develop key skills including: problem solving, creativity, critical analysis.





***It's impossible to prevent climate change, without focusing on biodiversity.***

*As we head into a critical phase to reduce the impact of climate change, we now understand that we must also solve the biodiversity crisis if we are going to make a difference.*

*Thankfully, most of this loss of biodiversity – wildlife, habitats and green space – can be reversed. This means that the sports industry has a chance to lead the biodiversity drive by focusing, not only on its carbon emissions, but on its environmental impact as a whole.*

***BASIS (British Association of Sustainability in Sport)***



***Biodiversity is essential for human health and well-being, economic prosperity, food safety and security, and other areas critical to all humans and all human societies.***

*Organisms, ecosystems and ecological processes supply us with oxygen and clean water, they help cycle carbon and fix nutrients, they enable plants to grow, they keep pests and diseases in check, and they help protect against flooding and to regulate the climate.*

*No one is immune to the adverse impacts of biodiversity loss and degraded ecosystems. Children, in particular, are affected because their bodies are still developing and their behaviour – like playing on the ground or eating dirt – can expose them to more harmful chemicals and organisms.*

***World Health Organization***



***Biodiversity supports human and societal needs, including food and nutrition security, energy, development of medicines and pharmaceuticals and freshwater, which together underpin good health.***

*It also supports economic opportunities, and leisure activities that contribute to overall wellbeing.*

***UNICEF (For Every Child)***





# ROAD TO NET ZERO

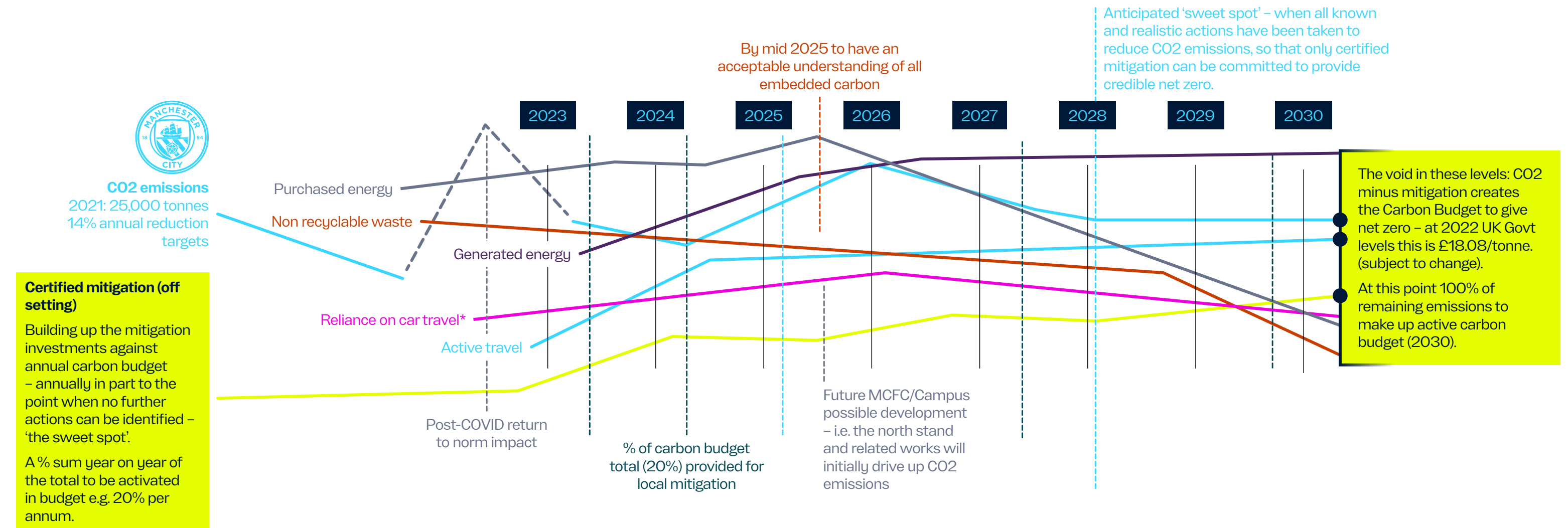
Manchester City's sustainability agenda and environmental impact report is covered in Game Plan.

This includes the Club's 'road to net zero - 2030' programme within which credible mitigation form a key part.

The creation and protection of green spaces, wildlife corridors, trees and grass lands is an essential part of our action plan and of the life of our community.

Mangroves was identified within the Game Plan agenda, inspired by Club partner – Etihad Airways – whose own sustainability plan is creating all-new mangroves.

## MCFC CO2 emissions from scopes 1, 2 & 3 and embedded carbon



Annual Sustainability ('Game Plan'), Environmental Impact and ESG reporting to measure and assure approved targets and modifications.





# THE THINGS WE CAN ALL DO

Whilst MANCGROVES is a Manchester City FC initiative and a key part of the road to credible net zero (2030), the aim of sharing the project and building a 'workbook' is to encourage and support a wide range of actions and opportunities – be these with individuals, community groups, school, colleges and places of work.

How we care for our cities and our planet is in the interest of us all.

The Club's thinking and ideas are by no means exhaustive and there will be all kinds of options across our neighbourhoods.

The Club is sharing just some initial thinking to kick start ideas.



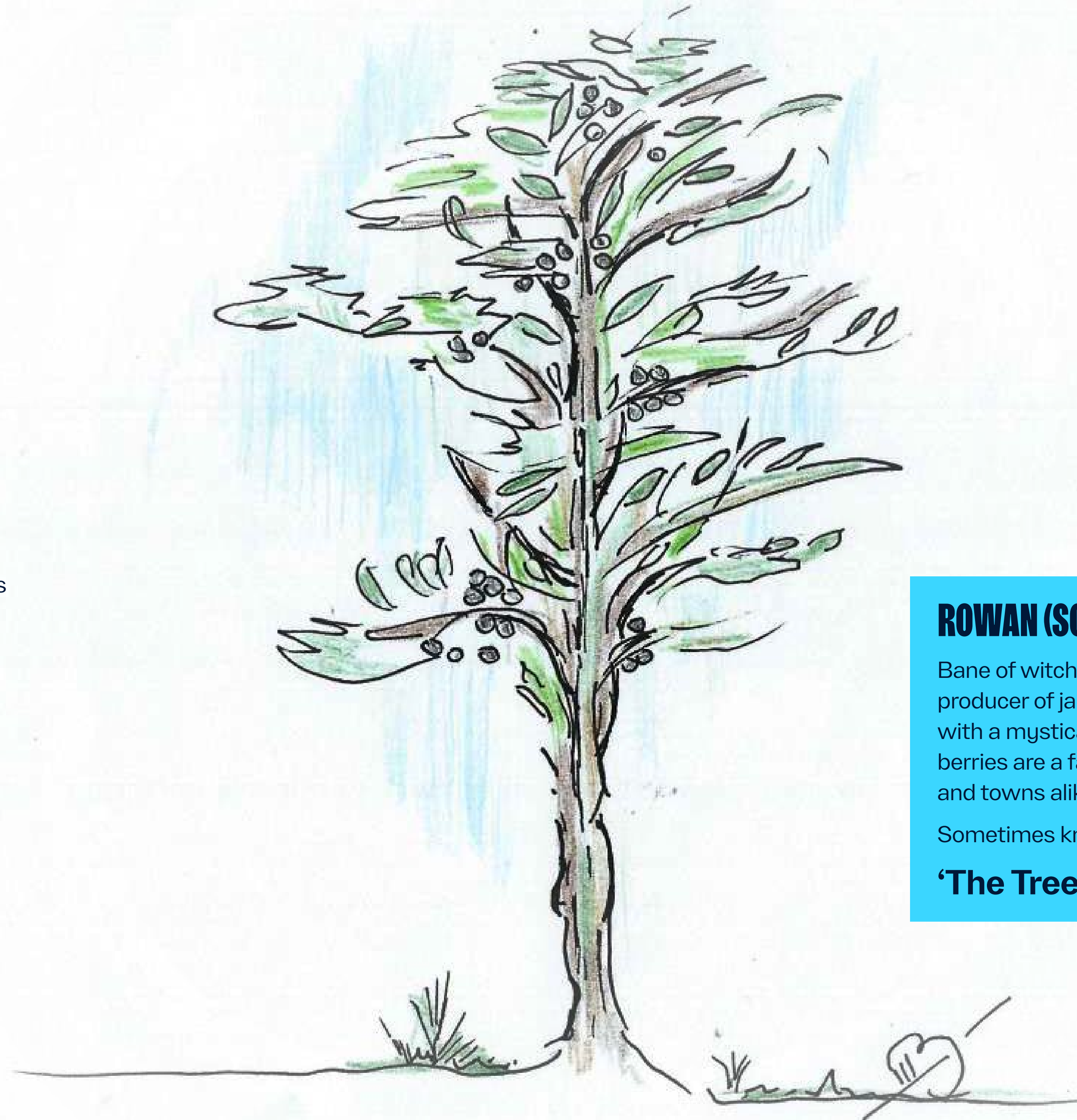
# TREES

All trees absorb carbon and help make our towns and cities. They create habitats for wildlife and form a range of boundaries and barriers – for wind and sound for example and help lift the environments of our neighbourhoods.

Mancgroves will aim to plant trees and hedgerows that are appropriate to our climate and that will thrive in the place we live.

Collaboration is key so that the woodlands we create are for life and can be looked after.

Mancgroves is also about wetland so we will identify opportunities to develop and promote spaces and places that meet this challenge.



## **ROWAN (SORBUS AUCUPARIA)**

Bane of witches, diviner of the future and producer of jam, rowan is an elegant tree with a mystical history. Its leaves and berries are a favourite for wildlife in woods and towns alike.

Sometimes known as the Mountain Ash.

**‘The Tree of Life’**





# TREES



Rowan



Birch



Manchester Poplar



London Plane



Blue Cedar



Scots Pine



# BALCONIES AND PATIOS

Living in cities and urban locations often means that we need and value our open and green spaces more than ever.

Mancgroves initiatives will support active green spaces, participation and active travel through them.

All plants have the ability to absorb carbon attract wildlife and lift spirits – planters, window boxes, balcony troughs and pots can be grouped to create incredible mini gardens in the smallest – and highest – of spaces.

Hardy species and grasses work best – and where there is season planting, work to save the

soil used before and keep the embedded carbon locked in.

Use recycled containers and be inventive in what's used, mixing of plant types and colours.

One 'must' however, is to ensure you retain water where you can, be mindful of neighbours, especially on lower balconies and in high rise buildings, it's worth checking with your landlord or in your building lease/details about any right limits on your own balcony.

But don't be put off, with care and thought, aerial gardens can be spectacular.





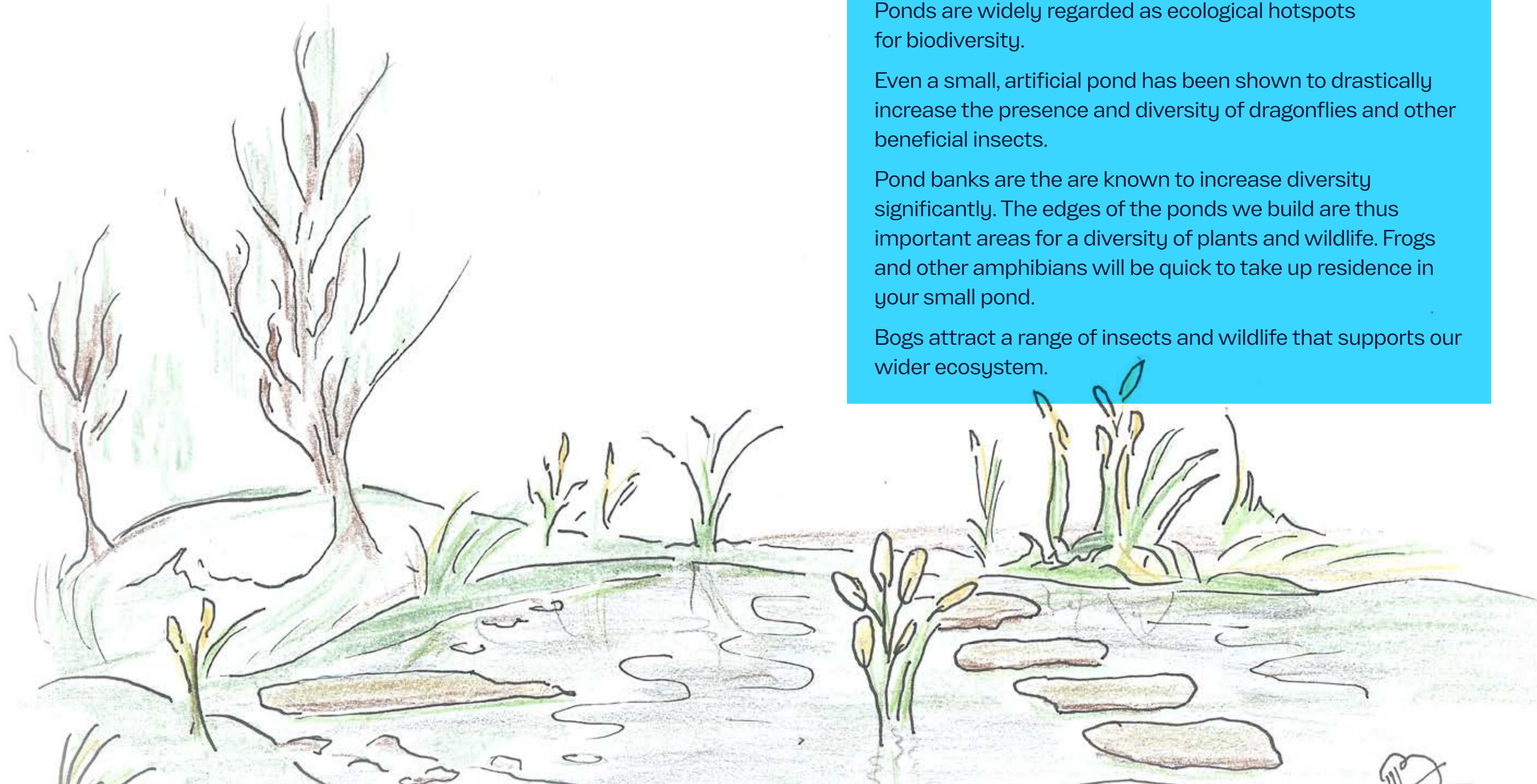


# BOGS AND PONDS

Ponds and bogs are great examples of true wetland – they can be shallow and any size – and here’s incredible levels of information available in how to make the most of your space – be it a small part of your back year or a community project.

Just be aware of depth and safety issues where ponds are deep and are accessible.

Bogs and wet, spongy ground may have virtually no depth at all, but retains water in the ground itself.



## CARBON SEQUESTRATION

Ponds have the ability absorb carbon at high levels, as such, they capture carbon dioxide in the atmosphere and store that carbon in the biodiversity of both land and aquatic plants that thrive in the pond ecosystem.

Creating even a small pond can drastically reduce your household carbon footprint.

## BIODIVERSITY

Ponds are widely regarded as ecological hotspots for biodiversity.

Even a small, artificial pond has been shown to drastically increase the presence and diversity of dragonflies and other beneficial insects.

Pond banks are the are known to increase diversity significantly. The edges of the ponds we build are thus important areas for a diversity of plants and wildlife. Frogs and other amphibians will be quick to take up residence in your small pond.

Bogs attract a range of insects and wildlife that supports our wider ecosystem.



# MEADOWS AND HAYFIELDS

The sowing of seeds for wildflower meadows and creating carpets of colour in the spring and through the summer is a delight to behold.

Supporting the habitats of bees, moths, dragon flies, cranes and a world of invertebrates and bird life, the meadows self seed and are high carbon absorbers.

Working with communities to ensure good maintenance and the natural autumn reseeding process (when plants can look bedraggled) is a key challenge.

Wild flower 'meadows' can cover large expanses of space, road side verges, the un-used end of a garden or a school field.

They do not have to be large spaces and can cheer up a dis-used piece of ground with simple actions and giving incredible results.

Of course, always be mindful of who owns the land and that seeding doesn't become a trespass or ransom problem.

Some larger spaces also lend themselves to self-maintaining hayfields that provide opportunity for an abundance of plant and wildlife.

As with all these examples in Mancgroves, the options and opportunities to promote social and health benefits are manifold, whilst learning (e.g. STEM) is also an added bonus.







# LOCAL ACTIONS

## Identify all kinds of spaces and places

Even our existing spaces can be uplifted with new care of trees and hedgerows – in replanting land and engaging with community to promote participation and the associated health and wellbeing that comes with it.

To share ideas and work with fans. Community groups, workforce and other with participative ‘home ecology’ projects – including workshops and demonstration sessions to promote positive actions.



Allotments for uplift



Backyard wall garden



Bridge College



Car park rail for planters



CFA wildflower sign



Top of a bin store





# FIND OUT MORE: MANCHESTER'S BIODIVERSITY STRATEGY

“““

*Manchester was the first city in England to sign the Edinburgh Declaration – a global pledge registering our concern about biodiversity loss and signalling our commitment to tackling the twin challenges of the biodiversity and climate crises...*

*Mancunians want a healthy and thriving natural world. If Manchester is to be nature-rich, we need nature-friendly policies and action that benefits people and wildlife alike...*

*Our ambition is to improve places for nature in Manchester.*

**We will:**

*Increase the scale of practical action to protect and recover habitats throughout the city.*

*Make smarter, evidence-based decisions on practical and policy actions to protect and recover nature in Manchester.*

*Increase our understanding of the ecology and species diversity in our city.*

**As citizens, we will work together to:**

*Increase the understanding, connection and love for nature throughout our communities.*

*Encourage all individuals, businesses, schools, community groups and neighbourhoods to recognise their role in Manchester's nature recovery and take action.*

*We will champion the role that nature plays in addressing many of the challenges which wildlife and our residents face; including climate change, poor health and wellbeing, pandemics and air quality.*



**MANCHESTER  
CITY COUNCIL**





# FIND OUT MORE: GREATER MANCHESTER'S NATURE RECOVERY PLAN

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## **What will the plan do for Greater Manchester?**

*In the Nature Recovery Plan, we will clearly set out our vision and priorities for nature's recovery and the practical actions needed to restore declining species and habitats.*

*The plan will help us put funding and partnership work where it is needed most. It will drive nature-based solutions for nature's benefit and deliver other environmental, economic and social benefits to our city region.*

*Our overall approach is based on the Lawton Report, Making Space for Nature, which sets out recommendations to help achieve a healthy natural environment for our plants and animals to thrive.*

*This recommends focussing on current wildlife sites, usually the existing nature conservation sites, as the start of efforts to reverse the decline in wildlife.*

### **From there, it recommends:**

- 1. Improving the quality of current wildlife sites by better habitat management*
- 2. Increasing the size of current wildlife sites*
- 3. Enhancing connections between wildlife sites, either through physical corridors, or through 'stepping stones'*
- 4. Creating new wildlife sites*
- 5. Reduce the pressures on wildlife by improving the wider natural environment*

**GREATER  
MANCHESTER**  
DOING THINGS DIFFERENTLY FOR THE ENVIRONMENT





# FIND OUT MORE: WORKING COLLABORATIVELY WE CAN BUILD OUR CITY OF TREES

City of Trees is delivering a green recovery and tackling the climate emergency head on, through planting trees and restoring woodlands for the people and wildlife of Greater Manchester.

Working with communities, organisations, and businesses to build an ambitious movement, dedicated to planting a tree for every citizen within just five years.

**This movement will be bigger than any of us.  
Together we will build a City of Trees.**



Manchester  
City of Trees





# KNOWING MORE

## Manchester City Football Club

### **About plants, biodiversity and ecology in practice**

Dan Lewis is the Club's Head of Landscape  
dan.lewis@mancity.com

### **About Manchester City's sustainability agenda**

Pete Bradshaw is the Club's Director of Sustainability  
pete.rradshaw@mancity.com

**Search Man City sustainability to find the Club's latest news and sustainability/environmental impact report – 'Game Plan'**

### **About City in the Community:**

Mike Geary is head of City in the Community  
michael.geary@mancity.com

**City in the Community can be found on the Club's website  
mancity.com**

## Other useful links

[City of Trees](#)

[Manchester's Biodiversity](#)

[Lancashire Wildlife Trust](#)

[ID Verde is the Club's landscape and ecology contractor](#)







# KNOWING MORE

## Garden plants are great absorbers – such as:

- Bamboo (is the king of absorption)
- Wild grasses
- Ferns
- Moss (esp sphagnum moss) is a huge absorber
- Figs
- Palms
- Ivy
- Most evergreen plants are excellent absorbers
- Shrubs, hedges and ground cover plants

## The Trees that absorb CO2 best are:

Birch, Sitka Spruce and Scots Pine.

Planes, Sycamore, Maple and Poplar are also very good absorbers.

**Though all trees absorb carbon.**

## **BORDER PLANTS AND ANNUALS ABSORB LEAST CARBON, BUT ATTRACT BEES AND OTHER WILDLIFE**

When digging them up – aim to compost them and try not to disturb the soil too much as that holds carbon.





# GLOSSARY OF TERMS

## **Biodiversity**

Biological diversity — or biodiversity — is the variety of life on Earth, in all its forms, from genes and bacteria to entire ecosystems such as forests or coral reefs. The biodiversity we see today is the result of 4.5 billion years of evolution, increasingly influenced by humans.

## **Biodiversity net gain**

Relates to development that works to leave behind meaningful and measurably better space and place than was in place prior to development. In 2021, the UK Government introduced The Environment Act (2021) that places regulation on all new developments to achieve at least 10% net gain.

## **Bog**

A bog is a freshwater wetland of soft, spongy ground consisting mainly of partially decayed plant matter called peat. Bogs are generally found in cool, northern climates. They often develop in poorly draining lake basins created by glaciers during the most recent ice age.

## **Ecology**

In simple terms is the study and acts of organisms and how they interact with and impact the environment in which they live .

## **Liveability**

The actions we have taken and impact gained that makes spaces, places and the daily lives of communities easier, safer, enjoyable and active – reducing a range of risks – including environmental.





# GLOSSARY OF TERMS

## **Pond**

A pond is a small area of still, fresh water. It is different from a river or a stream because it does not have moving water and it differs from a lake because it has a small area and is no more than around 1.8m deep.

## **SuDS**

These are sustainable drainage systems, typically built into our natural landscape and introduced to mimic natural drainage usually into attenuation tanks and rainwater harvesting systems so that the water is captured, passively treated and reused.

## **Swale**

Swales are shallow, broad and vegetated channels designed to store and/or convey runoff and remove pollutants. They may be used as conveyance structures to pass the runoff to the next stage of the treatment train and can be designed to promote infiltration where soil and groundwater conditions allow.

## **Rain Gardens**

The creation of small depressions in the ground that are often filled with local, native plants supporting filtration of water and often helping to reduce flood risks.

## **Wetland**

Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year, including during the growing season.





# ANNEXE: CITY FOOTBALL ACADEMY, TREE SURVEY AND URBAN FOREST OUTCOMES

Annually, Manchester City completes a survey of the impacts of its ecology and biodiversity. Included in this is the impact of trees, hedgerows and the urban forest that the Club has created in and around CFA.

**The detailed report is available from the Club's landscape team or sustainability lead.**







**At CFA, trees cover about 5.676 acres of MCFC and provide 23.71 acres of leaf area.**

Oxygen production is one of the most common cited benefits of urban trees. The annual oxygen production of a tree is directly related to the amount of carbon sequestered by the trees, which is tied to the accumulation of tree biomass.

Manchester City’s (CFA) trees are estimated to produce 14.3 tonnes of oxygen every year. However, this tree benefit is relatively insignificant because of the large and relatively stable amount of oxygen in the atmosphere and extensive production through the aquatic systems.

**The leading oxygen producing species of trees:**

Species	Oxygen pound	Gross CO2 sequestration	No of Tress	Leaf area(acre)
Austrian Pine	9,287.45	3,482.80	422	10.33
Scots Pine	7,370.04	2,763.76	268	4.98
European White Birch	3,547.80	1,330.42	139	3.01
European Hornbeam	1,867.71	700.39	94	1.05
Oak spp	1,799.35	674.76	71	0.74
Indian Paper Birch	1,343.50	503.81	80	0.81
Hedge Maple	1,231.37	461.76	88	1.33
Sweet Cherry	1,035.55	388.33	62	0.43
European Alder	408.64	153.24	59	0.77
Cypress spp	329.16	123.43	6	0.03
Atlas Cedar	193.41	72.53	5	0.06
Maple spp	90.51	33.94	3	0.03
Mountain Ash spp	46.57	17.46	2	0.01
Whitebeam	27.49	10.31	7	0.01
Western Red Cedar	25.57	9.59	32	0.11

**At City Football Academy – the most dominant species in terms of leaf area are Austrian Pine, Scots Pine and European White Birch.**

The ten species with the greatest importance in values are listed below – Importance Values (IV) are calculated as the sum of percent of population and percent of leaf area. High Importance values do not necessarily mean that they should be further encouraged rather that they dominate the urban forest structure.

Species	percent population	percent leaf area	IV
Austrian Pine	31.5	43.6	75.1
Scots Pine	20.0	21.0	41.0
European White Birch	10.3	12.7	23.1
Hedge Maple	6.6	5.6	12.2
European Hornbeam	7.0	4.4	11.5
Indian Paper Birch	6.0	3.4	9.4
Oak spp	5.3	3.1	8.4
European Alder	4.4	3.3	7.7
Sweet Cherry	4.6	1.8	6.5
Western Red Cedar	2.4	0.5	2.9





## Understanding the urban forest's structure, function and value can promote management decisions that will improve human health and environmental quality.

An assessment of the vegetation structure, function and value of the City Football Academy urban forest was conducted during 2022. Data from 1339 trees located across the academy site were analysed using the i-tree eco model developed by the US Forestry Service, Northern Research Station.

Number of trees

**1,399**

Tree cover

**5.676 ACRES**

% of trees less than 6" diameter

**50.6%**

Pollution removal

**290.9/POUNDS/YR**

Most common species

**AUSTRIAN PINE  
SCOTS PINE  
EUROPEAN WHITE BIRCH**

Carbon storage

**67.73 TONNES**

Carbon sequestration

**5.363 TONNES**

Oxygen production

**14.3 TONNES**

Avoided run off

**11.68 THOUSAND CU/FT/YR**

(Information taken from the Trees Risk assessment and five year plan – i-tree report by ID Verde for Manchester City Football Club (report No IDVO190.VTA.01.)







**WORKING FOR  
CREDIBLE  
NET ZERO 2030**