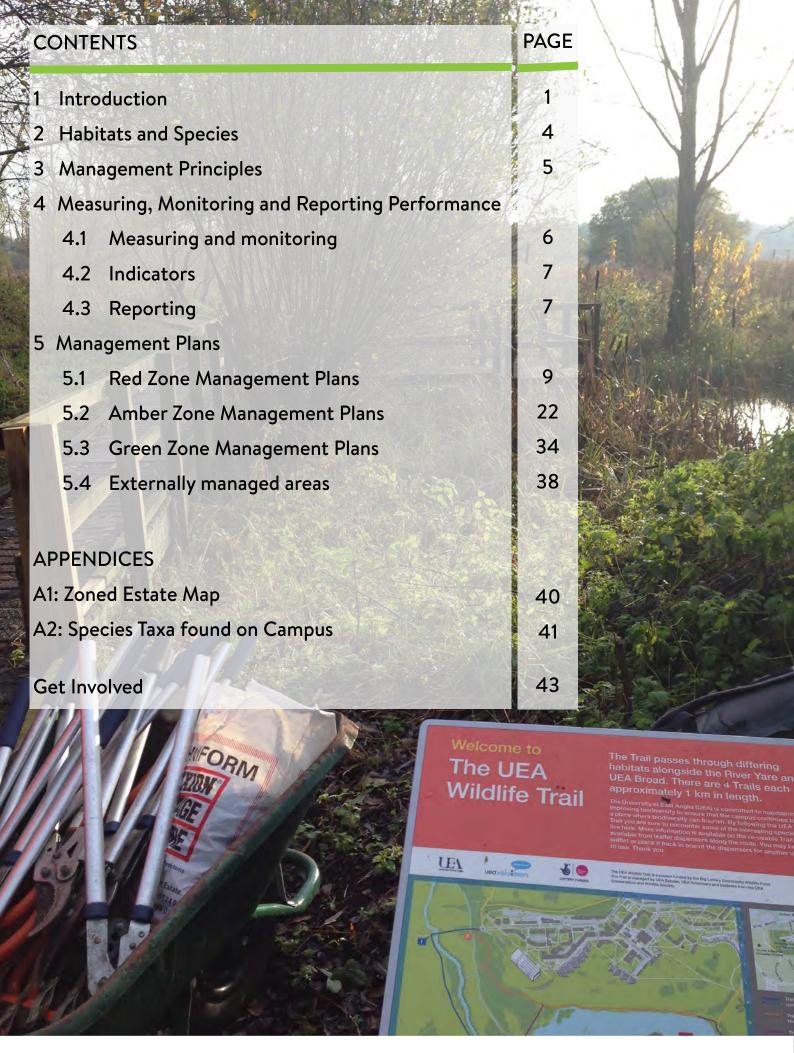


SUSTAINABLE WAYS





INTRODUCTION

The University of East Anglia (UEA) is a research-led, campus university located just outside historic Norwich city centre.

The primary aims of the Biodiversity and Landscape Management Plan (BLMP) are to:

- Provide a coordinated and inclusive process for the comprehensive management of the UEA main campus grounds
- Meet the Environmental Sustainability
 Policy goal of maintaining and enhancing the biodiversity of the estate
 - → <u>www.uea.ac.uk/about/sustainability/</u> <u>strategy-and-policy</u>

This BLMP is also set within the framework of the Environmental Management System (EMS), which ensures that it is appropriately resourced, regularly audited and reviewed, and that staff are given appropriate training to deliver the required actions.

The Plan has been based on a detailed evaluation of the current state of habitats across campus. The assessment has been made against the requirements to:

- Protect biodiversity by maintaining habitat health and quality and the associated biodiversity over the long term; and,
- Enhance biodiversity by improving habitats to maximise biodiversity.

We are proud of the diversity of species present on our campus, and are actively involved in protecting and maximising biodiversity at UEA and locally.



Environmental impacts

UEA is committed to ensuring continual environmental improvement. We take a comprehensive approach to environmental sustainability, and have been actively working to reduce negative, and to promote positive, environmental impacts since 2009.

Our Environmental Sustainability Policy, reviewed and signed by the Vice-Chancellor in April 2018, commits us to monitor and consider issues such as:

- Minimising consumption of non-renewable energy, and greenhouse gas emissions
- Resource efficiency and waste reduction
- Prevention of pollution
- Maintenance and enhancement of campus biodiversity through habitat creation/care.

50 hectares of the 144-hectare campus are managed within the Higher Level Stewardship (HLS) scheme to deliver significant environmental benefits, and staff receive regular training on maximising opportunities to create world-class green spaces.



This page: Members of the Grounds Team, winners of a UK Green Flag Award for exceptional public green spaces, 2017 and 2018

The Biodiversity and Landscape Management Plan (BLMP) is intended to be a guidance document to allow flexibility within our everchanging, unique natural environment. Detailed ecological survey work is ongoing to inform its continuing development.

The BLMP will achieve its primary aims by establishing a set of management principles to direct action, and by developing individual management plans for prioritised habitats across the estate. Habitats have been prioritised based on habitat decline and nature conservation and educational/amenity value.

The BLMP will undergo extensive consultation with experts and other stakeholders in order to develop robust and sustainable outcomes.

The Plan is divided into four sections:

- Habitats and species outlines the biodiversity baseline and the zoning criteria
- Management principles sets out the general management principles to be applied across the estate

- Measuring, monitoring and reporting –
 sets out the relationship of the BLMP with
 the EMS and outlines how performance will
 be assessed
- Management plans details the management specifications for prioritised habitats.



Background

- ISO 14001 certification and the Platinum EcoCampus Award were first achieved May 2015 for our Environmental Management System (EMS)

 demonstrating recognition for policies, procedures and operational controls around sustainability to a recognised international standard.
 UEA successfully certified to the ISO14001:2015 standard in May, 2018.
- There has been significant performance improvement in biodiversity management, communications, and waste management in recent years, driven by active engagement and collaboration.



2. HABITATS AND SPECIES

Monitoring of habitats and species on campus is ongoing in order to understand the value of biodiversity across the estate (see Section 4).

A semi-comprehensive biodiversity assessment was undertaken in 1987 (A Natural History of UEA, by Dr Chris Gibson, UEA School of Biological Sciences — BIO), and for several years Dr Iain Barr (BIO) has been collecting data on several taxa to compare against this. Led by Dr Barr, expert staff and students from BIO commenced a biodiversity audit in March 2010 and in 2016; detailed surveys are being conducted of all vertebrate species (excluding fish) and several major groups of invertebrates and plants. Representative surveys of other taxa are also being conducted in specific habitat blocks. An assessment of all Biodiversity Action Plan (BAP) species and habitats is also underway.

This work has provided a baseline for expanding our understanding of habitat condition and conservation and educational/amenity value, against which habitats have been prioritised. Prioritising habitats allows for the views and needs of various stakeholders and the effective distribution of resources.

A management process has been established using a simple traffic light system (see Table 1, below). This enables effective two-way communication of issues between grounds maintenance and projects office staff, and the various user groups and other stakeholders.

The traffic light system has significant value in aiding awareness raising. The system also facilitates decision making in relation to campus development by clearly demarcating areas of significance for biodiversity. The map in Appendix 1 details the current zones, and is cross-referenced to the management plans in Section 5.

The 2016 Biodiversity Audit report is available online through the Sustainable Ways website.

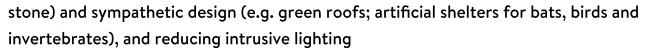
Table 1: The Traffic Light System

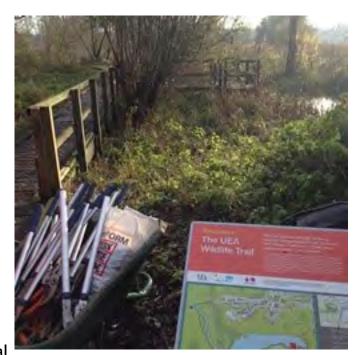
	Designation criteria	Action	Implementation Process
Red	Habitats of ecological conservation significance, or which support protected species.	Detailed management plans to be produced. Consult UEA Grounds Team and EMS Manager	Consultation to be sought before works commence. Establish process of communication.
Amber	Areas where temporary issues may be of concern (e.g. nesting birds, construction site compounds). Transition areas between amenity and conservation use.	Management plans to be produced. Consult UEA Grounds Team.	Consider timing of works for planned jobs. Check areas prior to works for reactive jobs (staff training required). Establish review process for construction and refurbishment works. Establish process of communication.
Green	Areas of amenity value.	Apply general management principles. No consultation required.	Training for grounds staff.

3. MANAGEMENT PRINCIPLES

The general management principles set out here establish the routine working practices for grounds maintenance and conservation.

- Make UEA a pleasant and enjoyable place to work and study
- Maintain habitat health and quality and associated biodiversity by the strategic management of the habitats across campus
- Improve biodiversity where possible
- Plan, cost and build to encourage biodiversity by selecting environmentally friendly, local building materials wherever possible (e.g. lime mortar, local





- Soften the transition areas between conservation and amenity use on campus through the appropriate use of planting, using UK-native species
- Plant only UK-native species (of local provenance where possible) in red and amber zones
- Only using chemicals for specific, justifiable actions (i.e. sports pitches, management of invasive species, willow scrub clearance), ensuring compliance with the Water Resources Act 1991
- Apply low-intervention horticulture and the use of sustainable materials (e.g. avoid peat-based products, non-FSC/PFEC timber and limestone).



4. MEASURING, MONITORING AND REPORTING PERFORMANCE

The BLMP is set within the wider Environmental Management System (EMS) in place across UEA.

The EMS is designed to ensure that all activities that can have an environmental impact, or that are associated with the use of a particular resource, are undertaken in a controlled manner and at minimal risk to the environment and UEA.

In relation to biodiversity this means measuring, monitoring and reporting on performance, as well as implementing procedures to ensure that resources are secured, staff are trained, and links are made with other management processes across UEA, e.g. campus development and refurbishment and land management by tenants.

Biodiversity-specific objectives and targets have been set within the EMS and are reviewed annually by the Sustainability Board to ensure continual improvement.

Responsibility for overseeing the connections between the BLMP and the EMS lies with the EMS Manager, who has convened a Biodiversity Implementation Team within the overall EMS management structure to drive biodiversity-specific actions.

The Landscape Manager is responsible for ensuring compliance with the plan at a strategic and day-to-day operational level.

Through the EMS, practices across the UEA will be audited to ensure compliance with the stated management principles and plans.

4.1 Measuring and monitoring

Measuring and monitoring biodiversity enables UEA to evaluate its performance over time, identify and address problem areas and exploit opportunities, improve performance, ensure legal compliance and increase efficiency.

In order to apply the first management principle, to 'make UEA a pleasant and enjoyable place to work and study', opportunities to survey stakeholder satisfaction (including grounds staff, students, users and volunteers) will be sought through the Sustainability Team's networks.

Biodiversity will be a regular agenda item for monthly Grounds Team staff meetings, covering issues such as nesting birds, notable sightings and training. Updates on all management principles will be provided to the Biodiversity EMS Implementation Team.

Table 2: Summary ecological monitoring programme

Survey Type	Details	Species Monitored
Biodiversity Survey 2010, 2016	Conducted over an 18-month period, this survey aims to provide baseline data on species across campus and includes an assessment of all BAP species and habitats. Survey to be repeated every 5 years.	Birds, bats, mammals, amphibians, reptiles, dragonflies and damselflies, butterflies, moths, beetles and plants
Annual surveys	Fixed transect routes and quadrats surveyed across campus by UEA BIO students.	BAP species, butterflies, dragonflies, birds and grassland plants
Managed areas	For areas where management is ongoing, surveys will be undertaken annually for 5 years and then biannually. Reviewed after every 5-year biodiversity survey.	Survey dependent on habitat: birds, bats, mammals and plants

4.2 Indicators

Impact on biodiversity can be very hard to quantify and requires strong scientific data.

Translating this data to demonstrate performance improvement requires the use of indicators. Ecological indicators will be set through discussion with ecological experts. These will be standardised so as to contribute to national monitoring databases. Potential indicators are:

- Detection or re-detection of listed species and targeting other species on the BAP i.e. ants, beetles, hoverflies, etc.
- Populations of invertebrates (e.g. dragonflies) as water habitat quality indicators
- Plant species diversity at fixed quadrats
- Birds as general indicators of habitat quality.

The effectiveness of activities, operations and decisions will be monitored, audited and reviewed through the EMS and appropriate management performance indicators established.

4.3 Reporting

Reporting this performance allows UEA to engage with its stakeholders more effectively and demonstrates accountability, transparency and improvement. Targets within the EMS will be reported quarterly to the Sustainability Board, and made publically available through the Annual Environmental Sustainability Report.

Regular updates and case studies will be provided on the UEA Sustainable Ways webpages (www.uea.ac.uk/about/sustainability).



"UEA has a strong ethos around a sustainable campus — from all aspects.

From the way we build and operate our buildings through to the way we look after the environment of our Estate, which includes some important conservation areas like the Yare Valley, we work to ensure a positive campus experience.

"We are very conscious of our position as custodians of this campus and its wider land, and try to develop it in a way that is as sustainable as possible whilst of course delivering the University's mission of education, research and enterprise.

"Many of the green campus elements are still present 50 years after we took the campus on because of the work that we do to ensure that we protect and conserve the environment on which our campus is built."

- Professor David Richardson, Vice-Chancellor

5. MANAGEMENT PLANS

5.1 Red Zone Management Plans



Water Soldier Pond

Map reference	1
Conservation designation	None
Aim	Restore the pond to high quality and prevent nutrient build up. Maintain a population of water soldier plants as indicator species, and for public interest.
Actions	Maintain programme of clearance to result in the pond being surrounded rotationally in quarters by clear bank, 1–2 year old willow coppice, 3–4 year old willow coppice (to provide suitable over-wintering sites for willow emerald damselfly). Include brambles as a screen from the broad path. Continue silt removal by ladle with half a day per winter over several sessions. Pile the silt at a distance from the pool. Skim the duck weed (Lemna spp) from the pond surface regularly and at least twice in the spring and summer. Replace water soldier if necessary up until water maintains quality to not require this: review each year. Remove any cutting and large wood from the pond at all times. Estimate 2 days' work per year. Major review in 2018/19.

Figure 1: Water Soldier Pond management



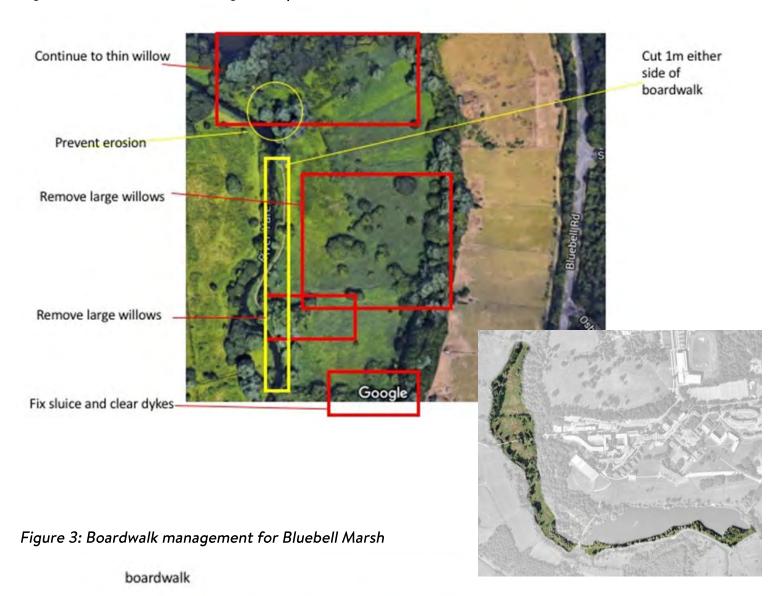
5.1 Red Zone Management Plans



University Fen and Bluebell Marsh

Map reference	2
Conservation designation	County Wildlife Sites (ref nos. 1447 and 1445)
Aim	Restore and then maintain good quality reed bed, sedge bed, fen edges and a healthy dyke system.
	Maintain boardwalk for general access.
Actions	Sedge bed: cut in a rotation or 1/3rd each year then leave for a year. Remove cuttings or burn on site and remove ash.
	Reed bed: cut in a rotation of >2 full days per annum for a team of >8 people. Cut and remove arisings. Leave the edge towards the strawberry fields uncut as a barrier and to allow long-lived invertebrates to thrive (e.g. flame wainscot).
	Trees: remove 10 willow/alder trees >3m high per annum. Maintain previous cutting if regrowth shows.
	Dogwood (Broad edge): Prevent encroachment by removing 3m ² areas per annum. Maintain for aesthetic value.
	Dykes: maintain edges after cutting and make a plan for restoration by 2019.
	Boardwalk: cut in April and July 1m either side to prevent overhang and breeding birds from being disturbed.

Figure 2: Bluebell Marsh management plan





5.1 Red Zone Management Plans (continued)

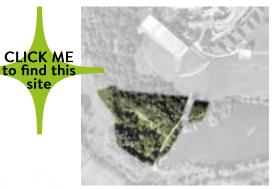
Butterfly Meadow

Map reference	3
Conservation designation:	County Wildlife Site (ref no. 1448)
Aim	Increase the area of nutrient poor chalky grassland. Restore edges with gorse in line with the original designation of the County Wildlife Site.
Actions	Cut 5-10 trees per annum to the ground (2/3 large ones and 2/3 small). Plug 50% and revise the plugging in 2020.
	Plant 8 gorse and 5 broom whips (in the areas marked for clearfell), protected by rabbit guards.
	Remove 5m ² area of scrub (bramble, birch saplings, rose and hawthorn etc) each year after 2018.

Figure 4: Butterfly Meadow management

Remove scrub. Clearfell this area In 2016/17





2016/18 Remove 2/3 large trees, 2018/19 remove 50% bramble and Birch and other scrub

Remove scrub. Clearfell this area in 2016-18

Carefully remove large alder and birch without removing brambles etc. 2016

New Plantations

Map reference	4
Conservation designation:	None
Aim	Create a healthy woodland with a mixture of woods and rides/glades
Actions	Selectively thin the woodland, removing weak and crowded trees. Create glades where possible (3), in zones every 2 years under advice from partners (Easton and Otley College). Stack main wood in piles and brash in dense habitat piles. Use brash to screen off desire lines and tracks used by unauthorised persons.



Figure 5: New Plantations management

mid new plantation



Maintain bramble thickets

Maintain this high hedgerow

5.1 Red Zone Management Plans (continued)

New Plantations Hay Meadow



Map reference	5 (by the Sainsbury Centre area)
Conservation designation	None
Aim	Create and maintain a summer meadow with species-rich hedgerows
Actions	Cut hedgerow with a rotation of one side one year, the other and top on the second year to preserve fruit and biodiversity in stems, in ca100m blocks.
	Cut grass in late September and remove arisings. Leave grassland to the River Yare side of the path uncut.
	Revise management in 2020.

Figure 6: New Plantations Hay Meadow management



Maintain path as short sward. Leave hedge Margin to >2m. Leave margin of longer grass On Yare side and cut in late September.

Make an erosion plan for the area 100m from the Bridge. Possibly with willow bunding from the fen ar

Institute Fields (wet grazing meadows)

Map reference	8
Conservation designation	None
Aim	Maintain and enhance wet meadow features.
Actions	Maintain wet grazing meadow.
	Maintain dykes by removing debris and managing vegetation.
	Maintain scrapes by lowering the level of the ground in a section of the scrape every other year to maintain water-holding ability in the winter.
	Review after 2020.





Figure 8: Institute Fields management



5.1 Red Zone Management Plans (continued)

The Sainsbury Centre Wood (includes The Heronry and Violet Grove)

Map reference	11
Conservation designation	County Wildlife Site (ref no. 1446)
Aim	Maintain a healthy woodland and manage invasive species
Actions	Trees: no specific management as the wood will self-maintain for 2016-2020.
	Ivy: cut ivy from 5 trees per year in rotation throughout to prevent over crowding cut in early Feb before the birds nest, but after berries have been used.
	If there is spare capacity in May check and remove and Spanish bluebells. Consider a section for traditional coppice management. Possibly the area by the roundabout? Discuss in 2018-2020.
	Remove litter from area, but don't remove understory.

Figure 9: Sainsbury Centre Wood management



Consider removal of Spanish bluebells

bracken

Maintain edge and leave a 2-3m buffer of



Spanish Copse

Map reference	13
Conservation designation	None
Aim	Maintain specimen sweet chestnuts and retain features for birds and bats.
Actions	Leave and maintain for safety. Leave understory to regenerate if possible (e.g. elder).
Comments	This area has important bat and bird roosts and nesting sites.



Figure 10: Spanish Copse management



Woodland patch of largely large sweet chestnut Maintain for safety but keep dead wood on tree for woodpeckers if possible.

This site is an important bat roost (in cracks and woodpecker holes)

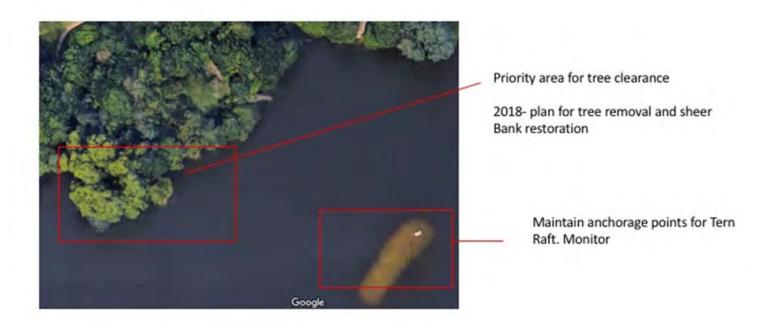
5.1 Red Zone Management Plans (continued)

CLICK ME to find this site

The Broad Island and Anti-Scrape

Map reference	14
Conservation designation	Part of The Broad County Wildlife Site (ref no. 1449)
Aim	Maintain woodland and restore bank margins
Actions	Consult tree surgeon with a mind to a longer-term plan to restore the island to low vegetation; remove trees and restore banks with vertical sides for wildlife. Investigate possibility of doing one-off work to maximise effective management.

Figure 11: Broad Island and anti-scrape management

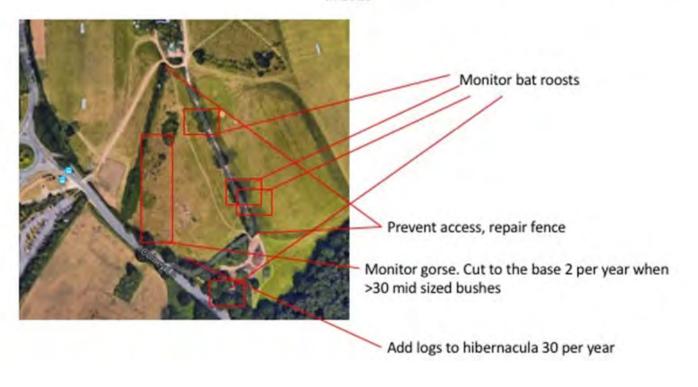


Lusty Hills

Map reference	25
Conservation designation	None
Aim	Maintain and enhance close-cropped, grazed community of plants and animals. Preserve and enhance biodiversity.
Actions	Maintain floristic diversity in line with grazing. Graze but do not cut with mower. Graze with horses and rabbits (i.e. natural).
	Secure boundary and prevent general access with signage.
	Allow Gorse to spread to not more than 30 plants then begin to remove one each year to maintain character of the area. Maintain reptile / amphibian hibernacula by the addition of 10-15 large to medium logs each year across the 5 sites.
	Cut hedges on two sides a year: leave one side to fruit.
	Maintain ivy on boundary oaks by reducing growth of one tree at the tree base every other year. The aim is not to remove completely but to reduce ivy burden gradually over time.

Figure 7: Lusty Hills site management

Reduce boundary oak Ivy burden each year cut 2 or 3 stems at the tree base of 1 tree on the cantley lane boundary review in 2018



5.1 Red Zone Management Plans (continued)

River Yare

Map reference	-
Conservation designation	None
Aim	To maintain this river course, protect and preserve banks and bankside vegetation whilst allowing access to selected areas. Minimise bankside erosion and maintain character of the river. Prevent nutrient build up and prevent run off from hard standing and sports pitches.
Actions	Prevent access to some well-used bank sites by temporary fencing and/or brush pile screens. Use willow bunding to shore up the banks and prevent future erosion; this will allow time for river vegetation to colonise. Consider restricting access to the river course on one side between the playing field bridge and Mathematical Bridge. Manage with the Norfolk Hawker, water vole, otter and kingfisher in mind, ensuring that all works are under license. Boardwalk: maintain and repair if necessary. Cut adjacent vegetation within 1m from the boardwalk in April and in July to maintain access and prevent nesting birds from inhabiting and being disturbed. Cut overhanging vegetation in the winter to maintain access. Remove boardwalk wood once repairs have been completed.
Comments	The main cause for concern is increased public access to the river banks in multiple locations and the trampling of bankside vegetation and removal of river plants by dogs swimming. Action is needed to prevent erosion due to dogs and due to people using the banks.
	Note: the banks of the River Yare are an Amber Zone.

Figure 12: River Yare management



Prevent erosion- ideal willow bund area

Cognow naturally, biasin barriers in necession-ideal willow bund area

This whole section has Norfolk Hawker, otter, cettis warbler and kingfisher plus water voles.

Prevent access by allowing vegetation to grow naturally. Brash barriers if necessary



5.2 Amber Zone Management Plans

Horse field area

Map reference	6
Conservation designation	None
Aim	To maintain grazing and enhance boundary features
Actions	Maintain consistently as is by livestock in the summer months. Manage brambles on hedgeline by removing overhanging stems by hand only.



Figure 12: DEV Farm (horse field) management



Secure boundary lock on gate

No further action 2016-2020. This area is heavily grazed and used by allotment holders. The wood Is of medium quality and damp nature. Good deadwood content.

Sports Fields Hay Meadows

Map reference	7
Conservation designation	None
Aim	To integrate recreation with conservation, maintain edges and borders of amenity use as species rich grassland (including leave corners where practical as unmown grassland). Blend the sports pitches into the Yare Valley where possible.
Actions	Maintain grassland as with the main hay meadows as an autumn cut long grass meadow with removed hay, to promote species-rich grassland. Maintain banks along the sloping sections of this area as grassland for the brown argus and common blue butterfly.
	Hedges should be cut on rotation with 100m sections left uncut each year but rotated to maintain hedge shape. Cut grass 1m from hedgerow on sports pitch side and 2–3m on the Yare side.
	Leave corners of fields as unmown grassland where practical to do so, manage by removing suckers in the winter.
	Ensure only UK-native species are planted in any development.
	Monitor orchid populations. Monitor butterfly populations and botanical surveys to assess grassland richness.

Figure 13: Sports Fields Hay Meadow management overview

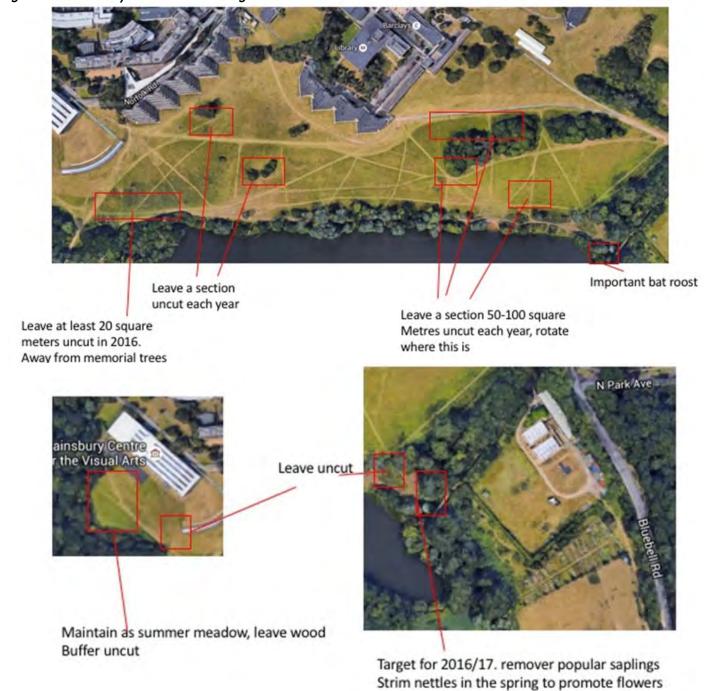


5.2 Amber Zone Management Plans (continued)

The Hay Meadows

Map reference	9
Conservation designation	None
Aim	Maintain as a mosaic of amenity grassland, spring meadow summer meadow and permanent meadow.
Actions	Cut annually Aug/Sept. Maintain designated paths for authorised vehicles and amenity areas
Comments	Summer meadow: cut for hay in Aug/September and if necessary 1 portion again late in the year, but only when temperatures are above 8 degrees. Leave a portion uncut each year but rotate section to prevent course weed and poplar sapling build-up and suckers.

Figure 14: The Hay Meadows management



Blackdale Plantation

Map reference	10
Conservation designation	None
Aim	Maintain healthy woodland
Actions	Maintain leaf litter and edges of the plantation (scrub).
	Prevent scrub removal other than for keeping the paths for use.
	Maintain trees and check for bats prior to any tree works.
Comments	Significant wildlife value. The space should be managed sensitively to maintain, for instance, sufficient deadwood as habitat. The Blackdale Plantation is an important roosting and maternity colony site for bats, particularly Noctules (a BAP / Section 41 protected species).





Figure 15: Blackdale Plantation management



Important bat roosts and rookery.

Maintain mix of understory and woodland

Maintain paths for forest schools but do not clear scrub

5.2 Amber Zone Management Plans (continued)

CLICK ME to find this site

Cow Drive

Map reference	12
Conservation designation	None
Aim	Maintain high hedges and species rich wildflower grassland for amenity use.
Actions	Maintain for floral diversity as many species here are not found elsewhere on campus. Prevent any additional light pollution as area is used by bats to commute.
	Maintain hedges for birds as these are important hedgerows at UEA. Maintain rough grass >1m from each hedge and more if possible. Mow 1m from path for access. If needed cut all grass once in August/ September.

Figure 16: Cow Drive management



Maintain hedges for bird nesting, maintain rough grass and Alkanet. Leave >1m from hedge each side As long grass.

Mow 1m from path but leave the hedge and under hedge uncut. If needed cut in August

The Broad

Map reference	15
Conservation designation	County Wildlife Site (ref no. 1449)
Aim	The Broad is a high quality mesotrophic lake with deep water and a steep bank and needs to be maintained for vistas, amenity and biodiversity. Enhance and maintain throughout.
Actions	Continue to enhance vistas from designated points around the Broad to restore to the original idea of the view through to the Ziggurats. Selectively remove willow and alder and dogwood each year to maintain open character.
	Allow bramble and specimen trees to persist, to maintain biodiversity and ground structure in flood.
	Maintain a 1.5m path buffer of cut vegetation around the western end and maintain access to the seating and fishing pontoons.
	Use brash from winter work to block off desire paths to the River Yare to prevent access to this stretch of river and maintain for otter and Norfolk Hawker. Leave dead wood in situ in large pieces to maintain fungal interest and for general biodiversity. Where vegetation is shredded remove from site.
	Monitor water quality and maintain edges of the Broad to allow emergent vegetation.

Figure 17: The Broad management



5.2 Amber Zone Management Plans (continued)

Research Amenity Land (mixed use) - DEV Farm



Grounds area

Map reference	16
Conservation designation	None
Aim	To protect the verbascum/ hypericum community
Actions	Maintain the Verbascum pulverulatum (hoary mullein or great mullein hybrid) population at 15,000 individual plant+ (2012 count 28,560) in the primary fenced area. Retain specimen plants where possible. Manage an area of Perforate St Johns Wort (Hypericum perforatum) in the larger, natural area of at least 5m². Monitor the lower area and prevent destruction. Monitor nettles and strim if needed to prevent scrub encroachment by removal. Secure the fenced area below the compound. Monitor scrub and keep as scrub habitat and monitor bird populations.

Figure 18: DEV Farm (Grounds area) management



Retain/ protect specimen verbascum and St John Wort in this area where practicable alongside needs of the working yard

Maintain for st johns wort/ verbascum habitat.

Prevent scrub encroachment and monitor nettles.



5.2 Amber Zone Management Plans (continued)

Triangle car park

Map reference	20
Conservation designation	None
Aim	To integrate carpark use with conservation, maintain edges and treeline as buffer zone to Red Zone wet grazing meadows (ref. 8)
Actions	Maintain sloped banks for wildflowers and insect biodiversity. Control invasive species as required. Keep tree management system in place for significant oaks and other native trees. Assess future needs for site in 2018-19.
Comments	This area has significant oak trees and wildflower cover on the border to Zone 8 and NRP site building. Management should be considered to preserve these areas and raise awareness with site users of their importance. NB: car park itself is ranked Green: surrounding areas are amber.



Figure 20: Triangle car park (awaiting updated image)



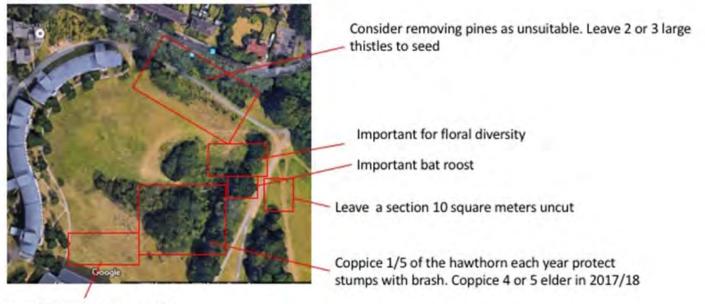


Colney Hill and Bluebell Road border

Map reference	-
Conservation designation	None
Aim	To maintain species-rich grassland slopes and restore and enhance scrub.
Actions	Remove non-native and inappropriate tree planting.
	Leave 2-3 specimen thistles each year if the rest must be removed.
	Develop a program of scrub regeneration with approx.
	1/5th coppiced to the ground in each year and protected by the resulting brash fence (maybe aim could be to train in fence construction?). Coppice in late winter.
	Plant 1 or 2 elm or wych elm trees.
Comments	This area is important for biodiversity at UEA, hosting several plant species not found elsewhere and several important bat roosts. Maintain with this in mind.

Figure 21: Colney Hill and Bluebell Road border management overview

Colney mountain



Prevent damage due to traffic

Maintain path edges for amenity but avoid mowing verbascum and vervain

5.2 Amber Zone Management Plans (continued)

Rabbit enclosure

Map reference	-
Conservation designation	None
Aim	To maintain for research, remove rubbish and accumulated litter, and enhance border vegetation.
Actions	Maintain for research. Strim of nettles if need be. Maintain willow herb bed and extend blackthorn scrub.
	Maintain border to river Yare as no access fen and reed. No cutting necessary to 2020. After this monitor for scrub clearance.

Figure 22: Rabbit enclosure management

Rabbit enclosure



Leave and prevent access for otter and snipe/ woodcock/ cettis warbler

Strim once per year if needed

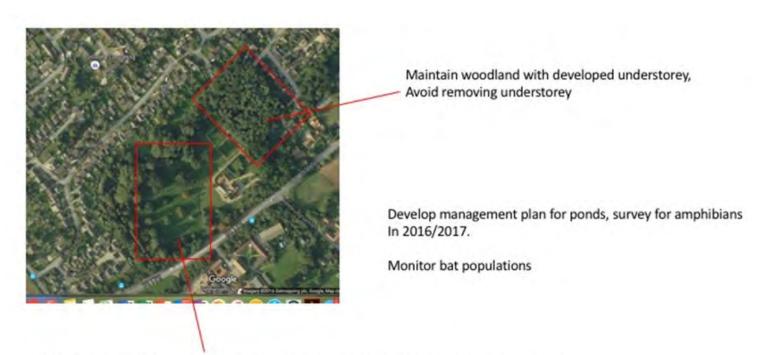
Hire a skip to remove old research equipment 2016/17

Allow scrub to develop and willow herb bed for insects

Wood Hall

Map reference	-
Conservation designation	None
Aim	To maintain mix of parkland, meadow and mature woodland.
Actions	Develop a management plan for Wood Hall after considering results of the biodiversity survey 2014-16. Develop specific plans for the ponds.

Figure 23: Wood Hall management overview



Maintain as long grass sward, hay meadow. Remove arisings after main cut in late summer.

5.3 Green Zone Management Plans

Aim	Maintain and enhance biodiversity alongside amenity value in the working environment.
Actions	Use enhancement planting of native species to guide and change access, plus provide food and shelter for biodiversity. Enhance existing green value areas and prevent degradation. Employ pest control measures as appropriate.

Maintain woodland as CWS



Monitor population of Hoary Mullein and add to Dev farm population estimates

Figure 24 (left): Area at bottom of Chancellors Drive

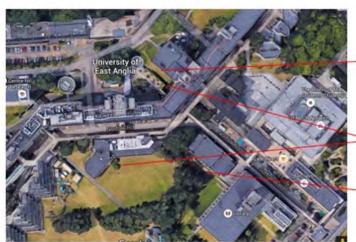


Figure 25 (left): Around
Norfolk Road

Keep Ivy and fix to wall. Prevent Building waste

Remove Spanish bluebells

Plant native species in tired beds by the terraces



Monitor bees and maintain grassland

Figure 26 (left): Areas around Arts Building and ITCS

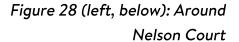
Maintain shrubs

Maintain and preserve ivy and creeping vegetation throughout.



Figure 27 (left): Around Medical Centre/ INTO/ Blackdale School

Preserve thick, berry-bearing bushes





Leave a section unmowed

Prevent regular driving

Maintain understory to trees



Leave standing deadwood where possible. Remove ivy from 1 or 2 trees per year

Figure 29 (left): Around main residences (Colman, Britten, Kett, Victory, Browne, Paston Houses; Crome Court)

Plant native shrubs/ herbs and thin Planted trees in 2018



Figure 30 (left): Around University Drive/ main car park

Retain and enhance dense bushes

5.3 Green Zone Management Plans (continued)

Earlham Hall area

Map reference	24				
Conservation designation	None				
Aim	Restore and maintain character and maintain parkland and gardens. Manage and enhance for biodiversity where possible.				
Actions	Develop management plan with external stakeholders. Manage grounds for amenity value, and ensure tree management meets requirements for bats and other species. Trees to be audited on a 2.5 year cycle, as per Grounds condition survey schedule. Note: Earlham Hall building is a Red Zone due to importance to bat species. No works affecting the building and curtilage to be carried out without due permission.				



Figure 31: Earlham Hall area overview (image: Google Maps)





5.4 Externally managed areas

Edith Cavell Building — Amber Zone



Map reference	21
Conservation designation	None
Aim	To maintain grassed areas for bee orchids, remove rubbish and accumulated litter, and enhance border vegetation.
Actions	Bee orchids are an unusual species and are on the decline. The single flower is the culmination of up to eight years growth and, if picked/mown, it is unlikely to flower again and has lost its only chance of producing seeds.
	Grassland verges should be mowed in late April/early May and then very late July/ early August as best practice.
	Consider significant trees for biodiversity; eg. minimise disturbance, especially end February – September (nesting season). Minimise use of glyphosate. Strim border to JIC if need be.

Edith Cavell Building car park — Green / Amber Zone

Map reference	22
Conservation designation	None
Aim	To maintain for amenity value, and to enable migration of Verbascum plant species to enhance habitats for the Mullein Moth.
Actions	Consider hedgerows and significant trees for biodiversity; eg. minimise disturbance, especially end February – September (nesting season).
	NOTE: the pedestrian pathway between Colney Lane and the main Hospital site is an Amber Zone. Sub-contractors should contact UEA Estates for guidance before proceeding with management.

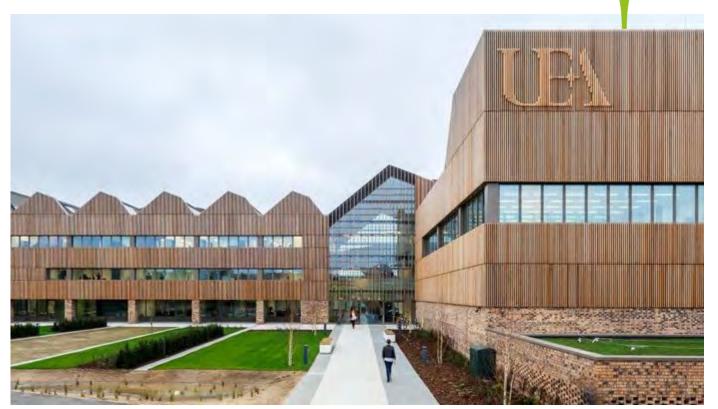
Figure 32: Edith Cavell Building and car park (image: Google Maps)



Bob Champion Research and Education Building — Green Zone

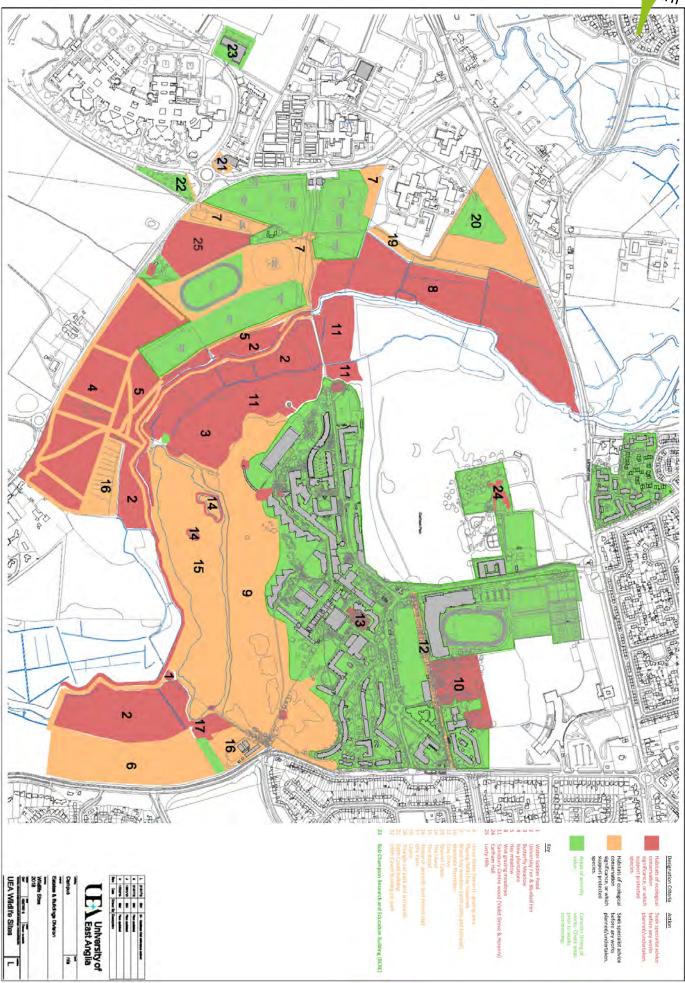
Map reference	23
Conservation designation	None
Aim	To maintain grassed areas for amenity value, and to consider opportunities for habitat improvement.
Actions	Consider opportunities to enhance site biodiversity with UK-native plant species. Minimise use of glyphosate. Minimise disturbance to hedgerows and treelines late February – September (bird nesting season). Consider use of mulch to shrub beds and newly-planted tree bases to preserve moisture; seek local/ UK sources.





Appendix 1: Zoned Estate Map





Appendix 2: Species Taxa Found on Campus

As set out in the BLMP, UEA grounds comprise a wide variety of habitats, and host huge biodiversity. Researchers from UEA's School of Biological Sciences have recorded 5,793 different species on campus to date. 108 of these are rare or endangered. UEA has one of the most biodiverse university campuses in the UK.

These results follow the 2014—16 biodiversity audit. The 2009—11 audit recorded around 2,600 species. Interim audits 2011—14 focused on specific groups or habitats. The below results are the product of thousands of hours and the efforts of hundreds of people over several decades.

GROUP	# species recorded at UEA	# species in the UK	Species with protected status	GROUP	# species recorded at UEA	# species in the UK	Species with protected status
Fungi	459	10910		Thysanura	2	8	
Plants	419	2951	1 notable	Collembola	55	300	
Mammal	38	82	9 BAP priority species. All bats and badger	Trichoptera	62	189	
	(2 domestic)			Lepidoptera	1004	2400	1 red data book, 2 nationally scarce,
Birds	213	500+	3 schedule 1, 14 red list,				>20 notable or BAP, 1 red databook butterfly
1	4-		14 amber list	Coleoptera	448	3900	6 notable A and B
Fish	17	82 non marine	2 BAP priority species	Hymenoptera	1581	7100	2 red data book, many
Amphibians and reptiles	8	27 (inc. naturalised alien species (8/9	4 protected species	(bees & some wasps)			notable
reptiles		Native))	·	Diptera	486	6900	several notable A & B
Lower plants	106	?		Siphonaptera	8	60	
Protozoa	26 (mainly	?		Raphidioptera	2	4	
	parasitic in birds &small mammals)			Plecoptera Mallophaga /	1 12	33 539	
Porifera	1	?		Anoplura		333	
Coelenterata	1	?		Megaloptera	2	Alderflies 3	
Platyhelminthes	45	?		Strepsiptera	1	Stylops 18	
Rotifera	1	?		Ephemeroptera	27	51	
Acanthocephala	6	?		Odonata	25	47	1 red data book and 1
Nematoda	22	2000+		Outhoutous	1.4	20	notable
Mollusca	84	220 (non marine)		Orthoptera	14	30	
Annelida	16	29		Dermaptera	2	7	
		(earthworms +?)		Psocoptera Hemiptera	12 188	88 1709	
Crustacea	31	463 (non marine)		Thysanoptera	4	159	
Arachnida	236	730+	5 notable	Neuroptera	16	76	
Diplopoda	28	70		Mecoptera	3	4	
Chilopoda	23	54		Other species	57	?	



GET INVOLVED

The UEA Sustainable Ways banner covers a diverse range of sustainability actions and issues.

Volunteering opportunities occur throughout the year. Students can join the Conservation and Wildlife Society (Facebook: @ UEA CAWS). Staff can join a notification list through the Sustainability Team.

Bat walks are often held over the summer, using detectors and local expertise for fantastic insight into these campus residents and visitors. Keep an eye on @SustainableUEA social media and the UEA e-bulletins for details.

The UEA Wildlife Trail takes walkers around UEA Broad and the River Yare. It showcases a variety of habitats and areas of key biodiversity.

Find out more: www.uea.ac.uk/about/
wildlife-trail

Green Impact

The Green Impact programme sees teams challenge their School or Department to improve its sustainable credentials.

An online toolkit guides teams through a range of actions to an end of year Awards celebration. Actions are grouped under themes, including 'Biodiversity and Community' and 'Health and Wellbeing'. The programme runs annually, September—May.

Sustainability Network

These champions hear about and help support environmental initiatives across UEA. With ongoing Estates support, staff and student members become part of an active network who share knowledge and best practice.

They provide a local focus for environmental and energy issues, and help encourage friends and colleagues to make small changes to everyday practices that will collectively make a difference.

Every member of the UEA community can be involved in our vision of a resilient, sustainable and low carbon campus.

Authors

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Tom Everett, Landscape Manager

With thanks to members of the UEA Biodiversity Implementation Team, and to the UEA Landscape Strategy (Broom-Lynne, 2010) for context-setting map images throughout.

For more information

For more information or to get involved:

Social media: @SustainableUEA











Email: sustainability@uea.ac.uk

Tel: 01603 593535

UEA's 356-acre campus has many varied habitats, including five County Wildlife Sites, and has documented nearly 5,800 species.

The Biodiversity and Landscape Management Plan provides insight into UEA's management of its green spaces in order to provide a world-class learning, living and working environment alongside strong ecological principles.



This document is part of UEA's landscape management strategy, and sits within the University's Environmental Management System.

Find out more online: www.uea.ac.uk/about/sustainability/campus/biodiversity