

Report for Resolution

Report to Mousehold Heath Conservators
13 March 2009

Report of Head of Community Services

Subject Vinegar Pond Restoration Proposals

ITEM

11

Purpose

To outline options for removing the invasive Reed Sweet-grass at the Vinegar Pond, Mousehold Heath.

Recommendations

That the Conservators discuss the information in this report and consider the options presented, to determine the method to be used for the removal of the Reed Sweet-grass.

Financial Consequences

The financial consequences of this report are dependent on which of the options outlined in the report is adopted. One of the options (bentonite lining) would require a large capital outlay.

Strategic Priority and Outcome/Service Priorities

The report helps to meet the strategic priority “Safe and healthy neighbourhoods – working in partnership with residents to create neighbourhoods where people feel secure, where the streets are clean and well maintained, where there is good quality housing and local amenities and where there are active local communities”

Contact Officers

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Background Documents

Mousehold Heath Management Plan 2008-2013, Section 4.8.

Norfolk Partnership Laboratory Vinegar Pond 2009-03-05

Mousehold Heath Conservators Minutes 15 September 2006

Report

Introduction

1. Since its unauthorised introduction to the Vinegar Pond, Reed Sweet-grass (*Glyceria maxima*) has taken over most of the open water area of the pond. It is likely that the Vinegar Pond has always been subject to some seasonal drying out. In ecological terms, this is not necessarily detrimental, as many aquatic animals are well adapted to living in seasonal ponds, with some occurring nowhere else. Ponds that occasionally dry out also tend to be much better for breeding amphibians (frogs, toads and newts), as large populations of their predators and competitors, such as fish, are unable to become established. The spread of the Reed Sweet-grass in the Vinegar Pond has, however, resulted in the pond drying out both more often and earlier in the season, which is detrimental for many species including frogs, for which the site is an important breeding site. The plant removes water from the pond by transpiration during the growing season, and during the winter months when it dies back, the rotting remains cause a build up of detritus on the pond base that, in turn, further encourages the plant's spread. If the weed were to be left unchecked, it is possible that the Vinegar Pond might eventually lose all its open water.
2. Previous attempts to control the Reed Sweet-grass have been made, notably in autumn 2003, when a mini excavator was used to remove the weed from the pond. These attempts were unsuccessful, as the weed rapidly re-grew from rhizomes and fragments left behind, and it is possible that the disturbance caused by the work helped the weed spread even further around the pond.
3. The Vinegar Pond issue has been discussed at previous Mousehold Heath Conservators meetings. At the Conservators meeting on 15th September 2006, the Natural Areas Officer outlined possible options for controlling the Reed Sweet-grass. The general consensus from organisations consulted (these included Natural England and Norfolk Wildlife Trust), was that control of the weed using a glyphosate based herbicide would be the most effective method. This method of controlling the Reed Sweet-grass was never used, possibly as a result of the 'no chemical policy'; however, there is no reference to such a decision being made in the minutes.
4. A basic geological survey of the pond was undertaken in May 2007. At the Conservator's Working Group meeting on 23rd October 2007, the Conservators requested that the Council's Officers, in conjunction with Malcolm Bryant, progress the restoration of the Vinegar Pond through the removal of the invasive Reed Sweet-grass. It was proposed to undertake the work the following year, after the amphibian breeding season.
5. The Mousehold Heath Defenders planned and organised Phase 1 of the restoration project, which was undertaken successfully in December 2008. The aim of this first phase was to remove as much of the invasive weed from the pond as possible, with Phase 2 of the project to be undertaken in late 2009; the rest of this report outlines the options for this phase.

6. In order to obtain further information about the structure of the pond, a more detailed geological survey of the pond was commissioned by the Conservators and undertaken on 20th February 2009 by Norfolk Partnership Laboratory. This has provided useful new information on the pond's structure.
7. The report concludes that no conclusive evidence was found to explain how the pond retains water. A relatively impermeable silt deposit was found at 3.5m but layers of dry sands above it.
8. The base of the pond has a thin, semi-impermeable layer of silts and decaying plant life at its base, and that this probably responsible for retaining the water for much of the year.
9. The report advises against any further excavation at the base of the pond and recommends that the invasive flora is chemically treated, rather than physically removed.
10. It was agreed at the Mousehold Conservators Management Sub Group Meeting, held on 20 January 2009 that a report outlining the options for the next phase of the restoration of the Vinegar Pond would be presented at the March Conservators Meeting, outlining strengths, weaknesses, risks and financial implications of each option.

11. Option 1: Excavate pond to remove Reed Sweet-grass

Method:

Scrape and dredge material from the pond, to remove Reed-Sweet-Grass roots using a mechanical excavator.

Deposit material on the bank and re-profile.

Disposal of all dredgings and pond material will comply with necessary Environment Agency and Planning Regulations.

Large cordoned off area around the pond with No Access Signs.

Bentonite clay would be used to seal the base of the pond if required.

Timing:

Between September and mid-November.

Repeated every three years until Reed Sweet-grass is removed

Duration of works:

Approximately two days

Cost:

The estimated cost of the project is between £2000 and £4000 on each occasion the work needs to be undertaken. The Defenders will part fund the project, any shortfall would need to be met from the Conservators budget 2009/10.

Strengths:

- i. Low financial cost based on initial estimates.
- ii. Enables a local community group to be involved in the positive management of their local environment.

- iii. The Defenders have wanted to deliver this project for a long time, and will have ownership of the project from inception through to delivery.
- iv. Review of the current policy of not using chemicals on the heath is not required
- v. Financial support for the project is being provided by the Defenders.

Weaknesses:

- i. Financial risk as the depth of excavation and associated volume of material to take out, to remove the Reed-Sweet-grass roots, will not be known until work starts. There is also the potential for hidden costs if there is a need for bentonite clay to be used.
- ii. It may not permanently remove the Reed-Sweet-grass.
- iii. Risk of undesirable media attention and visitors to the heath taking a view that funds have not been used effectively, if the project is unsuccessful.
- iv. High risk of damaging existing semi-impermeable layer.
- v. Risk of invasive weed spread on the banks of the pond and re-colonising it.
- vi. Excavation work will cause damage to any aquatic life present.
- vii. Disturbance will be caused to the pond approximately every three years until the Reed-Sweet grass is removed
- viii. Increased disturbance to the heath and its visitors as plant and heavy equipment will be used to carry out the work.
- ix. May require compliance with environmental and planning legislation.
- x. Pond will need refilling artificially to protect the lining.
- xi. Method conflicts with recommendations in the 2009 geological survey of the pond.
- xii. Operation could permanently change character of pond from a seasonal, nutrient-poor pond to a permanent, more nutrient-rich one; this would have consequences for both the pond's wildlife and its future management.
- xiii. Pond Trust has advised that seasonal ponds have high conservation value.
- xiv. County Archaeologist has expressed concerns in relation to further deep excavation on the site.

12. Option 2: Chemically treat invasive Reed-Sweet-grass

Method:

Spot spray invasive weed using a knapsack sprayer applying diluted Roundup, either when pond dries out, or by pumping out the pond if necessary.

An area around the pond would be cordoned off whilst the work is undertaken.

The operation would be carried out by a person with the relevant Certificate of Competence for applying herbicide.

Monitor the effectiveness of the application to determine if follow up treatment will be necessary. If follow up treatment is required this can be done with a weed wipe to treat individual plant leaves and remove the need for the pond to be drained.

Timing:

Between mid August and September to try and remove the need to pump out the pond and allow time for the frogs to leave the pond.

Treatment to be undertaken at dusk to allow the maximum amount of time for the solution to be absorbed by the plant without evaporating.

Duration of works:

Approximately 2 hours for the treatment to be applied.

Cost:

The estimated cost of a single treatment carried out by a fully certificated Mousehold Warden is £30.

Alternatively CityCare or suitably qualified external contractor could be used. An estimate of £165 for one treatment was obtained at the request of Mousehold Heath Conservators in 2007.

Strengths:

- i. Low financial cost.
- ii. Low financial risk as all costs actual and potential can be identified prior to commencing the project.
- iii. Removes the risk of damaging the pond's existing semi-impermeable layer which is currently retaining the water.
- iv. Methodology recommended by industry professionals and 2009 geological survey of the pond.
- v. Permanent eradication of the invasive weed, although this may involve more than one treatment.
- vi. Treatment may be undertaken without a need to drain the pond artificially if the pond dries out naturally during the summer.
- vii. Minimal disturbance to the heath and its visitors as no plant and heavy equipment being used to carry out the work.
- viii. Does not require Environment Agency permits.
- ix. Does not require planning permission.
- x. Risk of delays minimised as a result of not requiring Environment Agency consent or planning permission.
- xi. Resolves invasive weed problem without altering the pond's existing character.
- xii. Maintains the pond as a natural seasonal pond with associated wildlife benefits.
- xiii. Low cost and low risk option.

Weaknesses

- i. Requires the current policy of not using chemicals on the heath to be reviewed.
- ii. Risk of undesirable media attention and local people being unhappy about the use of chemicals on the heath.
- iii. Possible short-term damage to some non-target aquatic life.
- iv. Follow up treatment would probably be required to totally eradicate the weed.
- v. Project cannot be delivered by the Defenders

13. Option 3: Excavate pond and line with a bentonite liner**Method:**

Excavate using a mechanical digger through existing soil profile to depth of 30cm – 60cm through the base when the pond is dry and install a bentonite liner to form an impermeable layer.

Any soil and plant material would be spread on the banks of the hollow in which the pond is located.

All dredgings and the disposal of pond material will comply with Environment Agency and Planning Regulations.

Cover the bentonite liner with gravel.

Refill pond

Timing:

Between mid August and September to try and remove the need to pump out the pond and allow time for the frogs to leave the pond.

Duration of works:

Approximately 2 to 3 days to a week depending on weather conditions.

Cost:

The cost of the works is estimated to be between £10,000 and £17,000.

Strengths:

- i. Permanent removal of the weed from the pond as it cannot grow through the liner.
- ii. Low financial risk as all costs actual and potential can be identified prior to commencing the project
- iii. Provides a robust and impermeable layer.
- iv. Easy to install.
- v. Pond less likely to dry out in the future (though this could be viewed as a weakness based on the benefits of a seasonal pond).
- vi. Recognised method used by industry professionals.
- vii. Volunteers could have ownership of the project.
- viii. Does not require a review of the current policy of not using chemicals on the heath.

Weaknesses

- i. High financial cost.
- ii. Risk of ground works damaging the natural semi-impermeable lining.
- iii. Risk of invasive weed spread on the banks of the pond re-colonising it.
- iv. Excavation work will cause damage to any aquatic life present.
- v. Increased disturbance to the heath and its visitors as plant and heavy equipment being used to carry out the work.
- vi. May require compliance with environmental and planning legislation.
- vii. Pond would need refilling artificially to protect the lining.
- viii. Bentonite lining could be damaged in future.
- ix. Method conflicts with recommendations in the 2009 geological survey of the pond.
- x. Operation could permanently change character of pond from a seasonal, nutrient-poor pond to a permanent, more nutrient-rich one; this would have consequences for both the pond's wildlife and its future management.
- xi. Pond Trust has advised that seasonal ponds have high conservation value.
- xii. County Archaeologist has expressed concerns in relation to further deep excavation on the site.

14. Option 4: Excavate and line with puddled clay

This is a high cost, high risk option. Following preliminary investigations with pond specialists, planning officers and the Defenders, it is evident that this would be a complicated project, and it is recommended that this is not considered as a viable option for technical and financial reasons.

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