Committee(s): Epping Forest & Commons Committee – For decision	**Dated:** 23/11/2023
Subject: Natural Flood Management at Yardley Lane, Epping Forest	**Public**
Which outcomes in the City Corporation's Corporate Plan does this proposal aim to impact directly?	1, 11 & 12
Does this proposal require extra revenue and/or capital spending?	**Y**
If so, how much?	**£35,000 - £50,000**
What is the source of Funding?	**External grant**
Has this Funding Source been agreed with the Chamberlain's Department?	**N/A**
Report of: Bob Roberts, Interim Executive Director Environment	**For Decision**
Report author: Ella Brown, Ben Bishop (Environment)	

Summary

This report is to seek approval to submit an application for grant funding for, and subsequently deliver, a Natural Flood Management (NFM) project along a small section of a stream in the west of Epping Forest. NFM measures mimic natural processes and are designed to slow the flow of water during heavy rainfall events and therefore alleviate the risk of flooding. The project will consist of a small number of leaky dams and overland flow interceptors which will be made from natural materials that will be locally acquired from Epping Forest.

If the application for grant funding is successful, the funding for the project will be delivered by the Thames Regional Flood and Coastal Committee (TRFCC), who are supporting the delivery of Natural Flood Management interventions across the Thames catchment.

The proposed NFM measures will reduce the risk of flooding to the residential area surrounding Yardley Lane, which is situated downstream of the project site. The project will provide additional benefits to the Forest by retaining more water to lessen the effects of climate change on trees and vegetation from drought and heat stress, including the risk of wildfires. The measures protect habitats and tree root systems by reducing the high flow rates associated with extreme rainfall events. Extreme rainfall events are expected to become more frequent as a result of climate change, therefore it is vital that we ensure the City of London Corporation's land is resilient to the changing climate.

Recommendation(s)

Members are asked to:

- Note the report.
- Endorse the application for £35,000 - £50,000 funding from the Thames RFCC NFM Fund.
- Delegate authority to the Superintendent to enter into all necessary arrangements and agreements to secure the funding and implement the scheme, in consultation with the City Solicitor.

Main Report

Background

1. Natural Flood Management (NFM) measures (such as leaky dams and brash bundles) are interventions which are designed to mimic and work with nature to slow the flow of water and store more water in the landscape, thus reducing flood risk. NFM measures can also result in a host of other benefits such as improving water quality, reducing impacts of drought and wildfires and supporting crucial wildlife habitats to boost biodiversity.

2. The Thames Regional Flood and Coastal Committee (TRFCC) is a committee established by the Environment Agency under the Flood and Water Management Act (2010) that brings together members appointed by Lead Local Flood Authorities (LLFAs) and independent members with relevant experience for the purpose of communicating flood risks, encouraging investment for flood schemed and to establish links between stakeholders in the affected areas.

3. The TRFCC has awarded £1 million of funding towards the delivery of small-scale Natural Flood Management schemes, up to the value of £50k per scheme. The funding would cover 100% of the cost of the proposed works. A FAQ document provided by TRFCC on the funding is included in Appendix 1.

4. The proposed project site is located in the west of Epping Forest, to the south of Yardley Hill and to the north of Chingford Plain. An unnamed stream runs in a south easterly direction towards the River Lea and into London Borough of Waltham Forest. The downstream section of the stream runs through a residential area to the south of Yardley Lane. Online Environment Agency mapping indicates that a surface water flow path follows the course of the stream.

5. The delivery of this project will be a demonstration project of the benefits of NFM as part of the Climate Action Strategy (CAS). The Environmental Resilience Team are producing guidance on NFM and how it could be used across the City of London Corporation's land as part of the 'Mainstreaming Climate Resilience Programme' within the CAS.

6. Epping Forest has been supporting flood management ecosystem services schemes since 1987. The Charity has approved the construction of three flood management schemes (Cripsey Brook-Thornwood Flood Alleviation Scheme, Staples Road Pond Flood Storage Reservoir, Cobbins Brook Flood Storage Area).

7. Most recently, Epping Forest approved the creation of the Hillyfields Flood Alleviation Scheme in 2019 and the construction of leaky dams as part of a planning condition for the 2022 repair of the Birch Hall Park Small Raised Reservoir in Theydon Bois.

Current Position

8. A desk-based assessment and an initial site investigation by the Environmental Resilience Team and Epping Forest Conservation Team officer (conducted on the 28/09/23) have confirmed the suitability of the Site near Yardley Lane for the implementation of NFM.

9. The Environmental Resilience team are seeking permission to progress our investigations and apply or participate in the application for funding from TRFCC to support the delivery of these measures.

10. There is one existing NFM structure in the form of a leaky dam present at the proposed project site. It is proposed to introduce additional leaky dams and overland flow interceptors (brash bundles). An indicative location map of the proposed NFM measures is included in Appendix 2.

11. The City Corporation will need to collaborate with the LLFA, the London Borough of Waltham Forest, regarding the application for funding and implementation of the measures. Discussions with Waltham Forest regarding the implementation of NFM in Epping Forest have already taken place and are ongoing.

Options

12. Agree to the Environmental Resilience Team taking all necessary steps for the preparation and submission of a funding application and then implementation and agreements with other parties (such as the LLFA) (**recommended**).

13. Not agree to take the steps proposed in paragraph 9. This would free up time to allow work on other activities but would mean that a source of funding would not be available to progress a well suited project some of which have been identified as key resilience measure in the Climate Action Strategy (**not recommended**).

Proposals

14. The proposed project entails the construction of up to fifteen leaky dam structures in conjunction with up to three overland flow interceptors.

15. Leaky dams are debris barriers which sit within and across a watercourse at a 90* angle to the flow of water. Leaky dams hold back water during high flows but allow normal flows to pass through uninterrupted. These structures result in diverse spatial patterns of flow and sediment which supports a variety of in-stream habitats.

16. Overland flow interceptors are structures that lie across flow paths that are activated when it rains. The structures are positioned perpendicular to the flow pathways and slow the delivery of water to nearby watercourses. These can be made up of small logs or brash bundles, which can be secured in place if necessary.

17. The Environmental Resilience team as part of the CAS has the objective of scoping and supporting the trialling and delivery of NFM.

18. Implementing these measures will directly benefit local stakeholders and infrastructure through reducing the risk of flooding to properties and along Yardley Lane.

19. The project will increase the resilience of protected habitats and veteran trees by capturing more water within the forest. This will result in increased groundwater retention and will therefore improve the Forest's resilience during drier weather, drought periods and to the risk of wildfires.

20. Additional natural benefits alongside reducing flood risk are associated with the project, such as contributing towards the protection of the Forest's carbon stores and enhancing biodiversity through habitat creation and conservation.

21. The project will help trial measures that could be implemented in other areas of Epping Forest, and throughout other sites managed by the Natural Environment.

22. The deadline for the submission of funding applications is the 15th of December 2023. To meet the criteria, it is required that applicants identify and investigate sites suitable for Natural Flood Management through a

desktop survey. A site investigation is also required, which has already been conducted.

23. By indicating the number of and location of the measures for the scheme, an estimation of the volume of water attenuated as a result of the scheme can be calculated.

24. If the grant is accepted, design options will need to be specified as part of the tender process. A specification will be drawn up and provided to contractors once tender is agreed. It is expected that once a contractor has been appointed, ground works will begin in Autumn 2024.

25. As required by the grant, some monitoring should take place before the end of the grant. This will be agreed as part of the grant process and costed into project management. The monitoring role is likely to require input from the Epping Forest team and would need to be included within their operations.

26. This fund requires that a monitoring report is produced once the project is completed, within two years of the grant being awarded. It is anticipated that this will be produced by the Environment Resilience Team.

27. It is expected that the structures should be maintained for their lifetime which is five years. Inspections should take place every 6 months. Inspections should also be carried out after heavy rainfall events.

28. The design of the NFM structures will be specified based on their location along the watercourse, but typically will be no wider than 5m and no taller than 1m. Leaky dams are comprised of natural woody material laid across water channels with a base-gap provided at the bottom of the structure to allow normal base-flows to pass through.

29. Leaky dams can use a range of log sizes and other woody material depending on the channel and surrounding sites. These will be pinned in place creating a 90* barrier at which peak flow will be held back.

30. The leaky dams will be constructed of locally sourced materials that is acquired through the habitat management work of the forest such as felling, pollarding and coppicing. It is intended that this element of the project will primarily be delivered by contractors with some support from volunteers where possible.

31. The project will implement up to fifteen leaky dams to provide up to 500m^3 of water storage during peak flow. The placement of the dams will ensure no detrimental impact to access on paths and rides.

32. Overland flow interceptor structures will be constructed of locally sourced materials, including logs acquired through habitat work or ‘brash’ through scrub and land clearance.

33. Interceptors will be secured using stakes. These will be primarily constructed by volunteers with some contractor support if required, including movement of materials and installation of structures at more complicated sites.

34. Interceptors are only active during peak flow events. Three interceptors will be provided to reduce the flow of water towards the watercourse during peak flows, supporting the attenuation of 500m^3 of water.

Key Data

35. The Thames RFCC funding application window opened on Monday 11th September 2023 and closes on Friday 15th December 2023.

36. Up to £50,000 can be sought per scheme.

37. Projects need to be completed within 2-years of approval of application.

38. Up to 15 leaky dams and 3 overland flow interceptors proposed to provide up to 500 m3 of flood water storage.

39. Up to five properties at direct risk of in a 1 in 30 year (3.3% annual probability) surface water flood event in London Borough of Waltham Forest.

40. Online Environment Agency mapping shows surface water flooding with depths > 0.3 m are shown to occur along Yardley Lane and external property areas during the 1 in 30 year flood event. Depths greater than 0.3 m are not considered passable by people and vehicles therefore there are access / egress implications for residents associated with the existing level of flood risk.

Corporate & Strategic Implications

Strategic implications

41. The implementation of NFM aligns with the City Corporation's Climate Action Strategy through building adaptive capacity through delivery of resilience measures. These measures are referenced as key project objectives within the Cool Streets and Greening Programme.

42. The emerging Natural Environment Strategy will include a commitment to improving habitat resilience and adaptation measures that will be enhanced by the proposed NFM measures.

Financial implications

43. Works will not go ahead if the grant is unsuccessful and will incur no further costs than that supported by the grant.

Resource implications

44. Staff time from the Environmental Resilience Team and Epping Forest team will be required to support the application, development and implementation of the project. Following installation, 6-monthly inspections will be needed for five years.

Legal implications

45. Advice will be provided in respect of any necessary agreements as discussions with other stakeholders, including the London Borough of Waltham Forest (as LLFA) evolve and the respective roles of the parties is determined.

Risk implications

46. If the grant is unsuccessful then the project will not go ahead. NFM installations are increasingly becoming a common management technique. The Epping Forest team has experience of installing leaky dams and not progressing with this project would be missed opportunity for developing this experience.

47. Any delay in providing specifications, tendering and agreeing contracts could have significant impact on project completion, as works can only be completed within autumn and winter. This means that programming should also take into account the possibility of extreme weather and poor working conditions, which could cause delay in construction.

Climate implications

48. The use of NFM interventions will increase the resilience of the habitats to environmental and biological changes brought about by climate change. It will reduce local flood risk and the impact of water stress on habitats within the Forest caused by periods of drought and heat.

49. Extreme weather events such as flooding are predicted to become more frequent, implementation of NFM can build the adaptive capacity of the Forest to reduce the impacts of surface water flooding on biodiversity and accessibility.

50. Risk of fire to the Forest is going to increase as a result of rising temperatures and drought. The proposed measures will result in more water being retained within the Forest, increasing ground moisture and water available to vegetation and therefore reducing the risk of fire.

51. As a result of this, the work will enhance biodiversity and increase resilience by; protecting the Forest's carbon stores, it's habitats and through the creation of microhabitats such as temporary pools and wet grassland. The work complements the aims of the Climate Action Strategy of the City Corporation for both climate adaptation and biodiversity enhancement.

Security implications

52. None.

Charity implications

53. Epping Forest is a registered charity (number 232990). Charity Law obliges Members to ensure that the decisions they take in relation to the Charity must be taken in the best interests of the Charity.

Conclusion

54. The Environmental Resilience Team is seeking permission to submit or participate in the submission of a funding application to the TRFCC for £35 000 to £50 000 to wholly support the delivery of NFM measures within Epping Forest. If the funding application is successful, arrangements and agreements are likely to be required with other stakeholders. Delegated authority is sought for the Superintendent to enter into all necessary arrangements and agreements to secure the funding and implement the scheme, in consultation with the City Solicitor. The proposed NFM measures (up to fifteen leaky dams and three overland flow interceptors) would provide multiple benefits, such as reducing flood risk to downstream properties and roads, improving the resilience of protected habitats and veteran trees to drought, heat stress and wildfires by conserving water on the Forest, and improving biodiversity through habitat creation and conservation.

Appendices

- Appendix 1 – Thames Regional Flood and Coastal Committee grant Frequently Asked Questions (FAQs)

- Appendix 2 – Yardley Lane Natural Flood Management intervention location map – locations shown are indicative

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