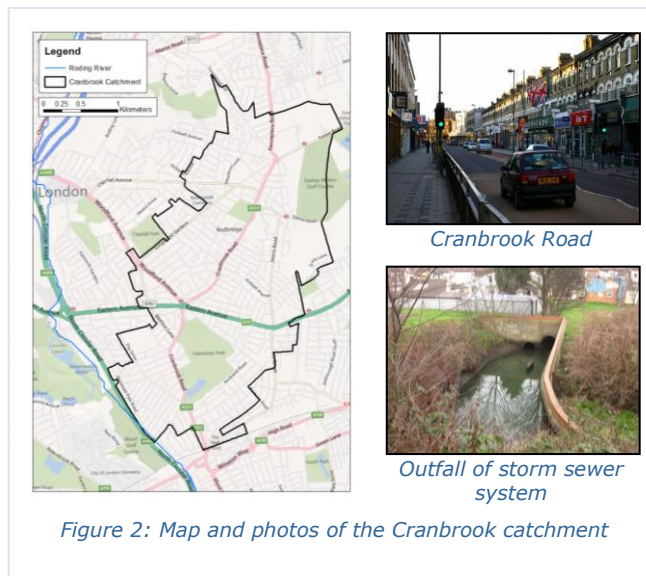
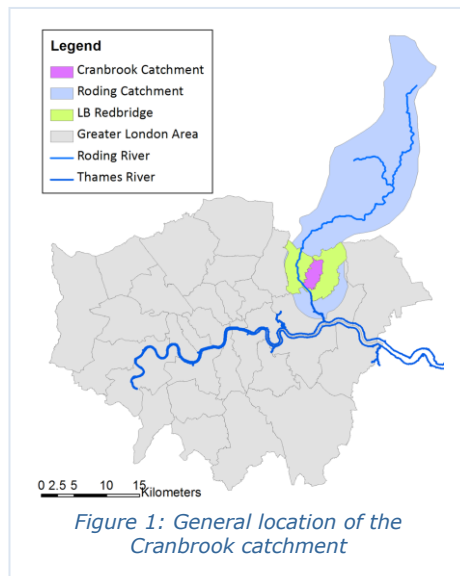


Pilot location: Cranbrook Catchment, London Borough of Redbridge (UK)

Location and Environmental Setting

The Cranbrook catchment is located in the London Borough of Redbridge, in the Northeast part of Greater London (see Figure 1).

The **drainage area** of this catchment is **865 hectares**. The main water course (i.e. the Cran Brook) is about **5.75 km long**, of which **5.69 km are culverted** and have become part of the storm water drainage system, which is mainly separate. The storm water drainage system of this catchment discharges into the Roding River and, in turn, the Roding River discharges into the river Thames (see Figure 1).



The catchment is **predominantly urban**, with a combination of residential and commercial areas, in addition to two off-line lakes, a couple of parks and playing fields (see Figure 2).

It has a **population of approximately 41,000** inhabitants (population density ~47.7 persons per hectare) and the main industries of employment are real state renting and business activities, wholesale and retail trade, and health and social work.

Urban pluvial flood risk problems and management objectives

The Cranbrook catchment has experienced **severe fluvial and pluvial flooding in the past**, with flood events reported since 1926. Recent major flood events occurred in October 2000 and February 2009 (both coincidental pluvial-fluvial events), in addition to a number of localised surface water flood events.

Table 1: Number of infrastructure/properties at risk of flooding in the Cranbrook catchment during a 1:100 years return period rainfall event

Type of property	Infrastructure	Households	Commercial Properties
Flood depth > 0.03 m	14	1896	251
Flood depth > 0.50 m	4	266	23



Figure 3: Feb 2009 coincidental pluvial-fluvial flood event



Figure 4: Localised surface water flood event - 2009

Pluvial flooding mechanisms:

- The area is **highly urbanised**, therefore it has a rapid response to rainfall and a big part of the rainfall becomes surface runoff.
- Surface **runoff** resulting from heavy rainfall generally **flows and ponds along the natural drainage pathways**, most of which have been covered by impervious surfaces and include man-made features that exacerbate ponding (see areas at highest risk in Figure 5).
- There is **strong interaction between pluvial and fluvial flooding**: high water levels in the Roding River reduce the capacity of the sewer system of the Cranbrook catchment and may cause a backwater effect, which causes and/or worsens surface water flooding in the downstream end of the catchment.
- The **Roding River is tidally influenced** at the point at which the sewer system of the Cranbrook catchment discharges into it. This has exacerbated locking of surface water sewer outfalls in previous flood events.

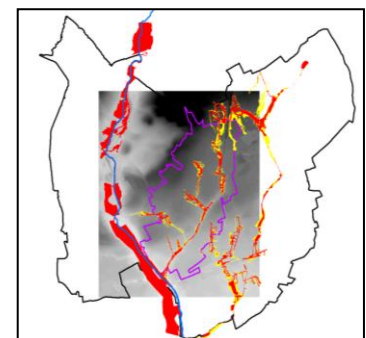


Figure 5: Areas at highest risk of flooding generally follow natural drainage pathways

Potential urban pluvial flood risk mitigation options:

Options under consideration for this area, some of which are being explored in the RainGain project, include the following:

- Creation of storage basins in the upper part of the catchment to alleviate flooding downstream
- Increase storage potential at Valentine's Park (increasing weir levels and restoring flood plain of the open channel section of the Cran Brook)
- Raising community awareness and implementing local property resistance and resilience measures
- Improve event management with the support of improved urban pluvial flood forecasting