

# 2 Catchment overview

This section highlights the principal physical, biological and cultural aspects of the catchment. It also highlights features, initiatives and policies that may provide an opportunity or constraint to future flood risk management actions.

## 2.1 Definition and extent of the River Irwell Catchment

The Irwell Catchment extends from the moors above Bacup to the Manchester Ship Canal in the centre of Manchester. The Manchester Ship Canal receives flows from the River Irwell and its many tributaries. The extent and the principal watercourses within the catchment are shown in Figure 2.1

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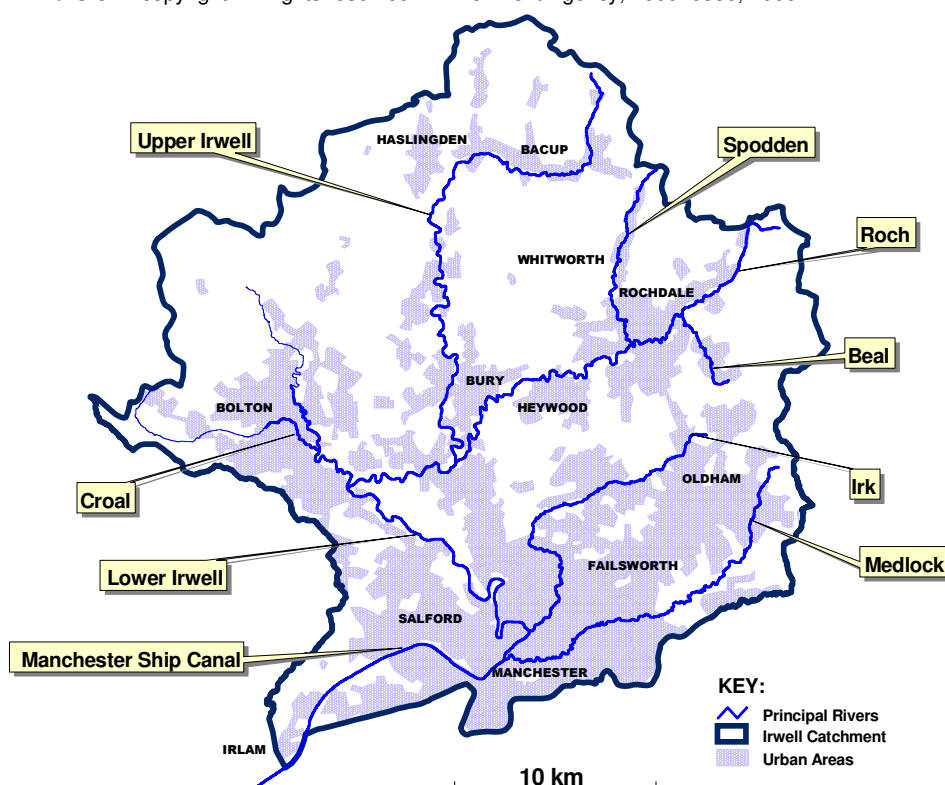


Figure 2.1 – Overview of the Irwell Catchment

## 2.2 Physical Characteristics

### 2.2.1 Topography

The topography of the catchment varies considerably, with the upper reaches dominated by the Pennine moors, with an altitude of between 350 – 450 metres above ordinance datum (AOD). The watercourses are characterised by steep narrow valleys, which rapidly convey the run-off into the principal rivers.

The catchment's rivers respond quickly to rainfall. Moving down the catchment to the large settlements of Bolton, Bury, and Rochdale the topography levels out, where the majority of the land lies between 250m and 100m AOD.

Towards the bottom of the catchment the land is relatively flat and lies between 20m and 150m AOD. Figure 2.2 gives a visual overview of the topographical nature of the catchment.

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Figure 2.2 – General topography of the Irwell Catchment

### 2.2.2 Geology and Hydrogeology

The geology of the catchment contributes to high rates of run-off. In general, the underlying solid geology comprises Lower Coal Measures overlying Millstone Grit, both from the Carboniferous era. These are both classified as minor aquifers, meaning they will hold water, but only in relatively small amounts. The Millstone Grit is then underlain by limestone rocks from the Lower Carboniferous era.

The superficial deposits comprise thick peat in the upper reaches, and glacial boulder clay and glacial sand and gravel in the lower parts. The sand and gravel are also classified as a minor aquifer, whilst the boulder clay is a non-aquifer.

### 2.2.3 Geomorphology

The higher, steeper slopes of the upper part of the catchment provide a large source of erodible material and debris which is transported downstream. Within the lower, flatter parts of the catchment and at local points where the channel is constricted, this material is deposited and can contribute to a reduction in channel capacity.

The effect of geomorphology on flood risk is addressed in section 3 and more detailed information on this movement of material can be found in Technical Annex D.

## 2.2.4 Climate

The climate in the catchment is characterised by that of North West England and North Wales. It is wetter than the UK on average, with rainfall of 1,456mm/annum compared to 1,231mm/annum. Differences in rainfall patterns also exist within the catchment due to the hills to the north and east.

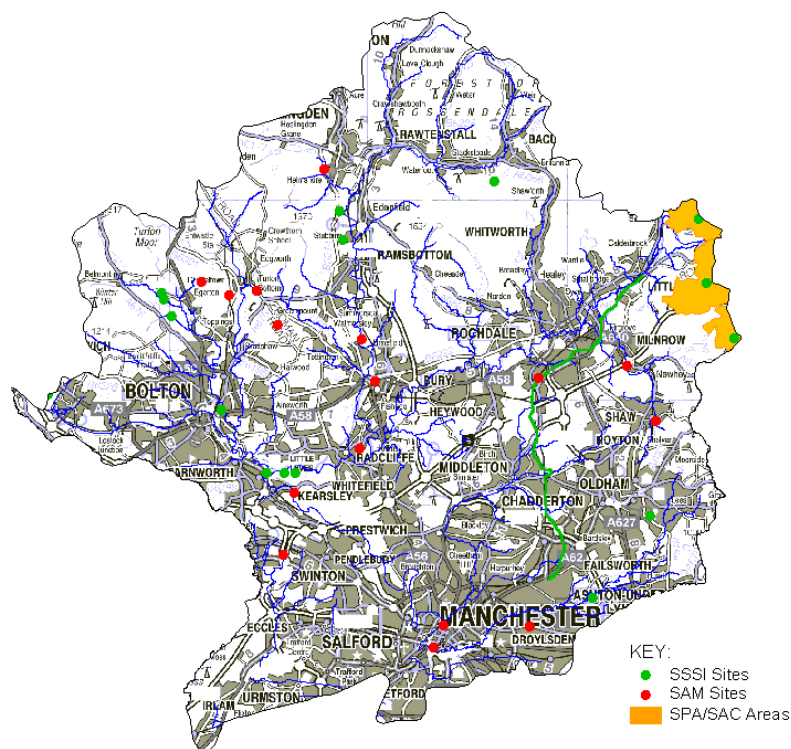
## 2.3 Natural and Cultural Characteristics

### 2.3.1 Ecology and Nature Conservation

The catchment is predominantly urban and, as a result, biodiversity is poor. It is one of the least wooded areas in the north west. However, as Figure 2.3 shows, it does have nature conservation sites of national and international importance. These include Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

There are a large number of sites of local importance, listed in the local authority Biodiversity Action Plans (BAPs) as ‘Sites of Special Biological Importance’ (SBIs), ‘Biological Heritage Sites’ (BHS) or Local Nature Reserves.

Nationally protected species found in the catchment, include great crested newts, water voles, floating water plantain and bats, which use rivers and streams as feeding areas.



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Figure 2.3 – Location of designated sites

### **2.3.2 Water Quality, Fisheries and Water Resources**

An assessment of the Irwell Catchment water quality was carried out during 2000-2002. This showed that the majority of the 150km of classified river was of good quality (Class B) or very good quality (Class A). In more urbanised parts of the catchment, namely the middle Irwell (near Bury), the Croal (near Bolton), the lower Irwell (near Salford) and the Irk (near Oldham), the water quality was fairly good (Class C).

In general, there has been significant improvement in water quality along much of the River Irwell catchment over the past 30 years, with associated improvements in the river ecology.

There are a number of initiatives to improve the water quality in the catchment, including an oxygenation scheme in the Manchester Ship Canal, a watercourse clear up by United Utilities (as part of the Asset Management Plan programme) and an Environment Agency scheme to improve the quality of mine water discharges.

The water quality has a major influence on the fisheries found in the catchment. The watercourses of the Roch, Irk, and Medlock can be split into two main habitat types. The upper reaches are fast flowing streams providing habitats suitable for trout and associated species. Downstream they become slower flowing and provide habitats for coarse fish species.

There are a number of surface water abstraction licences from both rivers and canals that are only for industrial purposes.

Drinking water in the catchment is supplied by a number of large reservoirs with a capacity of more than 1,000 megalitres (1 megalitre = 1 million litres). These include: Ashworth Moor, Clowbridge, Cowm, Delph, Turton and Entwistle, and Watergrove Reservoirs and Hollingworth Lake

### **2.3.3 Landscape, Recreation and Tourism**

The Irwell Catchment comprises the characteristics of four countryside 'regions' of the Northwest of England as defined by the Countryside Agency. These are the Southern Pennines, the Manchester Pennine Fringe, Manchester Conurbation and the Lancashire Valleys.

The development of industry and settlement has created a landscape with an intensely urban character. The main towns in the catchment are the Manchester conurbation, Oldham, Rochdale, Ramsbottom, Rawtenstall, Bolton, Bury, Bacup and Littleborough which have developed rapidly since the Industrial Revolution. The expansion of these towns has also been aided by the dense transport network, which line the valley bottoms.

The predominant land use of rural areas is agriculture with stock rearing and rough grazing on improved grassland between urban areas. In the incised steep valley sides in the upper urban parts of the catchment there are areas of planted woodland.

The Irwell and its tributaries provide green links, which are important for recreation, including fishing, sailing and canoeing. Other water based activities such as wind surfing, water skiing, leisure sailing, dinghy racing, and sub aqua are carried out on canals and reservoirs in the catchment. Furthermore, there are many areas for cycling, horse riding and bird watching, including a country park and a forest park.

In the urban areas, historic parks and gardens represent an important recreation resource. Examples of this are Alexandra Park (Oldham), Heaton Park (Manchester), Philips Park (Bradford, Manchester), Queens Park (Bolton), and Whittaker Park (Rawtenstall). Furthermore, as rivers are in close proximity to inner urban neighbourhoods and centres, they themselves can be used for recreation purposes.

### **2.3.4 Cultural Heritage**

There are a total of 15 Scheduled Ancient Monuments (SAMs) within the River Irwell Catchment. These are shown in Figure 2.3.

18th and 19th century stone and brick-built industrial buildings, including mills, lodges and reservoirs originating from the wool and cotton industry along the valley bottoms, provide important heritage features that were constructed during the Industrial Revolution. Since the 1920's, the textile industry has been in steady decline with many mills becoming derelict or converted into other uses.

In much of the catchment, there is a wealth of mill buildings, reservoirs and mill lodges which represent industrial heritage, especially in the towns of Bacup, Haslingden, Rawtenstall, Littleborough, Rochdale and Oldham.

In the lower part of the catchment, the Department for Culture, Media and Sport has recently nominated parts of Manchester and Salford (Ancoats, Castlefield, and Worsley) as candidates for World Heritage Status. This is because of the many important historic buildings and features associated with the navigation of canals during the 18th and 19th centuries.

## 2.4 Land Use and Development

### 2.4.1 Land Use Characteristics

The main land uses in the catchment are shown in Figure 2.4. The key feature of the catchment is the high proportion of urban land (36%) relative to other catchments.

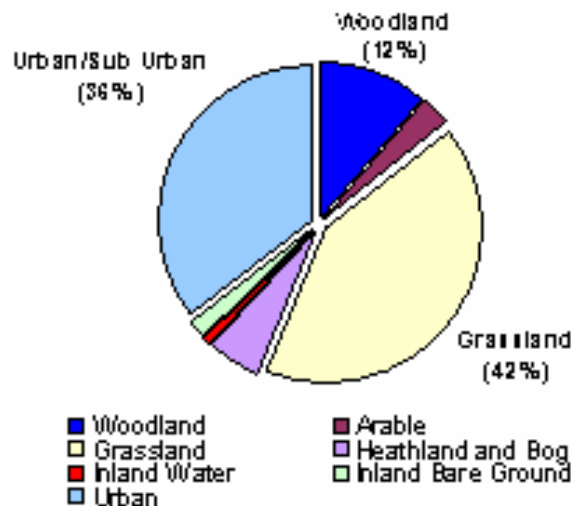


Figure 2.4 – Land use in the Irwell Catchment

### 2.4.2 Development

The Greater Manchester region including the Irwell Catchment is undergoing a period of economic regeneration. Significant amounts of development and redevelopment are planned that include major business parks and housing schemes. A lot of the focus for such projects will be the older industrial areas that have suffered decline.

For example, approximately 12,000 new homes are planned to be built in Salford and Manchester as part of the Pathfinder Partnership, a £125 million project involving the local authorities and central government. The aim of the scheme is to improve the standard of living within these areas. A large number of these new homes will be within existing flood risk zones. Other Pathfinder initiatives within the catchment are at Oldham, Rochdale and in East Lancashire.

Regional Development Agencies (RDAs) and Urban Regeneration Companies (URCs) are also involved in the regeneration of older urban areas. The RDA active in the River Irwell catchment is the Northwest Development Agency (NWDA), where its main target areas for commercial and industrial regeneration are East Manchester, Kingsway, Rochdale, Ashton Moss and Tameside. The housing regeneration areas include Ancoats, Cardroom (renamed New Islington), Clayton, Miles Platting, Beswick, Openshaw and

Higher Openshaw. In the East Manchester regional regeneration area, New East Manchester URC is also in partnership with NWDA. There is also a Central Salford URC.

The authorities involved in major housing and commercial redevelopment include Bury, Rochdale and Salford.

### 2.4.3 Socio-Economics

Many of the towns and cities in the catchment experienced rapid expansion in the 19th century during the Industrial Revolution. Much of this industry has declined and this has contributed to social deprivation in many parts of the catchment making those communities particularly vulnerable to the effects of flooding. Some of these areas are being targeted for regeneration as discussed in section 2.4.2.

Table 2.1 provides a summary of the parts of the catchment thought to be particularly vulnerable.

Location
Bolton – Central
Bury – Redvales
Manchester – Central
Middleton – Central
Rochdale – Central
Salford – Blackfriars
Salford – Broughton

**Table 2.1 – Areas within the top 10% of deprived areas in the England and Wales<sup>1</sup>**

## 2.5 Opportunities and Constraints

In developing plans for flood risk management responses, there are many factors that can influence whether any particular option is likely to be viable or not. These factors may provide opportunities or constraints which should be considered at all stages of any flood risk management planning process.

### 2.5.1 The built and natural environment

#### 2.5.1.1 Urban development and regeneration

The catchment is characterised by development adjacent to the watercourse. This can limit the options for flood defence and usually inflates the cost of work.

Regeneration brings the opportunity to reduce the vulnerability of assets that may be at risk from flooding, to reduce the impact that the development may have on rainfall run-off and to enhance the accessibility and biodiversity of the river corridor.

#### 2.5.1.2 Canals

Canals are another target of regeneration in the catchment and British Waterways have a number of plans to reopen and renovate disused canals. The reopening of the Manchester, Bury and Bolton Canal is one of their key targets over the forthcoming years. It is possible that some of these canals could play a part in flood management and be used to provide storage for flood flows or convey flood waters away from areas with high flood risk.

Organisations responsible for managing flood risk may wish to contribute to the regeneration of these canals if a reduction in flood risk could be achieved.

#### 2.5.1.3 Environmental Schemes

There are a number of environmental based initiatives that may provide opportunities for local flood risk reduction through the development of partnership schemes.

<sup>1</sup> Indices of Deprivation, National Statistics (2000)

*Water-based schemes* – The Mersey Basin Campaign leads improvement projects for several watercourses, which aim to deliver multiple benefits by bringing together several different organisations. The schemes typically involve improvements to the habitat, visual characteristics, amenity value and water quality. Agencies responsible for flood risk can work in partnership to create schemes that combine flood management measures with these wider objectives. Schemes operating in the Irwell Catchment are:

- Action Irwell
- Action Irk & Roch
- Action Manchester Waterways
- Action Medlock & Tame
- Action Rossendale Rivers
- Action Worsley Brooks.

*Woodland schemes and environmental schemes* – There are a number of initiatives for new woodland creation in the catchment. These include Red Rose Forest's Core Forest Area, the Forestry Commission's 'Newlands' Scheme, Lancashire County Council's Forestry Strategy, South Pennines Uplands Regeneration (SPUR), East Lancashire Woodland (ELWOOD), REMADE (Lancashire) and Pennine Edge Forest (Rochdale, Oldham and Tameside).

Many of these organisations have wider remits than targeted woodland creation. They focus on environmental and land management in a wider sense. With this in mind, there is the potential that flood risk reduction measures could improve the ecology and provide the local community with new amenities. This will attract funding and support across a number of agencies in many areas of the catchment.

An example of such a project is the Croal-Irwell Regional Park, which is a regeneration project to provide a green corridor between the centre of Manchester and the West Pennine Moors. This is being led by Red Rose Forest with input from local councils and funding from the North West Development Agency and elsewhere.

*Agricultural schemes* – Environmental Stewardship (ES) was launched in England early in 2005, replacing the existing agri-environment schemes (i.e. the Countryside Stewardship Schemes). One of the aims is to promote land management that contributes to a reduction in rainfall run-off. The Environment Agency and other organisations should promote the uptake of such schemes as part of a long-term strategy for flood risk reduction.

#### **2.5.1.4 Environmentally and culturally important sites**

Environmentally and culturally important sites provide both opportunities and constraints in developing flood management options. As each site is unique, the opportunity or constraint that it offers differs widely and should be considered in consultation with the relevant bodies; i.e. Natural England, English Heritage and local authorities.

## **2.5.2 Policy (National/International)**

### **2.5.2.1 The Water Framework Directive**

The Water Framework Directive (WFD) aims to improve the quality of our watercourses such that they achieve 'good ecological status' (or 'good ecological potential' where the water body has been heavily modified). This is achieved through the development of River Basin Management Plans (RBMPs), which the Catchment Flood Management Plan (CFMP) will contribute to. The WFD provides an opportunity to exploit the important common ground between effective flood management and river basin management in a way that can provide significant environmental, social and economic benefits.

The choice of flood management responses can impact on water quality and the ability of a watercourse to meet ecological objectives under the WFD, both in terms of the impact of measures on morphology, flow, riverine habitats etc and in terms of the risk of pollution incidents resulting from flooding.

### **2.5.2.2 Common Agricultural Policy**

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The Common Agricultural Policy (CAP) is being reformed and aims to make farming more economically and environmentally sustainable. More opportunities will exist for land management projects to be implemented that could reduce flood risk by increasing upland storage and flood event attenuation. These projects will also include the woodland and agri-environmental schemes.

### **2.5.2.3 Planning guidance**

National and Regional planning guidance are used by local authorities to decide whether it is appropriate to develop an area or not and what type of development it should be. Flood risk has always played a role in the decision making process but the relative importance of it has been varied across the catchment.

Recent planning guidance, in the form of Planning Policy Statement 25 (PPS25), requires the relevant local authority to consider flooding more consistently and sets out the criteria for allocating development land depending on its risk of flooding. This CFMP represents an opportunity for planners to better understand the catchment scale flood risks and identify areas that may be at risk in the future.

## **2.5.3 Economic**

The Environment Agency pays for flood management through income generated by flood defence levies and with funds from central government, for which they have to compete against all other requests for funding, i.e. hospitals, prisons, etc. Justification for expenditure needs to be made on national economic, social and environmental grounds. Likewise, local authorities fund improvement through local taxation and contributions from central government and utility companies through direct charging to customers. The money available for improvements is limited and needs to be directed at the areas with the greatest risk. This funding mechanism constrains the flood management responses that can be taken.