



North Lanarkshire Council

Kilsyth Flood Protection Study

Non-Technical Summary Report





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Type of document (version) Public

Project no. 70089784

Our Ref. No. 70089784NTS001

Date: January 2022

Quality control

Issue/revision	First issue	Rev B	Rev C
Remarks	Draft for NLC comment	Revised from NLC comment	Final Issue
Date	17/12/21	07/01/21	14/01/21
Prepared by	Dave Turner	Dave Turner	Dave Turner
Signature			
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Authorised by	Ben Murray	Ben Murray	Ben Murray
Signature			
Project number	70089784	70089784	70089784
Report number	70089784NTS001	70089784NTS001	70089784NTS001
File reference	70089784NTS001rA Kilsyth NTS	70089784NTS001rB Kilsyth NTS	70089784NTS001rC Kilsyth NTS

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1 Background

Flooding in Kilsyth

The flood risk management plan for North Lanarkshire Council (NLC) has identified Kilsyth as an area vulnerable to flooding. Most recently on 4 August 2020, heavy rainfall resulted in extensive flooding in the Burngreen Park area and along Stirling Road¹.

In response to the flood risk management plan, NLC commissioned studies to identify potential solutions to reduce the risk of river flooding to properties in Kilsyth.

The main objectives of the studies were:

- To reduce the risk of flooding from the Garrell Burn, Colzium Burn and Ebroch Burn
- To improve the health and wellbeing of the community
- To identify opportunities to improve the environmental condition of the streams

The Catchment

There are two main watercourses which flow through the Town of Kilsyth, the Colzium Burn and Garrell Burn a tributary of the River Kelvin which are shown in Figure 1-1. The Garrell Burn is the larger of the two, rising on the Garrell Hill approximately 2km to the north of Kilsyth, before running south east to join the Colzium Burn. The Burn then continues in a south westerly direction to join the River Kelvin.

The Colzium Burn rises to the south west of Garrell Hill, before running south and into Kilsyth. At the urban extent of Kilsyth, the Colzium Burn, locally known as the Ebroch Burn, runs in a south westerly direction before discharging to the Garrell Burn at Burngreen Park.

Both watercourses are intercepted by a Canal Feeder channel, locally known as the Mill Lade, where flow control structures are utilised by Scottish Canals to divert flows to the nearby Townhead Reservoir (also known as Banton Loch).

¹ Kilsyth flooding reported here:
<https://www.thescottishsun.co.uk/news/5889168/scotland-roads-flooded-weather/>



Figure 1-1 - Location Plan

Strategic Context

Local Plan

Kilsyth has been identified as Potentially Vulnerable Area 11/04 in the Clyde and Loch Lomond Local Plan District. The Local Plan recommends that NLC lead a flood protection study to further investigate the feasibility of works to reduce the risk of river flooding to residential and non-residential properties in Kilsyth. There is to be specific focus on options utilising the canal feeder channel to divert flood flows to Townhead Reservoir (Banton Loch).

River Basin Management Plan

Kilsyth lies within the Scotland River Basin, and the current River Basin Management Plan² (RBMP) classifies the Garrell Burn as a heavily modified water body with an overall condition as Poor. The main pressures on the Garrell Burn identified within the RBMP are water flows and levels due to abstraction, and barriers to fish migration.

NLC are currently undertaking river restoration works to the Garrell Burn downstream of Kilsyth to improve its condition by reinstating natural processes and improving biodiversity.

² The River Basin Management Plan for the Scotland River Basin district 2015-2027 (Natural Scotland), 21 December 2015

2 Flood Risk

As part of the study, a flood model was built for Kilsyth to assess the baseline flood risk, potential options, and flood damages. Modelling confirms that areas of Stirling Road and Burngreen Park are currently at risk of flooding from a 1 in 10 year flood event. The commercial properties at risk include a local nursery school which has flooded previously and is considered a Most Vulnerable Use³ by SEPA.

Modelling has been undertaken for the following events:

- 1 in 10 year (Figure 2-1)
- 1 in 100 year (Figure 2-2)
- 1 in 200 year (Figure 2-3)
- 1 in 200 year + 44% climate change (Figure 2-4)

The climate change allowance is a prediction of anticipated change in peak watercourse flow caused by future climate change. This allowance is an increase of 44% in accordance with SEPA guidance for the Clyde catchment.

The flood model confirms that the majority of flood risk is associated with the Colzium and Ebroch Burn, and the Garrell Burn downstream of the confluence at Burngreen Park.

³ Flood Risk and Land Use Vulnerability Guidance, LUPS-GU24, SEPA 2018

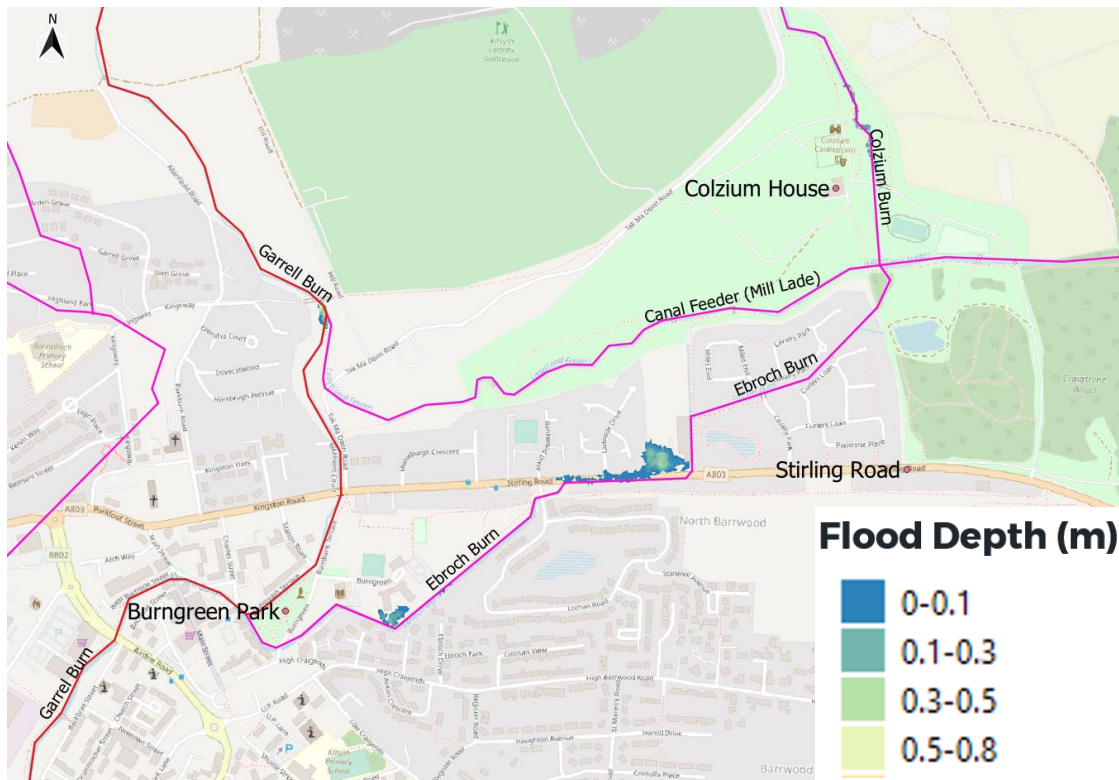


Figure 2-1 - 1 in 10 year flood extent and depth

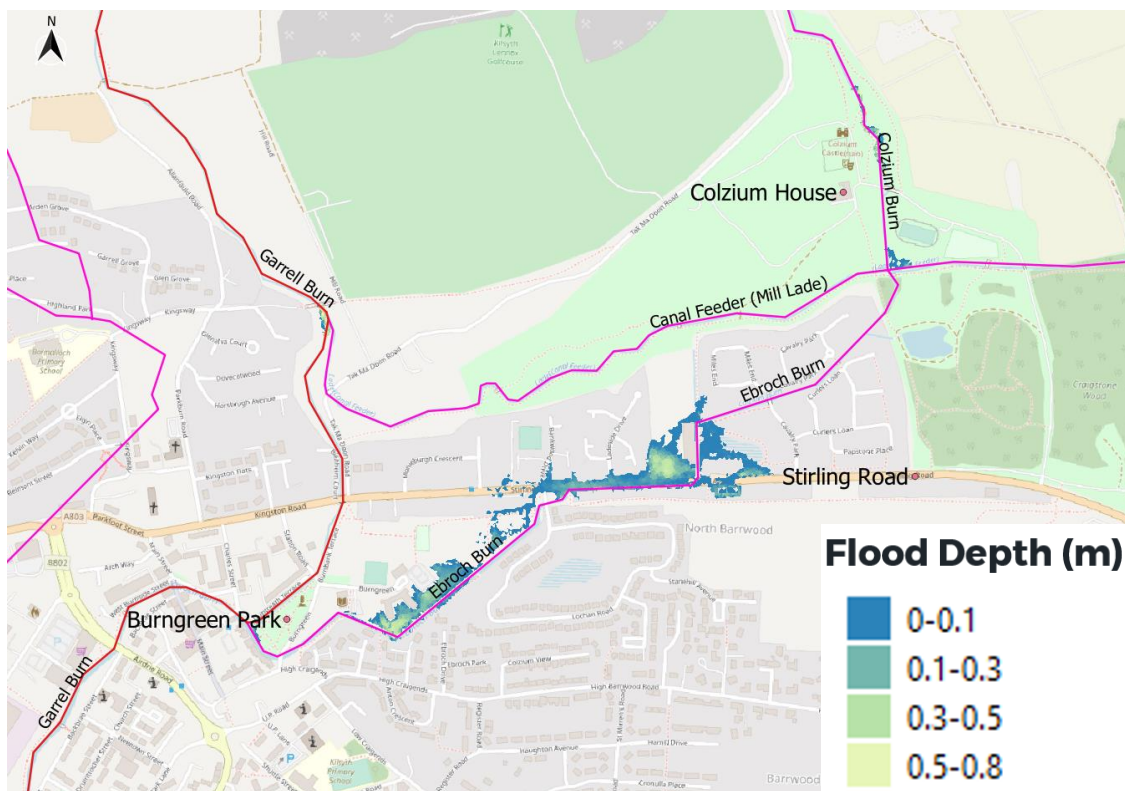


Figure 2-2 - 1 in 100 year flood depth and extent

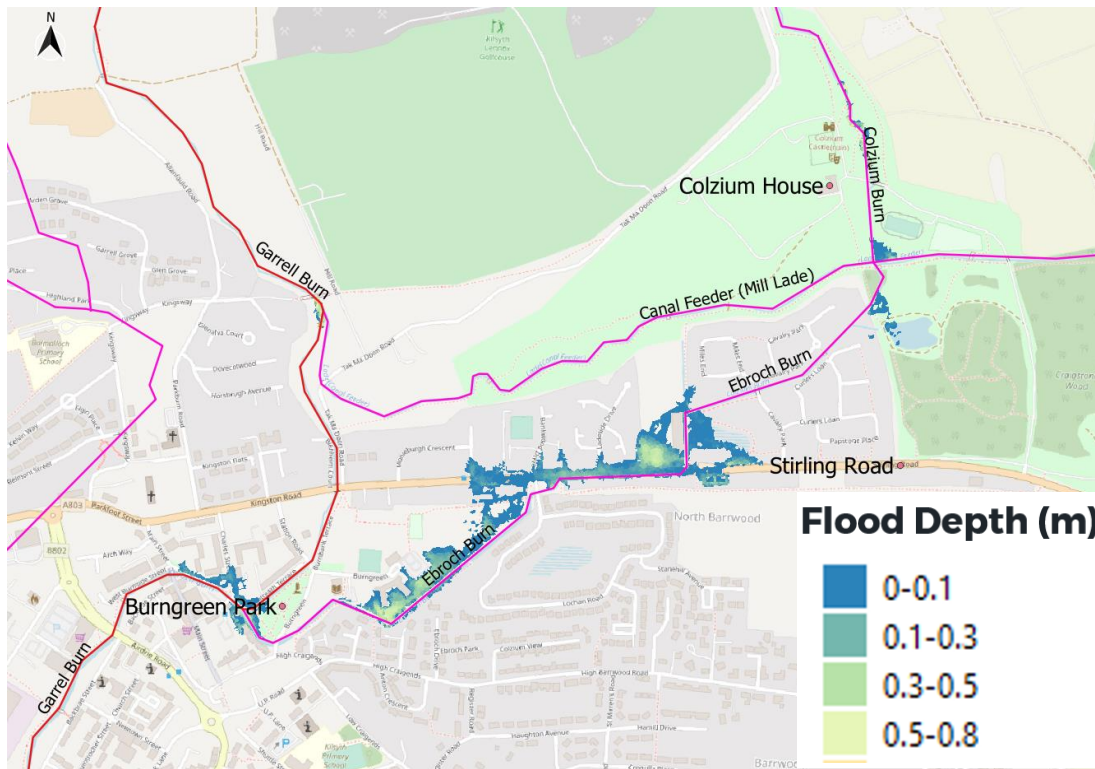


Figure 2-3 - 1 in 200 year flood depth and extent

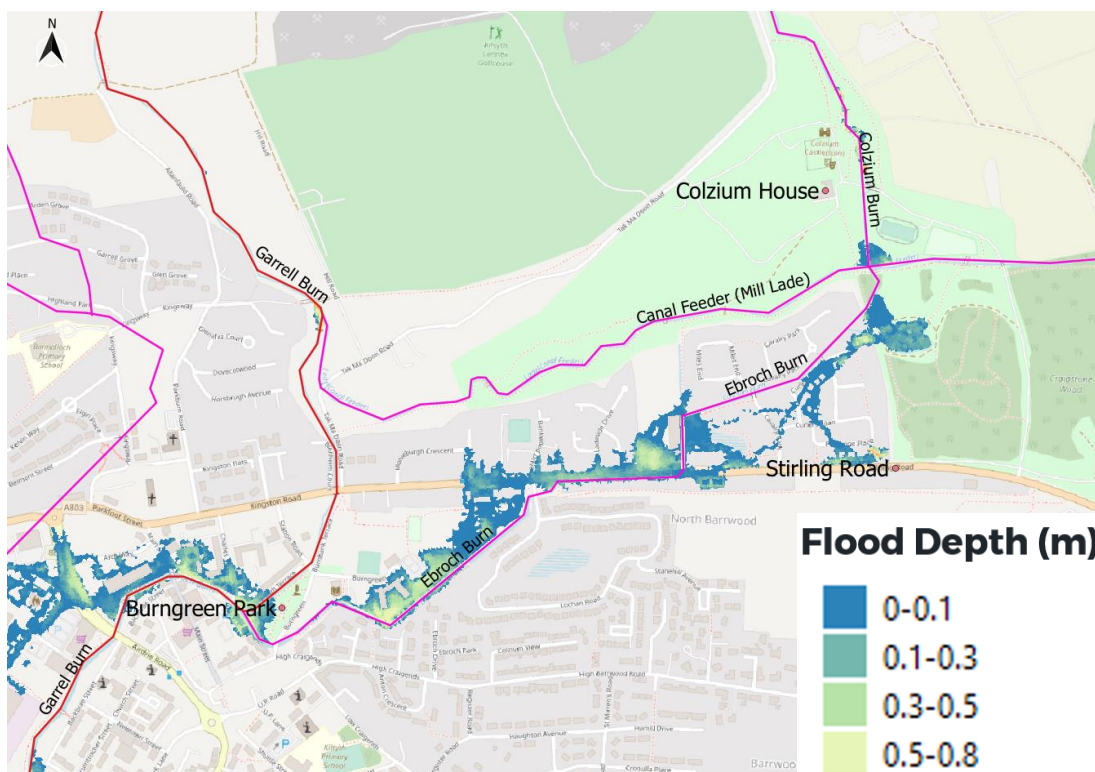


Figure 2-4 - 1 in 200 year plus climate change (+44%) flood depth and extent

3 Flood Risk Management Options

The long list of options has been considered against the following critical success factors:

- **Feasibility** – is the option practical and is the technology well proven?
- **Benefit** – how much will it reduce the risk of flooding?
- **Adaptability** – how readily can the option be adapted for climate change?
- **Health and Safety** – can it be built and operated safely?
- **Environmental impact** – are there potentially significant benefits or impacts to the environment?
- **Social** – what effect will it have on residents, businesses and recreation?
- **Relative cost** – does it provide value for money compared to the other options?

Long list of options

The long list of flood risk management options has been appraised against the critical success factors.

Over 30 options and combinations of measures were considered. The options included:

- Building areas to hold back flood water upstream.
- Increasing capacity of channels and structures.
- Land management measures to slow the flow of water from the upstream catchment e.g. woodland planting or changes in land drainage.
- Using the Canal Feeder to divert flood water away from the town.
- Protecting individual properties through measures such as flood proof doors.

An options workshop was held with NLC and Scottish Canals to score the long list and shortlisted options to arrive at the preferred option.

Use of the Canal Feeder

The Canal Feeder (known locally as the Mill Lade) is owned and operated by Scottish Canals, and its function is to divert flows from the Garrell Burn and Colzium Burn to top up Townhead Reservoir (Banton Loch). Reservoirs are carefully regulated and designed so that in the event of very extreme floods water can overflow safely.

As the Canal Feeder flows into Townhead Reservoir to the east of Kilsyth, there is a limit to how much flow can be diverted to the reservoir without compromising its safety. The reservoir has two large overflow structures, so that when full, it can safely overtop without damaging the dam.



The capacity of these structures has been checked by Scottish Canals as part of their regular reviews of the reservoir. They have found that the reservoir can safely take a maximum of 6 m³/s of flow from the Canal Feeder. This limits the extent to which this overflow option can be used to reduce the risk of flooding in Kilsyth.

4 The Preferred Option

Following the options assessment, a preferred long term solution was identified to reduce the risk of flooding to Kilsyth.

This would require construction of new flow control structures on the Garrell Burn and Colzium Burn, which would be operated remotely. These flow control structures would divert up to 6m³/s of water from the Colzium Burn and Garrell Burn to the Canal Feeder during flood events (Figure 4-1). This would:

- Provide a good standard of flood risk reduction from the Garrell Burn and Ebroch Burn, with less than a 1% chance of flooding in any one year (a 1 in 100 year event)
- Reduce predicted flood damage to the town by £1.6M over the next 50 years

Flood maps for the long-term solution are shown in Figure 4-2 through to Figure 4-5

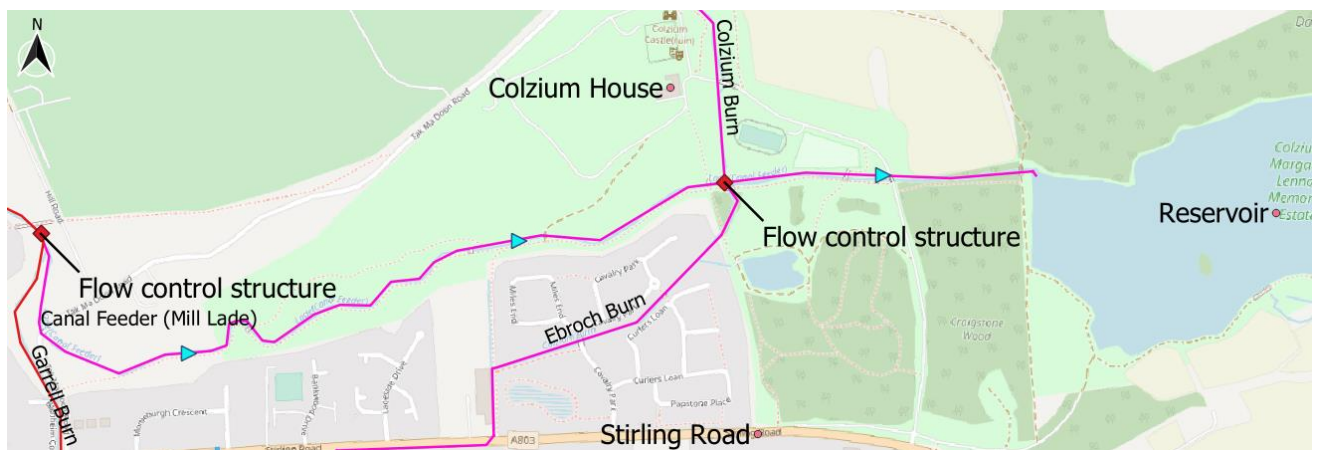


Figure 4-1 - Preferred Long Term Option

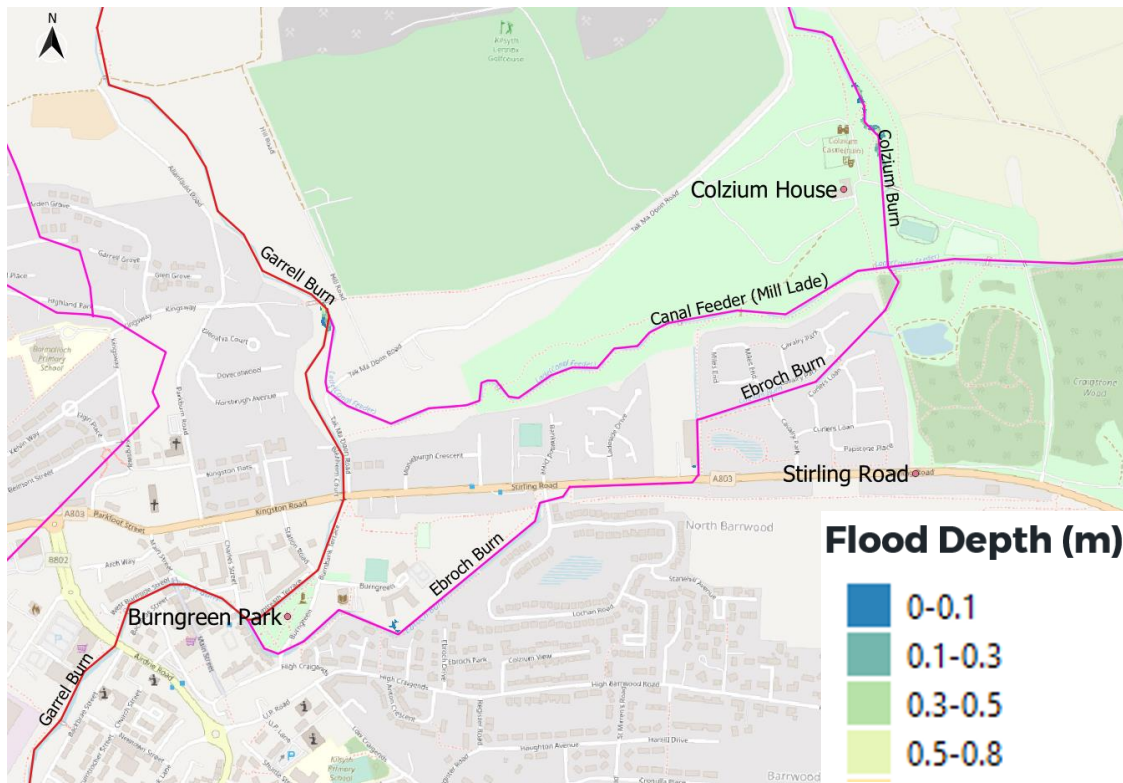


Figure 4-2 - 1 in 10 year flood depth and extent with preferred option

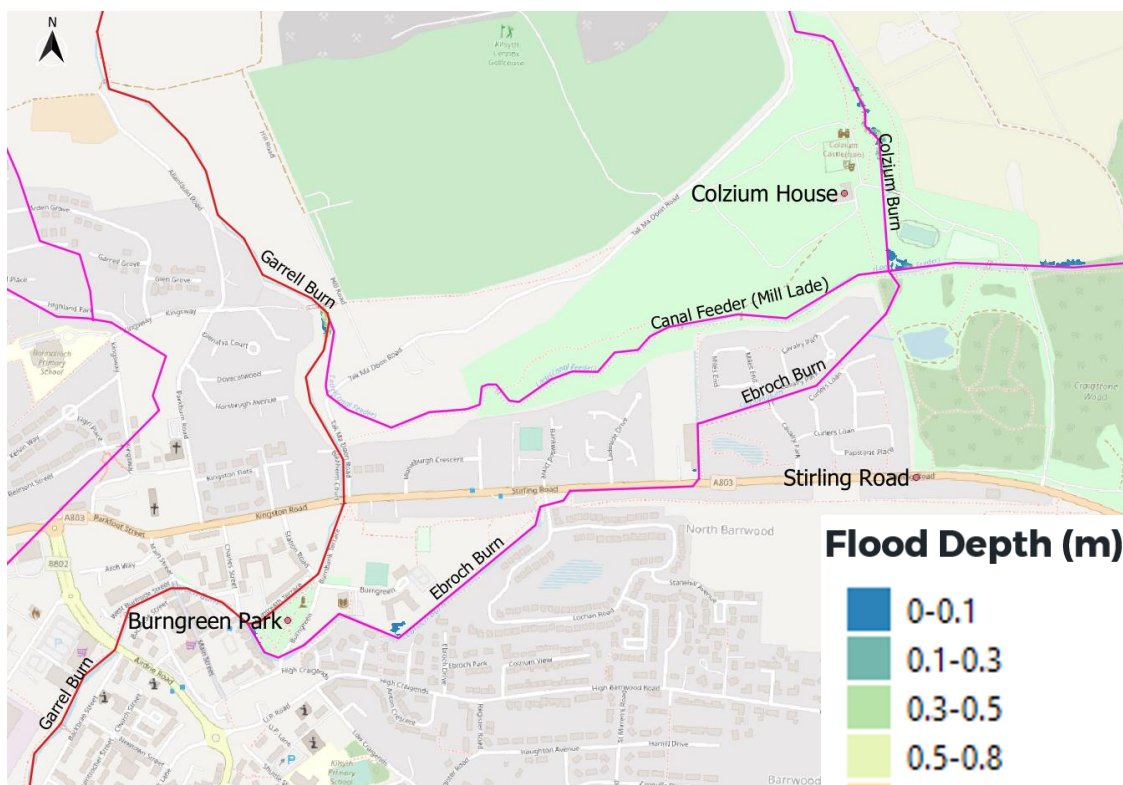


Figure 4-3 - 1 in 100 year flood depth and extent with preferred option

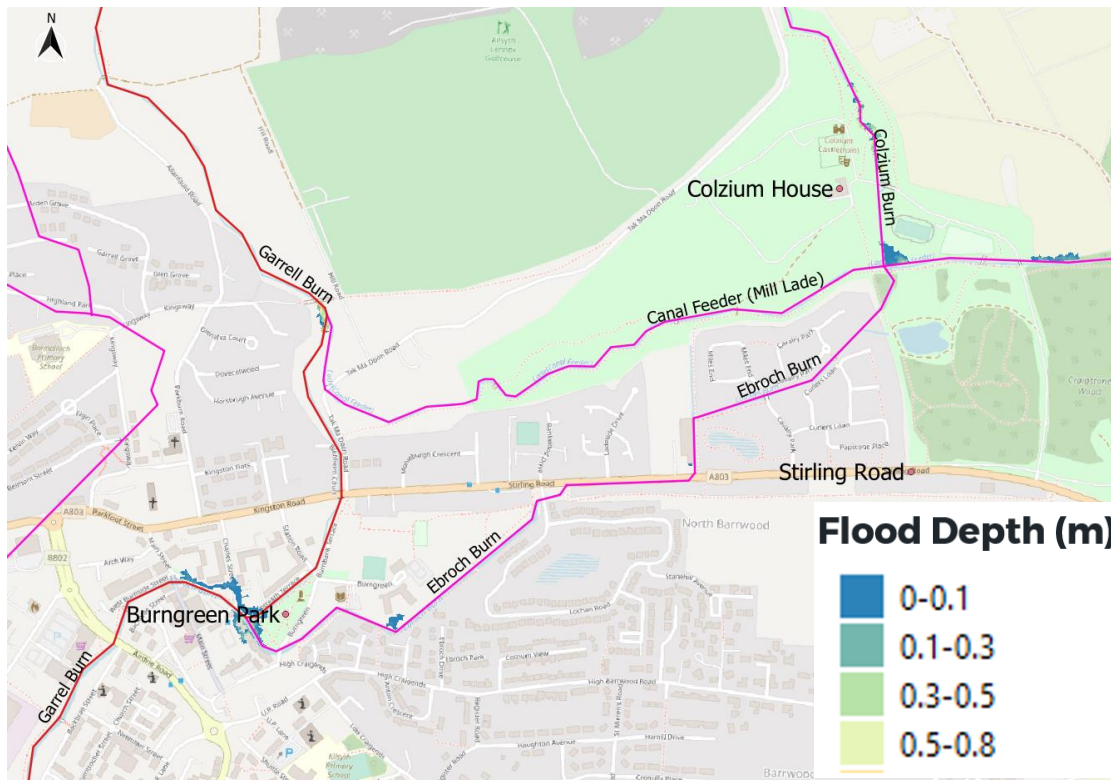


Figure 4-4 - 1 in 200 year flood depth and extent with preferred option

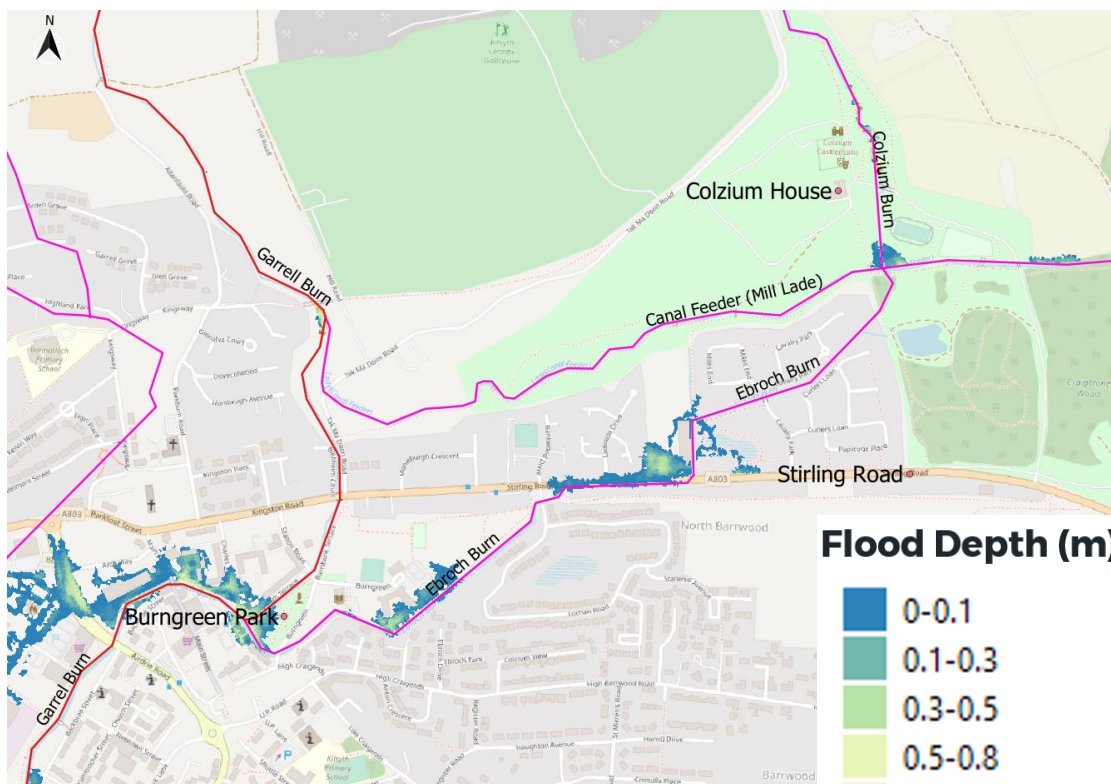


Figure 4-5 - 1 in 200 year plus climate change (+44%) flood depth and extent with preferred option

Short Term Improvements

In the short term, NLC will continue to undertake routine maintenance works to reduce the risk of flooding along the Garrell Burn and Ebroch Burn. In 2020/21 NLC have:

- Cleared 500 tonnes of silt from the Garrell Burn at its confluence with the Ebroch Burn in Burngreen along towards Stirling Road.
- Cleared vegetation along the Ebroch Burn, between Burngreen and Stirling Road, in order to undertake further desilting.

In 2022/2023 NLC will be:

- Clearing silt from the Ebroch Burn, between Burngreen and Stirling Road.
- Clearing vegetation along the Ebroch Burn from Burngreen to Backbrae Street, in order to undertake further desilting.
- Clearing silt along the Garrell Burn from Burngreen to Backbrae Street.

5 Summary

Kilsyth is at risk of flooding from the Garrell Burn and Colzium Burn (also the Ebroch Burn where it runs through the Town), with frequent flooding of Stirling Road and the Burngreen Park area. A flood model of the two watercourses has been constructed, and a range of options considered against a range of criteria including:

- Feasibility
- Benefit
- Adaptability
- Health and safety
- Environmental Impact
- Social
- Relative Cost

Over 30 different options were considered and narrowed down through a longlist and short list appraisal. The preferred option is to construct remotely operated flow controls at Colzium Burn and Garrell Burn. This will provide a good standard of flood risk reduction from the Garrell Burn and Ebroch Burn, with less than a 1% chance of flooding in any one year (a 1 in 100 year event). This has an estimated economic benefit of £1.6M over the 50 year appraisal period.

To support this, NLC have been carrying out routine maintenance works to clear silt and vegetation on the Garrell Burn and Ebroch Burn, and this will continue in 2022/23 whilst the long term solution is being further developed with Scottish Canals.



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