Biodiversity Management:

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Contents

1 Introduction

This document contains the most important results from survey work which focussed on geodiversity and biodiversity in 2007 . Biodiversity studies focussed on habitats, plants, fish, birds, bats and other mammal species found in Ireland. The final section contains a review of strategic issues and actions required to support biodiversity management. Section 5.3 is particularly important and needs to be discussed at the next meeting.

2 Biodiversity and geodiversity

Biodiversity describes the variation of life. While typically described and evaluated at either the species or habitat level, it also includes the diversity within species and landscapes. Legal protection is offered to particular species and habitats. Survey work usually concentrates on those species and habitats which are protected by legislation.

The concept of geodiversity is of more recent origin. This describes the variation in bedrock, soils, landscape features and is linked to biodiversity. Legal protection is offered to important features of geodiversity interest.

When evaluating biodiversity particular value is given to *native species and natural habitats* i.e. species and habitats which can be shown to be present in Ireland or in the Park for a very long period. This approach considers more recent arrivals (plants and animals) as being of low interest. If these species or habitats are rare (and they generally are) their value is increased. The same criteria are used to evaluate geodiversity. Rarity/naturalness can be assessed in a local, regional, national and international context, (but accurately only) for some species and habitats.

3 Geodiversity

Important features of geodiversity interest are:

4. Rare example of a mainly natural landscape within the confines of the City which was formed through postglacial processes; the movement of meltwater and deposition of till.
5. Contains outcropping limestone (small example in Quarry Pond)

6. The northern portion of the Park has limestone nearer the surface. It shows a crag-and-tail landscape form, with much of its' central portion being comprised of low, almost-indistinguishable glacial flutes;
7. The geometry of the deglacial drainage system and its meltwater channels explains much of the Parks hydrology and the position of many of the big ponds (dammed streams in channels). Fig. 1

Fig. 1 *The distribution of deglacial meltwater channels within the Park*

8. The terraces formed of sand and gravel at the south side of the park are associated with shallow, alkaline soils and high plant diversity.
9. Soil characteristics (wetness or dryness) are linked to end uses and biodiversity potential elsewhere.
10. The solid geology of the Park is linked to the architectural history, as local materials were used to build many of the residences and, in particular, it is likely that much of the material in the boundary wall came from the Quarry Lake.
11. These features while not rare are of educational interest.

4 Biodiversity

4.1 Habitats

Important features of habitat biodiversity are:

12. High cover of "wood pasture". This is a type of woodland not well described in Ireland. It is associated with the use of the park by deer. Its quality depends on age of trees and presence of rare invertebrates.

13. Presence of semi-natural habitats which are rare in Ireland. As well as wood pasture they include:
    Species rich calcareous grassland along sand and gravel terraces in the south of the park, the flora of which includes hairy violet, a protected species.
    Wet grassland, particularly south of the Quarry Lake where the flora contains another protected plant, the grass meadow barley
    Semi-natural woodland (0.5ha) dominated by ash near the Furry Glen
    Fringing wetland vegetation around the Fish Pond (now in the Zoo)

14. Presence of semi-natural habitats which are rare in Dublin. These include all the other remaining habitats in the park, wetlands, other woodlands, and grasslands with the exception of buildings, built surfaces and amenity grassland.

If the species rich dry grassland contains orchid species it would qualify as an example of a habitat requiring protection under the EU Habitats Directive .The semi-natural woodland in the Furry Glen is considered rare and deserving protection in Ireland. It is not listed in the Habitats Directive.

4.2 Plants

Important features of native floristic diversity include:

15. Presence of **three legally protected species** of wild plant in the park. These are hairy St John's Wort, on the edge of cleared woodland in the Aras grounds; hairy violet, found after much searching on the sand and gravel terraces at the south of the park and the grass Meadow barley in the wet grassland near the outfall from the Quarry Lake. The former was not seen in the park since the 18th century. Hairy violet has been seen in previous decades, is in decline, but no previous record has been made for the grass.

16. Published list of wild flora and bryophytes compiled by local botanist and published in 1993 (excludes enclosures).

The presence of rare and legally protected wild plants is particularly significant because of their location in Dublin city.

4.3 Birds

Important features of bird biodiversity are:

17. Presence of seventeen Amber listed species of medium conservation concern in Ireland. They include Tufted Duck, Coot, Stock Dove, Skylark and Swallow.
18. Presence of fourteen species of conservation concern in Europe.
19. Breeding Kestrel and breeding Skylark. It is remarkable to find skylark so near the city centre.
20. Presence of jay and stock dove associated with woodlands. Indicator of good old woodlands.
21. Potential to encourage recolonisation of the park by reed bunting and owls which were present in the recent past.

While none of these species are particularly rare in Ireland, the park has significant species diversity.

4.4 Wetlands

Important features of wetland biodiversity are:

22. Emergent wetland vegetation around Glen Lake and the Fish Pond in the Zoo important for birds, plants and aesthetically.

23. Presence of charophytes indicating relatively good water quality
24. Presence of Rudd and Tench with potential to improve fishery interest in all ponds.

4. 5 Bats

Important features of bat biodiversity are:

25. Evidence for large roosts in several locations (chimney in St Mary's; Ordnance Survey, west of Zoo)
    Minor roosts in St Mary Church, Superintendents House and Magazine Fort.
26. Includes species of Pipistrelle not previously recorded in Dublin City.

4.6 Mammals (to be added to by Tom Hayden)

Important features of mammal biodiversity are:

27. Park has a good baseline of mammal activity which can be used to measure success of initiatives to enhance biodiversity.
28. High levels of awareness of mammal activity by staff and residents
29. Long tradition of the use of the park to support research on mammals
30. Large number of active badger setts throughout the park (Fig. 2).

Fig. 2 Results of badger survey 2007 (from report compiled by Tom Hayden)

5 Management Issues

5.1 Mapping

31. Agree names for places, put up signage in the park. Confusion reigns e.g Quarry Lake = Quarry Pond= Island Lake etc.
32. Correct digital maps. Despite OS being based in the park their digital mapping is not accurate.

5.2 Geodiversity

3..2.1 Short term priorities are
Protect example of outcropping limestone

3.2.1 Medium term priorities are
Develop educational materials to interpret local landscape
Research sources of rock used in Park buildings and their relationship to local supplies
Map depth to bedrock, location of water table
Examine local aquifer (volume and quality) with help of Zoo which uses local groundwater.

3.2.3 Long term priorities are
Restore and develop the natural drainage system to provide treatment of surface waters
Examine potential to obtain energy from groundwater!

5.3 Strategic approach

33. Decide to be less tidy! and communicate that to users in the context of a programme which raises awareness of the biodiversity in the park. Less tidy means leaving the grass grow longer in certain places, allowing trees die naturally and aspiring to be chemical free (nominate areas to be identified).

34. Identify sanctuary areas where the priority is maximising biodiversity, such as Aras and US Embassy Woods, woods near Furry Glen. Active management will be needed to maximise their value.

35. Plant native woodlands in grasslands which are becoming rank (mapped in habitat map) after resolving conflict with this approach and aspirations of original tree planters which focussed on mainly non-natives.

36. Consider how to liaise with all managers (Zoo, US Ambassador's Residence, Garda Horse Unit, Abbottstown re Aras) to develop common approach to grassland, woodland and wetland management.

37. Offer training/awareness raising to make everyone aware of the sensitivity of different places and species and their role in improving biodiversity.
    a. Residents could erect bird nesting boxes for swallows.
    b. Specific training to ensure trees are felled without affecting bats
    c. Provide photos of rare plants to guide grass cutters.

38. Use information on biodiversity in a vastly expanded educational programme.

Medium term priorities
Appoint ecologist to staff.
Make new useful linkages. Ask the Botanic Gardens to propagate rare plants.
Encourage the Zoo to develop breeding colony of red squirrel. Suggest TCD Botany carries out study of woodlands.
Develop strategies to successfully re-encourage suitable species (birds, mammals) back into the park.

Long term
Monitor biodiversity using results of surveys carried out in 2007 as a baseline.

5.4 Actions to protect and enhance important features of habitat and species diversity

5.4.1 Priorities

39. Develop management prescriptions for all important habitats with managers and front line staff. Immediate priority is to discuss management options which conflict with historical or/and existing uses or would be difficult to implement with existing resources.

40. Develop management prescriptions to ensure survival of rare plants;
41. Hairy St Johns Wort , Hairy violet and Meadow barley

42. Improve the cover of habitats which would support greater diversity such as native woodlands, shrubberies and wetlands.

43. Protect some planted woodlands from deer grazing to increase their diversity.

44. Research "wood pasture" invertebrates

5.4.2 Grassland management

45. Identify grasslands which must be retained for deer (not to be planted with trees.
46. Adopt principle of not fertilizing, not reseeding, cutting late throughout the park and retaining grazing. In the absence of grazing institute suitable mowing regimes (or increase deer grazing pressure) to maximise floristic diversity (reduce fertility) and provide food and nesting sites for birds.
47. Vary cutting regimes in grassland areas near other habitats to increase diversity
48. Extend hay making to the optimum area possible
49. Stop practise of cutting and mulching in species rich grasslands on south side.

In the medium term grazing should be restored in the US Embassador's grounds or spring cereals should be planted to provide food for birds, small mammals (eaten by owls!). Grassland releves taken by Clare Byrne for her PhD (TCD 1993) should be resurveyed to discover changes in species and cover in high value areas.

5.4.3 Woodland management

Detailed woodland management plan would benefit from a more detailed woodland ecological survey. Therefore preliminary guidelines only.

Fence off semi-natural wood (ash dominated in the Furry Glen)
Fence off other recently established WD1's (planted woodlands) with potential in the park.
Manage wood in Aras and US Ambassadors ground as native woodlands.
Plant in natives where possible in good planted woodlands.
Establish more native woodland.
Leave trees to die naturally, leave deadwood on site (in certain areas)
Leave ivy on trees

Support research in “lowland wood pasture” and invertebrates associated with old trees (Natural History Museum).

5.4.4 Wetlands

Management issues resolve around the protection and improvement of water quality in ponds and watercourses, enhancing the limited potential of most lakes and ponds by extending, reprofiling, landscaping, and protecting remaining wetland vegetation around the Fish Pond which is now part of the Zoo.

Management actions (more medium term) are:

50. Improve the management of land uses/run off from hard surfaces to reduce nutrient inputs to Aras and Machine Ponds and levels of N and P in them.
51. Research waste water treatment in the park.
52. Construct reed bed behind Rose Cottage to improve water quality.
53. Reprofiling works neeeded in the Citadel Pond (too shallow) and are desirable around the Machine Pond and Quarrry Lake to create more semi- wetland habitat. In addition works needed in Glen Pond to remove trees on eastern side to promote increased growth of emergent vegetation.
54. Each pond should be managed to improve its fishery potential.

5.5 Actions specific to groups of fauna

5.5.1 Birds

Breeding areas for ground nesting birds in grasslands should be identified through a further stage of survey work (BirdWatch).
Mowing regimes copperfastened in those areas
Area of natural shrubberies bramble, nettles should be increased.
More wetlands developed
Spring cereals sown to feed birds in winter

5.5.2 Bats

Survey other potential roost sites or encourage owners/manaagers to do so (i.e.

in Zoo)
Provide training to staff (OPW and Zoo) to monitor bat activity
Inform owners/managers of known roosts.
Adopt best practice in construction methods and tree felling to protect bats.

5.5.3 Mammals

Map all badger setts and inform managers of good management practises including those required by law.
Maintain breeding colony of red squirrels to facilitate re-introduction to Park and other sites in Ireland
Research feasibility of re-introducing mammal species to park i.e hare

Appendix 1. Checklist of birds and their status (from BirdWatch report).

Information is presented on the likelihood of breeding, when the species occurs in Ireland, and on the conservation status at national and European level.

Name		Breeding status [1]	Occurs in Ireland [2]	Conservation status (National) [3]	Conservation status (Europe) [4]
Little Grebe	*Tachybaptus ruficollis*	BR	Resident		
Cormorant	*Phalacrocorax carbo*	NB	Resident & winter visitor	Amber	
Grey Heron	*Ardea cinerea*	BR	Resident		
Mute Swan	*Cygnus olor*	BR	Resident		
Mallard	*Anas platyrhynchos*	BR	Resident & winter visitor		
Shoveler	*Anas clypeata*	NB	Scarce resident & winter visitor		SPEC 3, declining
Pochard	*Aythya ferina*	NB	Winter migrant	Amber	SPEC 2, declining
Tufted Duck	*Aythya fuligula*	BR	Resident & winter visitor	Amber	SPEC 3, declining
Sparrowhawk	*Accipiter nisus*	BR	Resident		
Kestrel	*Falco tinnunculus*	BR	Resident		SPEC 3, declining
Pheasant	*Phasianus colchicus*	BR	Resident		
Moorhen	*Gallinula chloropus*	BR	Resident		
Coot	*Fulica atra*	BR	Resident & winter visitor	Amber	
Black-headed Gull	*Larus ridibundus*	NB	Resident & winter visitor	Amber	
Common Gull	*Larus canus*	NB	Resident & winter visitor	Amber	SPEC 3, depleted
Lesser Black-backed Gull	*Larus fuscus*	NB	Resident & summer visitor		
Herring Gull	*Larus argentatus*	BR	Resident		
Great Black-backed Gull	*Larus marinus*	NB	Resident		

Feral pigeon	*Columba livia*	BR	Resident		
Stock Dove	*Columba oenas*	PR	Resident	Amber	
Woodpigeon	*Columba palumbus*	BR	Resident		
Collared Dove	*Streptopelia decaocto*	BR	Resident		
Swift	*Apus apus*	PR	Summer visitor		
Skylark	*Alauda arvensis*	PR	Resident & winter visitor	Amber	SPEC 3, depleted
Sand Martin	*Riparia riparia*	NB	Summer visitor	Amber	SPEC 3, depleted
Swallow	*Hirundo rustica*	PR	Summer visitor	Amber	SPEC 3, depleted
House Martin	*Delichon urbica*	PR	Summer visitor		SPEC 3, declining
Meadow Pipit	*Anthus pratensis*	PR	Resident		
Pied Wagtail	*Motacilla alba*	PR	Resident		
Wren	*Troglodytes troglodytes*	BR	Resident		
Dunnock	*Prunella modularis*	BR	Resident		
Robin	*Erithacus rubecula*	BR	Resident		
Stonechat	*Saxicola torquata*	NB	Resident	Amber	
Wheatear	*Oenanthe oenanthe*	NB	Summer visitor		SPEC 3, declining
Blackbird	*Turdus merula*	BR	Resident & winter visitor		
Song Thrush	*Turdus philomelos*	BR	Resident & winter visitor		
Mistle Thrush	*Turdus viscivorus*	BR	Resident		
Sedge Warbler	*Acrocephalus schoenobaenus*	PO	Summer visitor		
Blackcap	*Sylvia atricapilla*	PR	Summer visitor & winter visitor		
Chiffchaff	*Phylloscopus collybita*	PR	Summer visitor		
Willow Warbler	*Phylloscopus trochilus*	PR	Summer visitor		
Goldcrest	*Regulus regulus*	BR	Resident		
Spotted Flycatcher	*Muscicapa striata*	NB	Summer visitor	Amber	SPEC 3, depleted
Long-tailed Tit	*Aegithalos caudatus*	BR	Resident		
Coal Tit	*Parus ater*	BR	Resident		
Blue Tit	*Parus caeruleus*	BR	Resident		
Great Tit	*Parus major*	BR	Resident		
Treecreeper	*Certhia familiaris*	BR	Resident		
Jay	*Garrulus glandarius*	BR	Resident		
Magpie	*Pica pica*	BR	Resident		
Jackdaw	*Corvus monedula*	BR	Resident & winter visitor		
Rook	*Corvus frugilegus*	BR	Resident		
Hooded Crow	*Corvus corone cornix*	BR	Resident		
Raven	*Corvus corax*	NB	Resident		
Starling	*Sturnus vulgaris*	BR	Resident & winter visitor		SPEC 3, declining
House Sparrow	*Passer domesticus*	BR	Resident		SPEC 3, declining
Chaffinch	*Fringilla coelebs*	BR	Resident & winter visitor		
Greenfinch	*Carduelis chloris*	BR	Resident & winter visitor		
Goldfinch	*Carduelis carduelis*	BR	Resident		
Linnet	*Carduelis cannabina*	NB	Resident		SPEC 3, declining
Lesser Redpoll	*Carduelis cabaret*	NB	Resident & winter visitor		
Bullfinch	*Pyrrhula pyrrhula*	BR	Resident		

55. BR = definitely breeding, PR = probable breeding, PO = possible breeding & NB = non-breeding

56. From Wernham *et al*. (2002)

57. See Newton *et al*. (1999) for further definition.

58. From BirdLife Internaitonal 2004.