

Contents lists available at [ScienceDirect](http://www.sciencedirect.com)

Urban Forestry & Urban Greening

journal homepage: www.elsevier.com/locate/ufug

Original article

Cutting the lawn – Natural burial and its contribution to the delivery of ecosystem services in urban cemeteries

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ARTICLE INFO

Keywords:

Ecosystem services
Identity
Lawn cemetery
Natural burial
Woodland

ABSTRACT

This article investigates the impact of natural burial on the delivery of ecosystem services (ESs) in urban cemeteries in England that are owned and managed by local authorities. Local authority natural burial sites have received far less attention from researchers than independent sites developed by farmers, charitable trusts, funeral directors and land owners. Here we argue that the local authority hybrid cemeteries that combine natural burial with traditional graves may have a far greater impact in delivering regulatory and cultural ecosystem services than the much larger and frequently more environmentally ambitious natural burial grounds developed by the independent sector. The article presents three case studies of cemeteries, each of which represents a different interpretation of natural burial. Two have retrofitted natural burial into an existing cemetery landscape. The third is a new cemetery where natural burial was included with traditional burial in the original design brief and planning application. The research reveals how natural burial is transforming the traditional cemetery, with its focus on an intensively managed lawn aesthetic, towards a more habitat rich and spatially complex landscape with its own distinctive identity. The research also reveals how natural burial (within the unique constraints of UK burial culture that does not permit the recycling of burial space) is increasing the burial capacity of urban cemeteries by accessing land and grave space that might not be suitable or appropriate for more traditional forms of burial.

1. Introduction

The natural burial movement began in 1993 in a municipal cemetery in the City of Carlisle in the United Kingdom (Clayden and Dixon, 2007). Ken West, then head of bereavement services, had a vision to transform a small area of rough grassland at the edge of the cemetery into native oak woodland by offering bereaved families the option to eschew the traditional headstone and instead plant an oak tree on the grave. Nature would be the focus of this new cemetery landscape rather than the preservation of individual graves and identities of the deceased. In making this provision, West instigated a revolution in UK burial culture that had not been seen since the introduction of cremation in the early part of the 20th Century (Jalland, 1999, Rugg, 2006). Understanding the scale of this movement is extremely difficult in the absence of any centralized record keeping in the UK (Hussain and Rugg, 2003); a challenge extant in other countries, including the USA (see, Coutts et al., 2011). In the absence of any centralized records, here we draw on our own survey of UK natural burial sites, completed in 2013

as part of an Economic and Social Research Council funded project, (Clayden et al., 2015) that was updated in June 2016. It currently identifies 268 sites spread across the UK. This is comparable to the estimated 270 burial grounds recorded by the Natural Death Centre (NDC), the organization which manages the Association of Natural Burial Grounds (ANBG) (NDC, 2016).

This article specifically focuses on the impact of natural burial within urban cemeteries managed by local authorities. Despite the fact that natural burial originated within the public sector and that they account for approximately half of all UK natural burial sites (Clayden et al., 2015) they have received relatively little attention from the research community. Researchers have instead focused on sites developed by independent providers including; charitable trusts and religious groups (Davies and Rumble 2012, Powell et al., 2011), farmers (Clayden et al., 2010a), and funeral directors (Clayden and Dixon, 2007, Clayden et al., 2010a, Clayden, 2011, Hockey et al., 2012). In her paper on 19th Century Garden Cemeteries, Tarlow alerts us to the danger of ‘focusing exclusively on the most innovative ... exceptional or

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Received 26 May 2017; Received in revised form 14 August 2017; Accepted 14 August 2017

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unique' as these may not be representative of national trends and tastes' (Tarlow, 2000: 220). As the natural burial movement began to gather momentum in the mid to late 1990s, supported by the activities of the NDC and encouraged by the writing of John Bradfield (1994), new independent providers were motivated to develop their own interpretations of natural burial, despite having no previous experience of designing or managing a cemetery.

These new burial providers, who included farmers and landowners, attracted significant media coverage and researchers were keen to understand their motivation and vision. It was a time of great experimentation around what a natural burial ground should look like and how it could most effectively achieve its environmental and ecological objectives. The concept of a tree on a grave was soon challenged as new providers experimented with different approaches to preserving and creating a range of different habitats that included burial within wildflower meadows, woodland groves, mature woodland and orchards. These new, independent providers were unencumbered by the constraints of working within an established municipal cemetery, nor had they experienced the potential challenges of working with bereaved people. They owned land in the countryside, which for many natural burial consumers already expressed ideas of being 'in nature' (Clayden et al., 2010b). Some new providers also brought a unique understanding of that land and had the skills and resources to realise their own vision and interpretation of natural burial (Clayden et al., 2010a). In contrast, the management of local authority sites was underpinned by the drive to maintain a more formal and manicured aesthetic of the traditional cemetery with its lawns, summer bedding and graves with headstones aligned in neat rows. Finding space for a wilder, 'messy' nature could thus be difficult and perhaps open to interpretations of neglect and perceived cost cutting by cemetery users. However, and in spite of these challenges, it was within the public sector that natural burial initially expanded with 'more than 80 per cent' of all sites developed by local authorities between 1993 and 1997 (Clayden et al., 2015: 26). The public sector was able to respond more quickly to shifting public demand than the independent providers because they had space within their existing cemeteries that did not require planning consent. The publication in 1996 of the Charter for the Bereaved by the Institute of Burial and Cremation Authorities also encouraged its members to provide a natural burial option (IBCA, 1996).

Whilst the introduction of natural burial within the public sector may not have been as innovative in its interpretation or as ambitious in scale as some of the independent sites, here we argue that the range of environmental and social benefits that these sites potentially deliver might have far greater impact than those in the private sector. Central to this argument is their urban location. Unlike the majority of independent natural burial sites, municipal cemeteries are typically located within towns and cities and might be larger and older than many municipal parks. Within this urban context, cemeteries can play a key role in contributing to the green infrastructure of cities and delivery of a wide range of ecosystem services (ESs). ESs can be defined as (1) *supporting* (e.g. soil formation, photosynthesis, primary production, nutrient and water cycling); (2) *provisioning* (e.g. food, fibre, fuel, freshwater, genetic resources, natural pharmaceuticals and chemicals), (3) *regulating* (ecosystem processes including regulation of air and water quality, climate, pest and disease) and (4) *cultural* (including cognitive development, spiritual enrichment, recreation and aesthetic experiences) (Millennium Ecosystem Assessment, 2005). Notwithstanding the potential of urban natural burial sites to make a supporting and provisioning contribution, here we focus on their *regulating* and *cultural* influence on supporting ESs.

1.1. Regulating ecosystem services

Cemeteries are dynamic landscapes, arguably more so than public parks. They are landscapes of consumption and use (Tarlow, 2000) incrementally changing with each new burial. More than half of all the

cemeteries in the UK were constructed between 1851 and 1914 (Hussain and Rugg, 2003). As such, they are often mature landscapes that frequently pre-date municipal parks and have been subject to changes in fashion, management and maintenance over an extended period of time. In the 19th Century, British cemetery design and management was driven by an informal, naturalistic style and sites were referred to as *Garden cemeteries* that were 'attractively planted with "domestic and exotic trees, shrubs and flowers"' (Tarlow, 2000: 218). With a strong emphasis on vegetation and maintained by hand, they would have made a positive contribution to a range of ESs. The rise of cremation in the early 20th century, however, challenged the 'Victorian cemetery aesthetic, which was deemed no longer appropriate in a modern age' (Rugg, 2006: 214). The response was a radical change in cemetery design and management and the introduction of the lawn cemetery. Rugg accounts for its 'invention and widespread adoption', as a 'rejection of Victorian aesthetics in favour of modern alternatives, resource difficulties that, particularly after World War II, increasingly constrained what might be achieved in terms of cemetery maintenance, and growing professionalism in the field of cemetery management' (Rugg, 2006: 217). Victorian cemeteries were simplified by removing obstacles that included kerbsets and planting and by levelling earth mounds on graves to enable access and regular cutting with new machinery. Extensions to cemeteries intensified the lawn aesthetic by reducing and standardizing the size of memorials and implementing a formal burial grid to enable further efficiencies in mowing.

Through this process the municipal cemetery was diminished in its capacity to deliver regulatory ESs. The intensive maintenance of fine turf is a significant contributor to greenhouse gas emissions (Milesi et al., 2005). Both fossil fuel use in mowing and the application of fertilizers/pesticides have significant negative impacts; e.g. lawns emitting up to 10 x more N₂O than agricultural grassland (Livesley et al., 2010). The extent to which turf releases greenhouse gases depends on management, and low frequency cutting (e.g. meadows) allows grass to act as net sequester of atmospheric carbon. Natural burial, which calls for reduced mowing and increased woodland cover to create a more complex range of habitats, therefore provides an opportunity to challenge the lawn cemetery aesthetic by returning to a more complex and diverse vegetated landscape. In doing so, the cemetery could once again make a more substantive contribution to delivering a range regulatory ESs that help to mitigate the effects of urban heat islands, flooding, poor air quality and loss of biodiversity (see Cameron et al., 2012 on the contribution of urban gardens).

1.2. Cultural ecosystem services

Whilst the potential benefits for mental health and wellbeing that can be derived from urban green spaces are well documented (Kaplan and Kaplan, 1989, Kaplan, 1995; Tzoulas et al., 2007; Van den Berg et al., 2014), the focus here is the unique opportunity provided by the urban cemetery to deliver other cultural ESs. In comparison to many European countries where burial space is regularly recycled, the UK is distinctive in operating a system of burial that, since the 1850s, does not permit human remains to be disturbed unless there is a license from the Home Office (Hussain and Rugg, 2003). UK cemeteries are therefore unsustainable as a burial space; in consequence, local authorities have an ever-increasing legacy of maintenance for sites that are either closed to new burial, or where large sections are no longer visited. When cemeteries close, communities can no longer maintain a 'sense of familial identity through the literal assimilation of recently deceased people and long-dead ancestors into "home" soil' (Woodthorpe, 2011: 262). They must instead relocate to cemeteries that are distanced from the communities they live in and often located in unfamiliar surroundings. For the elderly, infirm and those who do not own a car this can present a significant obstacle to maintaining contact with their deceased loved ones.

Natural burial cannot halt the process of cemetery closure. It can,

however, contribute to extending the working life of a cemetery by reclaiming space that would not be suitable for traditional burial and by reducing costs through less intensive maintenance. Natural burial might also help in preserving and enhancing the character and cultural identity of the cemetery landscape. In addition to their role as sacred places (Francis et al., 2005), cemeteries have a wider cultural remit as ‘spatial vessels of civic identity, telling diverse histories of the city and representing intangible notions of the character of a given place’ (McClymont, 2016: 393). McClymont illustrates this by showing examples of Anchor motifs on gravestones in cemeteries in the coastal ports of Plymouth and Southampton. Regional identities might also be expressed through the use of local stone to construct cemetery buildings and in the work of the memorial mason. The widespread availability of cheaper imported stone cut by machine to standard templates compromises a coherent expression of place (for example, the use of slate in churchyards and cemeteries in North Wales and gritstone in Yorkshire). By prohibiting the erection of new headstones, natural burial does not threaten existing narratives or compromise a vernacular identity. The addition of new planting might also contribute to identity and sense of place through the selection of locally appropriate species. Finally, the lawn cemetery aesthetic, which has included regulating for smaller headstones, has resulted in a much more open and exposed landscape where it might be difficult to find a place that is not in the public gaze. For example, The City of London Cemetery in 1959 restricted memorials to 90 × 30 cm (three feet by two feet) and in some cemeteries only plaques that were set flush with the turf were permitted, ‘giving the impression of an uninterrupted lawn’ (Rugg, 2006: 224). By introducing vegetation of different heights and form and relaxing the maintenance to reduce mowing, natural burial could improve the spatial complexity of the cemetery and provide more shelter and privacy for users, whilst also promoting contact with nature.

Whilst the potential benefits of natural burial in terms of the delivery of both regulatory and cultural ESs are most pertinent for a burial culture that does not permit the re-use of graves, the addition of natural burial in those cultures where graves are recycled may still have merit. As noted above, natural burial could enable cemetery managers to access marginal spaces within the cemetery that might not be suitable for traditional graves with headstones due, for example, to the difficulties of restricted access as a result of steep topography or where mature trees are already established. In this context natural burial could be introduced by adopting an approach that would still allow access and the reuse of graves by not permitting the planting of an individual memorial tree on the grave. This could, for example, include burial into mature woodland glades or meadows (see Davies and Rumble, 2012; Clayden et al., 2015). This would also increase consumer choice and potentially enrich the habitat and spatial complexity of the cemetery landscape.

2. Method

Three case studies are presented here to explore the impact of natural burial on the urban cemetery. Each site is owned and managed by a local authority and was originally identified as part of a three year Economic and Social Research Council Project: Back to Nature: The cultural, social and emotional implications of natural burial (2007–2010) (Award: RES 062-23-0448). The research generated a geographical information system (GIS) and database of all known natural burial grounds in the UK. From this database 20 sites were selected on the basis that they represented different types of: ownership, design interpretation, age, number of burials and location. At each of these sites interviews with owners/managers were conducted and a photographic and textual record of the site was recorded (Hockey et al., 2016: 30). The first two case studies, Allerton Cemetery, Liverpool and Waddington Road Cemetery, Clitheroe were included in the survey of 20 burial grounds. The third case study, High Wood Cemetery, Nottingham, was not part of the original survey. In the summer of 2016 as

part of a process of updating the database of sites, High Wood Cemetery was surveyed and the burial ground manager interviewed.¹ The three sites capture different design interpretations of natural burial; mature woodland, new woodland, and wildflower meadow and woodland glades. Allerton and Waddington Road Cemeteries are examples of a local authority retrofitting natural burial into established 19th and early 20th century sites. High Wood Cemetery was opened in 2006 and is included here to explore how natural burial is shaping contemporary cemetery design.

Prior to evaluation of regulatory and cultural ESs, a short description of each case study is provided. Additional context and analysis of data from the survey of other local authority sites is included in the discussion section.

2.1. Three case studies

2.1.1. Allerton Cemetery – Liverpool

Allerton Cemetery was opened in 1909 and is located in the South East suburbs of the City of Liverpool. It is a large municipal cemetery of approximately 61 ha enclosed by residential development, factories and recreational land. It continues to be one of the city’s main burial sites and includes formal avenues of mature trees, clipped hedges and graves arranged into rectangular sections set in lawns. In 2001 the authority designated an area of existing mature woodland as a section for natural burial. The woodland forms a shelterbelt that divides this large cemetery into two equal halves. Approximately 50% of this woodland has been allocated for natural burial and forms a narrow strip 350 m long and 60 m wide (0.8 ha). The trees are a mixture of Lime (*Tilia*) and Pine (*Pinus*) and are of a uniform age and maturity with an undercover of rough mown grassland. The woodland section is divided into two equal parts by a central drive and is accessed from the service road that encloses the area of traditional graves (Fig. 1).

The first section is open to all denominations and the graves are arranged in rows that are perpendicular to the service road. The second section, located to the South of the dividing access road, has been designated for Muslim burial. In both areas the graves are marked with a small cylindrical stone block, placed at the head of the grave. The graves in the Muslim section are more clearly identifiable by the neat earth mounding that has been seeded with grass and clearly defines the shape and orientation of the grave. The area of traditional graves is maintained as lawn whilst the natural burial section is cut twice yearly.

2.1.2. Waddington Road Cemetery – Clitheroe

Waddington Road Cemetery was opened in 1861 and is located in the North West of the small market town of Clitheroe. The burial ground was originally opened as a detached churchyard extension to St Mary’s and Bow Church in Clitheroe (Ribble Valley Borough Council, 2016). It was extended by Clitheroe County Council in 1953 when the cemetery was then opened to all denominations. The cemetery was further extended in 1999 by Ribble Valley County Council who had taken over administration of the cemetery following the reorganization of Local Government in 1974. Waddington Road is the only cemetery in Clitheroe. It is enclosed by agricultural land and woodland to the North West and a residential suburb along its Eastern perimeter. It is set out in a formal grid of rectangular burial sections and in total covers an area of approximately 5 ha. In the oldest sections there remain some traditional graves with kerbsets. In the more recent lawn sections the headstones are smaller and made from different types of stone (Fig. 2).

In 1995, the local authority designated an area of approximately 0.15 ha for natural burial. It lies at the North West perimeter of the

¹ The survey was part of Sheffield University Research Experience grant (SURE, 2016) that was supervised by Andy Clayden and Mike Livingstone working with undergraduate student Kelci Vittachi. A summary of the research was presented at the Institute of Cemetery and Crematoria Managers annual conference in Oxford (2016) Clayden, A., & Vittachi, K.

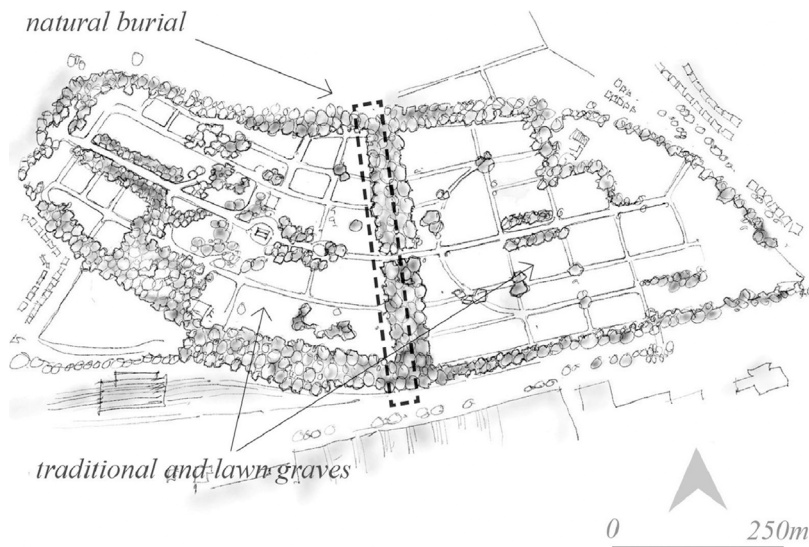


Fig. 1. Allerton Cemetery – Liverpool.

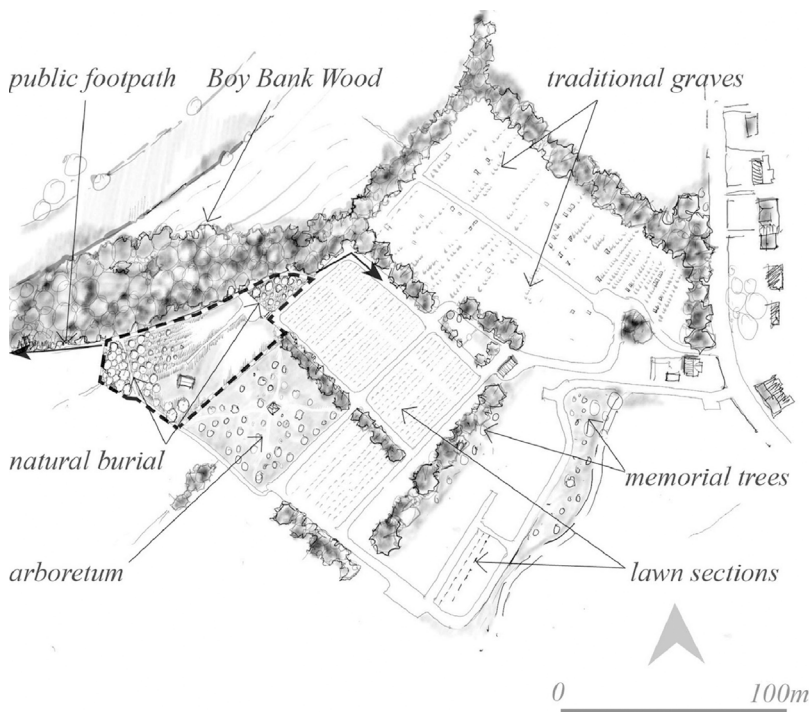


Fig. 2. Waddington Road Cemetery – Clitheroe.

cemetery next to existing mature woodland. The natural burial area was extended in 2001 to enclose an additional 0.33 ha providing a total area of approximately 0.5 ha. In 2005 the local authority further extended the site to include what is described as an ‘arboretum’, an area of memorial trees reserved for cremated remains. The family of the deceased may choose the tree, although there are some restrictions on size. The combined area of the woodland and arboretum is 0.85 ha, approximately 17% of the entire site. Recently the authority has further extended the area of memorial trees along the eastern perimeter of the site, which partly enclose the current section of lawn graves.

The woodland section is separated from the traditional burial plots by a wooden fence and gate and is accessed from a road that also services the cemetery. A public footpath runs alongside the natural burial area and connects the cemetery with the adjacent mature woodland and valley that the cemetery overlooks. Within the natural burial area there are two distinct areas of graves that are separated by rough grassland and a small tarmacked area reserved for parking. In both areas the

graves are arranged in formal rows. In the first section, a mixture of native broadleaf trees has been planted amongst the graves. Towards the perimeter of the site, where the first burials were located, the trees are more mature and moving forwards from the perimeter there is an area of more recent tree planting. In front of this area there are the most recent graves where there has been no tree planting. The second area of woodland burials is next to the South West perimeter of the cemetery, adjacent to a shelterbelt of young native broadleaf trees. At the time of visiting in 2008 this area was smaller and only included juvenile trees and new graves where there was no tree planting. Beneath the emerging woodland there was rough grassland and on some of the graves there were patches of snowdrops and daffodils. The woodland area is cut twice a year and wildflower seeds are sown on new graves.

2.1.3. High Wood Cemetery – Nottingham

High Wood Cemetery was opened in 2006 and is located in the north west suburb of Bulwell on the outskirts of the City of Nottingham.

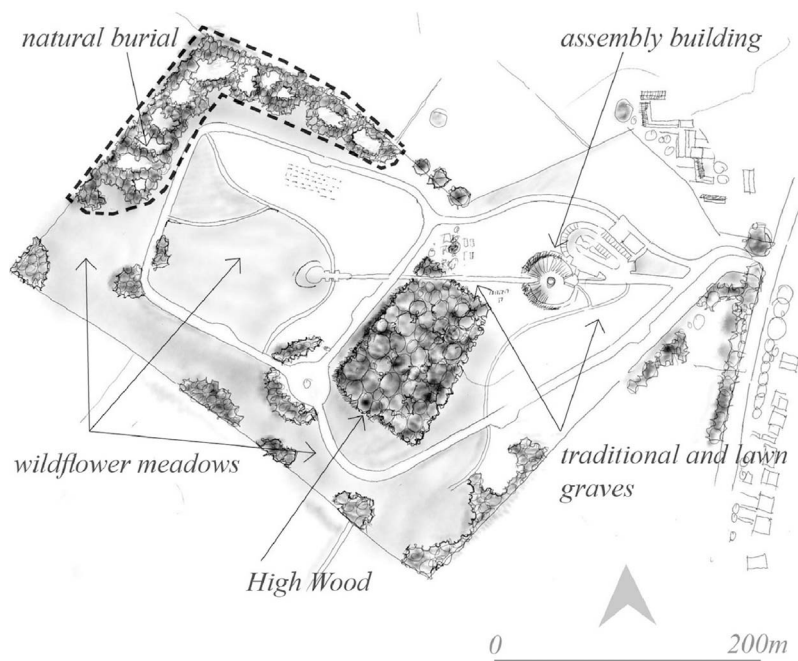


Fig. 3. High Wood Cemetery – Nottingham.

The cemetery takes its name from the rectangular block of ancient woodland at the center of the cemetery. The cemetery covers a total area of approximately 12 ha and is enclosed by agricultural land and a housing estate to the east. The cemetery was designed by Nottinghamshire County Council to include woodland and meadow burial, traditional graves, and lawn sections for different denominations, including the Muslim community. Approximately 3 ha are currently set aside as a wildflower meadow that is cut once a year (Fig. 3).

The natural burial area was designed to create a series of interconnected woodland glades along the northern perimeter of the cemetery. The glades are irregular in shape and size and contained by mixed native broadleaf woodland that was planted before the cemetery was opened, and which is now well established. The woodland section encloses a total area of approximately one hectare. To date there have been no woodland burials as this service is not currently being promoted by the authority. However the first burial glade, nearest to the cemetery meeting hall, has been used to provide public graves at a reduced fee, where there is no exclusive right to burial. The graves are each marked with a small plaque.

3. Discussion

3.1. Enhancing regulatory ecosystem services – cutting the lawn

Natural burial will improve the contribution that each cemetery makes to delivering regulatory ESs by reducing the total area of mown grass, frequency of cutting, use of herbicides and by creating more complex habitats that might include new woodland. This potentially increases carbon sequestration, reduces N₂O emissions and could help with flood alleviation. There is, however, considerable variation between each of these three sites in terms of their regulation and thus contribution to ESs. Allerton Cemetery reduces the amount of mowing, but as a proportion of the total area of the cemetery this is no greater than 1–2%. It does not increase the amount of woodland and arguably the frequency of mowing beneath the shade of a mature canopy would already have been significantly less than in the open lawn sections.

Waddington Road Cemetery will, over time, reduce the total area of mowing by as much as 17% of the entire site as this currently stands and potentially more if this area is extended. The addition of new woodland will also increase habitat diversity and carbon sequestration

along with other regulatory ESs. The reduction in mowing and increase in woodland is, however, directly linked to the rate of new burials. Trees are only planted after a row of graves has been completed. From 2012–2016 woodland burials accounted for 25–35% of all burials at Waddington Road Cemetery.² This not only represents an annual increase in woodland, but working on the assumption that these would otherwise have been traditional burials it has reduced demand for lawn graves. There might also be other environmental benefits that exist beyond the site, for example, a reduction in demand for imported stone memorials and the impact this might have in terms of extraction and waste and the embodied energy associated with production and transportation.

How the new woodland is designed, planted and managed will also impact on its potential to deliver regulatory ESs. Many earlier natural burial sites, including those in the public and private sectors, adopted the model of planting a tree on each grave, originally developed by Ken West. Over time, significant differences have emerged in relation to how natural burial landscapes have been envisaged. This has often been in relation to the knowledge and expertise of those responsible for creating and managing woodland. In the design and development of the woodland section at Waddington Road, the cemetery manager worked closely with the countryside officer, who was insistent that the bereaved family should not be allowed to select or purchase the tree and also that the tree would not be planted directly on the grave. He explained, ‘we couldn’t allow a situation where next of kin felt they had a sense of custodianship over the tree.’ This approach has enabled the authority to retain control over the distribution of trees and species mix and to schedule planting. Burials are arranged sequentially along the row, moving inwards from the perimeter of the cemetery. The cemetery manager told us, ‘you’re digging your way out and leaving that bit to nature ... once we’ve buried across a row then we plant trees across that row’. The Countryside Officer informed us that they planted bare root stock, 45–60 centimeters in the dormant season rather than the larger standard container grown trees he had seen at other sites. His argument was that they were less expensive, did not require watering and would be ‘easier to establish in a woodland situation’. The use of larger, container grown stock might have more immediate impact and appeal to

² Annual records for traditional burial, ashes and woodland burial 2006–2016 Waddington Road Cemetery, Clithero.

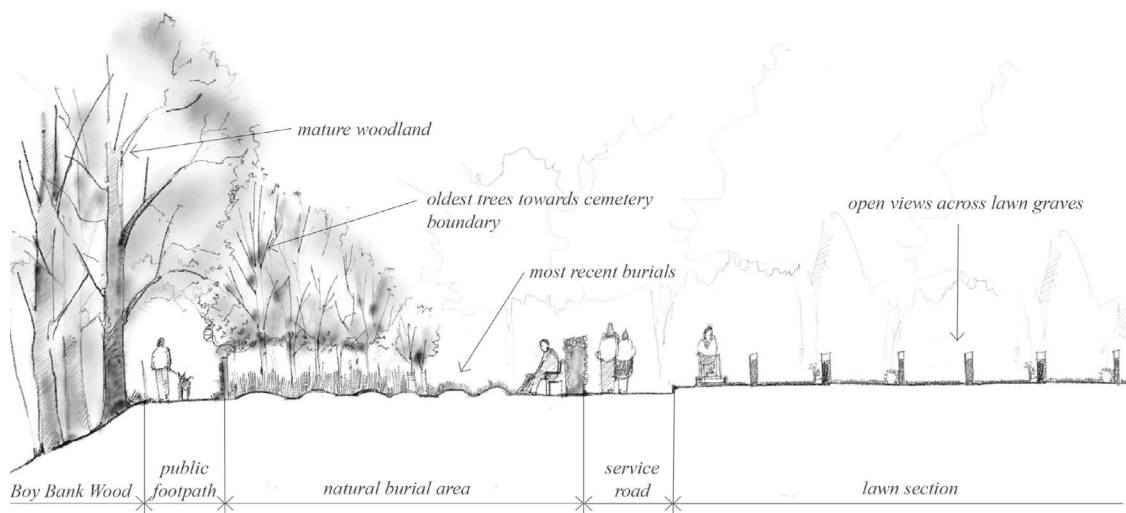


Fig. 4. Waddington Road Cemetery. Natural burial connects the cemetery with adjacent woodland whilst also creating shelter and privacy for the adjacent lawn section.

bereaved families but, like the issue of imported headstones, it raises wider environmental concerns, especially where trees have been grown using peat (Barkham, 1993), have been imported from the continent or have other maintenance activities that increase CO₂ production (Cameron and Hitchmough, 2016).

Nottingham City Council set ambitious environmental objectives in the planning application for the design of High Wood Cemetery, which was approved in 2002 (High Wood Cemetery Planning Application (HWCPC), 2002). The application highlights the need to ‘minimise any negative environments usually associated with cemetery design’, to ‘increase habitat diversity’ and ‘reduce traditional maintenance’ (HWCPC, 2002:4). It specifically identifies the importance of increasing the area given over to ‘natural grasslands and meadowland’ because of their ‘greater capacity for wildlife than the existing farmland or the lawns of traditional cemeteries’ (HWCPC, 2002:6). The application further identifies features within the development that will deliver these objectives including: reed beds for water treatment, species diversity to improve wildlife potential and woodland burials and large scale tree planting to ‘provide a carbon sink to minimize the pollution created by visitors’ cars’ (HWCPC, 2002:9).

Without the constraint of working within the existing formality and lawn aesthetic that is prevalent in Allerton and Waddington Road Cemeteries, Nottingham were able to re-imagine the design of the cemetery landscape. Here, natural burial was conceived as a series of informal and irregular burial glades contained by woodland wrapped around the edge of the site. The design and establishment of the woodland is entirely independent of burial. In little more than ten years the trees have grown to form a dense woodland edge that visually separates the burial glades from the rest of the cemetery. In addition to the habitat benefits provided by the woodland glades, approximately a quarter of the entire site has been planted as a wildflower meadow. This has also delivered important financial benefits to the council because an independent commercial seed producer manages the meadow on the understanding that they can harvest the seeds.

High Wood Cemetery demonstrates that where environmental objectives and natural burial are prioritized at the planning and design stage of a new cemetery it is possible to deliver far greater regulatory ESs than when these are retrofitted into an existing cemetery landscape. There is a note of caution, however, when we recall that the cemetery is a landscape of consumption (Tarlow, 2000) that changes over time. For reasons that are unclear, at the time of writing there has been no demand for woodland burial at High Wood Cemetery since its inception, and only traditional graves set within mown grassland are currently being used. This is in stark contrast to Waddington Road Cemetery, where the amount of mown grass is gradually being reduced and

woodland increased through a growing demand for natural burial. If High Wood Cemetery does not promote the use of the natural burial area and woodland burial glades then the lawn sections will increase more quickly and ultimately extend into the areas of wildflower meadow. This will reduce the regulatory ESs benefits derived from the meadow, whilst increasing the harmful impact of regularly mown grass (Livesley et al., 2010, Milesi et al., 2005).

3.2. Strengthening cultural ecosystem services

3.2.1. Places of richness, spatial complexity and shifting identities

The rise in popularity of the lawn cemetery throughout the 20th century, which has continued to this day, simplified many Victorian cemeteries, ridding them of their perceived ‘clutter’ and introduced ‘simplicity and uniformity’ into new cemeteries (Rugg, 2006: 225). In doing so, it diminished the cemeteries’ richness and spatial complexity created through the interplay of memorials and vegetation of different sizes, forms and textures and the opportunity for users to find a sheltered space for quiet contemplation. It also diminished the educational and cultural value of the cemetery landscape. The Victorian Garden Cemetery had, for example, provided a backdrop for discovery and learning about domestic and exotic trees and shrubs aided by ‘carefully labeled botanical specimens’ (Tarlow, 2000: 228).

Tree planting around graves and in memorial areas is changing the spatial complexity of the lawn cemetery at Waddington Road and improving the shelter and privacy in the adjacent lawn sections, see Fig. 4. The longer-term vision of the Countryside Officer is to ‘create small paths and glades’ and to consider managing the landscape using ‘horse loggers to do it quietly and benignly and not use any machinery’. Identifying an area of marginal land at the edge of the cemetery that was not suitable for traditional graves also provided an opportunity to connect the cemetery with the mature woodland of Boy Bank Wood. In addition, it has enhanced the experience of users passing through the cemetery along the public footpath that runs by the side of the natural burial area and connects the town with the Ribble Valley.

The natural burial area of woodland glades at North Wood Cemetery has also been used strategically to create shelter and areas of enclosure and privacy in this otherwise open and exposed landscape. Part of the planning condition for the cemetery in this area of Green Belt was that it would provide opportunities of access to the open countryside.³ This is reflected in the design objectives that seek to ‘encourage people to

³ Green Belt – in the UK it is land at the edge of the City where planning policy attempts to control urban development and expansion of the City.

visit at times other than burial, and to recognise the historical, environmental and amenity value of the site' (HWCPC, 2002:11).

Natural burial introduces a new identity to the established formality of Waddington Road Cemetery through its planting but also the use of agricultural gates, posts and rail fences and a timber shelter within the woodland section. North Wood Cemetery attempts to add a new identity of sustainability and sensitivity to environment and place for the urban cemetery, with the inclusion of an earth sheltered assembly hall, an ancient woodland at its center and new native woodland and meadows. Its design language and circulation is informal and naturalistic and responds to the topography. This identity has already been compromised, however, as the cemetery landscape adapts and changes with use. Hedgerows of cherry laurel (*Prunus laurocerasus*), a non-native evergreen shrub, has been planted to provide shelter and privacy and a shipping container has been placed next to the Muslim section as a temporary storage solution for tools.

3.2.2. Sacred places of continuity

The inclusion of a woodland section at Allerton Cemetery may not have made any significant contribution to the delivery of regulatory ESs or in redefining the character and identity of this landscape, but it has increased the burial options available to residents and enabled access to burial space that would not have been suitable for traditional graves. In response to a request from representatives of the Muslim community, the local authority has also provided a dedicated area for Muslim burial within the woodland area. In the absence of any existing burial grid the graves can be orientated towards Mecca and earth mounds will mark the position and orientation of the grave.

Our survey and interviews with managers also identified a small number of sites where local authorities had introduced woodland burial in areas of the cemetery where graves already existed. In these cases it is important to note that the authority was not re-using graves but instead reclaiming un-used space within a grave that included provision for multiple burials. Reclaiming burial space is different from grave reuse because it does not require the disturbance of any remains. The City of London Cemetery, which was opened in 1856, provides an example of a local authority re-purposing an area of existing graves for woodland burial. In 1998, the authority designated an area of approximately 0.8 ha that until the 1870s had been used to provide public graves when it was then considered to be full. In the early 1900s the area was planted with trees, which are now fully mature. The significance of public graves (also referred to as un-purchased or common graves) is that the authority retains the burial rights and thereby control over who can be buried in these graves. Although this section had been identified as full, at time of writing there is space in each grave for new burial. This is partly due to the significant time that has elapsed since the last burial, thereby allowing the coffin and body to decay and break down. The graves at that time were also dug much deeper than in the present day and allowed for a greater depth of earth above the final burial. In terms of being able to access the grave and reclaim unused space, public graves have an important advantage in that there are no memorials or headstones. This is because there are no rights to erect a memorial on a public grave. By selecting woodland burial for this area of the cemetery the City of London has been able to preserve the existing character of the cemetery landscape (designated grade 1 on the Historic England National Register of Historic Parks and Gardens) and also respect the anonymity of those already buried, without privileging the identity of those buried naturally.

4. Conclusion

Climate change is challenging us to reconsider how we manage urban green spaces to deliver more robust and resilient cities. In future, lawns may become an unaffordable luxury (see, Webster et al., 2017) and even the Commonwealth War Graves Commission (CWGC), who pioneered the development of the Lawn Cemetery after the First World

War, have been experimenting in its removal as part of their climate change strategy (CWGC, 2017). Natural burial within urban cemeteries could therefore play an important role in helping to move public acceptance towards a less intensively managed landscape that is aesthetically more messy and less manicured. If this can be achieved within such a highly invested landscape where communities choose to bury their dead, we might ask what contribution it could have, for example, in changing attitudes towards the acceptance of less intensively managed public parks in order to deliver greater ESs. For those who might once have chosen a traditional grave for their deceased, the presence of natural burial within the urban cemetery might also provide an opportunity to experience and benefit from the different spatial and temporal qualities and contact with nature that they afford.

In this article, we have provided case studies of three urban cemeteries to highlight the contribution they make to regulatory and cultural ESs. We have proposed that this is potentially more important than the much larger and frequently more environmentally ambitious natural burial grounds developed by the independent sector. A key difference is that they each deliver ESs in areas of greatest need; towns and cities. They also extend the working life of the municipal cemetery and enrich its spatial quality and identity. Natural burial is thus redefining both established and contemporary cemeteries. Moreover, the underpinning ethos of natural burial could enable a rethink with regard to the maintenance of urban open spaces beyond the cemetery walls.

Acknowledgements

This research was supported by grants from the University of Sheffield and the Economic and Social Research Council (ref. nr. 062-23-0448).

References

- Barkham, J.P., 1993. For peat's sake: conservation or exploitation? *Biodiv. Conserv.* 2, 556–566.
- Bradfield, J., 1994. *The d-i-y Guide to Law and Practice*. The Natural Death Centre, London.
- CWGC, 2017 <http://www.cwgc.org/news-events/video-news/latest-on-the-commissions-climate-change-strategy.aspx> (retrieved 12/4/2017).
- Cameron, R., Hitchmough, J., 2016. *Environmental Horticulture Science and Management of Green Landscapes*. Cabi, Croydon.
- Cameron, R.W.F., Blanuša, T., Taylor, J.E., Salisbury, A., Halstead, A.J., Henricot, B., Thomsson, K., 2012. The domestic garden – Its contribution to urban green infrastructure. *Urban Forest. Urban Green.* 6 (4), 129–137.
- Clayden, A., Dixon, K., 2007. Woodland Burial: memorial arboretum versus natural native woodland? *Mortality* 12 (3), 240–260.
- Clayden, A., Hockey, J., Powell, M., 2010a. 'Natural Burial: the de-materialising of death?'. In: Hockey, J., Komaromy, C., Woodthorpe, K. (Eds.), *The Matter of Death: Space, Place and Materiality*. Palgrave, London (ISBN 0-230-22416-4, 978-0-230-22416-2).
- Clayden, A., Green, T., Hockey, J., Powell, M., 2010b. 'From Cabbages to Cadavers: natural burial down on the farm'. In: Maddrell, A., Sidaway, J. (Eds.), *Deathscapes*. Ashgate, Aldershot (ISBN: 978-0-7546-7975-2).
- Clayden, A., Green, T., Hockey, J., Powell, M., 2015. *Natural Burial: Landscape, Practice and Experience*. Routledge, London (ISBN: 978-0-415-63168-6).
- Clayden, A., 2011. 'Reclaiming and reinterpreting ritual in the woodland burial ground'. In: Molendij, A.L., Post, P., Kroesen, J. (Eds.), *Sacred Places in Modern Western Culture*. Peeters, Louvain (ISBN 978-90-429-2498-7).
- Coutts, C., Basmajian, C., Chapin, T., 2011. Projecting landscapes of death. *Landscape Urban Plann.* 102, 254–261.
- Davies, D., Rumble, H., 2012. *Natural Burial: Traditional – Secular Spiritualities and Funeral Innovation*. Continuum, London.
- Francis, D., Kellaher, L., Neophytou, G., 2005. *The Secret Cemetery*. Oxford, Berg.
- Highwood Cemetery Planning Application, 2002. *Development and Design and Property Services - Nottingham City Council*. (Ref. No: 02/02587/NFUL3).
- Hockey, J., Green, T., Clayden, A., Powell, M., 2012. 'Landscapes of the dead? natural burial and the materialisation of absence'. *J. Mater. Cult.* 17 (2), 115–132 (ISSN 1359–1835).
- Hockey, J., Clayden, A., Green, T., Powell, M., 2016. Temporalities of transience and the mortuary landscape: the example of natural burial: the Example of Natural Burial. In: Sorenson, T.F., Bijerangard, P., Rasmusen, P., Rasmusen, A.E. (Eds.), *Materialities of Passing: Explorations in Transformation, Transition and Transience*. Ashgate, Farnham.
- Hussain, I., Rugg, J., 2003. Managing London's dead: a case of strategic policy failure. *Mortality* 8 (2), 209–221.

- Institute of Burial and Cremation Administration (IBCA), 1996. Charter for the Bereaved. IBCA, Carlisle.
- Jalland, P., 1999. Victorian death and its decline 1850–1918. In: Jupp, P.C., Gittings, C.C. (Eds.), *Death in England and Illustrated History*. Manchester University Press, Manchester.
- Kaplan, R., Kaplan, S., 1989. *The Experience of Nature: A Psychological Perspective*. Cambridge University Press, New York.
- Kaplan, S., 1995. The restorative benefits of nature: toward an integrative framework. *J. Environ. Psychol.* 15 (3), 169–182.
- Livesley, S., Dougherty, B., Smith, A., Navoud, D., Wylie, L., Arndt, S., 2010. Soil-atmosphere exchange of carbon dioxide, methane and nitrous oxide in urban garden systems: impact of irrigation fertiliser and mulch. *Urban Ecosyst.* 13, 273–293.
- McClymount, K., 2016. That eccentric use of land at the top of the hill': cemeteries and stories of the city. *Mortality* 21 (4), 378–396.
- Milesi, C., Running, S.W., Elvidge, C.D., Dietz, J.B., Tuttle, B.T., Nemani, R.R., 2005. Mapping and modeling the biogeochemical cycling of turf grasses in the United States. *Environ. Manage.* 36, 426–438.
- Millennium Ecosystem Assessment, 2005. *Ecosystem and human well being. Millennium Ecosystem Assessment 5* Island Press, Washington, DC.
- Natural Death Centre, 2016. retrieved 7/5/2017 from <http://www.naturaldeath.org.uk/index.php?page=find-a-natural-burial-site>.
- Powell, M., Hockey, J., Green, T., Clayden, A., 2011. 'I Bury Boxes, Not Bodies': Identity, Emotionality and Natural Burial. (ASA Online No 01/3, pp 1–18 ISSN 2073–4158.). Ribble Valley Borough Council. (retrieved 8/5/2017 from https://www.ribblevalley.gov.uk/info/200290/environmental_services/419/clitheroe_cemetery/5).
- Rugg, J., 2006. Lawn cemeteries: the emergence of a new landscape of death. *Urban History* 33 (2), 213–233.
- Tarlow, S., 2000. Landscapes of memory: the nineteenth-century garden cemetery. *Eur. J. Archeol.* 3 (2), 217–239.
- Tzoulas, K., Korpela, K., Venn, S., Yli-Pelkonen, V., Kaźmierczak, A., Nielma, J., James, P., 2007. Promoting ecosystem and human health in urban areas using Green Infrastructure: a literature review. *Landscape Urban Plann.* 81, 167–178.
- Van den Berg, A.E., Jorgensen, A., Wilson, E.R., 2014. Evaluating restoration in urban green spaces: does setting type make a difference? *Landscape Urban Plann.* 127, 173–181.
- Webster, E., Cameron, R.W.F., Culham, A., 2017. *Gardening in a Changing Climate*. Royal Horticultural Society, UK.
- Woodthorpe, K., 2011. Sustaining the contemporary cemetery: implementing policy alongside conflicting perspectives and purpose. *Mortality* 16 (3), 259–276.