10 Water

10.1 Flooding:

10.1.1 Torbay has a number of watercourses covering 42km in length[1] of which the majority drain east towards the sea, south into the River Dart and one, south west into the Teign (see figure 10.1). Of these, all except one are classified as Ordinary Watercourses and, due to their size, have only small floodplains. There is only one main river, controlled by the Environment Agency in Torbay's boundary, a tributary of the Dart which runs west from Galmpton[2]. Currently this is Torbay's only river but in 2006 a further 7 water courses will be classed as rivers, namely the Higher Brixham, Clennon Valley, Churston, Yalberton, Victoria Stream, Occombe Valley and Aller Brook water courses (see figure 10.1)[3].

10.1.2 The main risks of flooding come from coastal and fluvial flooding as well as a proportion of incidents related to surface water runoff. The Environment Agency identifies a small number of potentially 'at risk' areas from fluvial and coastal flooding (see figure 10.1). The Environment Agency classifications include:

Flood Zone 2: Extent of a flood with an annual probability of flooding of 0.1% (1 in 1000) or greater from rivers and the sea.

Flood Zone 3: Extent of a flood with an annual probability of flooding of 1% (1 in 100) or greater from rivers, and 0.5% (1 in 200) or greater from the sea, ignoring the presence of defences.

10.1.3 In terms of watercourses 20.2km of the ordinary watercourses have been classified as critical by Torbay Council and the Environment Agency. This is as a result of their potential to put a large number of people and property at risk[4]. Since May 1999 Torbay has suffered 8 incidences of major flooding which has caused 500 incidences of flooding to properties (although some properties included in this figure are counted more than once due to recurrent flooding). These areas are likely to be placed at increasing risk over future years as sea level continues to rise. Key areas are outlined below.

Torquay:

- An area to the west of Torre Abbey and east of Torquay Station which includes the bowling green and recreational area and the intersection of Torbay and Rathmore Road. This area is currently protected by a sea wall (flood zone 2 and 3) but frequently experiences localised flooding particularly around Kings Drive which causes disruption to traffic flows.

Paignton:

- Paignton Esplanade stretching back to the low-lying area of Torbay Road and land either side. This area includes a concentration of holiday accommodation in and around Kernou Road, Adelphi Road and the Esplanade as well as a

[1] Torbay Council (2004) ' Policy Statement on Flood and Coastal Defence' [http://www.torbay.gov.uk/flooding_policy (accessed 10/02/2004)]
[2] Almost all other watercourses, including streams, ditches (whether dry or not), ponds, culverts, drains, pipes and any other passage through which water may flow, are defined as **"ordinary watercourses."** In the case of ordinary watercourses, the District Council is the Operating Authority.
[3] Torbay Council (May 2005) Personal Communication, Highways and Engineering
[4] Torbay Council (2004) ' Policy Statement on Flood and Coastal Defence' [http://www.torbay.gov.uk/flooding_policy (accessed 10/02/2004)]

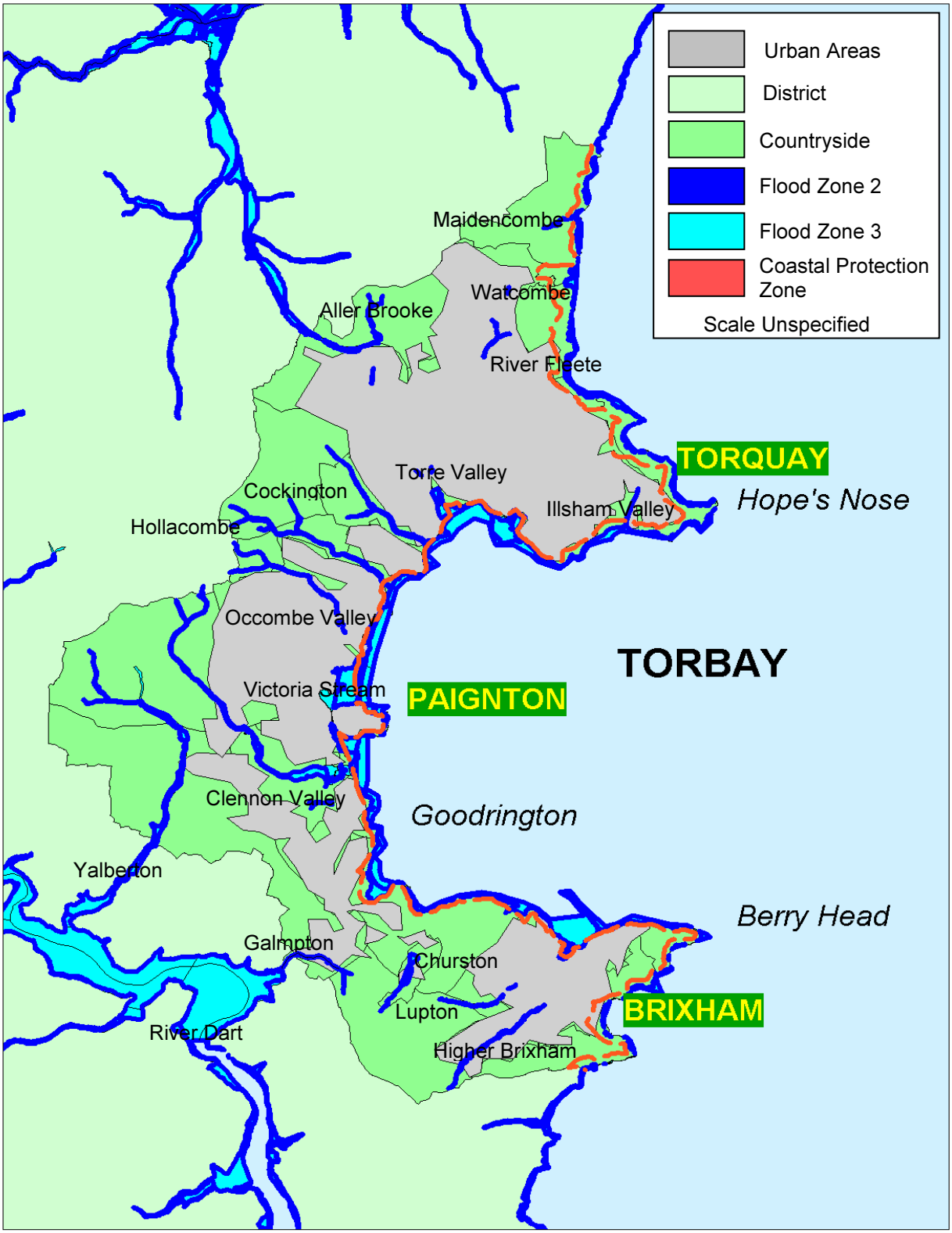

Figure 10.1 Major Waterways and Flood Defences in Torbay
Source: OS Maps

concentration of tourist related shops in Torbay Road. The majority of this area is covered by flood zone 3 with flood zone 2 stretching further into the south of Paignton. As well as a number of key road links, flood zone 2 also covers Paignton Railway Station, the bus station and a substantial area of car parking. Station Lane in particular is prone to frequent flooding as discussed below.

- Victoria Stream catchment is a problematic area as it is drained through a surface water system which discharges to coastal waters. Where high tides coincide with a storm the system is unable to discharge to coastal water hence causing flooding in areas such as Station Lane, Dartmouth Road, Adelphi Road, Queens Road and Sands Road. A bid to DEFRA aims to address this through for example a new pumping station in Paignton, upsizing of culverts and sewers, installation of a tideflex valve and removal of surface water connection to Station Lane Pumping Station.

- Flood risk maps indicate a fluvial flood zone extending from Clennon Hill to Goodrington Sands (flood zones 2 and 3). There is also a risk of coastal flooding in and around Goodrington Park and car park. The later is in part protected by Goodrington North Seawall, however there is a recognised need for remedial works to this wall which is planned for 2006/7 subject to DEFRA funding.

- A small area to the north of Broadsands including parkland and car parking areas.

- Land adjacent to the watercourse which flows through Collaton St Mary and Yalberton Industrial Estate could effect a small number of homes and businesses adjacent to the flood zone 2 and 3.

- Galmpton Watercourse, although only a small main river has in the past been highly susceptible to flooding. It has recently undergone remedial works by the Environment Agency to provide new and replacement culverts which has proved to be successful.

Brixham:

- Areas in Brixham harbour around Furze Lane, The Strand and Pump Street are included in flood zone 2 and 3. This area currently experiences little flooding except in times of exceptionally high tides.

- Within Brixham the Higher Brixham Watercourse has a history of flooding and although has only a small floodplain it has potential to flood many properties due to the high-density nature of this urban area. Funding has been secured from DEFRA for work to this area to improve culverts, upgrade pipes and provide additional storage.

Surface Water Runoff:

10.1.4 In addition to these areas linked to coastal and fluvial flooding, it is important to recognise the role of surface water runoff. This is especially important in Torbay

which is urbanised at a high and increasing density. A report to the Development Control Committee on the Review of Flooding in Torbay highlighted the need to consider the increasing risk of flooding from expanding housing developments and increasing number of hard surfaces created. This source of flooding is already problematic in Torbay which has a history of flash floods. This has, in the past been related to an inability of the sewer system to keep up with development rates in Torbay, but has been exacerbated recently by increasing areas of hard surfaces including roads/ buildings and increased popularity of patios and decking. The public sewers system and existing culverts are currently at capacity so any further development should employ a SuDS system which lessens, or at worst equals the runoff from that area of land.

Flood Alleviation:

Torbay has a number of means by which to deal with flooding through both hard and soft engineering.

10.1.6 There are numerous flood defences located along the Torbay watercourses including a number of flood storage areas at the following locations:

- Stoke Road storage area – Yalberton Watercourse
- Great Parks storage area – Clennon Valley Watercourse
- Hollicombe Woods storage area – Hollicombe Watercorse
- Coombe Park storage area – Occombe Valley Watercourse
- Sainsbury's storage Lagoon – Aller Brook
- Laywell Reservoir –Higher Brixham watercourse
- Rowan Way – Higher Brixham Watercourse

10.1.7 In addition to these flood storage areas outlined above there are a number of public open spaces which have potential for flood storage through either natural inundation or man made SuDs schemes. These include:

- In Torquay - Illsham Valley, Edginswell, Cockington, Hollicombe, Sherwell Park, Cockington, Cuthbert Mayne playing field,
- In Paignton - Victoria Park, Broadsands, Clennin Valley
- In Brixham – Farmland at Churston

10.1.8 A number of remedial works have been identified as necessary for highways to alleviate future flood risk. These are outlined below in figure 10.2:

Highways Flooding Problems – Outstanding Schemes			
Location	Problem	Solution	Comments
Occombe Valley Road	Culverted Watercourse in danger of collapse	Reconstruct section of watercourse	Planned for 2004/05
Brixham road at Windy Corner	Flooding on highway	Install new soakaway	Planned for 2004/05
Cockington Lane 0/s Rose Cottage	External flooding to property	Install new highway drain	Planned for 2004/05

Dartmouth Road O/s Gliddon Ford	Flooding on highway	Install new soakaway	Planned for 2004/05
Newton Road/Old Woods Hill	Flooding on highway	Install new highway drain	
Wheatridge Lane	External flooding to property	Install new highway drain	
Combe Lane	External flooding to property	Install screen and clean culvert	
Marldon Road	Flooding on highway	Install new highway drain	
Blagdon Road	Flooding on highway	Install new soakaway and drain	
Upton Mannor Road, Brixton	Flooding on highway	Install new highway drain	
Centry Road	Flooding on highway	Install new highway drain	
Tor Park Road	Flooding on highway	Clean culvert and assess capacity	
Long Road/Stoke Road	Flooding on highway	Install new highway drain	
Browns Bridge Road/Barton Hill Way	Flooding on highway	Install new highway drain	
Old Mill Road/Cockington Lane	Flooding on highway	Modify existing screen arrangement	

Figure 10.2: Outstanding schemes required to address highway flooding problems[5]

10.1.9 Government policy is moving towards 'soft engineering' and avoidance of development in flood risk areas and the allowance of managed retreat. As Torbay's economy is dependent upon the beaches and the directly adjacent tourist infrastructure, managed retreat is therefore unlikely to be an option here. Instead future emphasis is aimed at prevention or minimisation of development in high-risk areas.

10.1.10 It was highlighted by stakeholders of the development control committee on the Review of flooding in Torbay that a significant number of businesses in Torbay would benefit from flood alleviation works in Station Lane and Victoria Park (Paignton), Bolton Street and Fore Street (Brixham) and Torre Abbey (Torquay). Tweenaway Cross was identified as in need of monitoring to assess future need for flood alleviation works. Tweenaway Cross and Torre Abbey both have significant impacts on the transport system due to their importance in the road network of Torbay.

Coastal Defence:

10 Due to its coastal location, Torbay is at risk of future coastal erosion linked to increased storminess, associated with climate change. Lyme Bay and South Devon, The Shoreline Management Plan[7] (1998) indicated that the majority of Torbay's coastline is stable in terms of erosion laceration rates except for

[5] Torbay Council 'Review of Flooding Within Torbay' Report OSB/17/04 to the Executive 11.01.05. Adopted by the Overview and Scrutiny Board December 2004.
[7] Posford Duvivier (1998) 'Lyme Bay and South Devon Shoreline Management Plan'

Oddicombe Beach / Petit Tor Point Area which is retreating. Trends are unknown around Hopes Nose, Goodrington Sands and Berry Head.

10.1.5 The shoreline management plan states that coastal management should take the course of selectively holding the line. The 'do nothing' and retreat approach is not viable as this would lead to eventual failure of coastal defences with a significant economic impact including loss of the main road and parts of the 3 towns.

Torbay has a number of coastal defences including sea walls, revetments to harbour walls, groynes, natural beaches and cliffs. Coastal flood defences are located at the following beaches:

- Meadfoot
- Torre Abbey
- Preston Esplanade
- Paignton Esplanade
- Goodrington
- Broadsands

Despite these defences a number of areas are susceptible to coastal flooding including Torre Abbey, Livermead, Paignton, Goodrington Sands, Broadsands and Clennon Valley.

10.2 Water Quality:

Marine Waters

10.2.1 The quality of Torbay's coastal waters is of paramount importance in relation to maintaining the conservation value of the marine environment as well as maintaining the water-based activities and beaches which makes Torbay such an attractive tourist resort.

10.2.3 The quality of marine water in Torbay has been consistently good over previous years with only 4 out of a total of 217 Environment Agency samples tested for the bathing waters Directive over the period 1990 to 2004 being of poor quality. The most recent of these being in 1997 since when all samples have proved to be of good or excellent quality[8].

Inland Waters

10.2.4 Inland water quality is measured by the Environment Agency in only one location in Torbay, on the Aller Brook, near Kerswell Gardens. Water quality at this point has fluctuated over the years, failing to meet water quality targets between 1997-1999. This is due to its proximity to the Barton Tip landfill site. Compliance with Water quality in the minor tributaries in the remainder of Torbay is not measured[9].

[8] Environment Agency website www.environment-agency.gov.uk 'What's in your Backyard' (Accessed 10.02.05)
[9] Ibid.

Beaches

10.2.5 In 2004 the beaches in Torbay fell within the following EA Classifications:

- 7 beaches of excellent quality (Maidencombe, Watcombe, Oddicombe, Babbacombe, Meadfoot, Beacon Cove, and Shoalstone)
- 7 of good quality (Torre Abbey, Hollicombe, Preston Sands, Paignton Sands, Goodrington, Broadsands and St Mary's Bay)
- 3 Blue Flags beaches are located at Oddicombe, Meadfoot and Breakwater (see figure 10.3).

10.2.6 In 2003 all 15 beaches sampled passed the Imperative bathing water standard, while 8 did not pass the Guideline Standard (53%). In 2004 14 beaches passed the Imperative standard and one did not (7%), 8 did not pass the Guideline Standard (53%)[10].

[10] Torbay Council, personal communication (email, 03.03.05), Steve Cox, Principal Environmental Health Officer

Figure 10.3: Blue Flag Beaches in Torbay

Source: English Riviera Tourist Board 2004[11]

[11] English Riviera Tourist Board (2004), 'The English Riviera 05: Making a Lasting Impression,' English Riviera Tourist Board

10.3 Sewage

10.3.1 Until 2002 untreated sewage sludge was released through sewage outfalls into the sea. Favourable sea conditions meant that the sewage was taken out to sea rather than deposited on the beaches. The processing of Torbay's sewage however, has been vastly improved with the building of a new sewage treatment works at Churston in the disused Brokenbury Quarry. This is the largest state of the art works in the South West and has cost £44 million and taken two years to build, part of the £95 million 'Clean Sweep' project by South West Water.

10.3.2 Before the project, 10 million gallons of crude sewage flowed into the sea from Hope's Nose to the north of the bay, and Sharkham Point to the South. Initially sewage from Brixham and Paignton were treated, in 2003/04 flows from Torquay were treated with the completion of a new pumping station at Ilsham Valley. The new works includes tertiary and UV treatments before releasing the cleaned effluent into Sharkham Point. This is a significant improvement given the high ecological value of Torbay's wildlife[12].

[12] South West Water website www.southwestwater.co.uk 'Torbay gets the Clean Sweep treatment (accessed 11.03.05)