



UNIVERSITY
of York

LANDSCAPE MANAGEMENT PLAN



Landscape Management Plan

There are Three key objectives to the University's current strategy:

1. To be a world leader in research
2. To offer outstanding teaching and learning
3. To offer all our students an outstanding and valuable experience.

Through the management of the campus landscape a positive contribution is identifiable with both of objectives 2 & 3 above. An attractive campus will help to encourage students and staff to study and work at York. The landscape and external environment is potentially a productive teaching and learning resource, particularly for departments such as Biology and Environment. An attractive and stimulating environment promotes staff and student wellbeing, having a positive effect on mental health. Being able to enjoy the external environment can help both staff and students cope with the stresses of work and study. A study undertaken in 2018 'Revaluating Parks & Green Spaces' contained an economic valuation exercise carried out on parks and green spaces in the UK. It also attempted to value improvements in health & wellbeing associated with their frequent use. The study suggested the wellbeing value associated with the frequent use of parks and green space is worth £34.2 billion pa to the UK adult population and that parks and green spaces are estimated to save the NHS circa £111 million pa based on a reduction of GP visits alone. This strongly indicates both a financial and wellbeing return on investment made in the maintenance and care of the landscape.

The campus can also be managed so as to be beneficial to wildlife. Managing the landscape to encourage biodiversity is important in the context of national habitat and species decline. Through the landscape the University can also positively engage with the local community. Being an open campus, the wider community is also welcome to enjoy the campus environment.

The University campus is a public open space, but this is not its primary function. First and foremost it is home to many thousands of students, added to which it is a place of work for several thousand more staff. In this way the campus is almost like a small town, with residents which require facilities and services to be able to fulfill their roles, whether it is learning teaching or research. These demands bring a different set of pressures to bear on the campus and its landscape than those associated with a public open space in the truest sense of the phrase. In other words the

University campus may well be a public open space, but it is not a public park.

The University of York celebrated its 50th anniversary in 2013. In relative terms the University is therefore still young. More importantly it is still growing, it is still expanding. It is dynamic. The recent expansion onto Campus East is the most obvious manifestation of this, but the growth of the University inevitably puts pressure on the landscape, which is often compromised as a result. This in itself presents a challenge in managing the landscape to mitigate the impact of these pressures and to ensure the campus remains an attractive environment for the students and staff to live and work in and for the local community to be able to enjoy.

The Heslington West campus offers a variety of different landscaping possibilities, from the very formal surroundings of Heslington Hall and the Yew Gardens through to the woodland and naturalistic margins of the campus, in between which is contained a classic parkland landscape with a serpentine lake running the full length of the campus at its centre. Due in no small part to its careful planning and design during the early history of the university the landscape is highly regarded by many and makes the campus as a whole an attractive and pleasant place both to live and work.

In 2008 the University embarked on the development of a major new extension to its campus. Although not entirely geographically remote from the existing campus, the new development is big enough and far enough away to have to have generated its own identity as distinct from that of the existing campus. Campus east has quite clearly defined guiding principles and philosophies which have driven the on-going establishment of the landscape, including management, habit creation and biodiversity action plans. In this context it is important that the existing 'Campus West' is not overlooked and as such this document seeks to address this and encourage a uniformity of approach to the principles and practises employed across the whole University estate.

The University is now embarking on a renewed vision of the campus as a whole and to that end has recently engaged a new Masterplanning consultancy. The various phases of the process are expected to take 15 – 20 years, but phase 1 includes articulating the aim of linking Campus East with Campus West and how this may be achieved.



History and Development

While petitions were drawn up as early as 1617, permission to establish a university in York was not granted until 1960. The development of the University and its vision was headed by Baron James of Rusholme, the university's first Vice-Chancellor. With Heslington Hall and The King's Manor as the primary venues, the University opened its doors in October 1963 to 230 students and 28 staff.

In 1964, work began to expand the University campus to the marshy land around Heslington Hall. The development included landscaped parkland with a central man-made lake, innovative covered walkways, and the many CLASP buildings seen around campus.

By the end of the decade (and on schedule), the University of York's campus included five colleges, three laboratories, Central Hall, the JB Morrell Library, the sports hall and the Sir Jack Lyons Concert Hall. Undergraduate enrolment had increased to 2500 students.

"Without doubt the landscape of York University has proved to be imaginative and highly successful. This quality is largely due to the university's demand for high standards, incorporating a well designed landscape. The care shown by Robert Matthew Johnson Marshall and Partners in the design is reflected in the finished scheme; which is maintained in a positive way by a dedicated Grounds Maintenance Staff"

The University is renowned for its skilfully designed contemporary landscape. Designed and built in the early 1960's, the landscape has matured and is now accepted as a classic piece of design. In 2018 Historic England visited west campus, following which it decided to list several buildings as examples of 1960's architecture. Additionally, it also listed a significant area of the campus as a grade II registered park and Garden. www.york.ac.uk/staff/news/2018/listed-features Robert Matthew Johnson- Marshall and Partners (RMJM) initiated the design of the grounds, the concept for the landscape being developed and followed through by Maurice Lee, Landscape Partner, RMJM.



↓ Campus West during construction in the 1960s



↑ University of York Campus West designed landscape

The major elements for the landscape plan were the tree planting and construction of the lake.

TREE PLANTING

“ Intensive tree planting and the creation of a varied and interesting landscape which should form a valuable addition to the city’s public open space”

Originally 3 scales of trees were to be used;

- small ornamental trees in close proximity to the buildings
- medium sized trees linking groups of buildings to the site and each other
- large trees which were primarily planted in shelter belts and also intended to relate the university to the surrounding landscape.

LAKE

“ To improve the poor site drainage.....a new land drain system extending across the site was constructed. A surface reservoir was recommended to regulate the water flow from the site and this developed into a large lake which became the ‘Show piece’ of the site”

After the mid 1980's the input of RMJM & Partners was

reduced to provide a fresh outlook upon the management and in 1992 Hal Moggridge (Colvin & Moggridge) was engaged to carry out a strategic review of the university landscape, which assessed both the strategic and practical measures required to conserve and improve the landscape, several of which are listed below;

- define the lakeside landscape, keeping it free from vehicles and utilities
- reinforce the framework tree planting, creating avenues into the central campus
- open and conserve views across the lake
- have open space swept back across grass away from the waters edge
- plant a second generation of long-lived broadleaved deciduous trees
- undertake extensive grassland bulb planting.

To maintain its position as one of the top universities in the world, the University needed to upgrade and expand its campus. In addition to improvements to existing facilities, the University expanded on to Heslington East. The site is consists of 117 hectares of land close to the current campus on the outskirts of York. The development of the site includes academic buildings, college accommodation, sporting facilities and community facilities.

↓ Lake through Campus. Heslington



Activities and Facilities

LEISURE PROVISION

The University campus serves as a place of passive recreation for many campus users. During the summer term particularly, students use the external environment for informal games, sun bathing, studying outside and general relaxation. Many members of staff enjoy lunchtime walks around campus and taking their lunch outdoors in benign weather conditions. The local public use the peripheral areas of campus as a dog walking facility and many people from the local community like to come onto campus with children and grandchildren to feed the wildfowl on the lake.

Over the last couple of years, two campus walks (tree trail & nature walk) have been introduced, primarily with the aim of encouraging staff to get outside and enjoy the external environment. This helps to support the University's Health & Wellbeing initiative run by the Human Resources department. Both walks are available through the Grounds Sections web page york.ac.uk/admin/estates/operations/grounds/index.html. Alternatively walk leaflets are available at the Information Centre on Campus West and the Ron Cooke Hub on Campus East.

A new outdoor gym and trim trail has also recently been installed. The Yoractive trail is 5 km long and is set out across both east & west campus. There are five fitness stations along its route which starts at the Sports Centre on Campus West and finishes at York Sports Village on Campus East. Details of the trail can be accessed via YUSU's web pages yusu.org/opportunities/sport/yoractivetrail



↑ Yoractive Trail. Heslington East

SPORT

Sport is an important aspect of life at the University. The original Sports Centre on the Heslington West campus caters for a range of indoor sports. The new York Sport Arena is suitable for a range of sports including badminton, basketball, netball, 5 a side football and volleyball. There are also 4 squash courts and a comprehensive fitness and weights suite.

Outdoor facilities also include:

- Floodlit artificial hockey and football pitch
- Floodlit tennis and netball courts
- Athletics stadium
- Basketball court
- 40 acres of grass sports pitches used for football, rugby, cricket and lacrosse

The Sports Centre is now home to a new athletics stadium which replaced the original running track. The stadium includes a 400 metre track and a 500 seat stand, which opened in 2015. It is also home to City of York Athletics Club.

In August 2012 the University opened the new York Sport Village on the Heslington East campus, offering a state of the art sporting and leisure venue conveniently located and easily accessible by cycle, car or public transport.

Facilities include:

- Eight lane 25 metre swimming pool
- 18 metre learner pool
- Floodlit competition standard outdoor 3G football pitch
- 3 5-a-side 3G football pitches
- 120 station fitness suite
- Three air conditioned studios for classes such as spinning and yoga
- Spa facilities including sauna and steam rooms
- 1 Km floodlit traffic-free outdoor cycle circuit
- 250 metre Velodrome
- Café



↑ York Sport Village, Heslington East

The local community are actively encouraged to make use of the facilities on offer, with attractive membership rates being offered. For example the Sports Village cycling facilities and programmes are suitable for all ages and abilities; novices, casual cyclists, families and professionals alike. Daily pay as you go sessions are available to the public.

In early 2018 the University also instigated a weekend park run. The course is 5000m (5K) long and starts at York Sport Village, Heslington, York. The course is run entirely on permanent paths. Further details of the run can be found at parkrun.org.uk/heslington/course To discover the full range of sporting and fitness activities available through the University's sports facilities, please visit york-sport.com

ANGLING

There is a University Angling Club which is open to all students, members of staff and their families. Membership is available through The Sports Centre provided you also hold an Environment Agency rod licence. The lake on the west campus was stocked with coarse fish several decades ago. Angling however is not permitted on the new Campus East lake and it is not intended to stock this water with fish.

PLAY AREAS

There is one childrens play area on campus, which is located at Halifax College and caters for the children living in the family housing complex on this site. The play area is inspected annually by ROSPA to ensure compliance with current safety standards.

EVENTS

The campus is used throughout the year for outdoor student events ranging from pop concerts to bicycle repair workshops. The University has a formal process for approving and managing outdoor events and encourages the use of the external environment in this respect within the parameters of making sure outdoor events do not cause a nuisance to the local community. The event management process is now controlled through the University's Health & Safety department. Probably the biggest event that takes place on campus annually is the start/finish of the Yorkshire Marathon, which has been hosted by the University every year since its inauguration in 2013.

ARTS PROVISION AND COMMUNITY LEARNING

Concerts regularly take place at the Lyons Concert Hall .Members of the community are invited to attend the dozens of concerts, lectures and learning events held on and off campus .A full programme of events taking place can be viewed at york.ac.uk/news-and-events/events

The Centre for Lifelong Learning (CLL) offers a range of part-time, open access learning opportunities to the local community, as well as a number of distance learning courses. An on-line brochure detailing courses offered is available at york.ac.uk/lifelonglearning



'Aspiration' by Bill Hodgson (2006)

SCULPTURE

There are a number of sculptures located mainly around the Heslington West campus and include works by Austin Wright, Dr Thomas Taylor, Joanna Mowbray and a Barbara Hepworth between the Lyons Concert Hall and Music research Centre. A statue of the Bhudda is also located along the side of Spring Lane, close to the Berwick Saul building. Flowers and other offerings are regularly left in the cupped hands of the statue. The most recent addition to the University collection is 'The Singing Stone', a sculpture by Gordon Young commemorating the chancellorship of Dame Janet Baker from 1991 – 2004. It was unveiled in 2015 and can be seen outside Lyons Concert Hall.

The management and maintenance of sculptures is informed both by advice sought through the University's own History of Art Department and where appropriate through consultation and assistance from Yorkshire Sculpture Park.

ART

The University has two permanent galleries on campus that host contemporary exhibitions. The Norman Rea gallery is situated on the first floor of Langwith College and hosts exhibitions from Yorkshire artists. The Roslyn Lyons gallery is located in the Music Research Centre.

A comprehensive guide to art on campus can be viewed at: york.ac.uk/about/campus/art

CAR PARKING

Parking is limited, and visitor parking is on a pay and display basis (see the campus map for locations). Parking costs £1 per hour or £6 per day, and is free at weekends and between 6pm and 8am. You can pay using coins or with a mobile phone using RingGo Cashless Parking. The RingGo app is easy to use and the City of York Council now uses RingGo across all of their pay and display car parks.

There are disabled parking spaces in all University car parks.

TOILET FACILITIES

There are no public toilets on campus however, all the college nucleus buildings and catering outlets have associated toilet facilities and these are all accessible to the public.

REFRESHMENTS

There are a number of catering outlets situated across both the Heslington West and East campuses providing a range of food styles and types. Many of these facilities are available to all campus users and not just students and staff. There are also now several coffee franchises operating across campus, from the Roger Kirk Centre on Campus West to the York Sports Village café on Campus East, including Costa, Starbucks and Grumpy Mule.

↓ *'Beyond and within'* by Joanne Mowbray (1995)



Health, Safety and Cleanliness

HEALTH & SAFETY AT THE UNIVERSITY

As with all other similar institutions health & safety is a primary consideration at the University. The University has a Director of Health & Safety and within the health & safety Department there is a health & Safety Officer who has special responsibility for the Directorate of Estates & campus Services, of which the Grounds Section is part.

The details of the universities Health & Safety Policy are set out in the Policy Statement and Arrangements Document, which can be viewed at [york.ac.uk/admin/hsas/safetynet/Health%20Safety%20and%20Welfare%20Policy%20Statement%20\(VS1%205%20-%20May%202011\).pdf](http://york.ac.uk/admin/hsas/safetynet/Health%20Safety%20and%20Welfare%20Policy%20Statement%20(VS1%205%20-%20May%202011).pdf)

Ultimately everyone within the organisation is responsible for health and safety, but day to day responsibility of health and safety within the Grounds Section rests with the Grounds Maintenance Manager. Safety of work is governed by generic risk assessments and safe systems of work. As such all work carried out should be in accordance with the appropriate risk assessment and safe system of work. Where a body of work needs to be carried out which is not covered by a generic risk assessment, a specific risk assessment will be produced for the work prior to its execution.

Working in accordance with risk assessments and safe working systems will sometimes require further control measures to be met:

1. Wearing personal protective equipment – Wherever practical all staff should have their own dedicated PPE which they maintain in good condition, reviewed regularly and replaced as necessary.
2. Acquiring safety data sheets from which to produce C.O.S.H.H assessments
3. Servicing, maintenance and inspection of machinery and keeping up to date service logs
4. Testing equipment for hand arm vibration levels and determining maximum exposure limits.
5. Providing regular staff health surveillance in respect of hand arm vibration and hearing capacity
6. Provide where necessary operator training including aspects of health & safety training
7. Measuring the angle of slopes to and making staff aware of those which cannot be driven across

8. The maintenance of records and inventories pertaining to the use of equipment and pesticides
9. Having in place suitable disposal systems according to waste streams generated
10. Maintaining satisfactory stocks of important materials for example spill kits
11. Providing satisfactory and legislation compliant storage facilities for materials such as fuels, pesticides, fertilisers etc
12. Providing a measure of job rotation for staff to limit the effects of carrying out a specific task.
13. To have documented procedures in place to deal with emergency situations which threaten people, buildings or the environment
14. To provide adequate and comfortable welfare facilities for staff to enable them to perform their duties safely and comfortably.

The University is very aware the campus is an important public open space to local residents and in response to this the University has a specific risk assessment to cover the public and other campus users. The risk assessment is available on request and covers the following topics.

SECURITY

The Security Centre is manned 24 hours a day 365 days a year. The Security department provide 24 hour a day patrols both on foot and in vehicles. There is campus wide cctv coverage which is constantly monitored from the Security Centre. The Security Service is responsible for ensuring the safety of over 18500 staff and students plus the many thousands of visitors the University receives each year. In addition we maintain security throughout a large two campus University estate of 200 hectares, and 220 buildings of diverse and often innovative design. More information on the University's Security Department and the services they provide can be found at york.ac.uk/admin/security/about-us

From a grounds perspective, the section co-operates with Security in helping to improve security of the external environment by pruning trees where they compromise the effectiveness of external lighting or cctv cameras. Shrubs and hedges are also pruned to improve visibility splays

and in specific areas which are particularly vulnerable to opportunist theft. In some locations the Grounds Section has planted shrub types such as Roses, Berberis and Pyracantha in an attempt to deter theft.

TREE SAFETY

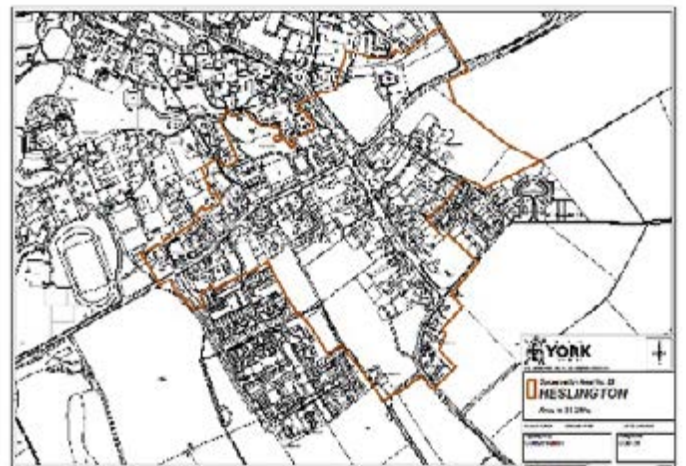
Since 2002 the tree stock on the University campus has been regularly surveyed by Arboricultural Consultant. Surveys form the basis of the on-going management of the tree stock, particularly with regard to maintaining it in a safe and healthy condition. Initial rationale was to survey all trees on a 5 yearly cycle. This however has now been refined and a 'traffic light' system has now been adopted, whereby trees are divided into red amber or green categories depending on the level of risk which they pose. In essence, a large fairly old tree in close proximity to buildings or areas of high people usage would be categorised as red. Whereas a small tree standing in an open space well away from buildings or people would be categorised as green.

Red trees are surveyed on an annual basis, Amber trees on a 2/3 year cycle and green trees on a 5 year cycle. When carrying out surveys it is good practise to rotate the time of year when they are done. This will give the consultant an opportunity to inspect trees in different seasons, which gives the broadest possible opportunity to spot problems that may otherwise not manifest themselves at other times of the year. When surveys are carried out it also gives an opportunity for the consultant to re-classify individual trees if they feel their size/condition/age warrants it.

A proportion of the Heslington West campus lies within the Heslington Conservation Area. Any work required to trees that fall within its boundary needs to have approval from City of York Council before it can be undertaken. Most tree work carried out on campus results from recommendations made within the tree survey. A copy of every tree survey undertaken is routinely sent to the Landscape Architect at City of York Council and approval for all works is sought, whether it lies within the conservation area boundary or not. This both informs the City Council about what is happening in terms of tree management and helps to maintain good planning relations. There are currently no individual tree preservation orders in force on either the Heslington West or East Campus.



↑ Landmark tree in front of Library



↑ Heslington conservation area

During 2019 a full tree survey was carried out which included all red, amber and green classified trees. The results of the survey were recorded by means of Geographic Information System mapping. This is a framework designed for gathering, managing and analysing data and will provide the University with a comprehensive data base of its trees, enabling it to effectively manage the tree stock in the future and record the management interventions carried out on all trees.

LAKES

There is no overt signage on campus that relates to lake safety or prohibitions regarding its use. Apart from Angling, recreational activities are not permitted on the lakes. Even the feeding of wildfowl is discouraged because of associated problems with pigeons/vermin and water quality issues.

Water quality is monitored in respect of algal blooms, with water samples going to the Environment Agency between April and October on a monthly basis. If algal blooms are found to be present, notices advising campus users not to have contact with the water are placed in locations around the lake periphery, but within the water to deter their removal.

In November and April every year signage is placed in the lake to warn campus users of thin ice and not to venture onto the surface.

SNOW CLEARING & GRITTING

Over the Winter period between the months of November to March inclusive, the Grounds Section operates a snow clearing and gritting service for the University. The operation consists of an early planned attendance system whereby weather forecasts are checked on a daily basis and a decision is made the previous day as to whether staff need to be at work early to clear and treat roads and paths. The system utilises the Met. Office Open Site forecast which is e-mailed to the Grounds Maintenance Manager and his assistants by 11.00am each day. This is a forecast which is site specific to the University and is considered to be the most accurate forecast information available. Grounds staff are organised on a rota basis and attend at 6.00am on days when snow clearing or gritting is required.

The work of the section is also supplemented by the use of Contractors. Roads and car parks are treated by external contractor who attend site based again on the Met. Office open road forecast. Local grounds maintenance contractors are also called in to supplement the work of in-house staff, particularly in periods of particularly bad weather or prolonged cold snaps. Information on the Snow Clearing & Gritting procedure can be viewed at york.ac.uk/admin/estates/operations/grounds/snow_clearance

↓ Wentworth College, Campus west



LITTER AND CLEANLINESS

External litter collection is now the responsibility of the Grounds Section, with 11 members of staff being employed on a full or part time basis whose duties include patrolling for litter and emptying external litter bins. Dealing with external waste is part of the overall waste management strategy and now all litter from external bins is fed into the waste recycling stream, rather than simply going into the general waste stream and subsequently to landfill. This demonstrates that the University is both committed to a clean and safe campus and pursuing its ultimate aspiration of zero waste to landfill.

A problem specific to the University is the problem of wildfowl droppings, which is a result of having two large bodies of water on campus. The Section operates a Hako 1250 Citymaster sweeper to try and keep on top of this problem and a Glutton external vacuum, which has proved very effective at dealing with all kinds of external litter from cigarette ends to discarded fly posters, including the up-lifting of goose droppings. Grounds staff are also now responsible for the cleaning of external bin bays, cycle stores and bus stops.

All University buildings are non smoking and as such smoking is now only allowed outdoors. To service this, cigarette bins are located ubiquitously across campus in areas popular with smokers and are emptied on a frequent basis by the Grounds staff.

↓ Gritter



DOG FOULING

Many local dog walkers use the University campus, however dog fouling itself is not a serious issue. Most Dog walkers stay on the periphery of campus, walking through predominantly woodland areas. University signage asks that dogs be kept on leads whilst on campus and most people comply with this request. Signage to this effect is not yet in place on Heslington East, but a programme of signage is planned, that will provide this within a wider framework of campus rules. Dog waste bins are provided on Campus East. There are several signs on Heslington East which specifically ask dog walkers to clean up after their dogs, but putting dog waste in litter bins is discouraged, as it would contaminate waste that currently goes into the recycling stream with offensive waste.

VANDALISM AND GRAFFITI

Both of these are low level problems on campus. Some episodes of vandalism are a consequence of student 'high jinx' and where these can be traced back to the culprit, fines are levied to cover the cost of repair or replacement. Most of these episodes are inevitably related to the consumption of alcohol!

Graffiti is a minor issue, no doubt because there are few places on campus which lend themselves to being used as a canvas for urban art. An external cleaning contractor is normally engaged to clean up most instances of graffiti.

↓ Member of staff operating the Glutton external vacuum



Maintenance & Resources

GROUNDS STAFF

The work of the Grounds Section now has 3 main strands:

- Grounds, Gardens and landscaping
- Grass and Synthetic sports fields maintenance
- External cleansing and re-cycling

The current establishment of staff within the section is 9 gardeners + 2 apprentices, 4 sports field staff and 12 external and re-cycling staff. Given that the University Estate is now 200 hectares in extent, as well as The King's Manor in the city centre, the number of staff is fairly modest!

The vast majority of grounds maintenance and sports fields work is carried out by in-house staff. The exceptions to this being specialist activities such as tree work which involves climbing and cutting steep grass banks. Most paving repairs are carried out by contractor, but the section is looking to take on more of this type of work by trying to recruit staff with these skill sets. A grounds maintenance specification covers the work of the grounds and the sports fields. The University also currently uses the Planon system for managing and allocating work across the different trade groups. This system also generates pre-planned maintenance (PPM) job tickets for specific tasks at appropriate times in the year, for example trimming the Yew bushes and planting seasonal bedding.

As with grounds and sports maintenance, much of the new landscaping which takes place on campus (including that associated with development and new build) is undertaken by in-house staff. There is also a model landscape specification, which covers soft landscaping aspects and this is also intended for issue to any landscape contractors that do work on campus associated with development projects.

Training is an important feature of staff development within the section. There are mandatory training requirements in terms of Health & Safety such as lifting & Handling and Fire safety. The other primary aspect of training is related to day to day work and all staff are required to undertake competence training and assessment in a range of disciplines:

- Handling & application of pesticides
- Tractor driving including reversing with trailers and operating a front end loader
- Driving utility vehicles
- Using ride on mowers
- Operating hand held machinery, such as hedge trimmers, brushcutters and pedestrian mowers

There are several other areas of work, where only a proportion of staff are trained and assessed and these include Chainsaw operation, Use of hydraulic platforms and applying pesticides through tractor mounted sprayers.

Currently the Directorate of Estates and Campus Services is working towards achieving Investors in People recognition.

EQUIPMENT AND MACHINERY

The Grounds Section owns and operates an extensive range of equipment and machinery from 4 wheel drive tractors with front end loaders to hand held battery powered hedge trimmers. A high degree of mechanisation is necessary due to the nature of grounds and sports fields maintenance and the low staff compliment in relation to the size of the estate.

All equipment is regularly inspected, maintained and serviced as required, with records being kept for all vehicles. The Grounds Section does not employ its own mechanic and so all major serving is carried out by local horticultural and agricultural engineers. Until recently, vibration testing was carried out on all hand held equipment on an annual basis to determine operator maximum exposure limits (MELs). The section has now adopted a proprietary vibration measuring system that integrates wearable and online technology to personalise

monitoring and reporting of hand arm vibration. The system works by providing a trigger accurate and real time assessment of exposure. The HAVwear is a wearable wrist device, which tracks and calculates in real time an individual's HAVS exposure and informs the operator of their personal exposure points and thresholds. Vibration measurement can also give early indications of whether a piece of equipment is in need of adjustment, repair or possibly replacement.

Many of the larger items of machinery are extremely expensive to replace and a rolling programme of replacement for large, important equipment helps to budget for this. For a large equipment purchase a business case is usually produced to justify expenditure. It is however becoming increasingly necessary to look at alternative ways of funding equipment replacement that can be accommodated within annual budgets.

↓ *Vertidrain*ing the sports pitches





OUTDOOR FURNITURE

The Heslington West campus has been under development since the early 1960s and some of the artefacts such as low level lighting and benches are still evident on campus. Over decades the quantity of outdoor furniture has increased in response to the steady increase in the number of campus users and the pressures that increased usage has brought. As a consequence there is now a broad variety of different styles of outdoor furniture around campus.

The approach to outdoor furniture in the future will be to progressively try to standardise around adopted styles and materials, particularly in respect of bollards, litter bins and obstacles such as cycle chicanes, with a preference for natural materials, including timber for bollards and natural stone where obstacles are required to control vehicle access or cycle speed.

In terms of maintenance, all external benches are now on a PPM cycle to make sure that they are primarily in a safe condition and also maintained appropriately, whether this be oiling, staining or painting.

PATH NETWORK

As with outdoor furniture, the path network around campus is made up of various different surface treatments such as loose gravel, tarmac and paving slabs. Frequent visual surveys are carried out on the paths made of paving slabs to identify and deal with any potential trip hazards. There are always issues with maintenance and delivery vehicles driving over paved surfaces, which can cause damage. The University's contractor induction process does try to address this by stressing that contractors are not allowed to drive over paved areas unless they first put down protection. Some contractors still flout this though and there is a persistent problem with supermarket delivery vehicles constantly delivering to students across campus.

Apart from vehicle damage, there is also an issue with damage to path surfaces from trees roots growing under paths and making the surface heave. This is difficult to remedy in the long term, and certain instances may demand the removal of tree roots to prevent future re-occurrence, in turn affecting the health and stability of the

tree. In instances like this the action taken will be decided in view of the individual set of circumstances prevailing.

As part of overall Estates Strategy, the campus path network is being considered in the context of future usage patterns. It is intended that paths will be categorised as:

- Pedestrian only
- Shared paths for pedestrians/cyclists and University utility vehicles
- Shared paths that contractors will also be allowed to access for maintenance purposes



↑ *Roses are white, Heslington, Campus West*

↓ *Campus path network, Heslington west campus*



SPORTS FIELDS

The current standards of the grass pitch playing surfaces is very good and has been for some considerable time. The objective in managing the sports fields is to maximise the playing capacity for all grass surfaces, but at the same time making sure that the standard of the pitches produced do not deteriorate through over use. This is an issue because currently the demand for student sport (Most notably football) is not fully satisfied, as many of the colleges would like to field several teams and not just 1st and 2nd teams.

The maintenance of the pitches is largely governed by the maintenance specification, although the exact timings of maintenance operations is very often governed by the weather. A primary objective of maintaining the sports fields is to produce grass surfaces that are safe to play on. As such intensive maintenance is often required to produce a true playing surface which is not going to present an obvious hazard to the pitch user.

Going forward, the maintenance of the sports pitches will concentrate on maintaining or improving where possible the current standards. This will be achieved through a combination of keeping up to date with the latest products and techniques through training and recruitment of staff and investment in the right equipment necessary to do the job. By its nature the maintenance of grass sports pitches probably involves the most intensive use of pesticides and chemicals of any of the work carried out by the section. As with other areas of maintenance the intention will be to limit this where possible by substituting cultural for chemical controls and the greater use of organic fertilisers.

Although the grass sports pitches are maintained primarily for student and staff use, there is an element of external use of the pitches from outside clubs and the community generally. For example, there are many summer schools offered by the University to local children during the summer holidays and the sports pitches are often used in conjunction with these. Community relations and involvement will be continued to be encouraged through making the pitches available when possible to outside user groups.

The biggest event in the sports fields calendar is Roses. The Roses Tournament is an annual sports competition between Lancaster University and the University of York in England, and is the largest inter-university sports tournament in Europe. It is organised by their respective Students' Unions,

YUSU and LUSU. The competition is held every summer, alternating its venue between the two universities.

The first event happened on 15 May 1965 after the Vice-Chancellor of York, Lord James of Rusholme, suggested a boat race between the two universities. The students amplified this idea and held a 3-day event with a variety of sports: rowing, table tennis, relay race, mixed field hockey, and tug of war. The winner of each of the sports received two points, and the losing vice-chancellor presented a trophy to the winning university. The event has continued to increase in size since its founding, with new events added every year (2004 had 37 different sports). Live coverage of the event is broadcast every year by a joint collaboration between the two university's student television stations YSTV and LA1:TV, and its two student radio stations, Bailrigg FM and University Radio York. The importance of non-sporting social activities at the event has also been increased, with organised events on the Friday and Saturday evenings.

The University has 40 acres of grass sports pitches, which includes 9 football pitches, 2 Rugby pitches and 3 Cricket tables. In addition to these more traditional sports the grounds staff also prepare playing surfaces for sports such as Lacrosse, American Football, Rounders, Softball and even on occasion Quiddich ! In 2018 a total of 343 games of football were played, which is an average of just over 38 games per pitch. The two Rugby pitches accommodated over 50 games, while the 3 Cricket tables accommodated 96 matches between them.. This intensity of use demands a high degree of skill and care in terms of their maintenance. It also means the Sports Fields Manager has to exercise astute judgement when it comes to deciding whether pitches are fit to play in periods of inclement weather. Being able to balance the demand to play with the knock on effects of using a pitch when surface conditions are inappropriate is an important factor in perpetuating grass pitch quality.

Environmental Management and Sustainability

The aims of the University's sustainability policy are as follows:

- To embed sustainability in the institutional culture
- To achieve widespread recognition for best practice in sustainability
- Enhance biodiversity and minimise its environmental footprint

The key overall objectives of the long term management of the University environment are to ensure that:

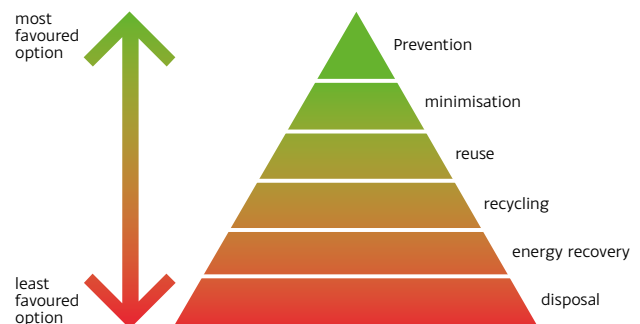
- The long term interest of nature conservation and the Landscape Structure is safeguarded
- Existing wildlife habitats as well as new habitats are conserved
- A sustainable and environmentally friendly approach is adopted where possible for all operational and maintenance activities
- Vegetation is controlled to maintain a safe environment for campus users
- Integration with Biodiversity Action Plans (BAP), both local and national as appropriate
- The reuse and recycling of materials and waste products wherever practical
- The use of energy conservation, pollution reduction and resource conservation measures
- The minimisation of pesticide use
- The achievement of high horticultural, arboricultural and ecological standards.

RECYCLING

The ultimate aspiration of the University is to minimise the quantity of waste created, with the limited waste being sent for sustainable waste treatment, sending zero to landfill (we have already achieved zero to landfill for our main wastes). The journey towards this starts with a look at what happens to our current waste in terms of collection and disposal. Our aims are to improve the levels of recycling and to move the remaining waste higher up the Waste Management Hierarchy.

2011 recycling levels were calculated to be around 29%. In 2015/16 The University recycled and composted 57.6% of its waste, with less than 1% being sent to landfill, but as you would expect, the aim is to recycle much more

Studies have shown that this mixed method increases the amount of recycling typically by around 25%. Mixed bins make it simpler and easier for user to recycle and it's easier for the waste company to collect and transport the materials.



By taking out food waste and waste to be recycled, the levels of residual waste should drop dramatically but will still remain a large percentage of total campus waste. This will go to our contractor to be sorted. Any materials that can be recycled will be removed and any remaining waste shredded and sorted into fine aggregate materials or refuse-derived fuel. This will move our residual waste higher up the Waste Management Hierarchy.

Staff from the Grounds Section play an important and active role in helping the University to manage its waste streams. As mentioned earlier in the Health, Safety and Cleanliness section, the grounds staff are responsible for all the external litter collection, but in addition to this, grounds staff are also heavily involved in recycling waste, making bulk collections of scrap metal, wood, furniture, cardboard/paper and electrical goods across campus and making sure the waste goes into the correct stream for collection/re-cycling. This has helped to contribute to improved recycling rates over time.

COMPOSTING

For many years now the Grounds Section has been shredding and composting the green waste generated from grounds maintenance activities. Until early 2018, green waste was stockpiled for several months until there is a sufficient quantity for a large shredder to be hired in for a day. Once shredded, the material was turned on a regular basis to aid the composting process, after a year to eighteen months the shredded material is then screened in a large rotating drum, with any remaining coarse material being filtered out for re-shredding and the remaining material forming a soil improver for use around the University campus.

Unfortunately there has always been a contamination issue with Himalayan Balsam and despite efforts to eradicate the problem, it has so far proved impossible to eliminate it entirely. This in turn has limited the amount of self generated composted green waste that has been able to be used around campus. In 2018 the University came to an arrangement with its waste management contractor, whereby green waste is now placed into a bulk skip and transported off site for shredding and composting. In return the University receives from the waste contractor an annual quantity of composted green waste, equal to that taken off site. This compost is guaranteed weed free and as such can be used freely and extensively across campus as a mulch and soil improver.

↓ Compost, on campus 2017



PESTICIDE AND CHEMICAL USAGE

It would be incredibly difficult to maintain an estate the size of the University without the use of herbicides. However, where practical it is the policy of the Section to substitute the use of a chemical control with that of a cultural control. Where herbicides are used it is also policy to limit use to those chemicals which have a low or no hazard rating at all.

As well as operator and campus user considerations it is important from an environmental viewpoint that herbicides are used sensibly. For example a lot of surface run off from the campus may ultimately find its way into the lake and as such the use of residual herbicides, which might enter the lake and begin to concentrate there would be inappropriate.

As a point of interest, at the time of the revision of this document records showed that whereas 803 hrs pa were spent on cultural/mechanical methods of weed control, only 297 hrs pa were spent applying herbicides.

Fertilisers are still used on the grass sports pitches to a degree, but the availability of the Sections own composted green waste, has the potential to limit the need to use compound fertilisers. In the landscape context, the use of fertilisers other than proprietary organics such as pelleted poultry manure has ceased.

THE USE OF PEAT

The Grounds Section no longer buys or uses peat based products for horticultural purposes. Peat free tree planting compost is frequently used, but the emphasis is increasingly on substituting this with soil improvers derived from our own green waste recycling operation. Planting borders are mulched with processed bark or wood chip which has been generated from campus through tree work operations.

It continues to be difficult to avoid the use of peat when ordering in plant material from nursery stock producers. Over time however it is hoped that peat usage in this regard can be reduced through consultation with preferred suppliers.

WATER CONSERVATION

The Vale of York is not an area of high rainfall, being in rain shadow from the Pennines. Nonetheless, the amount of watering carried out as part of grounds maintenance is superficial to say the least. There isn't a great deal of Summer bedding planted out and although much of it is in tubs, irrigation water is obtained from the lake and water retention granules are incorporated into the planting medium. There are no hanging baskets at all around campus.

When planting trees, it is standard practise to incorporate water retention granules into the backfill and a watering tube into the tree pit. Mulches are routinely used on new and existing shrub planting to help conserve moisture as well as suppressing weed growth.

TREES AND WOODLANDS

In addition to Health & Safety considerations, the intention of carrying out tree surveys is to manage the tree resource to perpetuate it. A broad age and species range is required to make sure the tree stock does not reach over maturity and start to decline all at the same time. The surveys also provide information in this regards and thus helps in structuring re- planting policies.

Many trees have been planted in various sizes ranging from whips to semi-mature trees, as part of landscaping around new buildings, woodland management and general improvement to the landscape. The objectives underpinning current and future tree planting programmes are as follows:

1. To provide a second generation of long lived native broadleaves within the wider landscape to provide a long term framework tree canopy. This was a recommendation made in Hal Moggridge's Strategic Review in 1992 and is still pertinent to the management of the tree stock. However the planting of large growing, dense canopied trees needs to be avoided close to buildings, especially species which develop structural weaknesses as they mature and are therefore prone to bough breakage and fork failure, for example Silver and Norway Maples, Horse Chestnuts and London Planes. There are significant populations of these species which have been planted close to buildings, paths, roads and car parks and which now present problems in monitoring and management.
2. To increase species diversity – different species have differing life spans which serves to even out peaks and troughs in the overall life cycle of the tree population, ie not all trees decline at the same time leaving a void until the next generation matures. Coupled with this, a broader species range mirrors the university's function as an institution for learning, which contains a high quality and successful Biology department.
3. To introduce more evergreens into the landscape
4. To move away from species such as willows & Poplars which decline as rapidly as they mature. Again Willows & Poplars dominate areas of the campus. These species are prone to wind damage resulting in splitting and bough breakage and like the species listed above now represent problems in monitoring and management.
5. To plant more smaller ornamental/exotic subjects in and around buildings and paths for campus users to appreciate characteristics such as flower, fruit, scent, bark patterns etc. Small ornamentals also pose a much reduced risk to buildings and people
6. To reinforce the stock of native species to attract a diversity of wildlife.
7. To compensate for the loss of trees through the continued development of campus and those highlighted for removal by the survey itself.

The GIS mapping format used for helping to record tree survey information has recorded more than 5000 trees across campus (excluding the woodland blocks on campus east). This figure represents a threshold at or above which the University aims to keep the campus tree population in the future.



↑ On campus, University of York

Together, the above will also serve to improve the 'Livability' of the campus by reducing pollution, dampening noise, softening architecturally impoverished buildings and generally introducing a 'Feel good' factor – sensible and appropriate management is needed to achieve this in the long term.

Prior to development the Heslington East site was primarily agricultural land comprising many large open fields. Apart from around the periphery of site there were few mature trees, which has in turn meant there are virtually no large mature trees close to buildings, paths or car parks. Having very few trees in high risk locations simplifies the management of the trees considerably. In Summer 2007, the University commissioned a survey of existing trees and hedgerows on the Heslington East development site. Trees were categorised by an Arboricultural Consultant using the British Standard 5837: 2005 '*Trees in Relation to Construction – Recommendations*' which identifies the quality and value of existing tree stock to inform decisions on tree removal or retention during development.

Future management of the mature tree stock will involve periodic surveys to monitor the health and vigour of the trees. Maintenance work will arise from the recommendations made within these surveys, with approval for all recommended works being sought from the planning authority and subsequently carried out to suggested timescales.

It is probably true to say that to some degree or other there is a perpetual element of development or refurbishment taking place on campus. Depending on the level/intensity, it puts the landscape under pressure, particularly the most obvious and identifiable element of the landscape ie trees. With the impending embarkation on the latest alliteration of the campus masterplan, it is important that a clear policy is in place to protect trees and to that end the procedure 'Trees in Relation to Design, Demolition and Construction at The University of York' sets out measures expected to be put in place to protect trees that are affected by development. The procedure is intended to act as a guide for both project managers and contractors.

Currently all woodlands on campus are surveyed on a 3 yearly cycle. Several of the woodland areas on Heslington West are covered by blanket tree preservation orders and as such it is essential that any work carried out on the trees within these woods has the consent of the local planning authority (City of York Council).

Woodland management is driven by usage. The woodlands on the periphery of the campus are first and foremost amenity areas used mostly by local residents. As such the primary management objective is to ensure the trees therein do not present a hazard to users. Both the woods along Windmill Lane and around the Chemistry car park have had extensive work carried out in this respect and

further woodland areas have been assessed as part of the recent survey.

Although Health & Safety is the first consideration, one of the most important aspects of the woodland management strategy should be to manage the woods in such a way as to promote and attract a variety of wildlife. To this end it is policy that following tree work as much wood as possible is left within the woodland, either as standing or felled trunks, log stacks and any brash chippings generated used to re-enforce woodland paths.

Re-planting considerations centre on maintaining the character of the woodland by re-enforcing the species already present and helping to perpetuate the woodland by supplementing natural regeneration. Also, by introducing a broader range of species, woodlands can be improved in characteristics such as broadening habitat range, introducing flower and evergreens and generally strengthening the woodland under storey.

Within the landscape buffer zone on the Heslington East campus there are many areas of woodland block planting of various sizes. The primary species are Oak and Ash, but each block contains a broad mix of native species. planting comprises species of tree, shrub and field heights offering a multi-layered environment into which deadwood piles, roosting and breeding boxes can be introduced.

The plants within the woodland blocks have initially been protected from grazing animals with plastic shelters, with bio-degradable mulch mats placed around the base to exercise some degree of weed control around each plant.

Over the first 5 or so years of development, maintenance involved periodic inspection of the planting blocks, whereby guards and shelters will be adjusted where necessary together with the spraying of a non selective systemic herbicide around the base of plants to keep them weed free. Herbicide spot treatment will also take place to prevent the encroachment of non-desirable species such as Sycamore.

Plant losses will also be monitored and if necessary replacements planted to ensure the species mix is maintained as originally planted.

Once the canopy begins to close, it will probably be necessary to carry out selective thinning to improve the woodland structure. At the same time and once more typical woodland conditions begin to develop the

ground flora will be assessed to determine the rate of colonisation of woodland herbs. If this has been poor, introduction of native species through seed and pot plants will be conducted.

DIAMOND WOOD

The Woodland Trust chose the 60 acre site of Kimberlow Hill on the Heslington East development as one of 60 Diamond Woods in the UK to celebrate the Diamond Jubilee of Her Majesty Queen Elizabeth. It forms part of an initiative by the Woodland trust to plant six million native trees across the UK under its Jubilee Woods project to provide a living legacy to celebrate Queen Elizabeth's reign. As Patron of the project, Princess Anne planted a ceremonial tree at the wood in September 2012 to officially declare it open.

So far on the Heslington East site the University has planted 70,000 native trees, of which over 30,000 will form the Diamond Wood. Together they will form a mixed deciduous woodland, which will attract a broad range of insect and bird life and develop an interesting woodland ground flora. It is the only Diamond Wood in North Yorkshire and as well as supporting a wide range of wildlife it will provide an attractive amenity for the local community to enjoy.



↑ *Diamond Wood, dedicated by the Princess Royal in 2013*



Grass and Meadowlands

On a 500 acre campus, where only just over 20% of its footprint is occupied by building/hard standing, a large proportion of the remaining area is made up of grass. As such grass is an important component of the campus landscape and offers a range of possibilities in its management and treatment.

In specific areas it is appropriate to manage the grass sward reasonably intensively, for example around Heslington Hall and within the Vice Chancellor's Lodge garden. The aspiration in these areas is to improve further the condition of the sward and as such it is anticipated that operations including fertiliser application, scarification and top dressing will be increased in frequency. The maintenance of both high and general amenity grassed areas is documented in the grounds maintenance specification.

There are several large areas on the periphery of the campus, or under extensive areas of trees that are left uncut for the duration of the growing season. The primary objective here is to encourage biodiversity, but it also has the benefit of saving time on maintenance.

There has for some years been an on-going programme of grassland bulb planting and this will remain an integral part of future grassland management, as it give a high visual impact for minimal outlay. Many of the grassland areas chosen for this treatment will be under trees and on slopes and as such represent an attempt to save time on cutting these areas, which are by nature more difficult. Further mixtures of bulb and wild flower plantings will also be made in areas which abut the lake. These will typically have a water side association, for example Snakes head Fritillary, Cowslip and Lady's Smock. In recent years special biodiversity mixtures of bulbs have been mass planted in several areas on campus. These mixtures provide a successional flowering display for several months during the spring and help to provide an early season food source for bees and other pollinators.



↑ Bee orchid

← Bulbs, naturalising under trees

SPECIES POOR HAY MEADOW

As part of the earth works on the new Heslington East campus there has been a great deal of mixing between sub soil and top soil in an attempt to reduce the high nutrient levels (particularly Phosphorous). This has taken place because before development the land was in agricultural use and thus highly fertilised. The problem with nutrient rich soil is that firstly it does not favour the development of species rich meadows and secondly nutrients leaching out of the soil in ground water will end up in the lake which would adversely affect the water ecology. As part of the nutrient management programme, species poor hay meadows are being sown down within the buffer zone landscape, with a seed mix intended to take nutrient from the soil year on year until eventually conditions should become more favourable for species rich meadows, but it is impossible to say over what timescale this will prevail.

In the short to medium term the species poor meadows will be managed by cutting annually in early to mid August. The grass meadows are cut by a local farmer as a hay crop, thus removing the vegetation and as a consequence, hopefully reducing nutrient availability within the soil. In the long term it is expected that by managing these grassland areas on this basis, nutrient levels will fall to a point where wild flower species can be introduced.

↓ **Figure 1 Hay Rattle is a parasite on grasses helping favour conditions for wild flowers**



SPECIES RICH HAY MEADOW

One of the main aims of the landscape development on Heslington East has been to create species rich hay meadows similar to those described in the National Vegetation Classification. These grasslands normally occur on nutrient poor clay-loam soils and are usually grazed after being harvested. The existing top soil on site was nutrient rich and as such unsuitable for the creation of species rich hay meadows. However nutrient levels are substantially lower in the sub soil and as large amounts of sub soil were available from the earthworks, this was subsequently applied to the top soil in the Western Buffer zone.

Once established the species rich meadows will be cut twice yearly in March and then again at the end of July once the annual species have set seed. As with species poor hay meadow, a local farmer will cut these areas and take off a hay crop.

Perennial weeds such as Ragwort will be controlled by herbicide spot treatment during late Spring.

Excessive grass development will be controlled by sowing Hay rattle in Autumn which will locally inhibit grass growth giving less aggressive species a chance to colonise.

Periodic monitoring of the vegetation sward will take place to ensure its compatibility with the national vegetation classification. If species do need to be re-introduced, this will probably be done by plug planting.



↑ Cornfield Annuals



↑ Shrub Beds

CORNFIELD ANNUALS

Within the buffer zone landscape in high profile locations, areas of cornfield annuals (Poppies, Corn Marigolds & Cornflowers) will be sown. As these plants need cultivated ground to grow, the initial establishment regime will be an annual iterative process as follows:

Applying non selective herbicide to the area to kill perennial weeds.

Prepare the ground by harrowing to create a seed bed into which seed mix is sown. Roll the soil to ensure good contact between seed and soil.

Cut down vegetation in September after seed as set to make sure ripe seed is dispersed widely.

During autumn, plough or rotovate the area and sow an additional amount of seed to supplement the natural seed bank.

SHRUB BEDS

As with grassed areas the management of shrub beds is outlined by the maintenance specification, which details the various maintenance operations to be carried out throughout the year. Additional to the maintenance, there are however several additional strands to the on-going management of shrubbed areas on campus. Wherever possible it is intended that weed control within shrub beds is of a cultural nature and as such extensive use of wood chip as mulch will be employed along with ground cover shrubs. It is envisaged that most of the wood chip used on shrub beds will have been generated on campus, but it will be occasionally necessary to buy in wood chip from local tree surgeons.

Shrubs beds have a finite shelf life and part of their management aims to renew or regenerate ageing or moribund shrub beds. In the process of doing this there is scope for the introduction of more botanical interest into new plantings. This sits well with the notion of an international university with a cosmopolitan population of staff, students and visitors, which is to some degree reflected in the plants used from around the globe. The reverse side of this ethos is however encouraging biodiversity through the selection of shrubs and plants used and within this native species fauna are obviously encouraged by native flora. As such there is a balance to be struck with plant selection.

With biodiversity in mind, several shrub/flower beds designed for Bees and Butterflies by using those species that are known to attract them have now been planted around campus. More bee friendly plantings are likely in the future, as awareness of biodiversity continues to grow amongst staff and students, through initiatives such as One Planet Week and Green Impact whereby the University aims to raise awareness of sustainability issues including biodiversity.

SEASONAL BEDDING

The maintenance of seasonal bedding is detailed in the maintenance specification. Due to the labour intensity associated with it, seasonal bedding will be limited on campus to those areas where it will have highest impact. Also because of the potential water requirement to establish Summer bedding, these areas should where possible be close to the lake, so that water can be drawn directly from this source to irrigate bedding if needed. Although carefully designed seasonal bedding displays can be extremely attractive, in some senses there is little point having a great deal of it during the Summer when the campus is generally quieter and not as many people are around to appreciate it.



↑ Seasonal Bedding

HEDGES

The maintenance of hedges around campus to a large degree driven by H&S considerations, such as making sure they do not provide a hiding place for undesirables and maintaining sight lines around roads and car parks. The management of hedges is generally set out in the maintenance specification, but where possible hedges will be managed to encourage wildlife and to act as corridors connecting habitats.

Hedges will by and large only be cut outside of the bird nesting season. Where H&S considerations dictate otherwise, before trimming the hedge will be checked along its length for signs of nesting activity and where any is found, that section of hedge will be left undisturbed.

Where it is possible the intensity of management will be relaxed, which should allow the hedge to afford more shelter and provide a greater food source.

Where new hedges are planted, a variety of native shrubs will be used to make the hedge as attractive as possible with flowers, Winter berries and good autumn colour, but also provide as rich and diverse a habitat as possible.

On the Heslington East campus work will be undertaken to restore and establish good-quality hedgerows which are rich in native woody species. Existing hedgerows will be retained where possible and protected from construction activities where necessary. Gaps in existing hedgerows will be planted with a diversity of native woody species. New hedges will first be cut six years after planting and then on a yearly basis thereafter.

PROBLEM VEGETATION

There are on campus problems with some non native invasive weed species, particularly Himalayan Balsam and Ragwort. The management of Himalayan Balsam is intended to try to systematically eradicate it altogether from campus over the course of the next several years. This will be achieved through an integrated programme of cultural and chemical control and will involve additional help from volunteers and conservation groups from both inside and outside the University.

Although Ragwort is a noxious and notifiable weed species, the ethos will be to control rather than completely eradicate it from campus. Control will mainly be achieved through mowing and hand pulling, but this will be supplemented by the use of citronella oil. Ragwort needs to be controlled to prevent it spreading into neighbouring grazing land, however it is quite a useful plant from a biodiversity point of view, providing a food source for many insects and is the host species for the Cinnabar Moth Caterpillar, which controls the plant in any case as it feeds on it.



↑ Cinnabar Moth Caterpillar on Ragwort



Lakes and Associated Water Features

Water is a unifying theme across both the Heslington West and East campuses. Indeed in some respects it could be said that water is the dominant feature of the landscape. In any case it is very important to the feel and character of the external environment.

Both lakes form an integral part of surface water management, acting as large balancing ponds and providing flood attenuation. The lakes do however differ in several respects:

- The new lake on Heslington East is twice as big in surface area as the Heslington West lake and to a large extent is twice as deep, which makes it a much larger body of water altogether.
- The lakes occupy differing geographical locations within the landscape. The lake on Heslington West is very much at the centre of the landscape, whereas on Heslington East the lake sits along the Southern margin.
- Heslington West lake is half a century old, whilst Heslington East was created within the last 10 years.

The differences above translate into lakes with different characters and eco-systems, which in turn demands a differing management regime for each.

The Heslington West lake which was constructed in the 1960's as an extension to the original top lake which originally formed part of the grounds of Heslington Hall. It has an area of 53,461sq/m or 13.2 acres and a capacity of 68,663 cu/m or c. 14 million gallons. The theoretical average water residence time is 78 days. The lake was constructed to act as a balancing reservoir for surface water drainage. The following is a quote from the original development plan: "Improvements of the land drainage will produce a considerably increased speed and quantity of run off of rain water from the site. This together with the increase in paved areas and roofs which the university development will produce could be such as to overload the existing drainage system.....if the lands drainage is improved.....the present storage capacity of the permeable ground will have to be replaced by some form of balancing reservoir.....We recommend that this reservoir should in fact be a surface reservoir and that virtue should be made of this necessity by designing it as a lake and integrating it with the landscape design as a

← *Flag Iris*, growing in the lake margins



↑ Heslington West Lake

whole” The development plan went on to state, “Although it appears that the rate of change of the water will be low, we do not anticipate that this in itself will cause its condition to become objectionable in any way. Water stored in a lake even if not changed improves in quality bacteriologically providing it is not subject to pollution”.

In hindsight, the optimism of the development plan does seem a little short sighted. Water quality depended on a balanced ecosystem being maintained and pollution being avoided, but no account taken of factors such as inputs of leaf litter, waterfowl excreta, detritus from storm water drains, or the fact that most of the surface water drainage system is not protected by oil interceptors. Subsequently 40 years on we have a lake with water quality which is severely degraded and as such does not fulfill its potential as the focus of the campus landscape. The key issues for the future management of the lake are therefore the problems of nutrient enrichment, a stressed/unbalanced ecosystem and aeration.

NUTRIENT ENRICHMENT

The primary sources of nutrient enrichment are waterfowl excreta, leaf litter, ground water and to a lesser extent unconsumed food fed to wildfowl by campus users. For several years now the grounds section has been trying to establish reed beds in specific areas of the lake to act as bio-filters. Beds of Norfolk Reed (*Phragmites australis*) have been proven to significantly reduce nitrate loadings on a long term basis, but establishing them in the lake has proved very difficult due to the damage caused to the plants by grazing waterfowl. Despite this difficulty, continued efforts will be made to establish reed beds and other species of marginal and emergent aquatics, as all vegetation of this nature will help to pull nutrients from the water and will also add to the aesthetics of the largely sterile appearance of the water.

Since the excavation of the lake approximately 300mm (1 Foot) of silt/detritus has accumulated on the lake bed, this represents approximately 25% of the water depth! Over time all bodies of water have a natural tendency to silt up and return to land and given long enough this would certainly happen to the university lake. To partially mitigate this it is proposed that the lake is seeded in sections with hydrated lime which will help to de-acidify the bottom sediment. By raising the pH of the sediment, bacterial action should be stimulated which should help to breakdown the organic content of the silt thus reducing its depth. Although the mineral content of the sediment will remain, it should mean there is less available nutrient to be constantly stirred up and recycled within the lakes ecosystem.

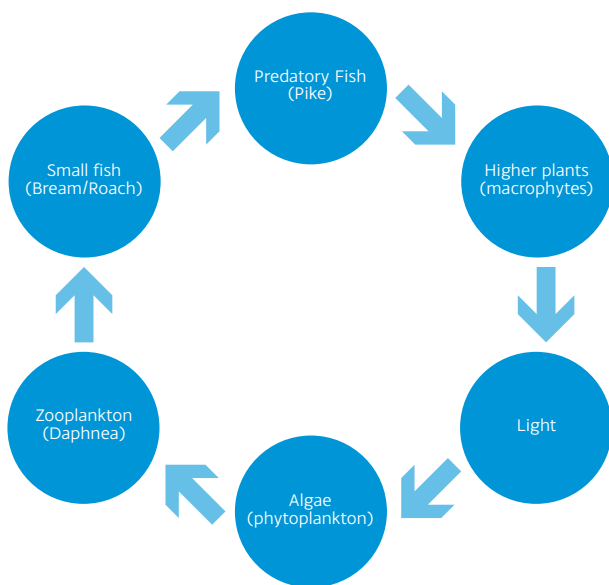
UNBALANCED/STRESSED ECOSYSTEM

The Campus West lake is impoverished in 3 elements of this balanced system :

Predatory fish

Higher plants (macrophytes)

Zooplankton



Each are affected by the other

Too few predatory fish leads to too many small fish, particularly Bream which are heavy grazers of zooplankton. This in turn means that zooplankton levels are severely depleted. Zooplankton feed on phytoplankton but, as zooplankton are largely absent, phytoplankton flourishes making the lake water turbid. This means that sunlight cannot penetrate very far down the water column, so any emergent aquatic vegetation will not have enough light to establish and photosynthesize.

Higher plants are extremely important to the ecology of a water body. They act as a buffer against phytoplankton by using up available nutrients and they also provide important habitats for zooplankton and young predatory fish, as they provide cover from other predators.

In short, restoring the balance of the lakes ecosystem should help to improve at least the water quality in the lake. One way of doing this would be to introduce an



↑ Large carp, a common site in Campus West lake

effective predatory species into the lake, namely Pike. This would eventually bring down the small fish population, but numbers of Pike may eventually proliferate to unacceptable levels.

In the past, an alternative to the biological control route has been to manipulate the fish population by some other means for example netting and removing fish on a regular basis. More pro-active management of the fishery theoretically had several benefits. Firstly the removal of a proportion of the small fish population will help to balance the ecosystem. But there is also the potential to remove from the lake, proportions of particular species that are known to be bad for the lakes ecology. Both Bream and Carp together have been identified as a trigger for turning a water body to a eutrophic state. Carp feeding activity disturbs sediments uproots plants, mobilises nutrients in the water and increases turbidity. Bream also forage bottom sediments and young Bream also graze heavily on zooplankton. Control of both species by netting and removal would certainly be both beneficial to the lake and provide a saleable product at the same time!

Prior to removal, health checks have been carried out on the fish population by the Environment Agency and they have been found to be clear of all parasites and disease,

which means they can be sent to any other body of water. The Environment Agency have been engaged to net and remove fish from the lake and offer them for sale to other angling associations. The services of the Environment Agency are free, but they would take 10% of the fish caught for their own use in establishing or supplementing other fisheries which they manage.

Additionally, removing some of the larger fish, particularly Carp and Bream would reduce competition for food within the remaining fish population. Smaller fish may then increase in size and in turn become saleable. The finances generated by managing the lake in this way could provide money towards future management objectives.

Manipulating the fish population of the lake in this way should help to re-balance the ecosystem of the lake. Fewer small fish will allow zooplankton to re-establish which in turn should feed on and reduce algal growth. Together with this bio-manipulation, the continued introduction of higher plants should be carried on, as this will benefit the lakes ecology in the ways previously outlined.

Over the very recent past however, appears that other forms of biological control are starting to have a marked effect on the fish population in the Campus West lake. Piscivorous birds such as Heron, Grebe and Goosander are frequent visitors to the water, but coupled with that, there is also strong evidence that an Otter has been present in the lake on several occasions, with the regular discovery of the remains of partially eaten large fish such as Carp and Eel.

AERATION

Available oxygen can fluctuate widely over a 24 hour period, as well as seasonally. Oxygen depletion will lead to fish kill and bad odours, which manifest particularly during hot weather. Introducing aeration therefore has several marked beneficial effects. It can help to condition the sediment on the bottom of the lake by helping to change its state from anaerobic to aerobic so the lower water column is no longer stripped of oxygen. This will help in the oxidation of the organic element of the sediment helping to reduce its depth and getting rid of nutrients contained therein.

Progress in this direction has already been made with the installation 15 years ago of an internal water circulation system, which utilises both Langwith and Spring lane weirs.

Although not achievable from operational maintenance, there may at least be the long term possibility of obtaining water from a borehole. If it were initially possible to use water from such a source for cooling purposes, say within the Chemistry department before discharge to the lake, then it may make the suggestion more feasible. A constant/frequent throughput of water would certainly help increase oxygenation within the main water body.

Again the establishment of emergent and marginal aquatic plants will also help to oxygenate the water, as oxygen is a bi-product of photosynthesis.

N.B. The oxygenating capabilities of the fountain are only localised. It is also possible that during the Summer at least it's effect may be counterproductive. This is linked to the scientific law of the solubility of oxygen in water being inversely proportional to the water temperature - ie as the temperature of the water rises, the solubility of oxygen decreases and vice versa.

OTHER LAKE MANAGEMENT ISSUES

Bank side maintenance is urgently needed in several areas of the lake. The shore line has eroded considerably over the last 40 years or so. In some places erosion has been stabilised by lakeside tree roots and this can give a perfectly acceptable natural appearance. There are other areas however where the lake margin requires reconstruction together with a suitable method of reforming the lake edge. Interwoven Willow pegs could be used in this situation, or a system timber pegs, brushwood faggots and pre-planted coir fibre rolls.

Unfortunately it is the case that the lake currently has very little protection from potential pollution sources entering the storm water drainage system and there have been significant pollution instances in the past. From even general observation it is evident that on a very regular basis films of oil (Whether vegetable or mineral) can be seen floating on the surface of the water somewhere on the lake. The installation of oil interceptors to protect surface water discharges into the lake must be a high priority. Presumably all recent capital project work will have incorporated this measure

RECOVERY PLAN

Having identified the problems which exist with the lake as it currently is, the next step is to determine the actions necessary to bring about an improvement in its current state. The information above relates mostly to how the lake may need to be managed on an on-going basis, which should hopefully over time bring about some condition improvement. There are however some fundamental problems which cannot be managed out in this way and which demand a more ambitious course of action.

To begin with, the main lake body is far too shallow and this is one of the root causes of its current condition. Furthermore, the lake is progressively getting shallower as sediment and detritus build up on its bed. It has already been suggested that one way to mitigate this is to seed the lake bed with hydrated lime. This however will not reduce the build up of mineral deposits on the bed and in time (Possibly now) serious consideration needs to be given to dredging the bed of the lake completely.

Prior to this being carried out, it must first be established where the arisings (Which will be considerable in

quantity) can be disposed of. A possibility may be to spread it on the agricultural land of the Heslington East site before it is developed. As a precaution however, it may be wise to have the sediments tested to make sure they do not contain any contaminants that would adversely affect the land on which the silt was spread or which would leach out into the groundwater.

In order to dredge the lake, it is recommended that it is first drained down completely, which would necessitate the relocation of the University's waterfowl. This would have to be done in consultation with the Wildfowl & Wetlands Trust. It would also necessitate the removal of current fish stocks, which could be health checked and sold to neighbouring Angling Clubs.

Draining the lake would also allow for the old defunct butyl liner to be removed and would provide for the additional opportunity of re-excavating the central channel of the lake bed to make it much deeper than it currently is. This would provide considerable benefits to the long term ecology of the lake and would offset the need to re-dredge the lake for a long time to come.

It is possible that following this, the lake may need re-sealing with puddled clay and then allowed to refill. The shallow areas left around the lake edges should then be replanted with marginal and emergent aquatics, which will require protection in the short term until they are well established and can withstand disturbance from the re-introduced waterfowl population.

It is suggested that fish are not introduced back to the lake straight away, but are allowed to re-colonise naturally, with eggs brought in on the feet of transient waterfowl.

A second alternative may be to undertake an abridged recovery plan that could prove satisfactory in the short to medium term. Such a plan would concentrate on the dredging of locally bad areas and the reforming of parts of the bank that have suffered badly from erosion since the lake was constructed. Campus west lake measures approximately 42,000m² and therefore contains a significant volume of silt. An average of 1ft silt over the whole lake would equate to over 12,500m³ of silt. Therefore the biggest hurdle to removing the silt would be finding enough space to deposit the silt.

When deposited on land, silt can generally be 'stacked' at about 0.2m-0.3m high, so would potentially need an

area between 40,000-60,000m² to store 12,500m³ of silt, as such it would be very difficult to have the whole lake dredged in one operation. The alternative approach would be to target the worst affected/priority areas and then other areas of the lake can be de-silted on an ongoing basis as and when suitable space is available for it to be deposited.

One area designated for silt disposal was the woodland near the Astrocampus which may be able to take between 600-900m³ depending on the exact dimensions of the land made available. The silt deposited here could be left in situ and added to at a future date once it has dried out, or it could be taken away and deposited elsewhere on the estate once dewatered.

Another option for silt disposal is to install a Nicospan membrane at various points in the lake. Nicospan is a semi-permeable membrane installed in the lake with wooden posts. Silt is then backfilled between the existing banks and the Nicospan fence line. This serves two purposes; firstly it acts as somewhere for silt to be deposited and secondly it strengthens existing banks, particularly useful for those that are eroding. Large stretches of the banks on the campus lake are suffering from significant erosion, a Nicospan fence line would reinstate the bank lines to any desired shape and would prevent further erosion.

Any silt that is removed and not deposited behind Nicospan fencing or in the woodland by the Astrocampus would need to be taken elsewhere on site, most likely in dumpers/trailers.

There are areas of the lake that have good water depth and do not need dredging – the benefits of de-silting these areas would not outweigh the cost when there are other areas that need more immediate attention.

TOP LAKE

From an ecological point of view, the top lake appears to be in a much better state than the main lake, possibly because it is much older and its ecology is more balanced. There are well established beds of marginals within the lake and an increasing volume of emergent aquatics, with the continuing establishment of the lily pads, which has been going on over the last 10-20 years.

Although the timber piling around the lake edge and smaller island has been renewed recently, the timber piling

around the main island has for some time been in a poor state, but the established vegetation on the island is doing a very good job of keeping the island stable. Indeed it may not be a good idea to disturb this island too much, as it is solid with Japanese Knotweed and it would be unwise to do anything which might encourage this very invasive plant to spread elsewhere on campus.

The top lake dates from around the mid 19th century and was excavated deeper than the newer main lake. It has however silted up considerably over its lifetime and would in turn benefit from at least certain sections being dredged and deepened. In comparison to the main lake however, this is nothing like as urgent a problem.

In recent years there have been problems in the lake with blue green algae manifestations. When this occurs there is very little that can be done to counteract it. Not all species of filamentous algae are dangerous to health, but as part of the lakes overall management, water sampling will be carried out at monthly intervals between April and September to determine if blue green algae is present in the water.

The experience of the Heslington West lake has informed the construction and subsequent development of the new lake on Heslington East, in that the problems that have manifested themselves with the existing lake are well understood and thus have been factored out across on Heslington East. This does not mean however that similar problems to those experienced within the existing lake will not occur in time over on Campus East because there are some common denominators. It does mean however that in the short term at least we are not trying to manage a eutrophic lake with a stressed eco-system and as such the management interventions will be based on prevention rather than cure. As such the management operations associated with the lake are likely to be as follows:

The control and management of nutrient levels will be a core objective for lake water quality. A SuDS 'management train' approach will be applied to treat surface water runoff from developed and landscaped areas before discharging to the lake (e.g. swales, filter drains, and wetlands). Zones of aquatic planting will also be cultivated within the lake to assist in the prevention of algal blooms.

A re-circulation facility will be included to enable further treatment of lake discharges and safeguard the downstream water environment. Abstracted ground



↑ *Figure 2, Blue green algae on lake*



↑ *Figure 3, Preparing to put barley straw into the lake to suppress blue green algae*



↑ *Bed of Norfolk Reed filters lake water on Campus East*

water will help to maintain flow conditions through the lake to will also supplement water levels during periods of lower rainfall.

In order to compensate for variable ground conditions the lake may require a partial or complete liner. This may comprise a geo-membrane with a 'bentonite' clay core. This lining technique requires an over burden of low nutrient subsoil to be placed over the liner to provide weighting and protection. This overburden will also allow aquatic plants to be introduced directly into the substrate.

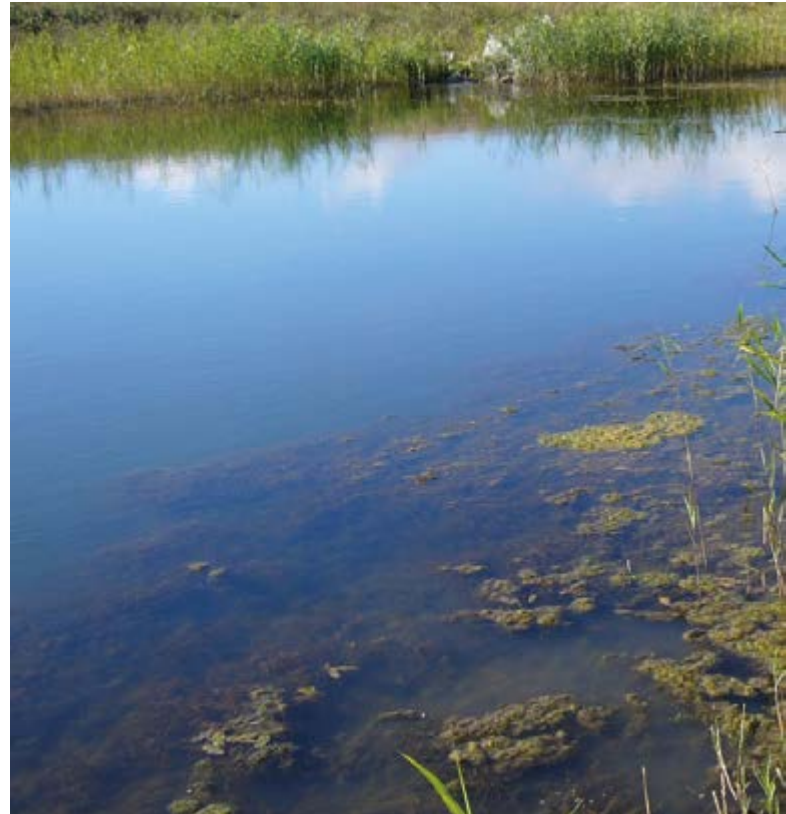
AQUATIC PLANTING

The establishment and maintenance of a wide diversity of higher aquatic plant species is important for maintenance of water quality conditions, reducing the potential for algal bloom development and maximising the visual and ecological qualities of the proposed lake. As the lake will serve a flood storage function and the selected aquatic plant species should be able to tolerate variation of water levels and periods of submersion following peak storm events.

Plants may need to be provided with protective fencing, particularly during the establishment phase. Many plants, particularly the reed type species, are generally resistant to waterfowl grazing once established and only temporary protection should be required. Routine maintenance of the aquatic plants will be required and consideration should be given to harvesting of plants such as reeds during the autumn to prevent release of stored nutrients back to the lake during winter degradation. The harvested plants may be disposed of to a suitable composting facility.

WATERFOWL CONTROL

The lake will be designed to keep geese and other waterfowl to manageable numbers. Lake margins will be planted with a band of fringing emergent vegetation and bank side shrub plantings. This may assist in restricting access for geese from the lake to surrounding grassed areas. Surrounding grassed areas are also best maintained in a coarse state rather than as manicured lawn area as this approach creates area that are less suitable for grazing by birds.



↑ Marginal vegetation beginning to establish

FISH STOCKING

Fish can have a profound and detrimental influence on the ability to maintain clear water conditions through their selective consumption of large zooplankton that may help in reducing algal density. In addition certain fish species that feed on the lake bed, such as adult carp and bream, may give rise to suspension of accumulated silts that may impact upon higher aquatic plants and visual quality and may contribute to remobilisation of nutrients with silt deposits. There are no proposals to utilise the lake as a recreational angling amenity and consequently there is not a requirement for fish stocking to support a fishery.

LEAF LITTER COLLECTION

A large proportion of silt accumulating with lakes is derived from leaf litter from surrounding trees. Leaf litter entering the lake can contribute to both nutrient and organic enrichment that may lead to degradation of water quality conditions. The development of a marginal fringe of



emergent vegetation may assist in reducing the entry of some leaves into the lake. An intensive leaf litter collection programme should be pursued from the lake surrounds and water surface during the autumn period.

The design of the lake has been based around requiring the minimum of maintenance intervention. The main maintenance works that are likely to be required include:

- Routine litter collection
- Leaf litter collection during the autumn
- Maintenance of the introduced aquatic plants to include autumn harvesting
- Annual maintenance of any installed aeration system
- Routine maintenance of the surface drainage system to include emptying of catch pits and oil interceptors.

If filamentous algae should prove problematical then control approaches will be considered that may include the deployment of barley straw.

Routine monitoring will take place on at least an annual basis to assess water quality and ecological conditions within the waterbody and to audit management actions undertaken in the previous year.

HUB BASIN

The Hub building basin is part of the lake but separated from the main body of water by the central movement spine. It's position close to the Hub and its isolation from the main body of the lake mean that it will have its own specific maintenance requirements as follows:

- **Dredging** – This is expected to be an infrequent occurrence (>5 years). The frequency of dredging will need to be assessed by the University during the first few years of operation drawing on the experience gained from managing the Heslington West Main Lake.. The eastern edge (the area at the foot of the Central Vista) provides a suitable area where equipment/boats could be lowered into the basin.
- **Reed Management** – Access needs to be gained to the reeds annually to cut and remove the reeds each autumn (known as reed harvesting). Access also needs to be gained to reeds that may have migrated in front of the Hub building, beyond the reed suppression slabs on the floor of the basin. These reeds will need to be cut back to keep this area of water, around the Pods, clear of reeds. The frequency of this operation will need to be assessed by the University during the first few years of operation. Where access to cut these reeds is not possible from land and has to be conducted more frequently than the reed harvesting operation, then access may need to be gained by other means, for example boat.
- **Hub Building RWP Outlets** – Access may need to be gained by maintenance persons to clean out RWP outlets or maintain flap valves, some of which are covered by the deck overhang. All RWP downpipes have been specified as having access hatches just before ground level, to provide easy access for rodding. Where the outlets exit into the basin, and should access be required, then some of these outlets could be reached from the decking above. However, some access may still be required by other means, for example shallow boat.



↑ Hub Basin

- **Basin Outlet Management** – The basin outlet weir has been designed with a screen at the inlet from the Basin to prevent rubbish being carried through into the structure. This has been designed to be cleaned by rake from behind the handrail. The frequency of cleaning will need to be assessed by the University during the first few years of operation.

The outlet structure and pipes will require de-silting from time to time to ensure its operation is maintained. The frequency of de-silting will need to be assessed by the University during the first few years of operation. The structure has been designed to allow access down into the weir area and onto the ends of the pipes that pass under the causeway. Part of the design includes penstock valves that will enable the pipes to be isolated from the Main Lake and Basin. An experienced jetting contractor should be able to conduct the operation safely with the available access, following their own risk assessments.

WETLAND AREAS

The wetland areas which border the South Western area of the lake are a mixture of pools designed and excavated to stay permanently wet, although with seasonally fluctuating water levels and several shallower 'scrapes' which will notionally hold water during the wetter Autumn & Winter months but dry out during the Summer. Together these should provide an optimum range of habitats for both plant and animal communities, which will be encouraged to develop naturally over time. However, the wetland area has not developed as anticipated. The pools and scrapes

have over filled and coalesced to become one homogenous body of water (a small lake in effect).

Management intervention within the wetland will be minimal and it was intended the area would provide a valuable study facility both for the University and local schools.

The majority of management will take place during the Autumn and will probably involve:

- **The reduction of dominating vegetation** – removed material will be left by the waterside for 24 hrs to allow any trapped invertebrates to return to the water.
- **Removal of large accumulations of fallen leaves.**
- **Removal of any invasive alien species.**

WILDFOWL

The management of the wildfowl is closely related to the management of the lake because of the effect the wildfowl have on the lake and also because they wouldn't be on campus were it not for the large body of water. Some of the species on campus are owned by the University and as such it has a duty of care to look after their welfare. In practise this consists of caring for injured birds in the secluded environment of the Walled Garden and if necessary taking them to the Vet for treatment.

During the Winter the birds are fed on regular occasions to supplement their food source, this being a difficult time for them to find food through natural foraging. This said,



↑ Wetland Areas



↑ wildfowl

it continues to be the University's policy to discourage the visiting public and staff and students from feeding the birds, as this inevitably encourages a high population of wildfowl, attracts vermin and adds to the nutrient loading within the lake water.

Certain species of wildfowl are so numerous on campus that they present problems, particularly because of the amount of faecal material they produce. For this reason it is necessary to take measures to control numbers of Greylag and Canada Geese and the University currently applies to DEFRA each year for a licence to dip eggs during the nesting season in paraffin. This will continue to be an iterative process annually. For more information on campus wildfowl and advice on what to do in the event of spotting a dead or injured bird can be found on the grounds sections web pages: york.ac.uk/admin/estates/operations/grounds/wildfowl

Notwithstanding the problems which manifest themselves with large populations of geese, wildfowl generally are largely enjoyed by all campus users. The University Biodiversity and Wildlife pages contain a 'duck of the day' link: duckoftheday.co.uk which takes you to a wildfowl picture which is changes daily.



↑ wildfowl



↑ Common Blue Butterfly

BIODIVERSITY

Biodiversity is an important aspect to the management of the external environment of the University. Biodiversity and habitat creation were probably not the primary concerns when the Heslington West landscape was being developed in the 1960's and 70's. However Over the course of the last 15 years or so, there have been subtle alterations to the way the landscape is managed on Heslington West to encourage wildlife, some of which have been outlined previously. Biodiversity considerations are at the forefront of the development of Heslington East, and although the two campus have developed at separate times and in separate ways, there are common overarching principles that should be adopted with the future management of both - biodiversity and habitat creation are a case in point.

Data is available on the species of flora and fauna to be found on the Heslington West campus but it is disparate and as such no comprehensive record is available. In the case of Heslington East, a lot of information has been produced in the form of reports from consultants which advise on the creation and management of a range of habitats to encourage biodiversity. Some of this information is transferable to Heslington West however, the management of biodiversity on Heslington West is largely informed by the Environmental Association of Universities & Colleges (EAUC) and its guide to practical management of biodiversity of campuses. Not every approach outlined in this guide is applicable here at York, but many of the principles and practises are:

- Timing management operations carefully to reduce impacts on species that may be breeding/feeding hibernating. For example hedge cutting is largely carried out through the winter months to avoid disturbing nesting birds.
- Think about pest control. It would be much more difficult to maintain an estate the size of the University without the use of herbicides, however where practical the policy is to substitute a chemical control with a cultural control. Where this is not practical it is the policy to limit the range of chemicals used to those with a low a hazard rating as possible.
- Practise low intervention horticulture where appropriate, such as leaving perennials to stand over winter to provide food sources and adopting reduced mowing regimes in appropriate place around campus

- Reduce chemical usage. For example substituting organic fertilisers for compound fertilisers and if possible using composted greenwaste
- Improve shrub beds and planting schemes. For example use single flowering varieties rather than double flowering so pollen/nectar is easily available to foraging insects. Use a variety of species with a range of flowering times. Use trees and shrubs that hold their fruit/berries into winter.
- Diversify structure to create a variety of habitats by using a variety of plants and trees to provide differing heights and flowering patterns.
- Composting greenwaste. This contributes towards the University's recycling targets and provides an organic alternative to fertilisers or bought in soil conditioners
- Providing additional shelter for fauna by introducing bird boxes, wood stacks and habitat piles
- Managing trees and woodlands to encourage biodiversity. For example removing and controlling invasive non native species. Retaining standing old trees and dead wood. Using a broad mix of tree species.

A baseline Ecological survey was carried out on the Heslington East site during 2011, which included flora and fauna (Birds, riparian mammals, bats and invertebrates). Additionally, breeding bird surveys were carried out on a regular frequency throughout periods of development that fell within the recognised breeding season by a consultant Ornithologist. The survey reports are all available through the Estates Department. These surveys have helped to inform the production of a long term ecological management plan for the Heslington East campus, which can be accessed both via the University's biodiversity web pages and the grounds section's web pages: york.ac.uk/admin/estates/operations/grounds/biodiversity/ecological_management_plan.pdf



↑ Bee friendly shrub bed



Heritage and Conservation

ARCHEOLOGY

The City of York has a rich historical past and as such it is hardly surprising that the University campus has yielded up its own antiquities from time to time. In advance of building work on Heslington East, York Archaeological Trust were commissioned to survey the site to find out whether it contained any areas of archaeological interest. They identified three areas of primary archaeological interest and completed a thorough investigation of two of these, situated under the new campus buildings, in 2008. The Department of Archaeology has been working on the third area, on Kimberlow Hill, since 2008 and completed work here in 2011. The discovery of extensive and complex organic deposits along a springline on Kimberlow Hill led to the appointment of On Site Archaeology in 2010 to undertake a further investigation in this area.

The Heslington East Project has provided an opportunity to bring together academic and commercial components of archaeological fieldwork, linked to both students training and community participation, and has resulted in one of the largest open area excavations seen on the outskirts of York. Prior to the archaeological fieldwork, which commenced in 2003, little was known about this area, it having been used for arable agriculture for centuries.

From November 2007 until October 2008 YAT undertook the excavation of an area beneath the current campus buildings. Evidence was found for a series of palaeochannels flowing north-south out of the moraine. A single Neolithic pit was recorded and some Bronze Age pits, with wicker revetments, were focused on a managed waterhole or springhead. Evidence of Iron Age settlement consisted of two roundhouses and several ring gullies, set within an enclosure system. One of the roundhouses had been rebuilt in its location on three successive occasions. Iron Age activity around the waterhole was considerable and a skull, with preserved brain matter, was found in this location. The area continues in use into the Roman period with some limited evidence for activity comprising mainly a pit, ditch and range of artefacts. Work by specialists to assess all the materials and samples from the excavation continues.

Since 2008 the Department of Archaeology has been working on Kimberlow Hill with work focused on a Roman masonry building and associated features. In 2010 evidence was discovered for earlier Iron Age activity here too, and work at the beginning of 2011, by On Site Archaeology,



↑ Roman coin

has identified possible Bronze Age features along the springline. More information on the archeological findings on Heslington East can be viewed at: york.ac.uk/campus-investment/completed-projects//archaeology

THE KING'S MANOR

As well as the main campuses of Heslington West & East, the University also occupies The King's Manor in the centre of the city, which borders the Museum Gardens, the site of the old St. Mary's Abbey and was built to house the Abbots and probably dates from the 11th century. Following the dissolution of the Abbey, The King's Manor became the seat of the Council of the North. The University came to occupy The King's manor in the 1960's and the Department of Archeology is based there. If it is ever necessary to do any tree planting at The King's Manor, then an archeological watching brief has to be maintained whilst tree pits are dug. A brief history of The King's Manor can be viewed at: york.ac.uk/about/campus/landmarks/king-manor

SIWARD'S HOWE

On the North West corner of the Heslington West campus stands Siward's Howe. It is a terminal moraine left as the glaciers retreated at the end of the last Ice Age and is so



↑ Female skeleton formally laid out

called because it is fabled to be the burial place of the Danish warrior Siward. It is however likely to be the site of an ancient burial ground and there is a story of a university gardener coming across human remains whilst planting trees on Siward's Howe several decades ago.

HESLINGTON HALL AND THE YEW GARDENS

Heslington Hall is a 16th century mansion on the South East outskirts of York – Built 1568 by Thomas Eymis (Secretary to the Council of the North). Originally it was thought to have been built to house Elizabeth I on one of her visits to Yorkshire, but this remains unsubstantiated and was more likely an expression of Eymis' rising wealth and status.

There is no record of garden making until 150 years after the Hall was built. In the intervening years the Hall passed to the Heskeths and then to James Yarburgh through his marriage to Ann Hesketh. James Yarburgh is credited with planting the Yews and building the Gazebo – A 1760 painting also details a canal centred on the Gazebo, which may also have had the dual purpose of draining the low lying garden. The top lake, constructed some time during the 19th century probably had the same purpose – an idea extended with the construction of the main lake during the 1960's.

The Hall passed through heiresses to other families who assumed the Yarburgh name until 1875 when the Hall passed by marriage to the second Lord Deramore. In a Country Life Publication 'Gardens Old and New' circa 1900 the grounds of the Hall are described thus..... The gardens occupy a notable place in the history of English gardening. 'Their strange, quaint and fantastic Yews, unlike anything else ever seen on sea or land, are own brothers to the better known curious creations of Levens. There are no Judges wigs nor royal courtiers shaped



↑ Heslington Hall, mid 19th century



↑ The Yew Gardens as they are today

out of the ductile Yew at Heslington, but only cylinders globes and adaptations of beehive forms with some other odd imaginings' However the Yew shapes are described frequently as Chessmen, which is borne out by this mid 1930's photograph.

The Yew trees in the Yew garden are approximately 300 years old and as such may well represent some of the oldest trees in York. Until World War II, when Heslington Hall became Bomber Command, the Yew trees were maintained in very ornamental topiaried shapes. However throughout the duration of the war and the intervening period before the Hall and grounds became part of the university, trimming of the trees was neglected and they consequently grew out of shape and despite being trimmed annually, they remain so.

One option as a treatment to the Yew garden would be an attempt at restoration to their former shape. Indeed a feasibility report into this was commissioned in 1998 which concluded that such a treatment could work very well. However, such an undertaking would require thorough archival research, accurate measuring, detailed assessment and an extensive public relations exercise. Furthermore the work would have to be phased over a period of many years. Consequently, there is little interest or impetus to attempt any restoration and as such the management of the Yew garden will continue in a similar vein for the foreseeable future.

IMPLICATIONS FOR THE 2018 HISTORIC ENGLAND LISTING

Campus west has a built footprint of 20%. The remaining 80% is greenspace. It follows therefore that a key component of any masterplan or estates strategy must include the landscape and public realm. The recent listing of part of the campus west landscape by Historic England only serves to reinforce the landscapes importance

The landscape of campus west is extremely important and events such as Graduation focus attention there

Primarily we must seek to identify the facets of the landscape which make it an enjoyable and memorable place and having done so we must then seek to protect them.

How can erosion of the landscape quality and character be limited and future development guided to achieve a consistency of approach ? when there is a continual change

of personnel at the University and as a consequence of that a continual change of approach.

“The University is renowned for its skilfully designed contemporary landscape. Designed and built in the early 1960’s the landscape has matured and is now accepted (and recognised) as a classic piece of design”

The landscape we now enjoy was the legacy left to us by the founders of the University. As such we have an obligation and responsibility to look after and perpetuate it. Although the landscape is dynamic and forever evolving, it is nonetheless relatively straightforward to maintain through day to day maintenance routines such a mowing, weeding and pruning, but we recognise that a continuity of management approach is important (cross reference LMP). Pressure to develop the estate intensifies demand on the landscape, which by default is vulnerable to change, clear policies are therefore essential to protect the landscape. The recent listing should now act as a catalyst for the production of a set of development guidelines to help mitigate future unnecessary damage through poorly controlled development. These guidelines should focus on the protection of retained trees, but not to the exclusion of other landscape elements.

Tree protection to British standards

- NJUG Guidelines on excavation operations in and around trees
- Tool Box talks delivered to Contractors and their staff
- Realistic financial penalties for careless/unnecessary damage
- Using contractor induction as a vehicle to raising awareness of the importance of the landscape with contractors
- Comprehensive impact assessments that look at both the direct and indirect effects of the development work

The University has already taken positive action with regards to this through the appointment of a full time Landscape Architect, embedded in the Development Office and as such part of the process. The benefits of this appointment should be properly designed and costed landscape proposals, together with tighter supervision of landscape issues on development sites.

Also the University could consider whether it is possible to foster better working partnerships with its main contractors engaged to carry out development work in the future. For example, could a contractor be encouraged to sponsor an initiative that makes a positive contribution to the landscape, whether this is in terms of a specific habitat creation measure, or general improvement, such as planting statement tree or bulb planting.

LAKE

The lake is the dominant feature of the campus west landscape. What’s more, it is a permanent element – it will always be there and it can’t be built on, although it can be affected by development. Water quality is relatively poor, which emphasises the importance of not doing anything to further degrade the amenity of the lake

The lake urgently needs management intervention to arrest decline in its condition and aesthetic. Proposals for this are already articulated in the LMP.

As much as any building (for example Central Hall), the lake is a primary feature of the campus and makes it unique amongst other universities and just as any other building would be, the lake also needs to be maintained.

TREES

Trees are the other most obvious and identifiable element of the campus landscape. They can be easily and seriously damaged, which often does not manifest itself straightaway. Notwithstanding conservation areas or preservation orders, we need to identify our landmark trees and afford them protected status – particularly in the context of development.

Existing mature trees provide character and value and need to be protected where desirable and appropriate, bearing in mind significant damage to a mature tree is irreversible.

Tree planting and management policy is already articulated in the LMP.

GREENSPACE

Look at the campus as a whole with a view to identifying and highlighting areas of critical greenspace that should never be considered for development. Some parts of the landscape almost possess a definable character of their own and should be places where we seek to identify particular features that work well and sustain or iterate them elsewhere.

OPPORTUNITIES TO ENHANCE WITHOUT COMPROMISING LANDSCAPE CHARACTER

- Key views, especially across water are identified, opened and conserved
- Grass land bulb planting is extended where appropriate
- Biodiversity is encouraged through sympathetic management and habitat creation measures
- Development brief in terms of public realm – uniformity of pallet of materials, outdoor furniture etc

FUTURE

It is important to remember that we are the custodians of the landscape. We have the responsibility of looking after the campus at this point along the timeline of the University's existence. In this context, there is a need for a management policy/strategy that is agreed and that is in some way binding or enshrined going forward, so notwithstanding the changes that occur in personnel, whether at operational or strategic level, the consistency of approach which is required is achieved. It is incumbent on those of us who are currently tasked with managing the landscape to hand it on to our successors in as good a, or better condition than which we inherited it.





The University and its Community

The University has in effect two communities. Firstly, it has an internal community of students and staff and in many ways it could be compared to a small town, with its own population, being looked after by staff such as the Estates Department. The second community is the external one, particularly the village of Heslington, who may visit the University campus as part of their relaxation and passive recreation, or who are affected by the university and its activities.

INTERNAL COMMUNITY

The Grounds Section has particularly close links with the student community. The primary example of this is the provision of sports pitches for both representative and college sport. There are however numerous other examples of interaction and service provision:

- Practical help and advice with student project work, usually for students from the Biology and Environment departments
- Help and support with the holding of outdoor events and concerts
- Help and support with student initiatives. One such project is Edible Uni, which involves students taking over pieces of ground within the campus landscape and cultivating them to produce food plants, which students can use themselves, or which could be used by the production kitchens in the different University colleges. So far production plots have been established in four different areas of the campus.
- The University Allotment Association also gives students and staff the opportunity to be able to garden on campus. There are also several allotment holders from the local community.
- Involvement of student volunteer groups in habitat management and creation initiatives. Recent examples include help and support with the building of Bee/Bug hotels in various locations across both campuses.



↑ Figure 4, Staff from the Department of Health Sciences with a Bee hotel they constructed for Green Impact Week



↑ Figure 5, Student allotments at Constantine College

EXTERNAL COMMUNITY

The University continually endeavours to foster good relations with the local community and regularly holds communications forums with local bodies such as residents associations, Heslington Parish Council and good neighbours groups.

The university's Directorate of External Relations also works closely with departments to support community relations in several different ways:

- The organisation and publicising of public lectures
- The organisation and publicising of concerts from the Lyons Concert Hall and Central Hall
- Through the Centre for Lifelong Learning the University offers over 200 short courses which are open to anyone

In addition to this there are many other areas where the University is active in promoting and increasing community outreach. The Yoractive outdoor gym (trim trail) has recently been completed. The 5 Km course runs across both east and west campus. Among the benefits of this new outdoor gym will be to make sport and fitness easily accessible to staff, students and the local community, who will be welcome to use it. Additionally, in early 2018 the University instigated a weekend 'park run' event, which has proved extremely popular with high participation levels from the local community.

The biggest community based event that takes place on campus annually is the start/finish of the Yorkshire Marathon, which has been hosted by the University every year since its inauguration in 2013. Year on year the number of participants increase and it has now become a popular annual 'tradition' with the local and indeed regional community.

For more information about the University in the community please visit: york.ac.uk/about/community

Another important aspect of community involvement is the voluntary work that University staff undertake out in the community. The University plays a pivotal role in the charity' York Cares, which brings businesses, employees and community organisations together to make a positive impact on the city of York. The university employs a team of dedicated staff and sits alongside community and business stakeholders on the York Cares Board as well as leading bids for further charitable causes with the charity.

Over 200 University of York employees have offered their time and expertise to projects including 'Starting Blocks', a scheme to equip young care-leavers with employability skills and work experience, and weekly lunchtime volunteering, team challenges and 'lifeswap' activities, such as taking a few hours to chat elderly people or helping to renovate a piece of public land. Every year in October the staff of the Grounds Section take part in a team challenge to improve public open space. In 2010 the Section won a Vice Chancellors award for its help with improvements to the nearby St. Nicholas Fields site.

LOOKING AHEAD

The University of York campus masterplan is a renewed vision for the University campus. The plan will provide a framework for how the campus is viewed, used and developed in the future. It is envisaged the different phases of the plan will take the campus through a journey lasting 15 - 20 years. The masterplan vision will seek to reimagine the University campus, whilst at the same time staying true to the principles of the original masterplan concept of routes, walkways and defined spaces.

Naturally the landscape must form an integral part of the masterplan and to this end the University has recently employed an in-house landscape architect to help with and advise on the plan and a draft landscape guideline document has already been produced.



↑ University Campus, Green Flag Award winner



↑ University Grounds Staff taking part in a local community challenge

Design Guide

Landscape and Tree Planting

The University of York is a tale of two landscapes. Campus West is a mature, landscape of a human scale with a number of historic elements. In contrast, Campus East is a large scale, contemporary landscape. The planting is naturalistic, with visible SuDS features and a rapidly developing biodiverse ecosystem.

The differences between these two Campuses and their landscapes should be celebrated. However, there should be a number of unifying elements that reinforce the unique sense of place and landscape character of the University of York.

CAMPUS WEST

Mature trees with a rich variety of species are the main focus of the landscape.

Human scale campus with a hierarchy of spaces. These include larger spaces outside buildings to courtyards and incidental landscape areas.

Planting is a mix of styles as the campus has developed over time. It is mainly ornamental and low maintenance. There is potential to unify the structure and style of planting to reinforce the sense of place. .

Different scales of planting from traditional planting beds and planters to large areas of grass underplanted with bulbs and expanses of wildflower meadows.

CAMPUS EAST

Planting is naturalistic, biodiverse and contemporary in style.

Spaces are generally large and can support larger tree species that require open areas.

Water is an important feature of Campus East with SuDS systems such as open swales and large water bodies. Potential for rain gardens to be included within schemes.

Habitat creation is an important aspect of Campus East, there are woodland areas and large lake eco-systems that support a wide range of plants, wildlife and insects.

EXISTING TREES AND VEGETATION

Trees are the principal element responsible for the character of the campus landscape.

Designs should incorporate and celebrate exceptional trees. Providing a new generation of trees for the future of the campus landscape.

Healthy, large existing trees and tree groupings of exceptional size and form should be protected.

TREE PLANTING 1: OPEN SPACE

Large, parkland trees should be used where there are opportunities to do so.

This will provide a new generation of parkland trees for the future of the campus.

Potential to include large, mature specimen/ exceptional trees should be explored in conjunction with development of buildings across Campus.

TREE PLANTING 2: OUTSIDE BUILDINGS

Medium to small sized species should be used adjacent to buildings.

Where space is constrained, fastigate forms of trees are a good alternative and can form a statement feature within the landscape.

TREE PLANTING 3: SMALLER SPACES

Courtyards, walkways, spaces between buildings should contain small tree species where possible

If the space cannot accommodate a tree, large specimen shrubs should be used to create height and visual interest

Planters can be used to add height to these specimen shrubs

PLANTING GUIDELINES

Plants for the campus landscape should be selected to enhance the beauty of the campus as well as supporting a sustainable landscape.

Selecting native, low-maintenance plants is preferred. Occasionally there will be opportunity for selecting non-native plant material to expand diversity and educational exploration. This would be considered in appropriate locations.

Many of the students are here during winter months so winter interest is an important consideration.

LIVING WALLS

The Environment Building has a successful Living Wall that has been in place for a number of years. Living Walls should be incorporated where possible across campus to provide screening, reduce heat effect on the buildings and for aesthetic colour and interest. They also create habitats for wildlife and increase potential for biodiversity.

GREEN ROOFS

Green roofs provide many benefits for wildlife and habitat creation along with reducing building temperature. There is a wide variety of green roofs available allowing a variety of uses, textures and planting styles across campus.

The potential to collect and harvest rainwater using green roofs and rain gardens along with the SuDS system should be explored. In a city such as York, where flooding is always an issue this could be both functional and educational.

SHRUBS

Shrubs selected should be a mixture of evergreen and herbaceous.

A structure of evergreen plants will extend the season and allow planted areas to be of interest all year round.

BULBS

Bulbs should be naturalised throughout grassed areas to provide seasonal colour and interest.

A succession of flowering bulbs should be considered to extend the season for as much of the year as possible.

These could also be used in areas where maintenance of grassed areas is difficult, including steep slopes.

WILDFLOWERS

Wildflower mixes should be used to add colour and biodiversity to the campus. Mixes should contain species that are beneficial for bees, butterflies and other wildlife.

Perennial mixes are preferred, except in high profile areas where re-sowing annually would be beneficial.

Areas of longer grass and wildflowers should have a close mown edge of no less than 1m to provide an indication to the public that these areas are intentional.



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york.ac.uk/students/welcome

f Join the facebook group
<http://bit.ly/uoy-freshers1819>

t Follow the hashtag *#UoYFreshers*
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