AGENDA ITEM NO

REPORT NO 711/09

ANGUS COUNCIL

NEIGHBOURHOOD SERVICES COMMITTEE – 8 OCTOBER 2009

UPDATE ON KEPTIE POND, ARBROATH

REPORT BY DIRECTOR OF NEIGHBOURHOOD SERVICES

ABSTRACT: The committee are asked to note the Director of Neighbourhood Services' update regarding the possible solutions to the ongoing management of the Keptie Pond, Arbroath

1. RECOMMENDATION

1.1 It is recommended that the Neighbourhood Services Committee consider the options outlined in this report regarding the possible solutions to the ongoing management of the Keptie Pond, Arbroath and recommend a preferred option to be taken forward.

2. INTRODUCTION

2.1 In 1994 the first phase of edge stabilisation of the pond took place on the north side of Keptie Pond which facilitated all year round access to the pond and improved arrangements for boating. The west side of the pond was stabilised in 1998 using stone gabions.

In 2000 boating was discontinued on the pond due to the lack of staff welfare facilities and financial burden on the council.

In 2003 the long dry summer highlighted the requirement for the pond to be supplemented by mains water supply. This has been required in every year since, with the exception of the summer of 2004.

In 2005 research was carried out to address the ongoing problem of bank erosion on the East side and the fluctuating water levels. At that time it was decided that the pond should be managed from a sustainable perspective and promoted as a biodiversity asset. This means that water level fluctuations would generally be accepted and only topped up in extreme drought situations. Improvements were carried out along the East side of the pond with the existing edging being stabilised by boulders and natural planting introduced. In addition a new footpath was installed to allow a circular walk around the entire pond.

Since that time the planting has established very well, increasing the biodiversity value of the pond and encouraging wildlife. The water is generally of good quality and provides a habitat for a variety of fish, mussels, invertebrates, insects and birds.

2.2 ISSUES AFFECTING KEPTIE POND

2.2.1 Algae

In recent years the warm summers and low water levels have caused the rapid growth of some algae varieties and resulting algae bloom. The growth levels appear to have increased each year and in summer 2009 concerns were voiced by members of the public and in the press. The algae seen in summer 2009 does not pose a health risk like blue - green algae (which has been present at Keptie Pond in the past) but is mainly a visual problem. However, when dying down in large numbers the decaying algae does add to high levels of nutrients in the pond, which in turn encourages further algae growth.

2.2.2 Fluctuating water levels

Preliminary research has indicated that Keptie Pond is a manmade pond created initially as a skating pond which was allowed to "dry out" during the summer months. In the early 1960's boating was introduced to the pond with the water level being maintained throught the summer to allow this activity to take place.

As there is no natural inlet to the pond it is likely that the water is topped up through ground water and natural surface water catchments. The fluctuating water levels are therefore possibly due to natural variation in the ground water table, but could also be caused by damage to the lining of the pond while carrying out past works. At present it has not been clear how this possible leakage could be investigated, located and repaired.

2.2.3 **Looking for possibility of restoring boats to the pond**

Boating was discontinued on Keptie Pond in 2000 due to financial constraints and the lack of staff welfare facilities. At the moment the existing water levels are too shallow to allow boating in the summer and a way of increasing the water depth would need to be investigated.

3. CURRENT POSITION

3.1 Possible solutions currently being investigated:

3.1.1 **Option 1: Retain the pond as a Biodiversity Feature and monitoring and removing algae population manually**

This option assumes that the existing policy of encouraging biodiversity and sustainable management of Keptie Pond that was established in Committee Report no. 500/05 is retained and fluctuating water levels are accepted. Any future algae bloom growth will be monitored and removed manually by Parks Maintenance personnel when required.

The cost of monitoring and removing algae is estimated at about £6,500 per year, assuming 5 working days on two occasions a year. Currently there is no revenue allowance for this within the Parks Maintenance budgets.

Additionally algae growth can be reduced by introducing green strawbales to encourage natural bacteria growth or by creating bufferzones around the pond to restrict nutrient input into the pond. This can be a 2 metre wide no-mowing strip around the pond to discourage grass clippings falling into the water and surface water stops at the hard edges at the north end of the pond. It would also be beneficial to remove leaf debris in the water in the autumn. The planting of oxygenating plants in the pond would also help with oxygen levels in the water.

Through carrying out a variety of alleviating measures and a long term commitment to remove algae growth manually as and when required the pond can be managed in its present form as a habitat for wildlife and a biodiversity asset in agreement with Angus Council's commitment to promote biodiversity.

3.1.2 **Option 2: Water aeration system**

Water aeration and circulation systems can help to control algae growth by increasing oxygen levels in the water. This in turn encourages the growth of aerobic bacteria, which act as a natural competitor for nutrients to algae and speed up the decomposition process.

For most commercial aeration systems the water levels in the pond need to be over 1000 mm, which is not achievable at Keptie Pond where in warm summer months levels can be reduced to 400 – 500mm average depth. There is however a possibility of installing a shallow water sub-surface aeration system, i.e. an air diffuser. This means that an air compressor is installed in a metal housing at the pond edge with airpipes leading to at least three different air diffusers around the pond bottom. A high volume aerator can circulate up to 647 m3 per hour.

The installation of such a system including electricity supply is estimated at £16,000. Annual running costs for electricity, maintenance and inspection of the units would need to be added for which there is no revenue allowance within the Parks Maintenance budgets.

The installation of an aeration system can help with the problem of algae growth although it is not proven that this system will entirely remove it. It is of some concern that the vast majority of companies would not offer any system as they felt that waters as shallow as Keptie Pond were unsuitable for this approach to be successful. The issue of water level fluctuations and therefore low levels in summer is not being addressed with this system

3.1.3 **Option 3: Topping up from borehole.**

As described in the Committee Report no. 500/05 it is possible to install a borehole reaching into the existing ground water table and abstracting water to top up water levels in the pond. A

submersible pump is installed after drilling the borehole, which can then pump up the water when required.

Any significant groundwater abstraction needs to be certified by the Scottish Environment Protection Agency (SEPA). According to current regulation SEPA will apply different registration rules and application and subsistence charges dependant on the amount of water abstracted.

Within these rules, for an abstraction that only poses a low risk and remains between 10 and 50 cubic metres per day an application to SEPA on the second level of authorisation is sufficient. This only involves an application for Registration with enclosed fee but no subsequent abstraction licence or annual charges.

SEPA requires that the size and type of pump installed meets their guidelines. The applicant must also give details of all on-going maintenance on the borehole and pump. However, with the second level of authorisation it is not required to undertake a temporary test pumping abstraction to assess the potential environmental impacts.

It is estimated that with a surface size of 18,860 sqm and fluctuating water levels of about 500 mm a year the pond would need to be topped up by approximately 10,000 cubic meters per year. If a daily abstraction of 50 cubic metres is assumed than the borehole would need to extract water over a period of seven months to ensure a high water level over the course of one year. In effect this would mean that the abstraction would need to start in March and run through until end September. Note this extraction level is at the very upper limit of the lower licence level and given the problems that have been experienced this year, taking into account the rain fall, the 50m3 per day may not be achievable, therefore the more onerous licensing may be required.

The cost of water divination to establish borehole points, drilling the borehole, pump and pipe installation and installation of electricity supply are estimated at £25,600. Annual running costs for electricity supply, maintenance, regular testing and replacement of equipment is additional and for which there is no revenue allowance within the Parks Maintenance budgets.

Although topping up the pond to its high water level should help to constrain the algae problem it should also be noted that algae bloom has become a major problem in recent years even in water bodies with much deeper depths, e.g. Crombie Loch or Forfar Loch

3.1.4 **Option 4: Topping up through mains supply**

In the recent past the pond has been topped up from mains supply as and when required. In 2008 Scottish Water voiced concern about water contamination through potential backflow and prevented further top ups through the existing system.

A modified system needs to be put in place to provide sufficient backflow protection for Category 5 contamination. Costs and details for such a system are currently being investigated with prices awaited from Scottish water..

The 2005 report indicated that ongoing annual costs for topping up through mains supply were in the order of £7,000 per annum. Again there is no revenue allowance within the Parks Maintenance budgets.

Again, topping up and therefore ensuring higher water levels will not necessarily solve the problem of algae growth in isolation. Other water bodies within Angus have had similar experience of enlarged algae growth in recent years.

3.2 **Looking for possibility of restoring boats to the pond**

The existing low water levels would at the moment not allow boating in the summer and a continual top up system as those described above would need to be in place before restoring boats to the pond.

To introduce boats could be potentially be in conflict with the existing biodiversity character created in the last few years, through disturbance of wildlife, increasing risk of pond edge erosion and damage to water plants introduced in 2005. One possible solution for this is to introduce floating timber trunk chains to divide the pond into sections for boating and for wildlife.

Preparing the pond for boating also requires regular cleaning of the pond bottom from weeds, litter and other debris, which can have a negative impact on existing wildlife and incur additional annual maintenance costs to the council.

If boating is to return to Keptie pond it is recommended that, to protect the Council from any additional financial burden and associated risk, the existing facility be let to a private concern. If a franchise company was to run boating on the pond the following would need to be established, this at the companies expence:

- Provision of staff welfare facility
- Staff to supervise the public on all areas for boating. The staff would require to be trained in open water lifesaving and rescue
- Installation of a new boat ramp
- Boats and associated equipment

4. FINANCIAL IMPLICATIONS

4.1 Whilst there are no immediate direct financial implications for the council arising from this report, there will be financial implications depending on the option to be pursued. Some of these are uncertain at this time or are the subject of information awaited and the financial position will therefore be clarified in a future report updating members on progress with the preferred option. As a common good property any funding for works will be sought via the Arbroath Common good fund once the preferred solution has been identified along with the full associated costs.

5. HUMAN RIGHTS IMPLICATIONS

5.1 There are no human rights implications arising from this report.

6. EQUALITIES IMPLICATIONS

The issues dealt with in this report have been the subject of consideration from an equalities perspective (as required by legislation). An equalities impact assessment is not required.

7. SINGLE OUTCOME AGREEMENT

7.1 This report contributes to the following local outcome contained within the single Outcome Agreement for Angus

- We value and enjoy our built and natural environment and protect it and enhance it for future generations.

8. CONSULTATION

8.1 The Chief Executive, Director of Corporate Services, Head of Finance and Head of Law and Administration have been consulted in the preparation of this report

RON ASHTON
DIRECTOR OF NEIGHBOURHOOD SERVICES

NOTE: No background papers, as defined by Section 50D of the Local Government (Scotland) Act 1973 (other than any containing confidential or exempt information) were relied on to a material extent in preparing the above report.

EM/NS/DI/JS