

## **Part Two**

### **AREAS**

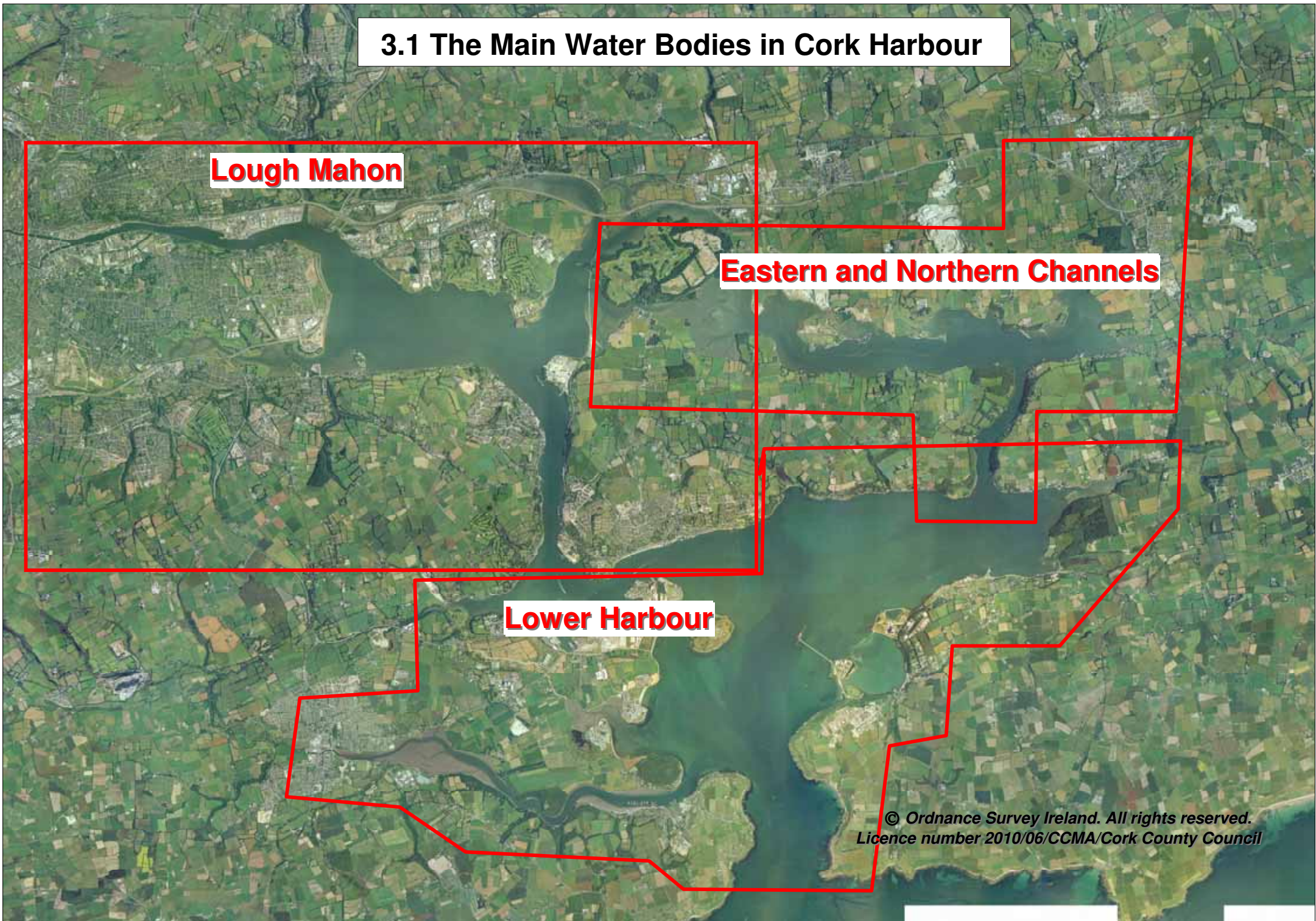
### 3.1 The Main Water Bodies in Cork Harbour

**Lough Mahon**

**Eastern and Northern Channels**

**Lower Harbour**

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## Chapter 3: Assessment of Component Areas

This Part of the Study surveys and assesses the Harbour and the land adjoining it, and is organised to reflect their physical layout. Specifically:

- there are 3 chapters, organised around the three main bodies of water in the Harbour: Lough Mahon, the Lower Harbour, and the Great Island channel. The way the Harbour is divided up between them is shown in Figure 3.1
- within these chapters, the survey assesses
  - these major bodies of water
  - the secondary connecting channels linking them to each other, and the estuaries feeding them. These main water bodies and channels form the basis for sections (A, B, C etc)
  - the land areas facing these primary and secondary water bodies. These land areas form the basis for subsections ((i), (ii), (iii) etc)

### Assessment and Mapping of Water Bodies

Ordnance Survey and orthophoto based maps accompany and illustrate assessments of major and secondary water bodies, and show shipping facilities such as docks and piers, as mapped in the CMRC survey of the Harbour. They also show any include ecological designations which apply: (Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Natural Heritage Areas (NHAs), and proposed NHAs.

As an indication of the visual significance of some parts of the Harbour, scenic routes and scenic landscape used in successive County Developments are also shown. While some of these designations were originally drawn up as far back as the 1970s, and may not always reflect subsequent changes, they define the areas which have been considered in need of protection for visual reasons in a fairly specific way. Under the current County Development Plan (para 7.2.28ff) the scenic landscape designations are currently being reviewed, as part of a wider process of finalising a Landscape Strategy for the County.

A landscape character assessment was carried out for County Cork in 2002, and incorporated in the 2005 LAPs. It described the balance between urban and rural in Cork Harbour in the following terms:

*“Notwithstanding the rural character around much of the greater harbour area, the tell-tale signs of urban intensity are evident everywhere through the prevalence of infrastructure such as roads, bridges and electricity power lines and the frequency of urban clusters. Overall, the city and harbour*

*comprise a balance of intensely urban form, rural character and seascape."*

A finer grain landscape study was carried out for the City Council in 2008. It saw the position of the city on a riverscape corridor, within a bowl formed by the ridgelines and steep slopes to the north and south as the prime landscape character element. Both City and County landscape studies include more specific comments on and designations of particular parts of the Harbour, and these are referred to in descriptions of water bodies and land areas in succeeding chapters.

Consultants have also carried out Habitat surveys on behalf of the County Council for the three electoral areas adjoining the Harbour, and areas of local biodiversity value are shown for each of the water bodies discussed and the land adjoining them.

### **Assessment and Mapping of Land Areas**

Land facing the Harbour has been subdivided into smaller areas, and so can be shown at a larger scale. This makes it possible to show additional CMRC survey data, including the nature of the shoreline, and the presence and condition of slipways and steps. These are shown on a 2005 Orthophoto satellite photograph base, on which buildings and roads have been highlighted, to give a clearer idea of how they relate to the Harbour and each other. Other additional information which can be included at this smaller scale includes areas of rock adjoining the shoreline, protected structures, and items listed in the Record of Sites and Monuments.

The subdivisions of land facing the Harbour reflects changes in the character of areas, not DED or ward boundaries used for Census purposes, and this complicates quantitative assessment of the land areas used in this report. Estimates of population density are based on households identified in the Geodirectory database, multiplied by the average size of household. Estimates of employment density are based on a number of sources, including the 2008 CASP Update, the 2006 City Employment Survey, and POWCAR<sup>1</sup> data from the 2006 Census. The small areas used for purposes of analysis in this Study do not correspond well with that for which data is available from these sources, so estimates of employment are subject to a substantial margin of error, and are used only as a rough indication of orders of magnitude.

Total employment for the inner study area (ie the area within 0.5 km of the HWM) is estimated at c.35,000, or one quarter of the total for the Cork Metropolitan Area in 2006.

A longer term view of how local areas which have significant population and/or employment are changing can be gained from census data for the Census DED or ward most nearly approximating to the area under consideration, and from estimates of employment incorporated in successive strategic plans for the Cork Area (ie the LUTS and CASP plans).

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<sup>1</sup> In "Place of Work Census of Anonymised Records" (POWCAR), census respondents are rounded to the centre of a 250m x 250m grid square. The smaller the area for which statistics are sought, the greater the likelihood that this geographical rounding will lead to jobs being allocated to an adjoining area.

## Flood Risk

Recent publication of the draft Lee CFrams study indicates the land areas at risk from fluvial (river) and tidal flooding. In Cork harbour, the study is more concerned with the latter, but fluvial flooding affects settlements at the heads of rivers, including Cork City, Carrigaline and Midleton. These 3 urban areas are also seen as the primary 'areas of potential significant risk' relevant to the harbour. Other such areas include Glanmire, Glounthaune, Little Island, Carrigtwohill, Rostellan/Aghada, Crosshaven, Passage/Monkstown, and Cobh.

The study developed a model of the harbour, using undersea profile (bathymetric) survey data, and applied possible tide and storm surges to estimate water levels. This computer modelling suggested c.2,500 buildings would be at risk from a tidal event with a 0.5% probability of occurring in any one year.

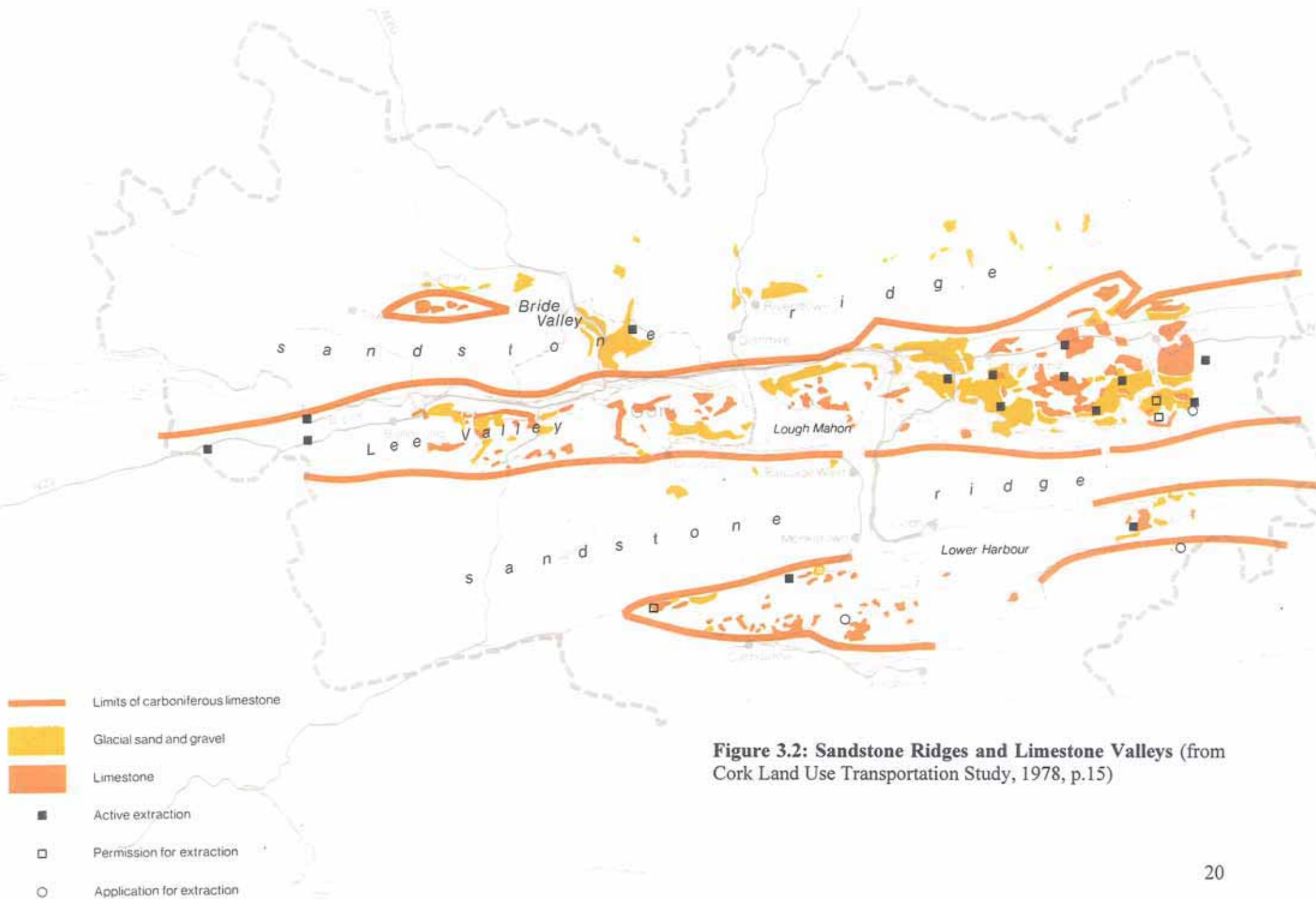
The option of tidal barriers within the harbour was assessed, but if provided at Monkstown on the W. channel and Marloag Point on the E. one, they would cost €340m, and were not considered economically viable at present, though benefits could equal costs by 2050-2075, assuming a sea level rise of c. 315mm by then. A detailed feasibility study will be done if and when sea levels rise.

LeeCFrams recommended as the preferred flood management option for the Harbour

- a tidal flood forecasting system combined with a targeted public awareness and education campaign and individual property protection. A flood forecasting tool is under development for Cork Harbour as part of the Irish Coastal Protection Strategy Study.
- structural defence options at Cork City, Midleton, Carrigaline, and Cobh, with a minor scheme in Little Island.

While evaluation of flood risk management options was based on existing conditions, options were also assessed against a Mid-Range Future Scenario (MRFS), based inter alia on a 0.55m rise in sea level due to climate change by 2100. mid range future scenario was included for the harbour. The harbour was identified as the most significant future flood risk area based on the increased number of properties at risk of flooding in the future scenario.

The Draft LeeCFrams Study includes flood extent maps under current conditions, and also under the MFRS. These refer to the probability of flood events in terms of annual exceedance probability or AEP. This is the likelihood of a particular flood event occurring or being exceeded in any given year. It can be expressed as a percentage or as odds (eg a 1% AEP flood event describes a flood event which has at least a 1% (or 1 in 100) chance of occurring any given year). Where current or possible future flood risk under the MFRS would substantially affect a particular land area, this is referred to in the relevant subsection.



**Figure 3.2: Sandstone Ridges and Limestone Valleys** (from Cork Land Use Transportation Study, 1978, p.15)

## Potential for Intervention

The sub areas examined vary widely, from purely rural areas to fully urbanised ones, with many intermediate categories. The potential for intervention, synergy between activities, and interaction between land and water also varies greatly from area to area. In areas where these are most evident, this has resulted in longer sections which explore the main issues and options more fully.

## Recurrent Themes

One of the advantages of working through the various sub areas systematically is that it helps identify common themes - some of them unexpected ones - found in a number of different Harbour areas. This 'bottom up' approach has led to a better understanding of some generic issues specific to this type of estuarine, incrementally urbanising environment. In order to highlight such issues, toned boxes explaining the common theme in question have been inserted into particular sub-area sections, with cross-referencing back to that box from other areas where the same theme recurs.

One contextual element which is worth stating at the outset is the influence of the basic geology of the Harbour area, which involves alternating bands of harder old red sandstone and softer limestone rock running east-west. The three main water bodies occur in the bands of softer rock, and are connected to each other and the sea by narrower channels which cut through the sandstone areas: the West Passage, the East Ferry channel, and the mouth of the Harbour.

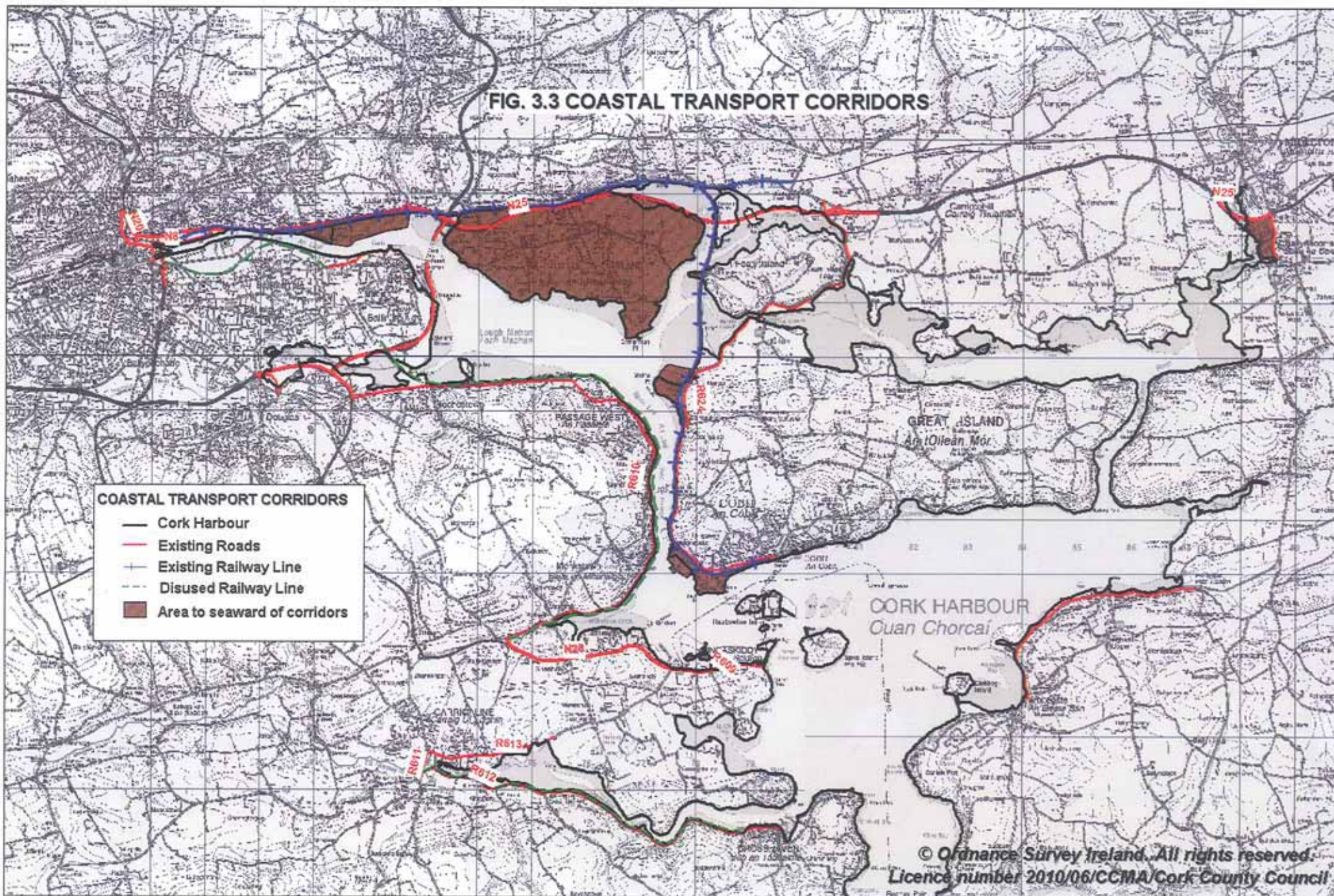
### *Theme 1. Geology and Steep Linear Coastal Settlements*

*There are typically steep slopes at the edge between harder sandstone areas and the Harbour, which give rise to the characteristic sloping linear settlements around the Harbour - Cobh, Passage West, Monkstown, Crosshaven, Glounthaune, Aghada. These settlements typically grew up around points where a minor valley gave easier than normal access to the shoreline from the hill behind. They look in particular directions, and are on land steep enough for many buildings to look out over ones lower down the slope. As a result, the proportion of buildings looking at more or less the same view, and having more or less the same solar aspect, is much higher than in a normal settlement. This in turn affects their character, and the planning issues which arise in them.*

Cork Harbour also has more normal coastal settlements - fewer in number but more populous - developed around the lowest bridging point of rivers flowing into the Harbour, such as Cork City, Carrigaline, and Midleton. These (or at least their historic cores) are in limestone areas, as are the main industrial areas on the Harbour (Little Island and Ringaskiddy). In general such areas are easier to develop, as the softer rock has eroded more, so more of the land is relatively level and descends more gently to the Harbour.

The topography of the Harbour Area has also created a characteristic position for transport corridors:

FIG. 3.3 COASTAL TRANSPORT CORRIDORS



## **Theme 2. Coastal Transport Corridors**

*Land transport corridors are disproportionately concentrated in the coastal zone around Cork Harbour, especially along the original or current shoreline itself, because*

- *a linear area of level undeveloped land is often available or easily created there, and in a protected harbour is less subject to erosion than it would be along open coastline*
- *the attractions of such routes are increased by steep slopes behind them. They often superseded earlier routes further inland, which had steep gradients and would have been expensive and difficult to upgrade*
- *river/harbourside corridors are natural and direct ways of connecting crossing and access points to a major river/harbour with each other, and with the lowest bridges crossing secondary tributaries flowing into it.*

*This pattern results in such transport links being close to sea level, often close enough to put them at risk from sea level rise. The original route 'over the hill' usually survives as a secondary access to coastal settlements, and is a potential fallback access. Improvements are typically concentrated on the new (coastal) route, often with the effect making any land on their seaward side less easily accessed.*

*These consequences are most strongly marked on the E. side of the Harbour (eg the combined road and rail corridor mostly along the original shoreline between St. Patrick's Bridge and Cobh).. On the W. side, shoreline roads are less major and serve smaller settlements (Passage, Crosshaven), and the adjacent rail line was closed in 1932.*

The extent to which this pattern puts transport routes at risk of flooding – or may do so in future – is summarised in Table 3.1:

**Table 3.1 Coastal Transport Corridors on Cork Harbour at risk of flooding**

Corridor		Road numbers	Length at Risk	
From	To		Current (km)	MRFS (km)
Cork	Cobh	N8/N25; R624	3.5	5.2
Cork	Cobh	(rail)	6.9	7.9
Blackrock	Raffeen	N25; R610	3.8	4.2
Carrigaline	Crosshaven	R612	2.5	2.8
Cobh Jct.	Whitegate	N25; R630	1.6	2.7
Total			18.3	22.8

## **Choices in the Coastal Zone**

Coastal zones are liable to experience a wider than usual range of potentially conflicting demands, abnormally concentrated in a limited amount of space. While competition between land uses is normal in planning and in the property market, there is usually greater choice of substitute locations for those who have no particular need to be on the coastline.

Coastal areas therefore tend to raise questions of compatibility between different activities in a more intense form than normal. There are several generic ways of resolving such questions:

- (1) treating one activity, use or function as of overriding importance, and accommodating other demands only in so far as they are compatible with full development of the dominant one
- (2) seeking to meet multiple demands in a limited area through restraint in how far specific uses are allowed to optimise conditions for themselves at the expense of others. In practice, such restraint is likely to apply most strongly to more dominant uses with greater resources and capacity to change their environment
- (3) a variant on (2), in which multiple demands within a restricted range of activities can be met, but subject to a previous choice on *which* restricted range is most appropriate
- (4) either/or situations – there are two or more potentially dominant uses of an area, and their scale and effect on adjoining activities are such that straight choice is needed.

Such choices do not arise in all areas adjoining the Harbour: some have a stable pattern of use, which is not subject to any obvious pressures or reasons to change it. However, there are also types of tension between different activities, which arise often enough to be worth setting out as recurrent themes.

Where an area appears to be faced with a significant choice between the approaches listed above, this has been noted in a toned box within the relevant subsection in the next 3 chapters.

Typically, there is a status quo, or trend, or proposed or planned future state, which falls into one of the 4 categories listed above, and an alternative, which falls into a different category. This helps us explore possibilities, and should not be read as an indication that the 'established' option is superior or inferior to the 'alternative' one.

