

## BOGGART HOLE CLOUGH LAKE BIODIVERSITY ENHANCEMENTS

### ECOLOGICAL OPTIONS APPRAISAL – REEDBEDS v FLOATING PLATFORMS

#### 1 Background

Boggart Hole Clough is a Public Park and Local Nature Reserve in North Manchester (location in Appendix 1). Parts of the site are also designated as a Site of Biological importance for Manchester. The details of the SBI designation can be found in Appendix 2.

The site is relatively large and has been designated as a Local Nature Reserve and a Site of Biological Importance primarily because it supports deciduous woodland and associated flora and fauna.

There are also two lakes present at Boggart Hole Clough. One (the 'northern lake') is used as a fishing lake. This water body has natural banks. There are several floating islands with establishing vegetation in this lake and some planting has taken place around the lake margins.

The second, larger water body (the 'southern lake') is more formal in character. The banks are of stone with a wide surfaced footpath around the lake and the lake is constructed with a brick bed. This lake has been formerly used as a boating lake. There is an island in the larger lake with mature deciduous trees that will act as a refuge for breeding birds and mammals. The island supports a small heronry. There is no marginal or aquatic vegetation present in this lake.

The main nature conservation value of the lakes lies in the fact that they support water fowl, but a resident population of Canada Geese is probably reducing water fowl diversity. The most important breeding sites for birds appear to be occupied in the main by Canada Geese.

There is a slow flow-through of water through the lakes resulting from an 'overflow' but during periods of low rainfall this flow-through does not operate. Both lakes suffer from a build-up of nutrients and from periodic blooms of blue-green algae. Nutrient build-up is likely a result of high water fowl densities, lack of regular water flow-through, the public introducing organic matter whilst feeding the waterfowl and probably from fish disturbing lake sediments(?).

The lakes are therefore limited in their biodiversity value and are capable of enhancement. Currently there are two proposals for enhancing the biodiversity value of the southern lake and for improving water quality. These proposals are –

- The creation of reedbeds over a significant part of the lake
- The introduction of floating platforms (artificial islands) and marginal vegetation into the lake

Since both of these proposals have biodiversity merit the Greater Manchester Ecology Unit (GMEU) has been asked to independently assess the relative benefits of the proposals for biodiversity and to provide independent advice as to which option may be most effective in enhancing the biodiversity of the site.

GMEU recognises that its conclusions will not be definitive in deciding which proposal to progress; the City Council must also take into account other considerations such as landscape impact, public involvement and engagement, cost-effectiveness and sustainability.

## **2 Reedbeds**

### **2.1 Importance for Wildlife**

Reedbeds are a priority habitat for nature conservation in the UK. This status reflects the very substantial reduction in the habitat type over the last 50 years and the importance of the habitat type for supporting rare birds and invertebrates.

Reedbeds are not botanically diverse habitats because the *Phragmites* reed plant dominates, often forming a uniform monoculture with little habitat variation. The significant amounts of dead plant material that accumulate in reed beds creates a deep 'thatch' through which other plants struggle to establish, at least until the reedbed is raised to such a level that shrubs begin to establish as the reed bed succeeds to drier scrub woodland habitat, something that they have a natural tendency to do.

The biodiversity value of reedbeds is rather in the fauna that they support, particularly birds. The rare and protected species Bittern, Marsh harrier, Bearded tit and Cettis warbler are all closely associated with reed beds. Other important bird species that use reed beds include Reed Warbler, Sedge Warbler and Water Rail. Most of these species need large areas of undisturbed reed beds in order to utilise the habitat effectively (>1ha for most and much larger for Bitterns and Marsh harriers). Reedbeds can also be used by roosting birds, particularly starlings, although again larger undisturbed reedbeds are favoured as roosting sites over small reedbeds.

Reedbeds can support important populations of invertebrates, including rare species, and can support small mammals such as water shrews and water voles. Even small reedbeds can be valuable for these species. Smaller reedbeds can also provide refuges for smaller waterfowl for roosting and breeding.

Reedbeds can act to reduce water pollution by physical action (trapping larger sediments and pollutants) and by facilitating nutrient recycling.

### **2.2 Establishing Reedbeds**

Reedbeds can grow in water tables which are from 1m below to 1 m above the ground but in general these extremes are best avoided – too dry and the reedbed will rapidly succeed to scrub and too wet and the value of the reedbed for invertebrates will be reduced.

To establish reeds in the lake new substrates will likely need to be introduced.

Establishment may be compromised by grazing wildfowl, particularly Canada geese and therefore it is recommended that any new plantings will need to be protected by fencing.

### **2.3 Management of Reedbeds**

Reeds will need cutting on a regular basis to reduce the dominance of the *Phragmites* and to arrest succession. There will be a tendency for a build-up of dead plant material to accumulate rapidly and therefore for reeds to spread across the lake and/or to succeed to scrub if the reeds are not managed.

For the most effective management for nature conservation a rotation cut is best, resulting in a reedbed with a varied structure and age. It is easier to establish rotation cuts in larger reedbeds.

### **3 Floating Islands**

An alternative proposal for improving the biodiversity value of the lake is the introduction of artificial floating islands and lake-edge planting. The islands are constructed of robust artificial materials and act as a platform for establishing vegetation. Various substrates can be introduced onto the islands which allows for 'bespoke' planting. Aquatic and marginal plants can be established by allowing plant roots to extend down into the water, basically a simple hydroponic system.

Areas underneath platforms can provide refuges for aquatic wildlife.

Platforms can improve water quality by reducing nutrient enrichment problems by increasing nutrient cycling and facilitating nutrient take-up by plants. They can reduce algal blooms by reducing the availability of free nutrients and by shading. 'Active' water quality improvement can be achieved by installing oxygenating pumps onto the platforms, although such active systems are clearly more costly to run and maintain than more 'natural' systems.

The introduction of several discrete platforms into the lake provides an opportunity to provide a range of different substrates, vertical and horizontal structure and plant species variety which will provide a wide range of available niches. The relatively small size of the island platforms will favour invertebrates and small mammals (as with reedbeds) and islands will also act as nesting platforms and refuges for waterfowl.

The introduction of *Phragmites* onto one or more islands to create areas of reedbed is not ruled out.

Without details of planting plans and details of the extent of the proposed islands it is difficult to quantify or qualify the biodiversity gains that would result from islands, but it is clear that the construction of platforms and lake edge structures will facilitate the establishment of a greater diversity of plant species and substrate types than the reedbed option which in turn will increase available niches for other wildlife (invertebrates, molluscs etc). But it is likely that no single planting community will be of the same potential extent of a reedbed.

#### **3.1 Establishing and managing Floating Platforms**

Rapid habitat establishment can be achieved on platforms by planting mature and semi-mature vegetation. Providing planting communities are designed appropriately there may be less need for management of the vegetation on islands than for reedbeds, although it should

be assumed that some removal of dead and ‘overgrown’ plant material will be required. There will not be a tendency for vegetation of islands to spread across the lake in the way that reeds may spread.

New plantings will need to be properly defended from wildfowl, particularly geese, during any establishment period and probably beyond.

#### **4 Education and Community Involvement**

An important part of the wildlife value of sites like Boggart Hole Clough lies in the access to wildlife and green spaces that they provide for local people. In fact this aspect is an important element in any Local Nature Reserve designation.

Opportunities for community and educational involvement in reedbed establishment would be limited, although the biodiversity gain from reedbed establishment would have some educational benefits (interpreting the reedbed system and increasing biodiversity).

There would be more opportunities for community and educational involvement arising from the Floating Platform proposal because people could be involved in the design, siting and on-going management of the platforms.

#### **5 Landscape Impacts**

Although not strictly a biodiversity concern the nature of Boggart Hole Clough as a widely-used public space means that landscape and aesthetic impacts of the options cannot be ignored. Some comments are therefore offered below –

##### **Reedbeds**

*“Reedbeds have an advantage in that they will appear more ‘naturalistic’ than artificial floating islands. However in contrast to other parts of the Clough the Lake is not a natural landscape; it was designed as a formal landscape feature with hard delineated edges and formal dimensions .*

*Reedbeds will provide a uniform habitat with limited intrinsic visual interest. Over time reedbeds may significantly reduce areas of open water and restrict open views over the Lake.”*

##### **Floating Platforms**

*Floating Platforms will appear as clearly introduced ‘unnatural’ features in the Lake. But the Lake is a formal landscape feature. Aesthetically platforms offer an opportunity to introduce more horizontal and vertical structure into the lake together with a greater variety of substrates, plant forms and species that will provide a range of textures and colours.*

#### **5 Conclusions**

- Both proposals have ecological merit as both will enhance the biodiversity value of the Lake by increasing species diversity, directly and indirectly by improving water quality.

- Faunal diversity enhancement arising from both proposals will be increased in invertebrate diversity, enhanced provision for small mammals and fish and some enhancement for waterfowl.
- The number of available niches introduced for invertebrates, small mammals and fish can be maximised by using floating platforms although the extent of any particular niche will be small.
- Both proposals will require active management but reedbeds will likely require more intervention if spread and succession is to be properly managed/controlled.
- Floating platforms will be likely to be more aesthetically pleasing than reedbeds; it will be easier to maintain a balance of open water – planted habitats.
- There is more scope for community involvement and educational benefits to arise from the floating platform option than from the reedbed option.

### **Conclusion**

**On balance the floating platform option is to be preferred.**