1.0 Vision Statement

The Laighills in Dunblane is a hilly area currently maintained primarily amenity grassland. Recently a skate park was built within the site as a means of meeting the social needs of Dunblane's and the development was praised as an example of sustainable development. However the Laighills has the scope to be developed further along these lines, and the promotion of certain habitats within the site would help with this cause. Whilst areas of grassland are currently maintained as playing fields and football pitches, other areas of habitat, some of considerable interest, are not maintained and face disturbance. The habitats of most interest are those with high biodiversity, namely mature oak-woodland, marshy habitat and rich neutral grassland. The preservation of these overlooked habitats would be of considerable value, and help move the site away from being an area most commonly associated with amenity grassland. The site was investigated twice by the Scottish Wildlife Trust in the 1990s during their ongoing cataloging of listed wildlife sites within (then) Central Region territory. This investigation yielded a phase 1 habitat survey of the site that identified important and fragile habitats within the site. However no further action was taken at the time and certain habitats have notably shrunk in size. Furthermore the invasive species Giant Hogweed threatens vulnerable riparian habitats onsite far more aggressively than identified within the phase 1 survey, especially on the banks of the small tributary stream known as the Scouring Burn.

2.0 Site Statement

The Laighills is an area of land to the North of Dunblane, Perthshire Scotland. It is included as part of the green belt area surrounding Dunblane, and therefore is not earmarked for urban development. The site consists of areas of well maintained amenity grassland alongside 'wilder' areas. The western half of the site is contained within a single meander of the river Allan, which also marks the site boundary to the north. The northerly extent of the site is a narrow strip of land running between the river Allan and a railway line. In this area two small islands lie in the river Allan though these are completely inaccessible. At the most Northern point within the site the boundary encompasses an area of mature oak woodland on a steep slope. The southernmost area of the site is flat, and consists of several football pitches and a playground for children. Along the north-most side of this area the ground rises up steeply to higher areas of acid grassland and patches of bracken. Occasional patches of dense scrub occur on the higher ground. The centre of this higher ground consists of another football pitch that is regularly maintained. The railway line bisects the site to the east of the higher football pitch and river meander, and access between the two halves of the site is afforded by the inclusion of a single railway bridge, that replaces an earlier cut-and-cover tunnel removed in the 1970s. Between the river meander and the railway line the land forms a mirrored D shape. The area to the east of the railway line is generally less accessible than the area to the west. Here a small stream, the Scouring Burn, flows North to South and meets the river Allan at the most south-easterly point of the Laighills. This Burn flows through the most remote and inaccessible areas of the site, and features a riparian habitat currently threatened by Giant Hogweed encroachment.

3.0 General Description

3.1 General Information

3.1.1 Location and site boundaries

The Laighills (site centre: NN780020) are an area of land to the North of Dunblane, Perthshire, Scotland. The site is approximately one kilometre wide at the widest point, and follows the course of the River Allan due north of Dunblane. Access is available around the southern and eastern sides of the site, with footpaths entering the site. The site itself is abundant in footpaths, many of which breach the site boundary at different points around the perimeter. The site itself is bisected by a railway line. The southern and eastern sides of the site are flanked by residential areas, whilst farmland lies to the north and west of the site. The western side of the site is defined by a single meander in the river Allan, which has shaped the topography of the site considerably (use map).

3.1.2 Land Tenure

The Laighills lies on Stirling Council title and there is no lease connected with the land. The railway track that bisects the site is the property of Network Rail, who owns the UK's entire rail infrastructure. Under the Land Reform (Scotland) Act 2003, site access is permitted as a statutory right of responsible access. This right applies to activities covered in the act if carried out responsibly.

3.1.3 Management infrastructure

Stirling Council has a Grounds Maintenance team who currently carry out mowing on the site, along with other repairs to features as necessary. The site is currently managed to allow access to the public, and for the potential for different recreational activities to take place. The grass is frequently cut on the playing fields (site Centre NN776019) and other grassy areas by Stirling Council. The footpaths are tended from time to time, when deterioration is noted. Invasive species are managed when reported, with Stirling Council managing Giant Hogweed (*Herculeum Mantegazzeianum*) during the early summer months to try and control spread of population. The 'wild' areas of the site are not currently managed in the interest of biodiversity.

3.1.4 Site Infrastructure

Within the site there is one building, located close to the Southern entrance to the site. It is a largely derelict building used as a changing rooms for football players.

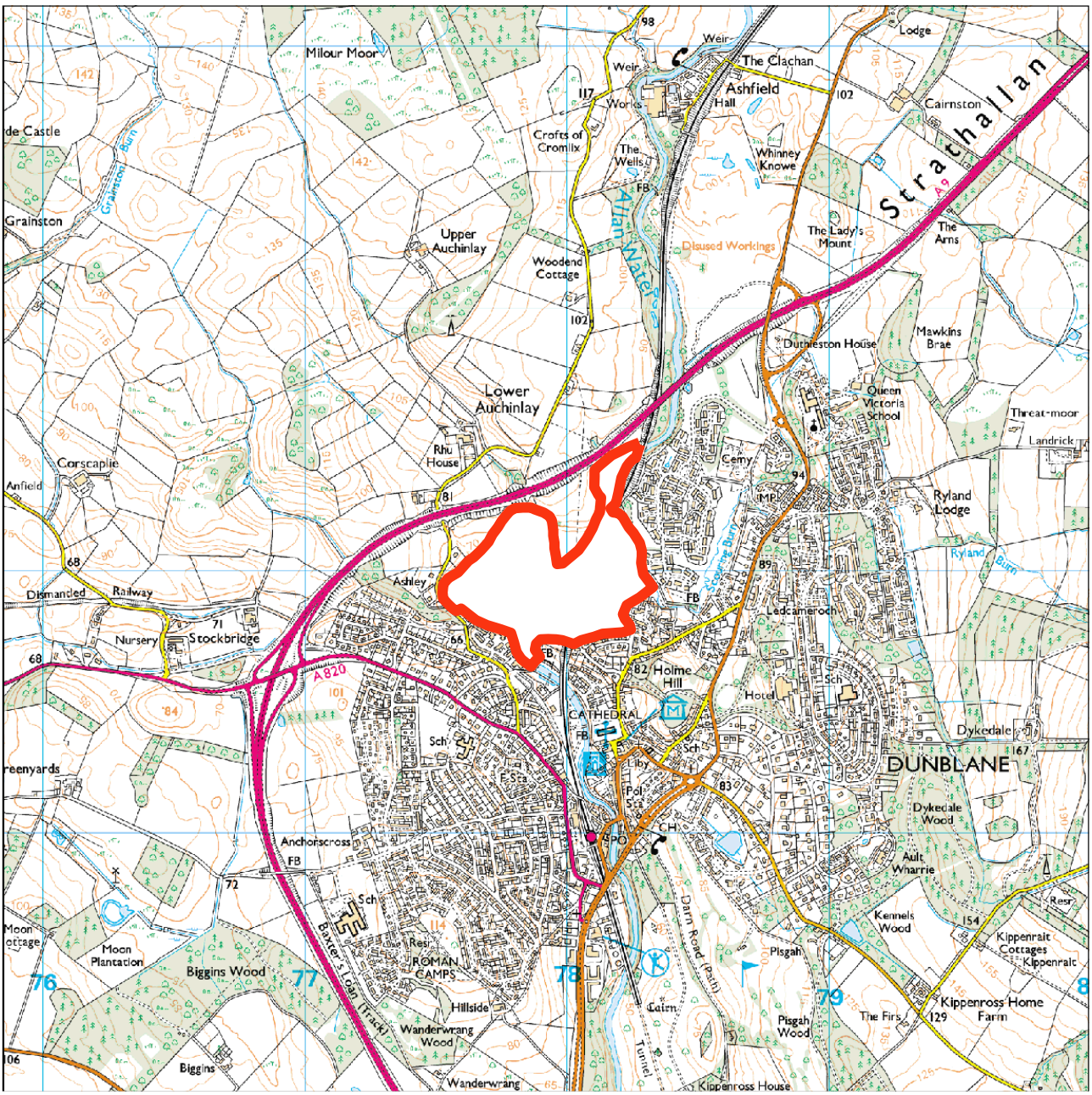
The site is traversed by many insubstantial footpaths created mostly by dog walkers choosing lines of best fit over areas and trampling shorter grasses. More substantial paths exist in each area of the site, and several feature imported stone material to strengthen them. The most substantial path starts at the play park in Section 4 and follows the steep slope overlooking the scouring burn into section 3 before running parallel with the railway at the top of the railway cutting. It leads to the railway bridge, and continues further north to the west of the railway though deteriorates in quality and leads into the predominantly overgrown areas to the north of the site. Across the railway bridge the path also continues north and stays on higher ground whilst the scouring burn meanders to the east of the path. This path connects with the "Jacob's Ladder" access path at the end of Tannahill Terrace. The main path then heads North past several small swampy areas before meeting a T junction. The western route here leads eventually to Ashfield, a small township to the North of Dunblane and outside the Laighills site boundary. The eastern route follows the route of the scouring burn further north until both pass outside the site boundary.

Several bridges lie within the site boundary. A heavily corroded bridge crosses the River Allan at the most Northerly point of the site, allowing access to the land on the inside of the river meander though it is difficult to access and only used infrequently. A single bridge crosses the railway within section 4 (though section 3 lies at its eastern side). The scouring burn features five bridges. Two of these are located at a distance of 100 feet apart at the most northerly part of Section 3 where Alpine drive meets the site boundary. Another bridge lies at the bottom of the "Jacob's Ladder"path. This bridge consists of a single concrete slab. A similar bridge is located in deep undergrowth roughly 200 feet upstream and is difficult to access and in poor condition. A new bridge crosses the scouring burn just before it meets the river Allan. This bridge allows access to the site from the Haining foot path and is constructed out of pressure-treated timber beams.

The skate park is located to the north of the low lying football pitches, halfway up the slope leading to the higher pitches. It is landscaped into the side of the hill in a natural valley there and is therefore invisible from lower and higher ground. It is constructed out of concrete which is now heavily vandalized with graffiti, though the infrastructure itself is in good condition and is generally well maintained. Access to the skate park is from a path that runs up the slope and eventually leads to the higher football pitch. This path was upgraded during the skate park construction to allow vehicle access, and gravel was used to reinforce it. However access for emergency vehicles is still widely regarded as inadequate and the access route might be further upgraded in the near future.

3.1.5 Map coverage

1:50 000	Ordinance Survey	Landranger Series 57	Stirling & the Trossachs
1:25 000	Ordinance Survey	Explorer Series 366	Stirling and Ochil Hills West
1:25 000	Crimson Publishing	Pathfinder Series 23	Loch Lomond, Trossachs, Stirling and Clackmannan

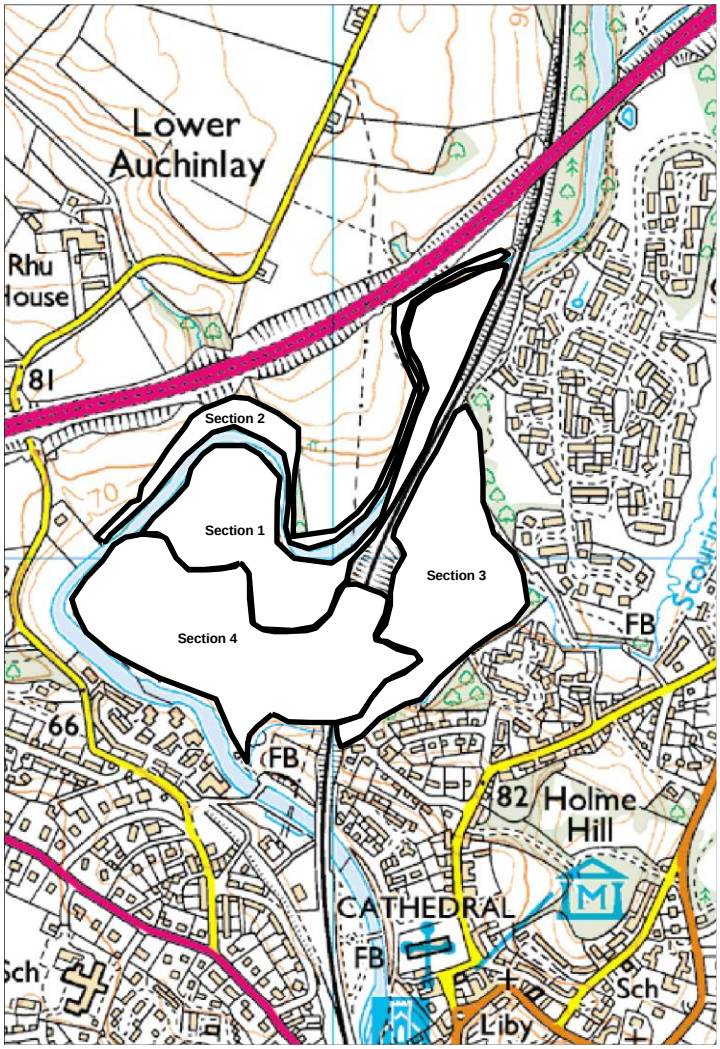


3.1.6 Photographic coverage

Currently no aerial photographic coverage exists that is up to date and contains the most recent urban developments adjacent to the Laighills. This is important as previously a brown field site (disused sand quarry) existed that altered the site boundary significantly at the north-easterly corner of the site. Google Maps and Google Earth updated their aerial coverage of the Laighills in 2009 but used older source photos that did not include the developments.

3.2 Zones

Scottish Wildlife Trust initially surveyed and mapped the Laighills in 1991 and divided the site into four sections. Section 1 consists of the hilly area to the South of the river meander and runs north along the West bank of the river Allan until it reaches an abandoned bridge and two small islands. Section 2 is the narrow band of tall ruderals to the north of the same meander that also marks the site boundary at that point. Section 3 consists of the low lying grassland area to the East of the river Allan upstream of the meander and incorporates the area through which the Scouring Burn flows through. Section 4 is the areas of amenity grassland to the south of the site, incorporating both football pitches and the play park area.



3.3 Environmental Information

3.3.1 Physical

The geology and geomorphology of the site is important in defining current appearance of the site, along with the species that currently thrive there. The site is predominantly hilly, shaped by the erosion and deposition actions of the River Allan. The river features a large meander in the site resulting in steep and unstable slopes on the outer curves of the meander and river beaches on the inside curves. The underlying geology of the site is Lower Old Red Sandstone, a common geological feature throughout Scotland. On top of this lies boulder clay and localized deposits of fluvio-glacial sands and gravels. Tills derived from sandstone sediments (mainly clay-loams), which result in free-draining nutrient-poor soils, occur on the upper flanks of the hills and slopes. Poorly draining fluvio-glacial clay soils occur in the hollows prone to flooding at the base of the steeper slopes of the site.

3.3.2 Biological

3.3.2.1 Habitats/Communities/Flora

The site is predominantly populated with stretches of bracken (*Pteridium aquilinum*) and dense scrub. This forms a mosaic with amenity, neutral and acid grasslands. The fescue/bend acid grasses of the hilly slopes on the site suffer from heavy rabbit grazing and are generally species poor. Smaller patches of unimproved acid grassland can be found on the steep slope overlooking the larger meander of the River Allan. On this slope a larger variety of grasses are found alongside clumps of blueberry (*Vaccinium myrtillus*).

A large variety of meadow herbs and grasses are supported by damp, low-lying fields of rank neutral grasslands. Common forbs lncluding clover (*Gen. Trifolium*), and ruderals are indicative of past improvement. The banks of the River Allan are predominantly covered in bracken but also provide species-rich verges that are covered with a dense mixture of tall grasses, herbs and legumes including substantial patches of Wood Crane's-bill (*Geranium sylvaticum*), Crosswort (*Galium cruciata*), Lady's Bedstraw (*Galium verum*) and Meadow Vetchling (*Lathyrus pratensis*). Greater Butterfly Orchid (*Platanthera chlorantha*) is also found in this area.

Rich neutral grassland occurs on the substantial river beach area of the great meander, and is highly abundant in Meadow Cranes'bill (*Geranium pratense*). However encroaching spread of scattered scrub, Bracken and Rosebay Willowherb (*Chamaenerion angustifolium*) invade this area making this area vulnerable.

Marshy grassland occurs in patches throughout the site and may be the remnants of wet meadows or

pastures. These areas are dominated by Meadowsweet (*Filipendula ulmaria*) and also contain other herbs. Fragments of marsh exist at the base of the north-facing slope overlooking the river meander, largely due to the sheltering from sunlight in this area and poorly draining soils. These fragments of marsh habitat are especially interesting and fragile, and consist of a dense cover of sedges. Within these sedges, patches of Purple Moor Grass (*Molinia caerulea*) occur, alongside a large variety of marsh herbs and many examples of Common Spotted Orchid (*Dactylorhiza fuchsia*) and Northern Marsh Orchid(*Dactylorhiza purpurella*).

The banks of the Scouring Burn provide a variety of marginals, including Marsh Woundwort (*Stachys palustris*), Great Willowherb (*Epilobium hirsutum*), Brooklime (*Veronica beccabunga*) and Water-cress (*Nasturtium officinale)*. This habitat is fragile and currently threatened by encroaching Giant Hogweed, which has moved substantially further upstream against the extreme East boundary of the site since first highlighted by the Scottish Wildlife Trust in 1994.

The woodland habitats in the Laighhills fall into two distinct types, Oak and Ash. Damp Ash (*Fraxinus excelsior*) woods have an understory dominated by Hawthorn (*Crataegus monogyna*). The ground flora here is typically patchy and dominated by herbs including Wood Aven (*Geum urbanum*), Water Aven (*Geum rivale*), Common Dog-Violet (*Viola riviniana*) and Primrose (*Primula vulgaris*). The mature oak woodland is more open, and contains dead wood from fallen trees. The development of a housing scheme means that a lot less of this habitat survives when compared to the 1994 phase 1 habitat survey report.

3.3.2.2 Fauna

Fauna within the Laighills has not been accurately mapped or surveyed. However Heron (*Ardea cinerea*)**,** Dippers (*Cinclus cinclus*), Mallards (*Anas platyrhynchos*) and Yellow/Pied Wagtails (Gen. *Motacilla*) are frequently spotted on the river. Mink (*Mustela vison*) have been seen by the author on the banks of the river. Woodland birds are also commonly spotted including Blue tit (*Cyanistes caeruleus*), Robin (*Erithacus rubecula*), Great tit (*Parus major*), Wrens (*Troglodytes troglodytes*) and Dunnocks (*Prunella modularis*). Rabbits are commonl seen on the site, and are responsible for heavy grazing in uphill areas. European Water Vole (*Arvicola amphibius)* is common in the Scouring Burn area, and Roe Deer occasionally are seen in the Laighills. Nocturnally, both male and female Tawny owls (*Strix aluco*) are commonly heard in the area. Both Common Pipistrelle (*Pipistrellus pipistrellus)* and Daubenton's (*Myotis daubentonii*) bats are frequently found in the Laighills, with the Daubenton's Bats found over the River Allan during summer months.

3.4 Cultural

3.4.1 Archeology

In 1872 William Black Esq., Fellow of the Historical Society hypothesised that certain mounds in the Laighills, all but untraceable as of late 2009, were the remains of a Roman station called Alauna. The precise location of Alauna has never been discovered, though the proximity of the Ardoch Roman road and location of other known Roman camps in the area would place the station within the rough area of the Laighills. No archaeological survey work has ever been carried out in the Laighills, and the mounds are not significant to warrant management of the site to suit their presevation.

3.4.2 Past Land Use

On the 2nd of April 1892 the Laighills was opened as a golfcourse. Dunblane railway station opened in 1848, making Dunblane an hour's commute from Edinburgh and Glasgow, attracting many visitors, many of whom were keen amateur golfers. What is surprising is the proximity of the 3rd hole to the railway line, and that players would have to cross the railway at the single railway bridge on site. The Laighills site lost favour as a golf course, impart due to land use conflicts with local smallholding owners contesting grazing rights for cattle, and by 1922 the 'Dunblane New Golf Club" opened to the south-east of Dunblane.

3.4.3 Present Land Use

The site is most commonly used by dog walkers from the local area. Fishing is permitted in the river Allan if a permit has been previously purchased. The football pitches are frequently used (and maintained). The wild areas of the site are currently not managed in the interests of biodiversity. Grass mowing occurs on the football pitches and other areas of amenity grassland, and is carried out by Stirling Council. Invasive species are managed by Stirling Council only when reported by members of the public. Footpaths are also maintained by Stirling Council when needed.

3.4.4 Past status/interest

As a result of the phase-1 habitat survey carried out by Scottish Wildlife Trust in 1994 as part of a then ongoing reassessment of SWT Listed Wildlife Sites in Central Region the site was identified as being suitable as a Local Nature Reserve. However certain disagreements arose during the reassessment regarding site boundaries, and although these were amended the site was never reconsidered.

3.4.5 Present conservation status

The site currently has no specific conservation status. It is viewed as a Green Belt area, as covered in the Scottish Executive's Scottish Planning Policy 21. Therefore urban development is unlikely to occur on the site within the foreseeable future.

3.5 People – Stakeholders, local communities etc

3.5.1 Local community and stakeholders

The Laighills site is currently most popularly used as a dog walking area. Dog walkers will most likely be interested in the preservation of important arterial paths within the site. The two areas of amenity grassland within the site are currently maintained as football pitches, with the provision of goals and white lines were appropriate. These sites play host to local tournaments, including inter-school tournaments and amateur leagues. Therefore the preservation of these sites would be viewed as important to local people who play football here. Currently the site is not used by Dunblane High School as suitable area for Duke of Edinburgh Award training. This presents an overlooked opportunity for interested high school students, and could be used for such an opportunity. The skate park attracts younger members of the public, and the maintenance and upkeep of the site is in their interests.

3.5.2 Access and Tourism

Access to the site occurs at points on the South and South Easterly sides of the site. These include access at The Haining, Tanahill Terrace, Cemetary Road (just off the B8033) and Barbush road. Extensive development of the areas surrounding the North and North Easterly sides of the Laighills by Cala Housing in the last decade has created access points from Pont Crescent, Norrieston Place and Alpin Drive. The Haining is the area roughly defined by the path adjacent to the River Allan that runs behind Dunblane Cathedral. Due to the proximity to the Cathedral it is likely that tourist

visiting Dunblane would encounter the Laighills using this access route predominantly, whereas other access routes are used mainly by residents.

3.5.3 Interpretation provision

The Laighills is covered by tourist literature regarding Dunblane. However the historical context of the site regarding the mill industry in Dunblane is not mentioned. At the point where the Scouring Burn meets the River Allan the burn has been artificially widened and a low stone promenade has been constructed. This feature relates to the mill located outside the Laighills site on the opposite bank of the River Allan yet it is not explained by any information boards onsite. This is an example of a feature that could be upgraded by interpretation provision as currently no information boards are installed onsite other than those detailing the children's play area equipment and signs cautioning against dog fowling or alcohol consumption.

3.6 Landscape

The layout of the site is not especially apparent until you actually enter the site. When viewed from other areas of Dunblane the site is typically dwarfed by higher topography in the background. When viewed from the South the site is hard to define against the presence of the Braes of Doune. When viewed from the West the site is overshadowed by the presence of Sherrifmuir. This phenomenon occurs because the Laighills lies within the river valley of the river Allan, whilst most of Dunblane has developed on higher land to the East and West of the narrow river valley. As the river flows North to South if flows through a narrow channel through Dunblane itself, and the Laighills at the North of the town is where the river forms an extensive meander. The highest parts of the Laighills sites are therefore only as high as the adjacent land in Dunblane on the other side of the River Allan, and the extensive low-lying areas of the site are very sheltered.

3.7 Bibliography

Information regarding habitats present on the site was initially sourced from the previously mentioned Scottish Wildlife Trust Phase 1 Habitat Survey. However this was compiled in 1994, so the author carried out extensive research on the site to identify habitats and to remap areas that have changed since 1994. Pat MacLachlan's '100 Years of Golf in Dunblane' was very useful in gaining further historical data regarding the Laighills, namely previous land use and potential archaeological features. Current land use was identified by the author making repeated visits to the

site and recording activity at different times of the day during August and December 2009.

Nature Conservation and Other Features of Interest

4.1 Identification and confirmation of important features

4.1.1 Previously recognized features

The Scottish Wildlife Trust carried out a phase 1 habitat survey (as previously mentioned) and identified a significant number of habitats, some of which are fairly fragile and worth preserving. However within the phase 1 habitat survey only a brief mention was made to fauna on the site. Whilst no species on the site is especially rare, and information regarding species present can only be gained through talking to local residents or independent field work, a lot of the species of fauna are typical of this kind of site. Therefore their existence is important in the fundamental aesthetic of the site.

4.1.2 Additional Features of Interest

Name	Semi-natural broad-leaved woodland.
Size	1ha [2]
Naturalness	Semi-natural, consisting a few mature Ash (*Fraxinus excelsior*) and young Rowan (*Sorbus aucuparia*) trees with a dense understorey of Hawthorn (*Crataegus monogyna*), Raspberry (*Rubus idaeus*) and Bramble (*Rubus fruticosus*) plants.
Rarity	Not a rare habitat.
Fragility	Being partly on a steep slope the steeper area is prone to soil erosion exposing tree roots, thus threatening the stability of trees.
Typicalness	This habitat is typical for the area, with other examples of semi-natural broad leaved woodland occurring outside the site boundary.

Potential for Improvement	The removal of dead wood from the area and the provision of brash piles in the area would improve biodiversity and encourage invertebrates and small mammals which would support a larger eco system.
Name	Swamp habitats (within section 3)
Size	5m x 10m (approx)
Diversity	High number of species present, making this a good example of swamp habitat.
Naturalness	Although formed from the remains of a curling pond the largest swamp habitat shows no signs of being man-made, with no visible drainage infrastructure. It also supports a wide range of species.
Rarity	No species found in the swamp is a protected species. However there is the largest of 3 areas of swamp on site, so within the Laighills this habitat is rare and this is the best example.
Fragility	This area is prone to flooding during periods of heavy rainfall and can dry out completely in summer months. However the site has expanded in area since 1994 due to poor drainage. The swamp habitats all feature expanding populations of Reed Canary Grass (Phalaris arundinacea), which would reduce overall biodiversity of the site if unmanaged.
Typicalness	With the wide range of typical swamp species the habitat is ‘typical’.
Potential for Improvement	Close proximity to a main footpath means improvement or expansion of this habitat is limited. Poor drainage of the site leads to the flooding of the adjacent footpath leading to a conflict of interests. Therefore it is difficult to improve this habitat but rather closely monitor it

	for obvious changes.
Name	Footpath Network
Size	It is worth noting that footpath quality within the Laighills varies from well maintained gravel paths to footpaths comprised only of areas of flattened grass. Some footpaths are hard to define and are misleading. The total area of footpaths gives access to most of sections 4 and 1. Section 3 is traversed North to South by one footpath that follows the route of the Scouring Burn and connects with the access path 'Jacob's Ladder' which meets the end of Tannahill Terrace.
Diversity	n/a
Naturalness	n/a / unnatural
Rarity	n/a
Fragility	n/a
Typicalness	n/a
Potential for Improvement	Interpretation boards, highlighting footpaths clearly, could be implemented at site entrances where necessary.
Name	Railway Bridge
Size	25m x 2m
Diversity	n/a
Naturalness	n/a
Rarity	n/a
Fragility	n/a
Typicalness	n/a
Potential for Improvement	This feature is important as it bi-sects the site completely. As the bridge is recessed into the railway cutting, access is granted by descending a steep flight of steps. This makes access from one site to the other difficult for disabled visitors. Because of this lack of access, Local

	Nature Reserve status for the Laighills cannot be granted.
Name	Play area
Size	50m x 100m approx.
Diversity	Low. Habitat is mainly amenity grassland with areas of Rosebay Willowherb and Gorse (gen. *Ulex*) on slope overlooking site.
Naturalness	Unnatural. Amenity grassland and other areas covered in protective plastic material. Sandpit has the potential to alter soil pH in locality.
Rarity	n/a
Fragility	n/a
Typicalness	n/a
Potential for Improvement	An area of land use that differs significantly from the rest of the Laighills site. However this feature attracts families with young children to the site and generally results in high visitor numbers in summer months.
Name	Giant Hogweed encroachment.
Size	Varies seasonally, upstream land management and summer weather greatly impacts on spread. Giant Hogweed can be found on the inside of the large river meander and on the banks of the Scouring Burn below Tannahill Terrace, alongside the banks of the river Allan at the meander and further upstream in section 1 and expansion in growth has been noted for the last decade. Growth has expanded significantly since the 1994 Phase 1 habitat survey.
Diversity	Low. Giant Hogweed is an aggressively dominant species and generally causes a decline in biodiversity due to thick canopy reducing light levels at ground level. Giant Hogweed also consumes most of the nutrients within the soil it

	grows from.
Naturalness	A non-native species accidentally introduced to the British countryside. Because of this it can be viewed as un-natural.
Rarity	Within the Laighills site Giant Hogweed has become a far more commonly seen species since 1994, generally following the routes of the railway and the river through the site and examples are no longer a rare occurrence, and therefore more intensive management is a necessity.
Fragility	A very dominant and hardy species, capable of withstanding aggressive counter-management.
Typicalness	Giant Hogweed is an increasingly common species associated with the verges of the River Allan, though as a non-native species it is not 'typical' of the riparian habitats associated with this region.
Potential for Improvement	Giant hogweed is difficult to manage, and has to be removed before the flowering or seeding stage.

5.0 Objectives

Feature 1

Swamp habitat.

Attributes

Swamp habitat should be managed in a way that prevents succession which would ultimately lead to loss of habitat (Ausden, 2007).

Objective

To control the population of Reed Canary Grass (Phalaris arundinacea) within swamp habitats in Section 3 of the Laighills to a state whereby it does not threaten biodiversity. Reed Canary Grass is a native species to the UK but is an invasive and dominant species that typically reduces the biodiversity of swamp habitats and can lead to succession. Reed Canary Grass itself is indicative of succession, suggesting that the swamp habitat has developed from an initial area of eutrophic water.

Therefore the swampland is developed and sustainable (Gilbert O, Anderson P, 2000). On site, Reed Canary Grass was noted growing in dense patches making it difficult for other species to thrive within the same area. Fauna such as small rodents also find Reed Canary Grass impenetrable, and therefore will not thrive in the area. It is also ungrazed by rabbits within the site and in areas grows up to five feet high, suggesting the swamp areas are highly fertile and capable of sustaining further species.

Limits:
Upper – No increase in total area of Reed Canary Grass within swamp habitats.
Lower – 80% reduction in Reed Canary Grass cover.
Monitoring: RF2301 Collect data, other vascular plants, monitor.

Reed Canary Grass coverage would be measured by assessing the mean number of plants within quadrat samples of the area. The initial findings would be recorded alongside the total area of coverage of Reed Canary Grass.

Factors

Hydrology: Poor drainage of the areas due to fluvio-glacial clay soils has lead to the growth of swamp habitat. Reed Canary Grass is likely to spread into extended swamp habitat as this species thrives in such habitats.

Monitoring: RP10 Collect data, hydrological.

Growth means: Reed Canary Grass spreads through underground Rhizomes, and is not susceptible to rabbit grazing. Therefore mowing or grazing will not impact significantly on the spread of Reed Canary Grass, and conversely makes the species especially hardy.

Habitat spread: Growth in tall ruderals adjacent to the largest swamp habitat has resulted in a decline in light levels and the swamp area is less prone to drying out. This is likely to result in the spread of Reed Canary Grass as the habitat area increases.

Monitoring: RF12 Collect data, trees/shrubs, Monitor.

Favorable Conservation Status

A reduction in size and/or density of Reed Canary Grass within the swamp habitats to allow other species such as Meadowsweet (Filipendula ulmaria) and Marsh Willowherb (Epilobium palustre) to

spread throughout swamp habit.

Feature 2

Riparian Habitat

Attributes

The population of Giant Hogweed (*Herculeum Mantegazzeianum*), which has spread throughout sections one and three of the Laighills within the last decade. Giant Hogweed contains a photosynthetic sap which causes burns and other skin irritations upon contact with bare skin. The sap can stay dormant within skin cells and cause unpleasant irritation upon further exposure to sunlight. Under the 1981 Wildlife and Countryside act it is an offence to plant Hogweed or to otherwise cause it to grow in the wild. Plants in the site currently only spread along the verges of the river Allan and the Scouring burn. However as more mature plants develop the chances of seeds being dispersed by the wind will increase and the spread of Hogweed could move away from riparian areas.

A good means of understanding the extent of Giant Hogweed establishment within the target area would be to ascertain the number of mature plants either in the flowering or seeding stage. Giant Hogweed flowers once it reaches a maturity of three to four years old. Such plants can reach a height of ten to fifteen feet and can disperse upwards of 7000 seeds leading to continual spread of plants throughout area if unmanaged.

Objective

Reduce the population of Giant Hogweed on the margins of the River Allan and Scouring Burn within the Laighills site to preserve riparian habitats.

Limits:

Upper - Current number of mature (3-4 year old flowering plants) examples of Giant Hogweed.

Lower – No fully mature Giant Hogweed plants.

Monitoring:

RF2302 Collect data, other vascular plants, monitor.

Factors

Upstream land management: The River Allan flows into Stirling Council from Perth and Kinross Council land. Insufficient Giant Hogweed management by Perth and Kinross Council leads to large

numbers of plants upstream seeding the river causing widespread growth downstream, as is the case in the Laighills.

Monitoring:

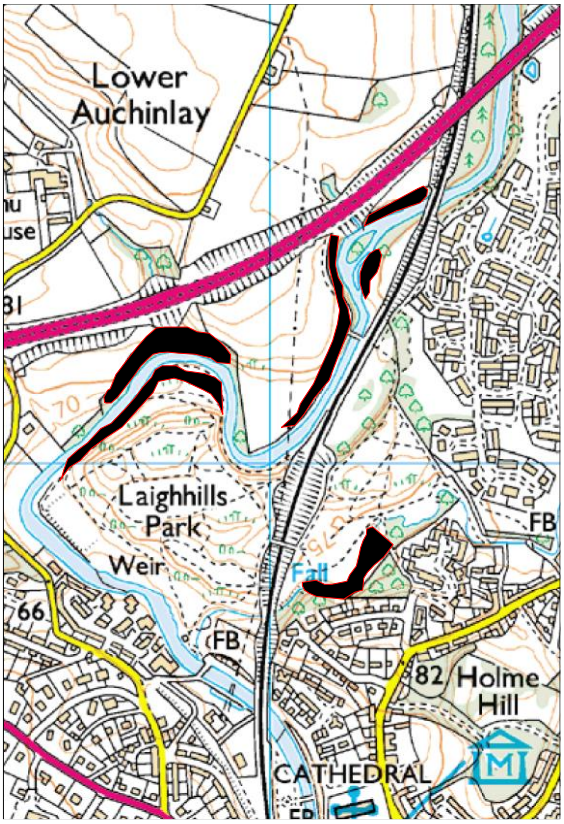
RF2303 Collect data, other vascular plants, monitor.

Favorable Conservation Status

The map overleaf shows (in black) the areas most heavily affected by Giant Hogweed. Of particular interest is the section at the south of the river meander as Hogweed there is currently encroaching on swamp habitat. As footpaths also follow the river meander at this point Hogweed presents a considerable risk to site visitors, especially children.

Management:

MS10 Manage Species: Other vascular plant.



Areas of Giant Hogweed encroachment shown in black.

Rationale

Giant Hogweed can be effectively controlled by removing the rootstock of the plant ad a depth of 8 – 12cm below ground level using a spade or mattock. Herbicide control within the Laighills would have to be carried out in Spring during calm dry weather using glyphosate at a recommended overall spray of 5 litres per hectare at a concentration of 200 litres ha $^{-1}$. Glyphosate is the only herbicide that can be employed with close proximity to water courses. However prior consultation with the Scottish Environmental Protection Agency (SEPA) would be required to ensure spraying of glyphosate is safe within the Laighills site.

Feature 3

Semi-natural broad-leaved woodland (a). Currently not managed in the interests of biodiversity the area of semi-natural broad-leaved woodland onsite situated at the most northerly point of the site on the west side of the river adjacent to the small island features heavily littered under stories creating a dark and impenetrable under layer unsuitable for invertebrates and ground level flora.

Attribute

Understory Composition.

Objective 1

Reduce cover of dead wood in understory down to five per cent of standing stems to be dead per hectare (Ausden, 2007) given that the area of Semi-natural broad-leaved woodland is 50 – 120 years old.

Limits:

Upper: none.

Lower: Reduction in cover of dead wood that does not exceed 5% dead standing stems.

Monitoring:

MH08, Managing habitat, woodland/scrub, by managing dead wood

Initial coverage and composition of coverage should be ascertained.

Factors

Previous site management: lack of previous clearance allowing prolonged accumulation of material.

Monitoring:

RF1201, Collect data, trees/shrubs survey.

Composition and quality of litter would have to be assessed. Some wood could be reemployed

within brash piles if acceptable.

Objective 2

Construct brash piles to encourage native invertebrate species and small mammals.

Factors

Available material: Brash piles are typically constructed from smaller branches and twigs compacted into piles.

Topograhy: Brash piles typically provide enough shelter for rabbits to begin constructing warrens underneath (Ausden, 2007). Constructing brash piles on the fragile slopes would encourage rabbit warren development, which would further destabilize the soil on these slopes.

Monitoring:

RF1202, Collect data, trees/shrubs survey.

Current invertebrate species: An initial count of invertebrates would need to be carried out to ascertain not only which species currently live onsite but their typical numbers. Pitfall traps could be employed over a period of two weeks to record species.

Monitoring:

RA74, Collect data, other/general insects, count/estimate/measure/census.

RA76, Collect data, other/general insects, list species.

Feature 3

Semi-natural broad-leaved woodland (b). A further belt of semi-natural broad-leaved woodland exists in section 3 adjacent to the main path and continues behind the disused and largely overgrown BMX track. Scottish Wildlife Trust identified this section to be mature. Ausden (2007) states that the introduction of woodland herbs would be viable in mature woodland.

Attribute

Species of woodland herb present.

Objective

Introduce woodland herb species; Bluebell (*Hyaacinthoides non-scripta*), Ramsons (*Allium ursinum*) and Woodruff (*Galium odoratum*), to the ground level habitat.

Limits:

Upper: Seeds spread at 3-5kg per ha (1 ha site).

Lower: none.

Monitoring:

RF2304 Collect data, other vascular plants, monitor.

Factors

Previous site management: lack of previous clearance allowing prolonged accumulation of litter material making site unsuitable for woodland herbs in present state.

Monitoring:

RF1201, Collect data, trees/shrubs survey.

The quantity of wood litter would have to be assessed and removed (possibly used for brash piles in other area of semi-natural broad-leaved woodland).

6.0 Project Register

Project Code	RF2301 Collect data, other vascular plants, monitor.		
Years	June 2010- June 2015	Section 1	
Staff	Voluntary	Time: 1 Day	Cost: £n/a
Description:	Coverage of Reed Canary Grass will have to be assessed on one day every summer for five years to assess the rate of expansion within the habitat. Coverage would be measured by recording the mean number of plants in 1m quadrat samples taken at random intervals within the swamp habitat.		

Project Code	RF2302 Collect data, other vascular plants, monitor.

Years	01/06/10	Sections 2, 3 and 4	
Staff	Voluntary	Time: 1 Day	Cost: £n/a

Description: Coverage of Giant Hogweed on Riparian Habitats to be assessed one day in June when the mature plants will be flowering and therefore highly visible and easy to make a rough headcount. Total number of mature plants would be recorded per area.

Project Code	MS10 Manage Species: Other vascular plant.		
Years	01/06/10 - 03/06/10	Sections 2, 3 and 4	
Staff	Stirling Council Maintenance (two individuals).	Time: 3 Days (one day per section).	Cost: £350 per day + cost of glyphosate.

Description: Glyphosate to be sprayed over areas populated with Giant Hogweed at a rate of 5litres per hectare at a concentration of 200l ha^{-1}. This should prevent flowering and further seeding from within the Laighills site though upstream seeding cannot be controlled.