

Appendix D: Report on the proposal for an ecological buffer zone at Druid's Glen

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Cherrywood Strategic Development Zone, August 2011

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This Report sets out the argument for a buffer zone around the boundary of the woodland habitat at Druid's Glen in the context of the design of the Cherrywood Planning Scheme.

1. Ecological Value of Druid's Glen

The Glen contains both freshwater and woodland habitat types including eroding upland rivers, calcareous springs and (mixed) broadleaved woodland. These habitats support a range of fauna that are found only in the Glen in the context of the whole SDZ area.

a) Eroding upland rivers

In Druid's Glen the flow was turbulent and there was an absence of any floating river vegetation. Plants are limited to bryophytes such as *Thamnobryum alopecurum*, *Sciuro-hypnum plumosum*, *Platyhypnidium riparioides* and *Conocephalum salebrosum*.

b) Calcareous Springs

The calcareous spring is of high, local conservation value but is not considered to be an example of the Annex I habitat 'Petrifying springs with tufa formation' due to the low cover of bryophytes and vascular plants (Denyer, 2010). Most of this spring and the stream below it were enveloped in dense mixed broadleaved woodland and not easily accessible.

c) (Mixed) Broadleaved Woodland

Tree species included Beech *Fagus sylvatica*, Ash *Fraxinus excelsior*, Scots Pine *Pinus sylvestris*, Oak *Quercus* species, Sycamore *Acer pseudoplatanus* and Wych Elm *Ulmus glabra*. The understorey on the slopes of the valley was dominated by Holly *Ilex aquifolium* with occasional Hazel *Corylus avellana* and Elder *Sambucus nigra*. The ground layer on these slopes was heavily shaded and only Ivy was found. On the valley floor there was a path sloping along the southern side and there were areas of Cherry Laurel *Prunus laurocerasus* that have become established. This invasive shrub out-shaded much of the central portion of Druid's Glen. Further upstream and downstream the valley floor contained a diverse ground flora with Bramble *Rubus fruticosus*, Honeysuckle *Lonicera periclymenum*, Male-fern *Dryopteris filix-mas*, Great Wood-rush *Luzula sylvatica*, Soft Shield-fern *Polystichum setiferum*, Hard-fern *Blechnum spicant*, Hart's-tongue *Phyllitis scolopendrium*. In Spring the woodland flora supported Sanicle *Sanicula europaea*, Lords-and-Ladies *Arum maculatum*, Herb-Robert *Geranium robertianum*, Wood Speedwell *Veronica montana* and Enchanter's-nightshade *Circaea lutetiana*. Wood anemone was found in both its white form *Anemone nemorosa* and the non native Blue Anemone like *Anemone apennina*. Bryophytes included *Mnium hornum*, *Fissidens taxifolius* and *Pseudotaxiphyllum elegans*, (Denyer 2010). The lower middle section of the valley floor hosted a community of Yellow Skunk-Cabbage *Lysichiton americanus*, a non-native curious-looking bright yellow plant that has probably reached the site through refuse dumping.

Three invasive species were found in this woodland in Druid's Glen: Giant Hogweed, Cherry laurel and occasional *Rhododendron ponticum*. The latter two are woody species that had out-shaded the native ground flora and limit its ecological value.

d) Fauna:

Otters

Suitable holt locations were noted upstream within the Druid's Glen woodland and spraints were recorded downstream at Lehaunstown Lane bridge and upstream at Priorsland. It is highly probable that otters are using the Glen for foraging and possibly for resting and shelter for moving through the area.

Bats

Druids Glen recorded the highest diversity of bat species in the whole SDZ area. Species included: Common pipistrelle *Pipistrellus pipistrellus*, Soprano pipistrelle *Pipistrellus pygmaeus*, Leisler's Bat *Nyctalus leisleri*, Brown Long-Eared bat *Plecotus auritus*, Daubenton's bat *Myotis daubentonii*, Natterer's bat *Myotis nattereri* and Whiskered Bat *Myotis mystacinus*. All records were by time expansion detector and a lower degree of confidence is generally awarded to classification of the *Myotis* genus by this means alone.

Bats were particularly abundant around the bottom of the valley around the river and were recorded commuting up and down through dense vegetation. Bats were also recorded along the southern and northern edges of the woodland and seen to dip in and out of openings at the woodland edge.

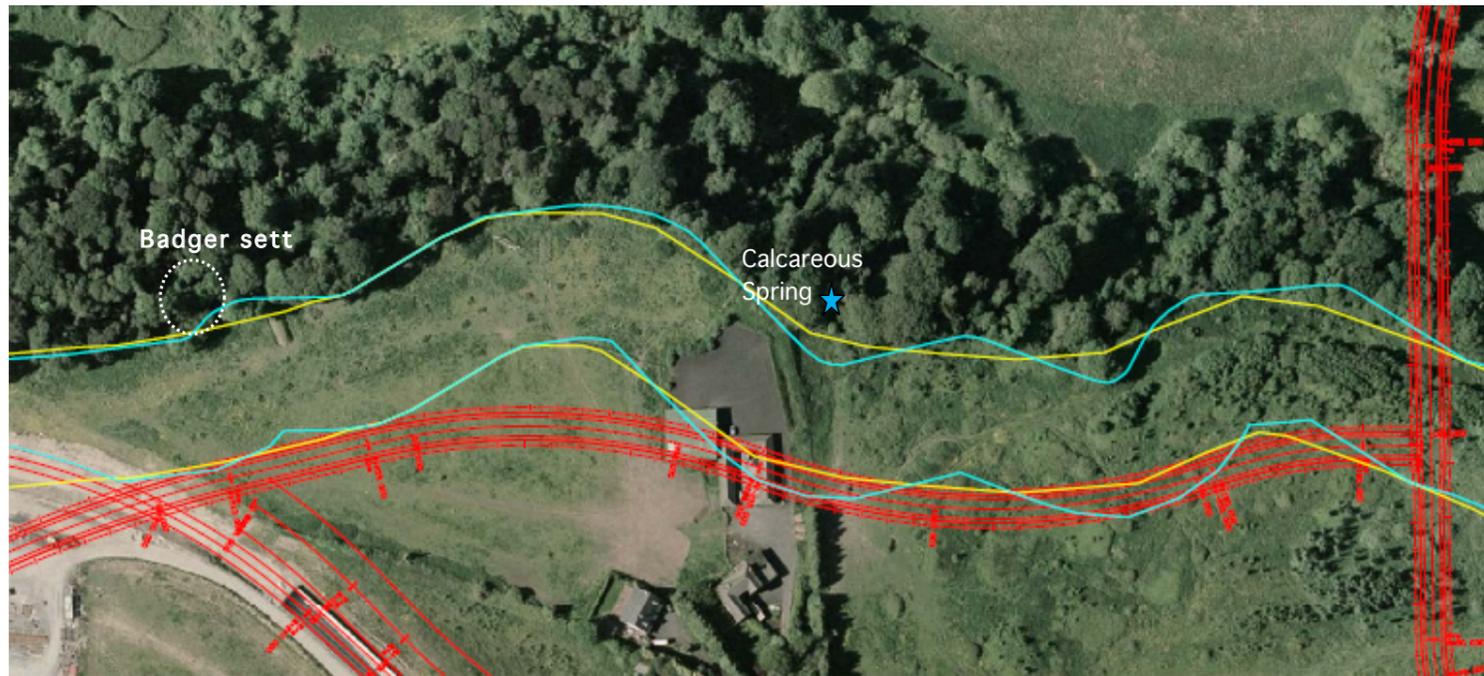
UPDATE: Surveys were carried out on 11th October by Paul Scott and Dr Emma Boston to try to catch the *Myotis* bats in order to confirm their species. Two harp traps and a mist net were erected in Druid's Glen. Despite warm and humid conditions with lots of insect life there were few bats and only occasional Pipistrelle bats with a rare passing *Myotis* recorded in the eastern end of the Glen. No bats were caught. It was noted that since the 2010 bat surveys had been undertaken that the new Luas line was operational and that station lighting at the western end of the Glen was spilling into the previously shaded areas. This light spill was considered strong enough to prevent the *Myotis* bats from using these areas. This observation lends support to the need to manage the impacts of development in this sensitive area.

Birds:

Birds of note that were only found in Druid's Glen included Blackcap *Sylvia atricapilla*, Buzzard *Buteo buteo*, Goldcrest *Regulus regillus*, Hooded Crow *Corvus cornix*, Raven *Corvus corax*, Rook *Corvus frugilegus* and Treecreeper *Certhia familiaris*. Confirmed breeding birds included Buzzard, Goldcrest and Hooded Crow.

Invertebrates:

The presence of Wood White butterfly has been reported by a local resident (H. Delaney). This has recently been re-classified as the Cryptic Wood White as the pure Wood White is only found in the Burren and its immediate surroundings. It is not listed on the Red Data List. Mollusc surveys at the calcareous spring revealed that this is a hotspot in Dublin for rare snails: two of the species found, the point snail *Acicula fusca* and the English chrysalis snail *Leiostryla anglica*, are nationally notable and were classed as Vulnerable in the Red Data List. A further species, the silky snail *Ashfordia granulata* is listed as Near Threatened. Both *Ashfordia granulata* and *Leiostryla anglica*, are species where Ireland is of global importance, having over 20% of the world resource in both cases. On this basis, Druid's Glen has a high local conservation value, and in the case of its populations of *Ashfordia granulata* and *Leiostryla anglica*, is contributing to world biodiversity.



Above: Map showing 50m buffer (blue/yellow line), location of badger sett and calcareous spring.

e) Habitat Continuity and Ecological Corridors

The Ecological Assessment noted that Druid's Glen is severed at its western end by the M50 and does not show continuity apart from connecting with low-density housing with extensive leafy gardens to the north in Brennanstown and Carrickmines. There are good linkages to the north generally with few barriers to species moving from the SDZ lands in a north-south direction. It was described as a "primary" ecological corridor and one of the key "Areas of Ecological Value". It is regarded to be of "local (high) importance", using criteria used by ecologists in Ireland to describe ecological features. Consultation with the National Parks and Wildlife Service has shown that they recognised that the Glen was an important ecological corridor and would therefore warrant a degree of protection under Article 10 of the EC Habitats Directive:

Article 10: Member States shall endeavour, where they consider it necessary, in their land-use planning and development policies and, in particular, with a view to improving the ecological coherence of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora. Such features are those which, by virtue of their linear and continuous structure (such as rivers with their banks or the traditional systems for marking field boundaries) or their function as stepping stones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species.

2. Potential impacts of development

A report carried out for the Woodland Trust in 2008 (Corney et al, 2008) lists the types of impacts that can result on woodland by having development located close by. These included:

- Activity visible from within the wood, causing flushing or avoidance within the woodland;
- Acts of vandalism;
- Animal avoidance;
- Animal mortality;
- Changes to soil structure;
- Disrupted hydrological function;
- Light pollution;
- Noise pollution
- Predation by pets or large-bodied birds;
- Removal of dead wood or plants;
- The dumping of rubbish or garden waste;
- Vegetation trampling.

Having a buffer zone between development and Druid's Glen will not *guarantee* that none of these impacts will take place, but it will help to control the magnitude, frequency and probability of them occurring.

Specific impacts that could potentially occur at Druid's Glen as a result of inappropriate land uses in proximity to the woodland edge include:

- Light spill from development reaching levels above 3 lux at the forest edge which could effectively prevent bats from flying along the edges. The physical extent of the light spill is impossible to determine without industry data on the height and type of light fittings. However our experience has shown that 'standard' street lighting can cast a back-spill of light that reaches up to 30m before a safe light level is reached that would allow the more sensitive bat species to fly through the area.

- Damage to root zone of trees. The area where roots are sensitive to compaction can extend 10m beyond the drip line of trees. Damage to root zones can lead to instability and risk of trees falling toward developments.
- Noise and visual disturbance. It is acknowledged that the valley floor is effectively screened from noise, light and disturbance by the steep southern slope. Any activity on the northern slope however would be able to affect the valley floor area used by bats and probably otters at night and by birds during the day. However the edge of the woodland is an important habitat for birds and bats that feed along the edge and rely on the varying microhabitats associated with the grassland-woodland interface. These fauna would be adversely affected by even small changes to the ambient light and noise environment.
- Conflict with badger sett and badgers: It is standard good practice to avoid any ground works or potentially disturbing works within 30-50m of a badger sett (generally 50m for a breeding sett). Also there are potential issues for badgers moving across developed areas and the risk of collisions with vehicles. However since badgers range across large areas this issue cannot be resolved by a buffer zone alone.
- Human access, vandalism and disturbance: Increasing the local population near the woodland will inevitably lead to antisocial activity in areas that cannot be overlooked or monitored. Regardless of any buffer zone, most areas within Druid's Glen woodland are not capable of being overlooked or monitored to prevent antisocial activity. It is likely that the closer the development is to the woodland the more likely there will be the temptation to enter it for antisocial reasons. Damage to trees and burning and refuse dumping often occur close to developments but would be unlikely to affect the resident fauna unless there was large scale activity on the valley floor. Disturbance to breeding birds is inevitable when humans enter dense areas of vegetation that were previously unfrequented.
- Hydrological changes caused by excavations within the catchment of the calcareous spring on the southern edge of the woodland could occur. The closer the subterranean disturbance is to the spring, the greater the impact it could have on the flows and the flora and fauna present there (particularly rare molluscs that are reliant upon specific humidity and hydrological regimes).

3. Use of Buffer Zones to protect Ecological Value

A buffer zone is defined as being an area that "protect the [ecological] network from potentially damaging external influences and which are essentially transitional areas characterized by compatible land uses" (Bennett and Mulongoy, 2006).

The concept of buffer zones to protect biodiversity is not new. Since the 1930's the idea of separating incompatible land uses with an area of land used for more biodiversity-friendly purposes has been practiced, albeit at a much larger scale. Buffer zones themselves may not be of high biodiversity value but provides an additional layer of protection to existing areas of biodiversity importance, and they are often fundamental to achieving conservation of those areas.

Corney et al (2008) identify some key principles for establishing buffer zones to protect woodland that are particularly relevant to the proposed SDZ and the impacts on Glen Druid. Whilst Corney's principles are targeted at ancient woodland, they are equally applicable to mature mixed woodland such as that at Glen Druid.

- The scale of woodland buffers should be tailored to individual developments and anticipated levels of disturbance but should be at least 50-100m wide.
- Locating development further away from woodland will reduce associated disturbance. The minimum distance over which this is likely to be effective will depend on the type of development, the nature of disturbance, and the local context, including intervening land use, vegetation and topography. Research suggests that the effects of disturbance by people at the woodland edge (e.g. dumping, vandalism) can penetrate up to 50-80m into neighbouring woodland).
- It is important that access connected with any new development is managed effectively. Road and path creation that connects a development to nearby woodland effectively renders any buffer zone ineffective and will facilitate some types of disturbance associated with unmanaged access.
- Development near to woodland should avoid altering the levels of surface and ground water bodies as a result of installing drainage systems, or creating new slopes or cuttings near to woodland edges. Local topography and substrate will strongly influence the distance over which protection and avoidance measures will be required. Hydrological surveys should inform the planning of engineering or construction work near to ancient woodland.
- Planting trees species within woodland buffers will provide a physical barrier to many forms of disturbance, such as rubbish dumping, or vandalism. It will attenuate noise pollution, limit light penetration, and reduce the negative effects of compaction and vibration in adjacent areas. It may also help to screen the woodland, reducing the visibility of exterior activity for woodland fauna. Tree belts of 100m width have been shown to create a significant attenuation of road traffic noise, in comparison with open grasslands of equivalent width.
- The addition of fencing to exclude access to both the area of new planting and the ancient woodland is likely to enhance the protective nature of this area, if public access is unmanaged. Where public access is granted, path maintenance is recommended, in order to channel access, particularly away from sensitive areas.
- Plants originating in residential gardens, including alien and invasive plant species, are likely to occur in nearby woodland, where this is within 250m of housing. Avoiding developments known to generate ongoing sources of invasion (such as housing, transport corridors, and energy infrastructure) within 250m of woods will substantially reduce the associated risk.

Using these principles, a design for a buffer that protects the ecological attributes has been discussed at length with Dun Laoghaire-Rathdown Council. The proposal is summarised below.

4. Proposal for a Buffer at Druid's Glen

The need for a buffer zone is embodied in the Government's commitment to halting the loss of biodiversity in the forthcoming second National Biodiversity Plan and the EU 2020 Biodiversity Strategy. It targets "Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss."

a) Purpose:

Aim of the buffer is to form a graduation between the woodland and the urban area so that effects of development are attenuated. The buffer is to prevent visual disturbance, light disturbance, control of use of the woodland and physical protection including disturbance during the construction phase that the space provides. It also aims to prevent direct harm to the underground tunnels and chambers of the badger sett, which can stretch up to 50m from sett entrances.

b) Width of the Buffer:

The width of 50m would be generally regarded to be conservative in the context of research carried out for ancient woodlands (Corney et al, 2008). However it is considered appropriate since the woodland at Druid's Glen would not be regarded to be as valuable as ancient woodland and that the nature of the topography shields the valley floor from impacts on the southern side. 50m is the recommended set-back from breeding setts (National Roads Authority Guidance) and has been used as the buffer zone width for the southern boundary up to the point where the proposed road crosses the Glen at its eastern end.

c) Compatible land uses at the Buffer Edge.

It is important to design the land use at the buffer edge to be compatible with the function of the buffer. Inappropriate land uses or activities would be meeting points (e.g. town squares) industry, retail units, residential streets or other types of developments that could generate intermittent loud noise, lighting or emissions of refuse, dust or chemicals. More appropriate land uses would be a road (suitably lit to minimise backward light spill), recreation areas not requiring strong lighting, SUDs systems (e.g. lakes, ponds). The key element is being able to predictably control the impact sources at a design level so that there is a low risk of unforeseen impact arising.

d) Compatible Land uses within the Buffer

It is important to carefully plan the use of the buffer zone so that: a) its value to the community is not wasted; and b) its value as a protective buffer zone is not compromised. Incompatible land uses would be those that generate light, disturbance and wastes – such as intensive recreational use (e.g. five-a-side pitches), playgrounds, allotments (due to tendency for organic refuse to be dumped nearby) and areas that might be used for meeting places. Compatible uses might be gently landscaped parkland, compensation habitats (hedgerows and calcareous grassland) bowling greens, SUDs (ponds and swales) and pedestrian paths following the valley edge. If paths are proposed then they should be either unlit (and accept that they will not be required to be used at night) or lit with bollard lighting but located 20m from the woodland edge and additional landscaping provided to screen any light spill.

e) Management of Buffer Zones and Druid's Glen.

The Council must decide on how the overall woodland area will be used so as to not compromise its biodiversity value but allow the community to appreciate it in a landscape and natural heritage context. It needs to be appreciated that it will be difficult to open up the wooded valley to the public and construct safe paths without having to fell trees and remove deadwood. Such measures will change the nature of the woodland habitat and possibly depreciate the biodiversity value. Management of the woodland is required however, in terms of limiting the spread of Cherry Laurel, Rhododendron and Giant Hogweed along the valley floor.

A Biodiversity Plan will be required (and is strongly advised by the NPWS) and will set out how the woodland will be managed. Integral to the management proposals will be how the Buffer Zone is managed to preserve its function. Measures such as litter control, vegetation control (e.g. hedgerow maintenance).

f) Buffer on the northern side.

Some of the SDZ lands encompass lands on the north east side of the Glen and it is known that there are proposals for development on this side. Whilst much of the discussion to date has been referring to the southern side of the Glen, there would be a requirement for a buffer zone on the north side although it would be limited to the SDZ lands which are at the eastern end of the valley. However a problem lies in the topography of the northern slope at the eastern end of the valley in that it lacks any natural screening and any the entire northern slope is visible from the valley floor and vice versa.

The aim of any design of development on the north side of the Glen must take into account the potential of the land to illuminate and provide indirect disturbance of the woodland habitats. A basic precautionary principle would be to be sure that lighting stays 50-70m away (depending on height of columns) from the river. Alternatively if applicants are able to prove that lighting at the river edge is 1 lux or below (by an applicant providing light modelling) then this buffer zone could be reduced but I would not expect the zone to be effective if less than 50m. Bat species using this area are the more sensitive Myotis type.

A buffer zone 50-70m on the north side of the Glen would also prevent casual tipping of garden refuse. This has led to alien invasion in this valley and needs to be prevented.

The buffer zone can be 'overlooked' in as much as it can be used for pedestrian paths etc but inappropriate activities would include lit car parking. Unlit parking may be acceptable but it may be deemed unsafe. A road could form the edge of the buffer zone and is a useful option that overcomes the problem of the unplanned private use of lands.

The buffer zone could also be used for flood attenuation or as a 'SUDS' swale.

5. Conclusions

This report has set out the case for a buffer zone that, in our opinion, is required to protect the sensitive ecological features that use the edges and interior of the woodland habitats at Druid's Glen. The proposal for a buffer zone should not be deemed to be a constraint to the overall delivery and success of the SDZ but should be perceived as a mean of protecting one of the area's most intact ecological assets. The protection of the woodland and its management are both requirements that can be effectively delivered by the Planning Scheme if ecological principles such as networks and buffer zones are integrated into the design.

References.

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