Colchester Borough Council

Colne Estuary Boating Study

Phase 2

Final ~~Draft~~ Report

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Background

The Colne Estuary is located near Colchester in Essex. It is primarily rural, apart from its headwaters which run through Colchester, and the town of Brightlingsea. Its waterside villages, such as Rowhedge and Wivenhoe, are characterised by sensitive conservation areas with often poor vehicular access.

The estuary has the twin distinctions of being a wildlife habitat of international importance and, together with the Blackwater and the Crouch, one of Britain's foremost leisure boating locations. Much of the Colne is part of the Essex Estuaries European Marine Site (a Habitats Directive designation), and numerous other designations apply to the Estuary - Special Protection Area (SPA), candidate Special Area of Conservation (cSAC), Ramsar site, Site of Special Scientific Interest (SSSI), and National Nature Reserve (NNR). Furthermore, the Colne is designated as a Countryside Conservation Area and Special Landscape Area and is subject to Essex County Council 'Coastal Protection Belt' policies. These sensitivities frame the potential for future sustainable development.

The Colne has traditionally been a commercial river. The narrow navigation to the port of Colchester and the important oyster fishery mitigated against extensive mooring and berthing facilities, except in Brightlingsea Creek and Mersea Quarters (off the western shore of Mersea Island). Colchester Borough Council, as the Harbour Authority, is now seeking to close the commercial Harbour, which will open opportunities for leisure boating development, both in the rural and urban sections of the river.

The local planning authorities are now faced with a classic planning conundrum: how to maximise the socio-economic benefits that can be gained from leisure activities while protecting a unique environment.

Study Objectives

The primary aim of the study is to provide a framework that will allow Colchester Borough Council and Tendring District Council to be proactive in guiding future leisure boating development. The framework must be adaptable to a variety of development types and assist with the formulation of spatial planning guidance. The Brief for the study included a number of separate tasks to be carried out over two phases. This report represents the outcome of Phase 2 and involved:

- The identification of ecological and landscape constraints profiles i.e. identifying areas of particular sensitivity to leisure boating development.

- The testing of a multi-criterion assessment methodology developed in Phase 1 and the preparation of generic guidelines for boating related development on the Colne Estuary. The methodology was designed to facilitate the comparative analysis of theoretical leisure boating development and provide a rationale for the preparation of planning policy.

- A market analysis to establish the importance of leisure boating to the local economy and to provide an indication of current boating activity.

- The provision of guidance on the content of environmental impact assessments (EIAs) or environmental reports submitted with planning applications for proposed boating development.

- Recommendations to promote the sustainable use of the estuary for boating activity.

Ecological and Landscape Sensitivities

An ecological constraints map has been developed in consultation with various organisations responsible for managing the Estuary. Key sensitivities were agreed as the maintenance of important habitats, which would thereby ensure the integrity of the estuary, and the influence of boating on the bird populations. The map shows the areas of the Colne Estuary that are most sensitive to boating disturbance. Significant environmental impacts arising from the development and operation of leisure boating facilities include the following:

- Direct loss of important habitat, communities and species from land take if infrastructre is necessary

- Indirect loss through secondary effects such as changes to flows and erosion etc.

- Direct disturbance to sensitive communities and species - for birds, direct disturbance will include impacts on high water roosts, breeding and feeding areas

- Indirect effects such as increased bird densities (crowding) on remaining undisturbed sites and potential for subsequent density dependent impacts.

Essex County Council has undertaken a landscape character assessment of the Colne Estuary. The study identifies distinct landscape character areas and the particular landscape types which combine to form these character areas. The County Council has mapped and described the main features of these landscape types and provided an indication of their sensitivity. This information was incorporated into the multi-criterion assessment methodology to assist in determining the significance of the impacts of boating development.

Boating Activity and its Importance to the Local Economy

The boating market analysis concluded that leisure boating is a key element of the local economy. As many as 350 people are directly employed in the leisure boating industry, predominantly in Brightlingsea and West Mersea. This level of employment equates to approximately £5 million in salaries and wages. Significant indirect and multiplier effects have also been identified.

The market analysis indicates that there is a very high demand for berthing spaces in West Mersea and Brightlingsea. National trends indicate a preference for marina type developments which provide continuous access to boats and to the water. Motorboats are increasingly popular. The boating facilities on the Colne predominately consist of floating pontoons and swing moorings. In comparison to other parts of the UK, facilities are generally very basic. It is possible that failure to provide improved facilities could reduce future activity on the Colne and damage the leisure boating economy.

Marina type developments are unlikely to be economically viable on their own. Developers are likely to use the marina facility to create an 'attractive' backdrop to other proposed land uses, stimulate activity in the area and thus increase the returns on their investment.

Multi-Criterion Assessment Methodology

A key element of the study involved the formulation of a multi-criterion assessment methodology for examining the feasibility of boating development. The methodology has been used to examine a number of potential developments (from marinas to swing moorings) in different parts of the estuary from a number of perspectives – technical practicability, economic feasibility and environmental effects.

Developments subject to Multi-Criterion Assessment

Case study area	Selected development	No. berths
Pyefleet Channel	Swinging moorings	100
Brightlingsea	Quayside marina development	450
Hythe	Impounded waterbody behind barrage	20
Rowhedge	Marginal pontoons	15-35
Fingringhoe ballast quay	Locked basin marina	500
Seawick	Harbour marina	700

General Conclusions of Multi-Criterion Assessment

It is considered that the methodology is sufficiently robust to provide a rational means of determining the types of development that are feasible on the basis of technical practicability, economics, and environmental impact. The results can therefore be used to develop strategic planning guidance for leisure boating development. It should be noted that the results represent the first application of the multi-criterion assessment. It is likely that the methodology will need to be refined following consultations on the results of the study, and where it is to be used to assess developments encompassing non-boating activities such as housing.

The methodology can also be used to examine planning applications against the assessment criteria. However, the acceptability of planning applications will depend on compatibility with development plan policies and may be strongly influenced by public opinion. Where applicable, all planning applications for new leisure boating facilities should subject to environmental impact assessment (EIA) procedures and, (where they are likely to have a significant effect on a European Site (SPA, cSAC)) Appropriate Assessment. The acceptability of development on the Colne will often depend on local considerations including design characteristics and public opinion. The assessment methodology is strategic in nature and does not currently include these issues within its scope.

With respect to specific developments, the following recommendations have been made:

- Small to medium size marinas should be encouraged on the developed watersides of Brightlingsea and the Hythe in Colchester. Strict criteria regarding environmental impact (with particular emphasis on ecology and

landscape) and the type and scale of shoreside development should be applied to these marina developments. The Councils should produce updated development briefs for these sites in consultation with the local community.

- Planning applications for marina development or the intensive use of floating pontoons or swing moorings should normally be refused in undeveloped areas of the Mersea Quarters and the Colne, including its Creeks.

- The small scale installation of floating pontoons in tidal waters or of fixed or swing moorings should be restricted to areas where such facilities already exist, or on sites previously developed including:

  - Fringrinhoe Quay
  - Rowhedge ABP Site
  - Wivenhoe.

- The increased use of fore and aft moorings should be encouraged to increase density in existing channel locations, although further encroachment up channels (especially Pyefleet, Strood and Brightlingsea) or onto intertidal areas should be discouraged.

There is a high probability that a number of developments will take place within the Colne Estuary either simultaneously or over an extended period of time. Focussing on discrete developments may give an inaccurate assessment of the true impact on the Estuary. Cumulative impacts from boating activity are therefore a potentially significant issue. Further research would be required to establish historic and current boating activity, forecast future activity and determine the potential impacts on the estuary, particularly with respect to bird numbers.

The study concludes by identifying the importance of the ecological and landscape sensitivities which frame the area and create its unique appeal, while recognising the need to stimulate socio-economic development and preserve the well being of local communities.

1 INTRODUCTION AND OBJECTIVES

1.1 Background

The study is concerned with the sustainable development of leisure boating on the Colne Estuary in Essex. The Colne is subject to a number international, national and local designations that recognise its high ecological, heritage, fisheries and landscape value. Together with the Crouch and Blackwater, this part of the Essex coast is amongst the premier boating areas in south-east England. There are numerous pressures on the Colne from existing and future uses; the closure of the port at Hythe in Colchester and its future redevelopment, and the likelihood of boating related development being proposed at a number of other sites is likely to increase recreational boating activity on the Colne and environs.

The primary aim of the study is therefore to provide a framework that will allow the local planning authorities at Colchester Borough Council and Tendring District Council to be proactive in guiding future leisure boating development. The framework must be adaptable to a variety of development types, assist with the formulation of spatial planning guidance and the assessment of potential cumulative impacts.

The study will inform the Marinas and Yacht Harbours in the Lower North Sea (MAYA) project. This is a European Union funded research programme. The Colne Estuary study is one of six pilot projects aimed at setting the parameters for managing future leisure boating development. The framework must therefore be sufficiently generic to be used elsewhere in the Lower North Sea.

1.2 Study Phases and Objectives

The study has been split into two phases (the study brief is contained in Appendix A). This report represents the outcome of Phase 2.

Phase 1 was strategic in nature and consisted of the following tasks:

- An information audit to identify and catalogue relevant environmental information, literature and reports.
- Drafting of a multi-criterion assessment methodology to facilitate comparative analysis of case studies and provide a rationale for the preparation of planning guidance.

- A market analysis of the leisure boating sector. It considered current and future demand for boating related facilities and canvassed views of local stakeholders.

Phase 2 of the study involved:

- Character analysis – the identification of ecological and landscape constraints profiles i.e. identifying areas of particular sensitivity to leisure boating development.

- The testing of the multi-criterion assessment methodology and the preparation of generic guidelines for boating related development on the Colne Estuary.

- Additional market analysis to establish to importance of leisure boating to the local economy and provide an indication of current boating activity. This work was undertaken by Dr Arwel Edwards and is contained in Appendix B of this report.

- The provision of guidance on the content of environmental impact assessments (EIAs) or environmental reports submitted with planning applications for boating development.

- Recommendations to promote the sustainable use of the estuary for boating activity.

2 CHARACTER ANALYSIS

2.1 Introduction

It is clear that from both an environmental and boating perspective the Colne is not a homogeneous environment, but has a number of distinct character areas. The type and scale of development that is appropriate will therefore vary from area to area. The term 'character area' can be applied to many aspects of the environment including habitat type, landscape/townscape, boating activity, navigational constraints.

In order to inform the assessment methodology, an attempt has been made to identify character areas and establish their relative sensitivity and constraints on leisure boating development/activity. Rather than attempt to identify sensitivities for a number of issues, it was considered more manageable to focus on ecology, the issue of most importance. (Large parts of the Colne estuary are designated as being of international ecological importance). In addition, the landscape sensitivities of the Colne have been defined based on the work being undertaken by Essex County Council.

2.2 Ecological Constraints Profile

The purpose of the ecological constraints profile was to:

- Identify the range of ecological sensitivities in the project area in relation to boating activities.
- Provide ecological risk assessment information to inform the multi-criteria evaluation.
- Qualitatively assess the direct and indirect ecological constraints associated with the various boating activities.
- Inform an operational boating management plan for the area.

The section therefore firstly identifies the ecological context of the project area, together with the associated nature conservation designations. The ecosystems and assemblages associated with the estuarine and near coastal environment are then described. Having defined the ecological sensitivities, the direct and indirect boating activities that have potential ecological implications are established. Finally, a qualitative assessment of the ecological risks from the various defined activities are determined, to arrive at an ecological constraints profile for boating activities.

2.2.1 *Ecological Context*

The Colne Estuary is a shallow sheltered estuarine system with a complex of inlets and embayments. The upper estuary through Colchester is typified by a narrow constrained channel, which restricts the ecological function of the system. As the estuary passes downstream, particularly after the confluence with the Roman River, the banks of the estuary are less subject to the constraints of flood defence embankments. This is particularly the case on the western side of the estuary and beyond Brightlingsea. Where natural geomorphological processes have been allowed to continue, a rich and diverse ecosystem remains, as reflected in the wide range of nature conservation designations in the mid to lower estuary.

The estuary can be viewed as two distinct areas, dictated largely by wind and wave exposure. The inland areas tend to be very sheltered, dominated by saltmarsh and mudflat complexes, with the slightly more exposed (although still relatively sheltered) areas adjacent to the North Sea characterised by coarser littoral and sub-littoral sediments, such as St Osyth and West Mersea beaches.

2.2.2 *Nature Conservation Designations*

The rich diversity of ecosystems represented in the Colne Estuary is recognised through the wide range of international and national nature conservation designations ascribed to the area. The estuary is of international importance for wintering and breeding birds, and the variety of habitats it supports include mudflat, saltmarsh, grazing marsh, sand and shingle spits, disused gravel pits and reed beds, and outstanding assemblages of habitats. Two areas of the foreshore at East Mersea are of geological importance, with Colne Pont and St Osyth Marsh of geomorphological interest.

Essex Estuaries Candidate Special Area of Conservation (cSAC)

The area is being considered as a candidate SAC because it contains habitat types and/or species which are rare or threatened within a European context. Habitats include Glasswort and other annuals colonising mud and sand; Cordgrass swards; Atlantic salt meadows; Mediterranean saltmarch scrubs; estuaries and intertidal mudflats and sandflats. The Colne is also the last known British site for the Houting (a fish). To the south west of the Colne estuary, the Maplin and Dengie Flats represent open coastal areas with very extensive mudflats of an unusually undisturbed nature.

Mid-Essex Coast Special Protection Area (SPA)

The Colne Estuary qualifies as an SPA by regularly supporting nationally important populations of a number of species: breeding population of Little tern (Birds Directive Annex 1), a wintering population of Hen Harrier (Birds Directive Annex 1) and summer breeding populations of Pochard and Ringed Plover. The estuary is also a wetland of international importance, supporting over 20,000 wintering waterfowl, particularly of Brent geese and Redshank. Additionally, Cormorant, Mute swans, Shellduck, Goldeneye, Ringed plover, Grey plover, Sanderling, Dunlin, Black-tailed godwit and Curlew are well represented.

Mid-Essex Coast Ramsar Convention Site

The Colne Estuary qualifies as a Ramsar site by supporting a number of rare plants and animals, and by supporting over 20,000 wintering waterfowl. The species of note are similar to those specified in the SPA designation.

Colne Estuary National Nature Reserve (NNR)

The Colne Stuary NNR has three distinct areas: Brightlingsea Marsh; East Mersea and Colne Point. Brightlingsea Marsh is an area of low lying grazing marsh directly behind the sea wall. East Mersea is a thin strip of coastal land subject to ongoing morphological change, which also has areas of saltmarsh. The site holds a number of rare plant species and is well known for its wintering bird populations. There are also fossil remains. Colne Point is comprised of an extensive shingle spit, together with saltmarsh and shingle banks/shell beds that support a diverse plant and animal community. The NNRs at Dengie Flats and in the Blackwater Estuary should also be recognised, as they have the potential to be affected by increased boating activity.

Colne Estuary Site of Special Scientific Interest (SSSI)

The Colne Estuary SSSI is designated for a wide range of ecological features, many of which are mentioned in the international designations specified above. In summary, the estuary is designated for its saltmarsh, grazing marsh and mudflat habitats and the diversity of animals and plants that occupy these niches.

Two other SSSIs are designated in the upper Colne estuary, the Hythe lagoons and the upper Colne marshes, both beyond the Hythe itself. Both are off-channel and are unlikely to be influenced by possible additional boating activity.

Regional and Local Designations

There are a number of sites that are recognised by regional (Essex County Council, Essex Wildlife Trust) or local (Borough or District Council) designations in the Colne Estuary. Most of the sites are within or adjacent to the internationally or nationally recognised designations and are often specified for the protection of the same habitats and species. Of note for this study are the local nature reserve sites supervised by Essex Wildlife Trust at Howlands Marsh, Rat Island and Fingringhoe Wick; Wivenhoe Marsh (Colchester Borough Council); Langenhoe Marsh (Ministry of Defence); and, Cudmore Grove (Essex County Council).

2.2.3 *Specific Habitats and Species*

In addition to the habitat and species designations detailed in the previous sub-section, a number of Essex Biodiversity Action Plan (BAP) habitats and species are a feature of the area. These include coastal grazing marsh and reedbed habitats, and probably Harbour porpoise although its distribution and abundance are not currently known. Other BAP species may be associated with the estuarine saltmarsh, including Fisher's estuarine moth, the Shrill carder bee and Hogs fennel. The Native Oyster is nominated as a flagship species for the local BAP.

The strategic nature of this study precludes the detailed assessment of the habitat, community and species assemblages of the Colne Estuary. However, data were sought from a wide range of organisations on the locations of any ecologically significant biota. The consensus view was that the habitats, communities and species identified in and protected by the nature conservation designations would be sufficient to describe the various ecosystems in the estuary.

2.2.4 *Recreational Boating Activities with Potential for Ecological Effects*

General Considerations

There are a number of potential effects of recreational boating on the environment, depending on both the type and scale of disturbance. In terms of ecosystem effects, construction activities during implementation of development proposals tend to be short-term, temporary and reversible (excluding land-take). Many of the impacts can also be mitigated. The above statement assumes that the development is sympathetically designed, does not have any significant adverse effects on hydrodynamic function (both locally and regionally) and consequently would not affect the geomorphology or ecology of the area. For example, evidence from significant construction activities over a prolonged period adjacent to the Humber Estuary SPA has shown that birds tend to habituate to construction noise and disturbance effects (IECS, 2000), although encroachment of workers onto mudflats etc. should be avoided. Given the assumption that wide-scale disturbance during construction can be phased to avoid significant impacts, the main long-term effects are likely to arise from land-take, the operation of boating facilities including the boats themselves.

The most obvious impact of new boating development would be direct loss of coastal, intertidal and subtidal habitats as a result of built development. In the case of a marina this could be a substantial area, as most marinas will require access to a deep water channel. The significance of such a loss largely depends on the range and sensitivity of the habitats, communities and species that are taken by the development footprint, and the area around the development that is likely to be influenced (for example, by changes to currents, sedimentation etc.).

The wider-scale implications of recreational boating tend to result from the disturbance effects of boat movements, particularly on bird populations. A number of studies have been undertaken of bird disturbance by recreational boating activities, but the majority have been in inland locations. Care should be taken when extrapolating these studies to coastal locations, as coastal ecosystems tend to be less restrictive with far greater access to undisturbed areas that could be sought in preference. However, as a general principle the findings can usefully be cross-referenced.

Research has shown that boating activities fall into two main categories, relating to the effects of powered and unpowered craft. As would be expected, powered craft and associated activities such as waterskiing and jetskiing have the greatest disturbance effects (for example, Ward and Andrews, 1991). Birds tend to react to faster moving objects such as powerboats at greater distances. Sailing boats tend to have fewer implications, although there is some evidence to suggest disturbance effects on birds in the water at distances varying from 100 to 300m (Platteeuw and Beekman, 1994). Disturbance distances vary widely depending on bird species and phase of development. Breeding and moulting birds tend to be most sensitive.

Once disturbed the behaviour of birds can vary significantly. Birds subject to reasonably low magnitude disturbance will often resettle or return within a relatively short timescale. However, birds that are significantly disturbed have been shown to relocate, although how far away is not known. It is these more serious responses that have the greatest potential for long-term harm to resident and migrant populations. Migrant populations are more susceptible to disturbance as they do not tend to habituate. If relocating birds cannot find a habitat of equal or better quality, for example because of density dependent influences (too many birds there already or reduced food source), they may suffer a decline in well-being. Clearly, if continued boating activities result in repeated disturbance and relocation, there may be unacceptable consequences for bird populations.

At present there is insufficient evidence to suggest long-term detrimental impact on bird populations from the disturbance effects of boating activities. Similarly, the cumulative effects of powered and unpowered boating on population viability is unknown. However, given the sensitivity of the Colne Estuary it is reasonable to suggest that undue disturbance activity in sensitive areas should be minimised. Of particular concern are activities in proximity to nesting and breeding birds, together with feeding and roosting areas, particularly during spring and autumn migration. These factors have been taken into consideration in development of the ecological constraints map.

Boating in the Colne Estuary

Boating activity in the estuary varies significantly. The main difficulties with boating activity in relation to nature conservation is the wide-scale use of power boats in sensitive areas of the mid and lower estuary. Speed restrictions apply for much of the estuary through bye-laws, and there are prescribed areas for power boat activities. However, there are many areas of the estuary where the bye-laws are not being complied with, with consequent effects on wildlife. This appears to be exacerbated at present at a number of boat access points to the estuary that cannot be

adequately controlled. Anecdotal evidence would suggest that intensive boating would have a detrimental effect on the ecological integrity of parts of the Estuary. The main constraints are discussed below.

2.2.5 *Ecological Constraints Map*

An ecological constraints map has been developed on the basis of the information gathered and a meeting to discuss the sensitivities of the estuary with various interested parties. The following bodies were represented:

- English Nature
- Colchester Borough Council
- Tendring District Council
- Essex County Council
- Colchester Museum Biological Records

Data were also incorporated from the Environment Agency, although they were unable to attend the meeting.

Key sensitivities were agreed as the maintenance of important habitats, which would thereby ensure the integrity of the estuary, and the influence of boating on the bird populations. Given the level of field data and disturbance studies currently available it was felt that trying to define boating effects on communities and species lower down the food web would be inappropriate. However, consideration of the habitats and birds should afford protection to the other important and sensitive species of the estuary.

The sensitivity map (Figure 2.1) shows the areas of the Colne Estuary that are most sensitive to boating disturbance. The map was collated by local nature conservation experts with knowledge of the local sensitivities. In general terms a number of boating related activities will be of particular significance:

- Direct loss of important habitat, communities and species from land take
- Indirect loss through secondary effects (changes to flows and erosion etc.)
- Direct disturbance to sensitive communities and species - for birds, direct disturbance will include impacts on high water roosts, breeding and feeding areas

- Indirect effects such as increased bird densities on remaining undisturbed sites.

In terms of boating activity the cSAC has a number of sensitivities. Areas of saltmarsh are prone to impact from direct trampling, wave erosion and disturbance from boat ploughing (especially jet-skis). They provide particularly good habitat for feeding and roosting birds and the intertidal mud and sandflats are vital for bird feeding. The sand and shingle banks are sensitive to trampling and disturbance from walkers, specifically for some of the associated rarer plant species and breeding birds. Areas of particular note include Colne Point, Point Clear, Mersea Stone, Langanhoe Point, Rat Island and St. Peters Meadow on West Mersea.

The area of SPA has similar sensitivities, although it extends down to mean low water and includes the grazing marsh habitats. The grazing marsh tends to be prone to disturbance in winter and during migration, although this is more a factor of access by walkers etc. than from boating activity. The area of Langanhoe is well protected from these influences as it is an MoD site, and the area at Brightlingsea is behind a large sea wall that provides a barrier to direct disturbance. The area of the Pyefleet channel is worthy of note, as it supports many important species and is relatively undisturbed.

Of the other designated areas, Howlands Marsh may be susceptible to boating disturbance, although a proposal for a large country park adjacent to the site could be of more significance.

Insert Figure 2.1

2.2.6 *Summary and Recommendations*

In summary, much of the Colne Estuary is to a lesser or greater extent sensitive to development and subsequent disturbance activities, as recognised by the number of conservation designations ascribed. However, there are a number of areas that have particular relevance, as detailed on Figure 2.1. Co-existence of recreational boating and wildlife can be developed and managed to maximise the socio-economic benefits to the area while protecting the wildlife values for which the area is known.

Recommendations for development opportunities should therefore consider the following:

- Upstream of the Colne barrier, small scale and low disturbance activity would be most appropriate. This will limit large-scale movement of boats in the constrained middle reaches of the estuary.

- The potential for increased use of fore and aft moorings to increase density in existing channel locations, although further encroachment up channels (especially Pyefleet and Brightlingsea) or onto intertidal areas should be discouraged.

- Development of larger boating facilities and particularly marinas in areas already subject to more intensive boating activity, and specifically Brightlingsea.

- Greater use and policing of bye-laws to control recreational boating activities in the areas identified as having particular ecological sensitivity.

2.3 Landscape

2.3.1 *Approach*

The objective of this aspect of the study was to determine whether there are areas of particular sensitivity and whether it is possible to differentiate between these areas in determining what type of boating development may be suitable. The approach was straightforward. Brief discussions were held with local authority officers with responsibility for landscape at Colchester Borough Council, Essex County Council, and Tendring District Council. Available landscape character assessment information was collected. Based on this information, the sensitivities of different parts of the Colne Estuary were identified.

2.3.2 *Landscape Character Areas and their Sensitivity*

Two landscape designations apply to the Colne:

- Countryside Conservation Area (Colchester Borough Council)
- Colne Estuary Special Landscape Area (Tendring District Council)

These designations reflect the area's high local landscape value. The Colne is also subject to Essex County Council's coastal protection belt policy. Urban areas are generally not included within these designations, however, there are conservation areas at West Mersea, Wivenhoe and Rowhedge. Colchester Borough Local Plan also affords protection to the West Mersea Area of Special Character.

The Colne contains numerous heritage features which add to the area's landscape character. Furthermore, high ecological value can be synonymous with the areas of high landscape value eg large flocks of wading birds are a striking feature in the landscape.

The most detailed landscape analysis of the Colne Estuary is that being undertaken by Essex County Council following the Interim Landscape Character Assessment Guidance (Countryside Agency, 1999). The studies being undertaken by both Colchester Borough Council and Tendring District Council are following the same methodology with the intention that all assessments should be complementary. Nine local character areas have been identified along the Mid-Essex Coast, many of which have several sub-areas. The character areas applicable to the study area are shown in Table 2.1.

Table 2.1 Landscape Character Areas

Character Area	Sub-Area
Tendring Coastlands	St.Osyth coastlands
	Brightlingsea Creek
	Brightlingsea enclosed valelands
Colne Estuary	Lower Colne Estuary
	Upper Colne Estuary
Colchester Coastlands	Lower Roman River
	Colchester claylands and marshlands
	Mersea Island

The landscape character areas consist of a variety of landscape types. The Essex County Council study has mapped each of these landscape types, described their main features and provided an indication of their sensitivity. A summary of the landscape types applicable to the Colne is shown in Table 2.2.

The great majority of the Colne Estuary is described as Inter-tidal Saltmarsh or Unvegetated Foreshore. Both these areas are considered to be highly sensitive. Beyond the foreshore the Colne is largely characterised by Ancient Coastal Marshland which, because of its agricultural nature, is not considered to be as sensitive. Northern parts of the estuary including Aylesford Creek are described as Enclosed Valley Sides, and are considered to be moderately sensitive.

The landscape assessment undertaken by Essex County Council excluded urban areas. There are sound reasons for this exclusion. Each urban area has its own character. Indeed, there are distinct character areas within each town and village eg the Rowhedge waterfront includes both a conservation area and an industrial estate. Urban areas are therefore more difficult to categorise in terms of landscape character and sensitivity.

2.3.3 *Applicability to Boating Development*

Boating is an integral feature of the Colne Estuary. Sailing boats in particular partly define the landscape character of the Colne and boating facilities are common features within many towns and villages on the river. While boating development can be considered a traditional and compatible land use activity in urban areas and some creeks, the suitability of new development will depend on its character and scale. The quality of the design will be critical in evaluating the acceptability of proposals. Ideally, development briefs including design guidelines should be prepared to guide development in towns and villages. The assessment which follows provides a strategic appraisal of a variety of development types in a number of character areas. While broad conclusions can be drawn on the landscape/townscape impacts of boating development it is considered that there is no substitute for a detailed EIA of development proposals.

Table 2.2 Landscape Types and Sensitivity

Character Area	Description Characteristic Feature	Areas Covered	Sensitivity
Intertidal Salt Marsh	Dynamic environment between low and high tide. Rich wildlife habitat. Open landscape with extensive views of estuary and coast. Strong sense of weather and sky. Sense of remoteness. Restricted access.	River Colne channel, Alysford Creek, Geedons Creek, Pyefleet Channel, Strood Channel, Mersea Quarters, Brightlindsea and Flag Creek.	Highly Sensitive
Unvegetated Foreshore	Dynamic system of muds, sands, shingle and shells between tides. Rich wildlife habitat. A large scale open landscape with extensive views of estuary and coast. Big skies giving keen sense of the weather. Sense of remoteness.	Mersea Flats, Brightlingsea Reach, Colne Bar to St Osyth Beach.	Highly Sensitive
Ancient Coastal Marshland	Enclosing seawall and associated borrowdykes. Open intensively farmed agricultural landscape. Long views within marshland. Views dominated by sky. Restricted public access except along sea wall.	North Mersea Island, Wick Marsh (between Pyefleet Channel and Geedons Channel).	Sensitive
Enclosed Valley Sides	Strongly sloping or undulating landscapes on clay loams south of Colchester. Dissected by small tidal channels. Small settlements including distinctive line of farmsteads. Small woodlands and planting around settlements increase sense of enclosure.	East bank of Colne north of Aylesford.	Moderately Sensitive

3 MULTI-CRITERION ASSESSMENT

3.1 Background

A key element of the study was the formulation of a tool for the strategic appraisal of new leisure boating development. The tool which was developed in Phase 1 is a multi-criterion assessment methodology. It has been devised to examine the theoretical feasibility of leisure boating from different perspectives and incorporates economics, technical practicability and environmental impact. In order to plan for future development it is necessary to establish the types and scale of proposals that could theoretically be promoted. The methodology has been applied to a number of development scenarios and the results are presented below.

There were a number of requirements for the multi-criterion assessment methodology:

- To allow for the examination, at a strategic level, of the feasibility of a theoretical boating development with respect to its technical practicability, economic viability, and environmental impact.
- To allow for the comparison of a broad range of alternative boating-related development scenarios.
- To use the results to provide a rationale for spatial planning guidance for boating development on the Colne Estuary.

3.2 Study Limitations

The multi-criterion approach has not been designed to determine whether or not a proposal would be acceptable in planning terms. Firstly, it does not make judgments about whether a boating development is compatible with development plan policies. Secondly, it includes issues that are not strictly material to a planning decision ie commercial viability and technical complexity. Thirdly, it does not take into account political factors; the acceptability of a project may often be influenced by local public opinion (which can be diverse) as well as wider economic aspirations for an area. In addition, the study is strategic in nature and does not consider detailed design aspects of schemes that could be fundamental to their acceptability.

A further limitation is that the study focuses on leisure boating development in isolation; the environmental and economic costs and benefits of other land uses lie outside the scope of this study. A large housing or leisure development which encompasses a marina would have quite different financial and environmental implications. For developments of this nature the methodology would need to be adapted to take into account different technical, economic and environment criteria.

Bearing in mind these limitations, one of the central aims of Phase 2 is to test the multi-criterion assessment methodology by applying it to a number of case studies. It is likely that the methodology will require refinement. It should therefore be seen as a starting point from which to make rational judgments concerning the pros and cons of alternative development scenarios.

3.3 Consultations

In order for it to be effective, it is essential that the methodology is widely accepted by stakeholders, and adaptable to a variety of scenarios within the Colne, and estuaries elsewhere. The results presented below represent the first application of the multi-criterion assessment. Initial consultations have been carried out with the Colne Estuary Strategy Advisory Group. Further consultations with local authority officers within Colchester Borough Council, Tendring District Council and Essex County Council are to be carried out by the Essex Estuaries Initiative.

3.4 Case studies

Case studies were selected to provide a range of boating developments for a range of different character areas. The choice included areas where boating developments have recently been proposed, urban areas likely to be redeveloped in the near future, the coast, and a creek. Within the selected case study areas a number of types and scale of development were proposed for assessment, selected from the range of possible development scenarios. To a great extent the case studies were chosen from the perspective of a developer seeking to build sizeable developments to maximise return on investment. From an environmental perspective they tend to represent worse case scenarios. The case general study areas are shown on Figure 3.1, the boating facilities examined in each of these areas are listed in Table 3.1.

Insert Figure 3.1

Table 3.1 Case Studies

Case study area	Boating facilities to be examined
Pyefleet Channel	❑ Marina ❑ Swing moorings
Brightlingsea	❑ Marina (500, 200 berths)
Hythe	❑ Boating activity in the upper reaches of the River
Rowhedge	❑ Marina ❑ Pontoons
Fingringhoe Ballast Quay	❑ Marina (500 berth) ❑ Pontoons
Seawick	❑ Marina

3.5 Summary of Methods

The proposed methodology for the multi-criterion assessment was established in Phase 1. Several refinements were made during the assessment, as indicated below.

For each case study, established criteria were assessed, quantitatively or qualitatively depending on the availability of information and the nature of the criterion. The value was expressed in terms of a high, medium or low rating, with high reflecting positively on the development.

This approach is consistent with the strategic nature of the assessment but necessarily reduces the resolution or level of detail in which each impact is assessed. The range between "low" and "high" classifications broadly reflects the range in the assessed values, ie it is a relative classification which applies only to this multi-criterion evaluation and to the range of options considered.

3.5.1 Assessment of Practicability

The criteria used in the multi-criterion assessment of practicability, and the rating definitions are given in Table 3.2.

Table 3.2 □□ Practicability Criteria

Criterion	Rating		
	High	**Medium**	**Low**
Construction Simplicity	Simple technology widely used and with low engineering risk. Good access and services available.	Proven technology with moderate engineering risk. Reasonable vehicular access and availability of services.	New technology required, or serious restrictions due to poor access. Lack of available services
Operational Simplicity	Limited operator involvement with low skill level requiring little routine maintenance.	Moderate operator involvement with maintenance required by skilled staff.	High operator involvement. Complex routine maintenance required by skilled staff.
Operational Reliability	No tidal or seasonal restrictions on use. Close access to open water. Very good shelter provided.	Occasional or moderate restrictions on use of facility. Reasonable access to open water and moderate shelter provided.	Significant restriction in use due to low water, distance from open water, or poor shelter provided.
Long Term Security	No threat from changing estuarine characteristics.	Potential moderate risk to facility due to changing estuarine characteristics, rising sea levels, siltation etc.	Serious risk to future operations due to rising sea levels, siltation, changing estuarine geomorphology etc.

In practice, the Operational Reliability criterion proved ambiguous and may require amendment. The degree of shelter offered by a development does not always coincide with the degree of tidal or seasonal restrictions on use or the proximity of access to open water. This was a particular problem in assessing the selected development at the Hythe where shelter is good but the development would be located a very long way from open water and with very limited tidal access. The lowest relevant rating was therefore applied and this development was assessed as low.

3.5.2 Assessment of Economic Viability

The methodology is based on a commonly used rule of thumb for establishing the viability of a development by calculating the potential Net Present Value (NPV). NPV can be summarised as follows:

Net Present Value = Y - X, where Y is the value of the return and X is the present cost.

The costs for an option can be estimated on the basis of:

a) Estimated capital expenditure
b) Aggregated lifetime operating costs
c) Aggregated lifetime revenue generated

The method is simplistic and in reality developers will undertake a more rigorous analysis of costs and returns. The aim is to provide an indicative financial assessment for comparative purposes and identify those schemes that would be unlikely/likely to attract investment. The NPV calculation, in combination with other forecasting techniques, can also be used to determine the scope for 'developer contributions' (otherwise known as 'planning obligations' or 'planning gain') that could be secured through planning conditions or Section 106 Agreements. Such contributions could be used to mitigate environmental impacts or provide other infrastructure of benefit to the community.

It must be stressed that marinas tend to be mixed-use projects and their economic viability may depend on the inclusion of new housing or waterside business and recreational facilities. Ideally, the analysis should be widened to take into account such larger scale mixed-use developments where the boating facilities create an attractive environment but do not in themselves generate significant returns on investment. For the purposes of this assessment, the economic viability of a project does not include mixed use developments.

Marketability

In determining the rate of return an assumption has to be made on the take up of berth spaces. According to the market analysis (Appendix B) there is a high demand for berth spaces in the area and it is likely that demand will be high for most types of facility. A brief statement is made for each assessed scheme.

3.5.3 *Assessment of Environmental Criteria*

For each case study, established criteria were assessed, quantitatively or qualitatively depending on the availability of information and the nature of the criterion (eg landscape impacts are more subjective than those on water quality). The environmental assessment value (positive or negative impact) was expressed in terms of a severe, high, medium, low and negligible rating. This means that the assessment of different categories of environmental impact was consistent and comparable.

In determining impacts, a common assumption has been made concerning mitigation. To compare options on an equal basis it has been assumed that good practice will be following in avoiding or reducing environmental impacts. It has also been assumed that all facilities will be built to a high quality of design. For this strategic level study, possible impacts and the effects of mitigation have been established on the basis of professional judgement. In practice, detailed EIAs of individual developments might find that some impacts may be greater, and in other instances mitigation will significantly reduce impacts.

Ecology

The potential significance of disturbance of breeding, roosting and feeding estuarine waterfowl in the highly designated Colne Estuary from construction activities and boat movements is great. As discussed in Section 2.2.5, the potentially most significant impacts from boating activities and development are direct bird disturbance by boat movements in the very sensitive and constrained middle reaches of the estuary and further encroachment up the relatively undisturbed Pyefleet and Brightlingsea channels. At present there is insufficient evidence to suggest long-term detrimental impact on bird populations from the disturbance effects of boating activities. For the case studies in this assessment, it was assumed that all boating associated with the development would be yachts and other unpowered craft, however, were boating activities provided for to include power boats or jet skis, the impact on direct bird disturbance would increase significantly. Additional discussion on estuarine waterfowl disturbance is given in Section 3.6, recommending additional studies to validate the assessments undertaken.

3.5.4 *Landscape and Visual Amenity*

The landscape and visual amenity category presented in the Phase 1 report was considered not to give sufficient specificity between the case study areas. Section 2 of this report provides definitions of landscape areas and types and establishes their relative sensitivity. Amendments to the criteria are as indicated in Table 3.3. The terms used are based on the landscape character assessment presented in Table 2.2.

Community

The Colne Estuary Advisory Group considered that the assessment should give greater consideration to how a development would affect the community. A number of terms were suggested including 'integration', 'fit', and 'sympathy'. Although design character has an important bearing on how a development fits into an existing environment, the greater concern related to potential changes in the social make up of towns and villages that could result from any large influx of newcomers. Such an influx would more likely result where a marina is promoted in combination with residential development, and it therefore falls outside the scope of this assessment. It is recommended that the methodology be adapted to take into account community integration where it is to be used to examine proposals with a residential element. It is recognised that a 'community integration' criteria creates a difficulty for the assessor; how does one determine the significance of the impact? A further recommendation of this report is that a consultation process should be carried out in coastal towns and villages to establish the scale and type of development that local people would find acceptable.

Table 3.3 □□ Definitions for Rating Adverse Environmental and Human Impacts

Environmental & Human Criteria	Rating Definition[1, 2]			
	Severe	High	Medium	Low
Ecology	▪ loss or damage to aquatic ecology resulting in a reduction of more than one biological GQA class ▪ severe impact on key habitats, communities or species, eg SSSI ▪ loss or significant damage to any site covered by a European/international nature conservation designation eg SPA, Ramsar	▪ loss or damage to aquatic ecology resulting in a reduction of one biological GQA class ▪ significant impact on key habitats, communities or species, eg SPA, SSSI ▪ loss or significant damage to any site covered by a national statutory nature conservation designation eg SSSI, NNR	▪ loss or damage to the aquatic ecology which may bring it close to failing one biological GQA class ▪ moderate impact on key habitats, communities or species, eg SSSI ▪ loss or damage to any site covered by a county nature conservation designation	▪ change in the aquatic ecology which is insufficient to jeopardise the biological GQA class ▪ minor impact on key habitats, communities or species, eg SSSI ▪ loss or damage to any undesignated sites with potential ecological value eg wetlands, hedgerows, woodland
Water Quality	▪ change in surface / groundwater quality to render it unsuitable for its current use, resulting in a reduction of more than one RE/GQA class	▪ change in surface/ groundwater quality to render it unsuitable for its current use, resulting in a reduction of one RE/GQA class	▪ change in surface/ groundwater quality which would limit its current use and which may bring it close to failing the RE/GQA classification	▪ change in surface / groundwater quality which is insufficient to jeopardise current use or RE/GQA classification
Watercourse characteristics (Hydrology & geomorphology)	▪ severe change to existing river flow and /or severe change in channel or bank form and/or flooding ▪ significant wider scale change in groundwater flow	▪ major change to existing river flow and/or major change in channel or bank form and/or flooding ▪ major change in local groundwater flow	▪ moderate change to existing river flow and/or moderate change in channel or bank form and/or flooding ▪ moderate change in local groundwater flow	▪ minor change to existing river flow and/or minor change in channel or bank form and/or flooding ▪ small change in local groundwater flow
Landscape and Visual Amenity	▪ major detrimental change in quality to nationally designated landscapes (e.g AONBs) or other important designated landscape features (e.g. conservation areas, SAMs)	▪ major detrimental change in area considered to be of Very/High Sensitivity.	▪ detrimental change in area consider to be of Moderate Sensitivity, or Sensitive. ▪ minor detrimental change in area of Very/High Sensitivity.	▪ minor change to area considered to be Sensitive.

1 "negligible" omitted as self explanatory
2 the rating is dependant on one or more of the definitions within each environmental criterion being met
3 materials and energy use and/or waste generation

Environmental & Human Criteria	Rating Definition[1,2]			
	Severe	High	Medium	Low
Cultural Heritage	▪ loss or significant damage to internationally designated areas or features of archaeological or historic interest (including setting) ▪ severe impact to either known or previously undiscovered areas or features of archaeological or historic interest (including setting)	▪ loss or significant damage to nationally designated areas or features of archaeological or historic interest (including setting) ▪ major impact to either known or previously undiscovered areas or features of archaeological or historic interest (including setting)	▪ damage to county level designated areas or features of archaeological or historic interest (including setting) ▪ moderate impact to either known or previously undiscovered areas or features of archaeological or historic interest (including setting)	▪ minor damage to locally designated or undesignated areas or features of archaeological or historic interest (including setting) ▪ minor impact to either known or previously undiscovered areas or features of archaeological or historic interest (including setting)
Agriculture	▪ severe loss of 'best and most versatile agricultural land (i.e. Grades 1, 2 and 3a)' ▪ loss of existing patterns of farming and farm holdings	▪ major loss of 'best and most versatile agricultural land ▪ significant disruption to existing patterns of farming and farm holdings	▪ loss of small areas of 'best and most versatile agricultural land' ▪ moderate disruption to existing patterns of farming and farm holdings	▪ loss of other agricultural land ▪ minor disruption to existing patterns of farming and farm holdings
Commercial fisheries	▪ severe loss of areas of shellfisheries/fisheries	▪ major loss of areas shellfisheries/fisheries	▪ small loss of areas of shellfisheries/fisheries	▪ minor disruption to shellfisheries/fisheries
Recreation & navigation	▪ major loss of recreation opportunities	▪ minor loss of recreation opportunities	▪ degradation of recreation opportunities	▪ minor change in recreation opportunities
Community	▪ severe effects on local communities, eg loss of jobs, housing, facilities, noise, dust, traffic nuisance	▪ major effects on local communities	▪ moderate effects on local communities	▪ minor effect on local communities
Resource Use[3]	▪ extremely high consumption of energy and/or materials and significant production of wastes from non-renewable sources, production of significant amounts of Special Waste, or significant water resource degradation	▪ major consumption of energy and/or materials and significant production of wastes from non-renewable sources, production of significant amounts of Special Waste, or significant water resource degradation	▪ moderate resource consumption, waste generation or water resource degradation	▪ minor energy/materials usage required, minimal waste generation or water resource degradation

Notes:
GQA General Quality Assessment of chemical water quality
RE River Ecosystem Class, a water quality target
SPA Special Protection Area

3.6 Case Study Assessment

3.6.1 Pyefleet Channel

Scheme Overview

The Pyefleet Channel is located along the north side of Mersea Island. The channel forms part of the link between the River Colne and the River Blackwater, which is not navigable and is crossed by the Strood causeway. The study area comprises a length of approximately 3.5km on, or adjacent to, the Mersea Island shore.

In its lower and middle reaches, Pyefleet Channel is about 400m wide but only the central 150m is in water at all low tides, the remainder typically dries to more than 2.5m above Chart Datum.

A small number of swinging moorings have been established at the lower end of the channel, where the channel is deep enough for yachts to remain afloat throughout the tide. Access appears to be via a private arrangement with the oyster fishery that has a slipway and small dinghy park on its land. There is no public vehicular access to the foreshore.

Leaving aside, for the time being, environmental issues and the existence of the oyster beds, it would be possible to extend the provision of moorings in the channel or develop a marina. However, given the problem of road access, and the consequently long dinghy trip between slipway and mooring, such moorings are unlikely to be popular.

Whilst the development of swinging moorings would not in itself justify improving the road access, this would not be true of a marina. In purely boating and engineering terms, two possibilities can be considered:

- A dredged pocket within the intertidal mud (comparable to Woolverstone Marina, on the Orwell).
- An excavated basin behind the existing flood bank (comparable to Burnham-on-Crouch yacht harbour), with the flood defence maintained around the marina.

Neither option is likely to be viable unless offering at least 1m depth of water in the approaches at all states of the tide, and preferably 2m. In effect this limits development potential to the lower 2km or so of the Pyefleet Channel. However, within this constraint there is, in principle, sufficient room either in the mud bank or fields behind the Mersea Island flood bank to accommodate a marina of 350 to 500 berth capacity.

In the absence of a ground investigation it has been assumed that development costs would be increased by the presence of very soft alluvial deposits necessitating either heavy sheet pile walls or very shallow slopes to any excavation. Excavation of any pocket within a natural estuarial mud bank would create a "silt trap" requiring frequent and costly dredging.

Given the highly sensitive character area of Pyefleet Channel, boating development comprising either swinging moorings or a marina are not considered suitable. However, for the purpose of a multi-criteria assessment, the swinging moorings development to a limit of 100 moorings was selected for assessment. Changes to the assessment for an excavated basin marina development have been noted where appropriate.

Technical Practicability

Civil Engineering

Construction and operation of the development requires no special technology.

Reliability/Security

The proposed scheme is well sheltered and not tidally restricted.

Economic Viability

Capital Costs

Fore-and-aft trot moorings, assuming boats share chains, but are moored at both "ends" cost about £800 per boat, including design fees and contingency. This assumes 25 boat moorings above a single ground chain with anchors and includes mooring buoys and tails. Four such structures could be constructed along the channel to provide moorings for a total of 100 boats.

Operating Costs

It is considered that the Pyefleet Channel moorings would not require full time manning and would instead be administered from another marina or by the Harbourmaster at an annual cost of around £5,000.

There is no current dredging requirement but the slipway may require occasional maintenance dredging every five years at an annual cost of around £2,500.

Revenue Generated

Annual revenue generated from the development would be low, at around £500 per berth, because of limited on-shore facilities and dinghy access.

Table 3.4 Costs for Pyefleet Channel Case Study

CAPEX (Total Q3 2000)	£80k
OPEX (annual average)	£7.5k
Revenue (annual)	£50k
Net Present Value (20 years @ 6%)	£370k

Environmental Impact

Construction

Construction activities would generally be small in scale and cause limited impacts. The area is nationally designated as Colne Estuary SSSI, East Mersey flats NNR (part), and internationally designated as a SPA, RAMSAR and cSAC. There would be moderate direct disturbance of estuarine waterfowl in a very sensitive area during construction. There would be loss of a small area of intertidal habitat from enlargement of the existing slipway at the oyster fishery or construction of a new slipway in a different location.

For a marina development construction activities would be greater and all impacts increased. An area of intertidal mud flat designated as shellfish harvesting area for oysters *C. gigas* and *O. edulis*. would be lost. The shellfishery is of good quality, Class B from 1/9/99, and commercially fished by the Colchester Oyster Fishery Ltd, who also have intertidal depuration facilities in the area. The impact on fisheries would be severe.

Operation

Operational impacts would generally be related to boat movements and mooring. The most significant potential impacts would be on the sensitive and important species of estuarine waterfowl and on shellfish quality and shellfish harvesting activities. There would also be a high impact on landscape and visual amenity reflecting the sensitivity of the undeveloped creeks and adjacent saltmarsh in a remote setting.

Table 3.5 Summary of Assessed Values for Pyefleet Channel Case Study

Category	Rating/Value*	Comments
PRACTICABILITY		
Construction simplicity	Medium	Simple technology but no public vehicle access and remote from mains services.
Operational simplicity	High	Limited operator involvement
Operational reliability	Medium	No restrictions on tidal access with good access to open water but variable shelter.
Long term security	Medium	Potential moderate risk of increased siltation of shore access due to changing estuary characteristics.
COST		
Net Present Value	£370k	
ENVIRONMENT Adverse impacts		
Ecology	Severe	Area designated as Colne Estuary SSSI, East Mersey flats NNR (part), SPA, RAMSAR, cSAC. Significant cumulative direct disturbance of estuarine waterfowl in internationally designated sites (RAMSAR, SPA) from mooring and boat movements. Less significant direct disturbance of estuarine waterfowl during construction, including potentially small loss of intertidal habitat from slipway.
Water quality	Negligible	CEWP Class A, 1996. No water quality impact. 1 pollution incident in period 10/96 - 9/97
Watercourse characteristics	Negligible	No change. Within coastal protection belt.
Landscape & visual amenity	High	Landscape sensitivity high, undeveloped creeks with few boats. Remote setting, within Local Plan designated Countryside Conservation area.
Cultural heritage	Negligible	No recorded heritage features. Minimal excavation during construction; likelihood of discovery of previously undiscovered features negligible.
Coastal recreation & navigation	Low	Slipway and transfer craft storage may necessitate re-routing of sea wall footpath.
Agriculture	Negligible	No agricultural land.
Fisheries	High	Shellfish harvesting area for oysters *C. gigas* and *O. edulis*. Class B from 1/9/99. Colchester Oyster Fishery Ltd site including intertidal depuration facilities in the area.
Community impacts	Low	Few receptors. Small development. Currently no public road access to shore. Increase in traffic movements minor due to small scale and limited facilities.
Resource use	Low	Small development.
ENVIRONMENT Beneficial impacts & opportunities		
None		

* Note a high rating for technical practicability is good, while a high rating for adverse environmental impacts is bad.

+ Beneficial impacts

3.6.2 *Brightlingsea*

Scheme Overview

Brightlingsea is a small, apparently thriving port close to the mouth of the Colne. In Brightlingsea Creek away from the quay, a high density of river moorings has already been established and the town has several chandleries and boatyards to support boating activity.

The waterfront is heavily silted but, with dredging, two sites have some potential for marina development.

- The largely derelict James and Stone shipyard, downstream of the quay.
- The Brightlingsea Boatyard site, upstream of the quay.

James and Stone Site

The slipways, jetties and quay walls of the James and Stone site are silted and dilapidated but onshore there are several large sheds, one relatively new, which appear to be capable of renovation for boat storage and maintenance. The principal difficulty with the site is its size. The water area of 1.5 ha is insufficient for a viable marina and would not justify the infrastructure improvements. However, the opportunity exists to extend 200m to the west, in front of the boating lake, and provide, in total, berths for up to 450 boats. The extended area would probably need a degree of wave protection, such as a floating breakwater or wavescreen.

The primary components of the development may include:

- 700m of sheet piled quay wall to enable dredging to 2m below Chart Datum
- Pontoon berths for 450 boats
- Boat lift out dock
- Facilities building
- Floating breakwater.

Brightlingsea Boatyard

To the east of the port there is a frontage of some 300m which, if dredged, could accommodate about 180 boat berths. Part of the foreshore has been reclaimed and would provide sufficient area for a viable marina or boatyard operation, albeit on a relatively small scale.

The primary components of the development may include:

- 350m of sheet piling to enable a basin dredged to 1.0m below Chart Datum
- Pontoon berths for 180 boats
- Surfacing of foreshore area for car parking
- New administration and facilities building.

Both developments were considered feasible and of comparable merit for assessment. The scheme comprising an extension to the James and Stone site was selected for assessment for the Brightlingsea case study area. Changes to the assessment for the Brightlingsea Boatyard development have been noted where appropriate.

Technical Practicability

Civil Engineering

Neither scheme is considered to pose any technical difficulty.

Reliability / Security

Both schemes are in relatively sheltered locations with access to deep water. However, both schemes would be susceptible to siltation, as are any dredged pockets in the banks of an estuary.

Economic Viability

Capital Costs

Construction costs are estimated as:

- James & Stone site (450 berth) £5.5 million
- Brightlingsea Boatyard site (180 berths) £2.3 million

Operating Costs

Annual operating costs based on a 350 berth marina, with full security, manned 24 hours a day, employing ten full time staff and two casual staff in the summer are estimated at £1,400 per berth.

The Brightlingsea schemes are considered to be particularly at risk to silting and could lose depth at 0.5m per year. The areas would need to be dredged at least every other year to command top berthing rates. Dredging costs have been estimated pro rata on berthing area to be:

- James and Stone site £130,000 pa (450 berths)
- Brightlingsea Boatyard site £50,000 pa (180 berths)

Revenue Generated

Enquiries were made at a number of east coast marinas, with varying degrees of access, to give an indication of current berthing fees for 10m long boats. A top quality marina, in a good location, with all-tide access would generate annual revenue of £2,200 per berth (inc VAT).

Table 3.6 Costs for Brightlingsea Case Study (James and Stone Site)

CAPEX (Total Q3 2000)	£5,500k
OPEX (annual average)	£760k
Revenue (annual)	£650k
Net Present Value (20 years @ 6%)	-£6,300k

Net present value for the Brightlingsea Boatyard site was calculated as -£2,600k.

Environmental Impact

Construction

Construction activities specific to marina development at the James and Stone site would generally be moderate, reflecting the developed waterfront and local environmental sensitivities. The James and Stone site is part of Brightlingsea conservation area although impact on landscape and visual amenity has been assessed as low adverse during construction.

Noise, dust and traffic during construction would be moderate with many residential and recreational receptors. The extended area beside the James and Stone site is part of the area nationally designated for the conservation of estuarine waterfowl, Colne Estuary SSSI.

The entrance to Brightlingsea Creek, including the James and Stone site is designated as a shellfish harvesting area for mussels. The shellfishery is of poor quality, Class C from 1/9/99, and unlikely to be exploited.

Resource use would be moderate with materials from the largely derelict James and Stone site to be removed. Dredged sediment from the former shipyard is likely to be of low level contamination and would require monitoring to assess its status prior to disposal of dredgings.

Brightlingsea Boatyard is not designated as SSSI or a shellfish harvesting area, and is outside Brightlingsea conservation area. Fisheries and community impacts during construction would be less significant.

Operation

Operational impacts would generally be related to boat movements including during maintenance dredging. The most significant potential impacts would be estuarine waterfowl disturbance in Colne Estuary SSSI and the adjacent Brightlingsea NNR (outer harbour), SPA, RAMSAR and cSAC, although the more heavily used area by birds is upstream in the river.

The urban nature and potentially popular visitor location of Brightlingsea would lead to a moderate increase in traffic movements, with access difficulties for towing vehicles in the narrow and congested streets behind the waterfront.

There is the potential for long term landscape/townscape benefits from the redevelopment of the area. This assumes a high quality design that provides greater access to the waterfront. There would also be a recreational benefit from improvements in boating facilities on Brightlingsea waterfront.

Table 3.7 □□ Summary of Assessed Values for Brightlingsea Case Study

Category	Rating/Value*	Comments
PRACTICABILITY		
Construction simplicity	High	Proven technology being applied in a sheltered location with good road access.
Operational simplicity	Medium	Conventional medium sized marina operation.
Operational reliability	High	No tidal or weather restrictions on access; close to open water; susceptible to siltation.
Long term security	Medium	Moderate risk of increased siltation due to changing estuarine characteristics.
COST		
Net Present Value	-£6,300k	
ENVIRONMENT Adverse impacts		
Ecology	Medium	Area designated as Colne Estuary SSSI; adjacent to Brighlingsea NNR (outer harbour), SPA, RAMSAR, cSAC. Secondary bird disturbance. Loss of currently developed intertidal habitat.
Water quality	Negligible	CEWP Class A 1996. No water quality impact. 2 pollution incidents in period 10/96 - 9/97
Watercourse characteristics	Low	Minor change in resuspension/deposition patterns in creek. Land liable to flood (Local Plan).
Landscape & visual amenity	Medium	Landscape sensitivities Moderate/Low at developed waterside and Very Sensitive within Creek. High density of residential and recreational receptors. Local Plan designated special landscape area. beyond urban area.
Cultural heritage	Low	Loss of one locally designated anti-tank obstacle, already listed as destroyed. There are four Listed Buildings adjacent to the James and Stone site which would not be impacted by development. Minor excavation during construction; discovery of previously undiscovered features low.
Coastal recreation & navigation	Low	EU designated Brightlingsea bathing water nearby: Achieved guideline standards in 1996, 1997 and 1998; achieved mandatory standards in 1995 and 1999. Beach huts. Caravan and camp site nearby. Perhaps reduction/relocation of dinghy launching/storage area.
Agriculture	Negligible	No agricultural land.
Fisheries	Medium	Entrance to Brightlingsea harbour, including James & Stone site designated as shellfish harvesting area for mussels. Class C from 1/9/99.
Community impacts	Medium	Moderate noise, dust and traffic during construction. Moderate during operation from increase in traffic movements due to large number of berths and potentially popular visitor location. Many receptors adjacent.
Resource use	Medium	Some material to be removed. Sediment likely to be of low level contamination (subject to monitoring).
ENVIRONMENT Beneficial impacts & opportunities		
Recreation	+	Boating. Secondary improvement in existing facilities.
Landscape & visual amenity	+	Given sympathetic design would be moderate improvement on partially derelict waterfront.

* Note a high rating for technical practicability is good, while a high rating for adverse environmental impacts is bad.

+ Beneficial impacts

3.6.3 *Hythe*

Scheme Overview

The Hythe is the former port area of Colchester which is no longer in use as a quay. The King Edward Quay on the west bank of the port area has been largely re-developed as an industrial estate, none of the occupants of which appear to need a waterfront location. The east bank is currently undeveloped although land further back is under development for housing. The upstream limit of the Hythe for boating is restricted by the A134 road bridge.

The Hythe is 12km from the open sea and would require substantial regeneration before it became an attractive destination for boaters. The current speed restriction of five knots in the upper estuary and the restricted tidal access to the Hythe would severely hinder yacht access. Whilst it would be feasible for the site to become a centre for powerboats, perhaps with a dry berthing facility whereby boats are stored onshore and lifted into the water on demand, this might not be considered compatible with the present ambience of the middle reaches of the tidal Colne.

The King Edward Quay is heavily silted, with perhaps only a metre of water at the Quay on Mean High Water Springs.

The Colne Barrier, some 4km downstream, is more or less at the limit of low water navigation and, therefore, access to any development of the Hythe is bound to be constrained by the tide.

Enhancement may be achieved by impounding water at just below Mean High Water Springs (MHWS) combined with dredging to a level of 1.9m above Chart Datum, giving an opportunity for boating at all states of the tide. Incorporating a gate in the impounding structure would be necessary to maintain the flood discharge capacity but would have the added benefit of enabling sea-going yachts to gain access to the basin at high tide. This would open up the area to visiting yachts and vessels of special interest.

The primary components of the development may include:

- Barrier immediately downstream of the industrialised area, incorporating flood control sluices and a boat channel for use at high water, to impound water at just below MHWS.
- 300m of visitors pontoon at one or more of the redundant quays.
- Dredging to a general level of 1.9m above Chart Datum.

Technical Practicability

Civil Engineering

The engineering of the impounding structure would require no special innovation but the construction phase would need to maintain the freshwater discharge channel and it would, therefore, be necessary to construct it in two stages.

The feasibility of the scheme would depend upon:

- Water quality issues relating to a number of outfalls upstream of the proposed barrier.
- Possible contamination of the silt leading to difficulty in disposal of the dredgings.
- Flood control issues, to guarantee no increase in flood risk in Colchester.

It is understood that a broadly similar proposal has already been incorporated in the Colne Harbour Urban Design Framework.

Reliability/Security

Access from the sea would be limited to 1 to 2 hours around each high water period. There would be a low risk of access being denied due to gate operation failure of the new barrier gate to open or the existing Colne surge barrier being closed. Use for watersport/recreation with an immersion risk (eg canoeing) would be dependent on the water quality issues being resolved.

Economic Viability

Capital Costs

The estimated capital cost is £3.5 million predominantly related to the water control structure construction and associated studies. This would rise significantly if the silt is found to be contaminated or if the cost of improving water quality is borne by the scheme.

Operating Costs

It is considered that the Hythe moorings would require a full time "harbour master" and lock operators for at least daylight hours, seven days a week in summer. Annual operating costs of £150,000 including £85,000 salaries and wages are suggested.

If a barrier is constructed across the river to retain water at the Hythe maintenance dredging may be difficult because a vessel of the size required may not be able to transit the lock. Annual siltation rates might be 0.3m pa, and the annual cost of dredging could be £100,000.

Revenue Generated

Enquiries were made at a number of east coast marinas, with varying degrees of access, to give an indication of current berthing fees for 10m long boats. A marina with very restricted access (high water ± 2 hours) at distance from the sea would generate annual revenue of £1,100 per berth (inc VAT).

Table 3.8 Costs for Hythe Case Study

CAPEX (Total Q3 2000)	£3,500k
OPEX (annual average)	£250k
Revenue (annual)	£18k
Net Present Value (20 years @ 6%)	-£5,700k

Environmental Impact

Construction

Construction activities would be focused on the barrier and lock immediately downstream of the industrialised area of the Hythe and the secondary impacts of impounding river water. A significant amount of dredging would be required, the dredgings are likely to be contaminated by previous industrial activities and discharges from existing outfalls. Impoundment would result in changes in river characteristics with potential downstream impacts on sediment deposition patterns, flow patterns and salinity profile of the estuary. Upstream impacts would result from the creation of a body of standing/slow flowing water.

Several outfalls discharge to the section of river which would impounded. Water quality would be required to be within acceptable limits for boating, and possibly secondary use of the standing water area for potential immersion sports eg canoeing. To facilitate this and reduce the risk of pollution incidents, several outfalls would need to be diverted to discharge downstream of the barrier or sources of pollution eliminated.

The dredging of anoxic, possibly contaminated sediment and improvement in water quality in the standing water area would be to the benefit of wildlife. Given sympathetic design, the overall development would be major visual improvement on the current industrial waterfront.

Operation

Operational impacts would generally be related to boat movements although it is likely that these would be in low numbers due to the restricted number of moorings in the development.

There is the potential for direct disturbance of important species of estuarine waterfowl at internationally designated sites (RAMSAR, SPA) from boat movements particularly in the very sensitive and constrained middle reaches of the estuary. Although boat movements would be concentrated around the period of high water, a small number of unpowered boats are unlikely to have a greater than moderate impact on bird communities.

There would be recreation benefit from secondary leisure developments at the Hythe waterfront.

Table 3.9 □□ Summary of Assessed Values for Hythe Case Study

Category	Rating/Value*	Comments
PRACTICABILITY		
Construction simplicity	Medium	Proven technology of barrier and lock gate with reasonable access.
Operational simplicity	Low	Operator required to control, operate and maintain lock.
Operational reliability	Low	Sheltered but very long way from open water and with very limited tidal access.
Long term security	Medium	Risk of estuarine changes causing further reduction in tidal access.
COST		
Net Present Value	-£5,700k	
ENVIRONMENT Adverse impacts		
Ecology	Medium	No nationally designated wildlife sites on or adjacent. Channel is SINC. Potential for direct disturbance of estuarine waterfowl at internationally designated sites (RAMSAR, SPA) from boat movements along middle estuary, particularly at high water.
Water quality	Low	Water quality target RE 3. GQA (chemical) class B in 1998, class C in 1996-1997; GQA (biological) class B in 1996. Possible improvement of poor quality water - mitigated by moving outfalls - therefore residual impact low. Several reported pollution incidents in period 10/96 - 9/97.
Watercourse characteristics	High	Impoundment resulting in change in river characteristics from current. Potential downstream impacts on sediment deposition patterns, flow patterns and salinity profile of estuary. Possible upstream impacts from body of standing/slow flowing water.
Landscape & visual amenity	Negligible	Landscape sensitivity low, tidal river with developed waterside. High density of industrial receptors. Development would improve currently poor visual amenity.
Cultural heritage	Low	Possible damage to locally designated post-medieval wharf, Hythe Quay. Dredging during construction on previously developed site; discovery of previously undiscovered features negligible.
Coastal recreation & navigation	Low	Riverside walk on west side. National cycle network path on east side may require re-routing.
Agriculture	Negligible	No agricultural land.
Fisheries	Low	Designated coarse fishery 1.5km upstream of site. Barrage may impact on fish migration patterns, mitigated to low impact. No shellfish harvesting areas at or adjacent to site.
Community impacts	Low	Regeneration area (Local Plan). Adjacent to employment zone (Local Plan). Low impact compared with current/historic landuse. Increase in traffic movements minor due to small scale.
Resource use	Medium	Land currently probably of low level contamination. Dredged sediments likely to be contaminated.
ENVIRONMENT Beneficial impacts & opportunities		
Recreation	+	Boating (restricted by closure of barrages). Secondary leisure developments.
Landscape (visual)	+	Given sympathetic design, would be major improvement on industrial waterfront.
Ecology	+	Current anoxic mud improved to freshwater pound and associated habitats.

* Note a high rating for technical practicability is good, while a high rating for adverse environmental impacts is bad.

+ Beneficial impacts

3.6.4 *Rowhedge*

Scheme Overview

The Rowhedge case study area comprises the former Associated British Ports (ABP) site and quay downstream of the village. Ships ceased using the quay at Rowhedge in around 1998 and the port area is now used as an entirely road-based container unpacking and redistribution centre. The site is directly across the river from Wivenhoe village.

The quay could not readily be used by small craft as it stands, but with regular dredging and the addition of pontoons could be a small berthing facility with access over most of the tidal cycle. Depending upon the configuration, between 15 and 35 boats might be accommodated.

Consideration might be given to excavating a yacht basin behind the quay wall but the ground level, which was presumably raised above flood level before construction of the Colne Barrier, is high relative to low tide level. It would, therefore, be necessary to include a gate, or even lock, between the basin and the river. The area behind the quay is approximately 2.5 ha. This is sufficient for approximately 200 yacht berths but would leave little land for car parking, winter storage or other marina facilities. This is unlikely to be sufficient to justify the engineering involved. Should the site be developed for housing, consideration might be given to enhancing the house values by including a mooring basin with limited access to the river but this would be beyond the scope of the present study.

A scheme comprising limited pontoon moorings on the existing quay is selected for the Rowhedge case study area.

The primary components of the development may include:

- Pontoon berths for 15 to 35 boats
- Dredging to a general level of 0.5m above Chart Datum, the presumed ruling depth in the channel
- Sanitary facilities.

Technical Practicability

Civil Engineering

Assuming that the existing quay wall has been designed to allow deepening to a similar depth to the present main channel, as one would expect, neither installing pontoons nor excavating a basin behind the wall should present special engineering problems.

Reliability/Security

The site is prone to siltation and will require periodic maintenance dredging from time to time. The site is beyond the limit of all tide access and access would be limited to about eight hours in every twelve, more on neap tides. The site is above the Colne Barrier and, therefore, access will be affected, albeit to a small degree, at times of surge tide when the barrier is closed for flood control purposes.

Economic Viability

Capital Costs

The cost of installing 150m of pontoon with access, dredged to 0.5m above Chart Datum, is estimated to be £140,000, exclusive of any onshore facilities and services but including dredging the berth to the same depth as the main channel.

Operating Costs

It is considered that the Rowhedge moorings would not require full time manning and would instead be administered from another marina or by the Harbourmaster at an annual cost of around £5,000.

The quay is already silting up and maintenance dredging would be required to maintain the depth at greater than the hydraulic regime. Allowing for the removal of 1,000m^3 of silt every five years suggests an annual maintenance dredging cost of £5,000.

Revenue Generated

The selected development would be capable of accommodating 15 boats alongside the pontoon, increasing to about 35 with "rafting" when demand for visitor berths is at its peak.

For the purposes of determining revenues, it has been assumed that five to ten berths are occupied on an annual lease, generating an annual revenue of £5,000 to £10,000. Visitor income would be dependent on the weather, but assuming a monthly average visitor profile from experience of similar sites would suggest approximately 340 visiting boats per year. Assuming an average stay of 1½ nights, and an overnight berthing fee of £10, annual visitor revenue might be £5,160 (inc VAT).

For a small facility, the revenue is heavily dependent on the number of annual leases that are sold and increasing the allocation from five to ten boats would arguably have negligible impact on visitor revenue, and lift the annual revenue from £10,000 to £15,000. An annual revenue of £15,000 was assumed in the cost assessment, but a facility with a relatively high proportion of visitors could be expected to contribute more, pro rata, to local businesses such as general stores, pubs and food outlets.

Table 3.10 Costs for Rowhedge Case Study

CAPEX (Total Q3 2000)	£140k
OPEX (annual average)	£10k
Revenue (annual)	£15k
Net Present Value (20 years @ 6%)	-£79k

Environmental Impact

Construction

Construction activities, including dredging, would generally be small in scale and cause minor, local impacts.

Although the site is adjacent to Colne Estuary SSSI (Roman River) there would be low construction impacts on ecology and loss of a small area of currently developed intertidal habitat. Given sympathetic design, the overall development would be a moderate visual improvement on the current industrial waterfront.

Operation

There is the potential for direct disturbance of important species of estuarine waterfowl at internationally designated sites (RAMSAR, SPA) from boat movements particularly in the very sensitive and constrained middle reaches of the estuary. Although boat movements would be concentrated around the period of high water, a small number of unpowered boats are unlikely to have a greater than moderate impact on bird communities. Additional boat movements would be necessary for maintenance dredging of the channel, although their significance would be minor

after appropriate mitigation, including programming works outside the bird nesting and migration seasons.

The change in local flow patterns at pontoons would cause a minor impact on watercourse characteristics and a change in resuspension and deposition patterns in the river.

Table 3.11□□ Summary of Assessed Values for Rowhedge Case Study

Category	Rating/Value*	Comments
PRACTICABILITY		
Construction simplicity	High	Small scale engineering proposed with good access.
Operational simplicity	High	Limited operator involvement
Operational reliability	Medium	No restrictions on use: sheltered; but significant distance from sea.
Long term security	High	Small risk of estuarine changes limiting tidal access.
COST		
Net Present Value	-£79k	
ENVIRONMENT Adverse impacts		
Ecology	Medium	No designated wildlife sites. Adjacent to Colne Estuary SSSI (Roman River). Loss of currently developed intertidal habitat. Direct disturbance of important species of estuarine waterfowl at internationally designated sites (RAMSAR, SPA) from boat movements along middle estuary. Channel is SINC.
Water quality	Negligible	CEWP Class A, 1996. No pollution incidents in period 10/96 - 9/97.
Watercourse characteristics	Low	Change in local flow patterns at pontoons. Change in resuspension/deposition patterns in estuary. Adjacent to coastal protection belt.
Landscape & visual amenity	Low	Industrial land use set in landscape of Moderate Sensitivity. High density of residential receptors including across the river in Wivenhoe. Local Plan designated countryside conservation area and adjacent to Rowhedge village conservation area.
Cultural heritage	Negligible	Dredging during construction on previously developed site; discovery of previously undiscovered features negligible.
Coastal recreation & navigation	Low	Re-routing (or loss) of footpaths through site.
Agriculture	Negligible	No agricultural land.
Fisheries	Negligible	No shellfish harvesting areas at or adjacent to site.
Community impacts	Low	Designated employment zone in Local Plan. Construction noise low and short-lived. Road access for construction is significant problem; improved if material delivery/waste removal undertaken by boat. Increase in traffic movements minor due to small scale and limited facilities. Many receptors adjacent.
Resource use	Low	Small scale development. Dredged material probably has low level of contamination.
ENVIRONMENT Beneficial impacts & opportunities		
Landscape/visual	+	Given suitable landscaping, overall development would be moderate improvement compared with current use including screening with containers.

* Note a high rating for technical practicability is good, while a high rating for adverse environmental impacts is bad.

+ Beneficial impacts

3.6.5 *Fingringhoe Ballast Quay*

Scheme Overview

The Fingringhoe ballast quay case study area comprises part of the currently operational aggregate extraction site including the quay. Fingringhoe ballast quay is the only quay in Colchester Harbour which continues to be used by ships, with small bulk carriers of about 1,000 tonnes exporting aggregates from the site. It is understood that extraction is likely to cease within the next 10 years.

Ordnance Survey maps give the impression that there is an existing area of water behind the flood wall which might readily be used as a marina basin. In reality the ground quickly rises from the river and the body of water is a settling pond for wash water. Access from the river to a landward basin marina would need to be via a lock, with substantial excavation and landscaping necessary for it to be used for yachts after the aggregate extractions cease. This could be undertaken as part of the aggregate extraction. It would probably also be necessary to pump from the river to maintain water levels in the basin.

Advantage might be taken of the existing road access to the water's edge and the quay wall to establish a pontoon berthing facility, on a small scale, possibly in association with increasing the density of the moorings in the river. Mooring density has to date been held at a low level because of the need to maintain a shipping channel and room for vessels to turn. However, the loss of all commercial traffic could in due course permit intensification of river moorings.

In terms of feasibility small scale pontoon berthing, similar to the development selected for assessment at Rowhedge, would be preferred. However, in order to demonstrate the methodology, the development selected for assessment is a locked basin marina located in the current area of aggregate extraction, behind the ballast quay. The primary components of the development may include:

- Excavated basin behind the existing ballast quay
- Lock structure and boat channel for use at high water, to impound water at mid tide
- Pontoon berths for 500 boats
- Dredging to 0.4m above Chart Datum
- Car parking, winter boat storage and marina buildings
- Landscaping.

Changes to the assessment for smaller scale pontoon or swinging mooring developments have been noted where appropriate.

Technical Practicability

Civil Engineering

Construction and operation of the development requires no special technology or innovation. A locked basin would only be practicable if ground levels were reduced by at least 4m or 5m by major earthworks as part of the quarry restoration.

Reliability/Security

Water depths at the existing quay are maintained by the visiting gravel ships, which in effect carry out agitation dredging when manoeuvring. Silting is likely once the ships cease to trade through the quay.

The site is immediately downstream of the Colne Barrier and, therefore, access would be unaffected by closure of the barrier to prevent flooding upstream.

Economic Viability

Capital Costs

Assuming that the marina basin was constructed during aggregate extraction, construction costs are estimated as £3.2 million for a 500 berth marina.

Operating Costs

Annual operating costs based on a 350 berth marina with full security, manned 24 hours a day, employing thirteen full time staff including lock operators, are estimated at £1,600 per berth.

There is no current dredging requirement but without the agitation effect of visiting ships it is considered the berth would silt up. Allowing for the removal of 1,000m^3 of silt every 5 years suggests an annual maintenance dredging cost of £5,000.

Revenue Generated

Enquiries were made at a number of east coast marinas, with varying degrees of access, to give an indication of current berthing fees for 10m long boats. A serviced pontoon berths in a marina with restricted access (high water $\pm$ 3 hours) at distance from the sea would generate annual revenue of £1,800 per berth (inc VAT).

Table 3.12 Costs for Fingringhoe Ballast Quay Case Study

CAPEX (Total Q3 2000)	£3,200k
OPEX (annual average)	£805k
Revenue (annual)	£740k
Net Present Value (20 years @ 6%)	-£3,700k

Environmental Impact

Construction

Assuming most construction activity would be undertaken during aggregate extraction construction impacts related to developing the aggregate pit to a marina basin would be minor, concentrated on the construction of the lock in the quay wall link the boat channel and landward facilities.

There would be no loss of intertidal habitat provided all construction activity is within the current aggregate extraction site.

For smaller boating developments including pontoons on the quay wall or swinging moorings in the main channel construction impacts would be smaller in scale, still with minor impacts.

Given sympathetic design, the overall development would be a moderate visual improvement on the current aggregate extraction and stockpiling on the waterfront.

Operation

Operational impacts would generally be related to boat movements and access to the lock. Additional boat movements would be necessary for maintenance dredging of the lock entrance.

There is the potential for direct disturbance of important species of estuarine waterfowl at internationally designated sites (RAMSAR, SPA) from boat movements particularly in the very sensitive and constrained middle reaches of the estuary. The channel adjacent to the site is designated internationally as SPA, RAMSAR and cSAC, and nationally designated as Colne Estuary SSSI. Landwards, the site is adjacent to Fingringhoe Wick County Wildlife Site. The high number of unpowered boats were assessed as having a high impact on bird communities. Additional boat movements would be necessary for maintenance dredging of the channel, although their significance would be minor after appropriate mitigation including timing outside the bird nesting season. The large scale of the development would increase local traffic movements although road access is good and impacts would be reduced to minor with suitable mitigation.

The change in local flow patterns at the marina entrance would cause a moderate impact on watercourse characteristics and a change in sediment resuspension and deposition patterns in the river.

Operational impacts would be similar for smaller boating developments including pontoons on the quay wall or swinging moorings in the main channel. With fewer boat movements disturbance of estuarine waterfowl would be reduced to moderate. However the developments would be less screened by landscaping, possibly with a higher landscape and visual impact.

Table 3.13□□ Summary of Assessed Values for Fingringhoe Ballast Quay Case Study

Category	Rating/Value*	Comments
PRACTICABILITY		
Construction simplicity	High	Small scale engineering proposed, outside of existing aggregate extraction operations, with good access.
Operational simplicity	High	Limited operator involvement
Operational reliability	Medium	No restrictions on use; sheltered; but significant distance from sea.
Long term security	High	Small risk of estuarine changes limiting tidal access.
COST		
Net Present Value	-£3,700k	
ENVIRONMENT Adverse impacts		
Ecology	High	Area designated as SPA, RAMSAR, cSAC, Colne Estuary SSSI. Adjacent to Fingringhoe Wick County Wildlife Site. Channel is SINC. Significant direct disturbance of important species of estuarine waterfowl at internationally designated sites (RAMSAR, SPA) from boat movements along middle estuary. No loss of intertidal habitat provided all construction activity within current gravel extraction area.
Water quality	Negligible	CEWP Class A, 96. No pollution incidents in period 10/96 - 9/97.
Watercourse characteristics	Medium	Change in local flow patterns at marina entrance. Change in resuspension/deposition patterns in estuary. Within coastal protection belt.
Landscape & visual amenity	Low	Landscape sensitivity low, tidal river with developed waterside. Medium density of residential receptors including across the river in Wivenhoe. Local Plan designated countryside conservation area. Improvement from current land uses for aggregate extraction.
Cultural heritage	Negligible	Excavation associated with current aggregate extraction; discovery of previously undiscovered features negligible.
Coastal recreation & navigation	Negligible	Currently no recreational opportunities.
Agriculture	Negligible	No agricultural land.
Fisheries	Negligible	No shellfish harvesting areas at or adjacent to site.
Community impacts	Low	Negligible impact compared with current land use. Reduction in dust and noise. Most construction activity would be undertaken during gravel extraction. Low impact during operation from increase in traffic movements due to large number of berths.
Resource use	Low	Most construction activity would be undertaken during gravel extraction.
ENVIRONMENT Beneficial impacts & opportunities		
Landscape & visual amenity	+	Given suitable landscaping, would improve visual amenity compared with current use, including stockpiled aggregate.

* Note a high rating for technical practicability is good, while a high rating for adverse environmental impacts is bad.

+ Beneficial impacts

3.6.6 *Seawick*

Scheme Overview

Seawick is a coastal resort, approximately 3km east of the Colne Estuary, on the south facing coast. The coastline is protected by a "hard engineering" sea wall of, variously, sheet piles or concrete revetment. Rock groynes have been constructed to control the shingle beach with some rock placed against selected lengths of the sea wall itself to reduce wave overtopping into the low lying hinterland. The land behind the sea wall is below high tide level and occupied by extensive mobile home parks and, at the western end, holiday bungalows.

Being an open-coast site, any kind of marina or mooring development would require the construction of breakwaters to create a new harbour. This new harbour might contain the marina itself, as at, for instance, Brighton Marina, or simply give shelter to a narrow entrance, possibly a lock, to a basin behind the sea wall. This approach was adopted at Eastbourne in the Sovereign Harbour development.

There is undeveloped, agricultural land behind the sea-wall immediately to the west of Seawick Holiday Village which would lend itself to a marina development, possibly with an associated residential, entertainment or retail development. However this land is nationally designated for nature conservation and access from the sea would require a channel of at least 200m through the coastal salt marsh and a further 500m to reach deep water offshore. In addition the channel would require breakwaters and a lock to control the water level in the marina basin. A basin behind the sea wall has been rejected because of the large landtake and risk to the integrity of coastal defences. A coastal marina or harbour seaward of the sea wall is selected for assessment, located immediately to the west of the 'fishtail' rock groyne, near the Martello Tower.

The primary components of the development may include:

- Entrance in about 2m minimum of water, approximately 500m from the shore
- Rock breakwaters, forming a fully tidal harbour of approximately 16 ha which would be dredged to 2.5m below Chart Datum
- A minimum of 700 berths (average 10m boats)
- An area of approximately 6 ha reclaimed with material dredged from the basin, to accommodate car parking, winter boat storage and marina buildings.

Technical Practicability

Civil Engineering

The location is afforded considerable protection from waves by the Dengie peninsula to the southwest and the Buxey Sand to the south. The breakwater structures are, therefore, well within the limits of practicability for rubble mound structures. Armourstones are likely to need to be less than 10 tonnes and would, therefore, be widely available. Delivery by sea from quarries in Scandinavia (eg Larvik), as has been adopted for many sea defence and harbour schemes, would be entirely practicable.

The reclamation of back-up land using the dredged sea-bed material would be subject to the sea-bed comprising suitable sands and gravels, but would be no more technically challenging than any coastal engineering project.

Reliability/ Security

It is not practicable, at this site, to provide an all weather harbour with sufficient depth at the entrance for it to be a genuine " harbour of refuge". The entrance would need to be at least 1km from the shore and construction costs would be prohibitive. At low tide, swells could make the entrance of the proposed scheme untenable but in calm weather or offshore winds the vast majority of cruising yachts would have access at all states of the tide.

The presence of the offshore banks means that breaking seas in the entrance, which would be particularly dangerous for small craft, would be unlikely. Locating the harbour at the existing "fishtail" groyne, which is presumed to be a barrier to littoral drift, should mean that beach management and high rates of beach loss due to interruption of the natural shingle supply would not be an issue. The formation of a sand bar in the entrance, particularly after southerly storms cannot be ruled out at this stage.

Economic Viability

Capital Costs

The estimated construction cost, including pontoons and engineering fees is £10 million.

Operating Costs

Annual operating costs based on a 350 berth marina with full security, manned 24 hours a day, employing ten full time staff and two casual staff in summer are estimated at £1,400 per berth.

Assuming that a trailer suction dredger is mobilised every three years to clear sand from the approaches the annual cost will be £20,000.

Revenue Generated

Enquiries were made at a number of east coast marinas, with varying degrees of access, to give an indication of current berthing fees for 10m long boats. A top quality marina, in a good location, with all-tide access would generate annual revenue of £2,200 per berth (inc VAT). Potential tidal restrictions at Seawick are estimated to reduce annual revenue to 80% of premium rates.

Table 3.14 Costs for Seawick Case Study

CAPEX (Total Q3 2000)	£10,000k
OPEX (annual average)	£1,000k
Revenue (annual)	£1,000k
Net Present Value (20 years @ 6%)	-£9,300k

Environmental Impact

Construction

Construction activities specific to marina development would generally be large scale with long term residual impacts. Although the landscape sensitivity of the area is moderate partially-developed estuary mouth, and designated as a landscape improvement area in the Local Plan, the development would be out of setting with current land uses, with many residential and recreational receptors.

The scale of construction activities would necessitate major resource use including the importing of materials and significant earthworks. Impacts on the local community would be high, with significant noise, dust and traffic nuisance throughout the construction period.

Intertidal and subtidal development over a large area could cause a moderate impact on littoral drift of sediment, potentially altering beach profile. The site was chosen to coincide with an existing barrier to littoral drift and modelling would be required to determine the scale and significance of this impact. The large landtake would cause a permanent loss of beach and beach access for recreation including angling and non-designated habitats. Additional angling opportunities could be provided on the new breakwaters. Construction would probably necessitate re-routing of the popular sea wall footpath and cause permanent restricted access along the beach.

Even with mitigation, construction activity would be likely to cause moderate disturbance of estuarine waterfowl at nearby internationally and nationally designated sites. The western part of the case study area, outside the assessed marina location, is designated as Colne Estuary SSSI, SPA, Ramsar and cSAC. Colne Point NNR/Wildlife Site is directly adjacent to the assessed marina location.

Operation

Impacts from operation of the marina would be minor in comparison with construction impacts. Impacts associated with boat movements, access to the marina and maintenance dredging would be minor. Human-related impacts would be minor as boating activity would largely be off-shore and within setting. The large scale of the development would increase local traffic movements although road access is good and impacts would be reduced to minor with suitable mitigation. Unlike boat movements within the river, impacts on sensitive wildlife would be minor to negligible.

Table 3.15□□ Summary of Assessed Values for Seawick Case Study

Category	Rating/Value*	Comments
PRACTICABILITY		
Construction simplicity	Medium	No innovative technology required but construction of breakwater may be disrupted by adverse weather. Temporary works to give road access to site minor in relation to project size.
Operational simplicity	Medium	Conventional large scale marina operation without lock.
Operational reliability	Medium	Access may occasionally be denied in strong onshore winds; small risk of storms creating sand bar in entrance.
Long term security	Medium	Minor risk of changes in coastal geomorphology within project life of 50 years.
COST		
Net Present Value	-£9,300k	
ENVIRONMENT Adverse impacts		
Ecology	Medium	Western part of area is designated as Colne Estuary SSSI, SPA and Ramsar, cSAC. Colne Point NNR/County Wildlife Site adjacent to site. Moderate direct disturbance of estuarine waterfowl at internationally designated sites (RAMSAR, SPA) from mitigated construction activity. Direct loss of intertidal habitat.
Water quality	Negligible	No water quality designation as site is non-estuarine. 1 pollution incident in period 10/96 - 9/97.
Watercourse characteristics	Medium	Change in littoral drift of sediment patterns from structures in intertidal. Land liable to flood (Local Plan). Within coastal protection belt.
Landscape & visual amenity	Medium	Landscape of Moderate sensitivity. High density of residential and recreational receptors. Local Plan designated landscape improvement area but large scale development would be out of setting.
Cultural heritage	Low	Loss of locally designated eroded oyster pits on shore. Loss of three or more locally designated pillboxes, already listed as destroyed. The Martello Tower in Seawick village, is a Listed Building and Scheduled Ancient Monument; it would not be impacted by development. Excavation during construction mostly on mobile substrate; discovery of previously undiscovered features low.
Coastal recreation & navigation	High	Major disruption during construction and minor permanent loss of beach, beach access, re-routing of sea-wall footpath, loss of angling.
Agriculture	Negligible	No agricultural land.
Fisheries	Low	Adjacent to shellfish harvesting area for mussels. Class C from 1/9/99.
Community impacts	High	Significant construction work. Long term construction with noise, dust and traffic impacts on local community. Low during operation from increase in traffic movements due to large number of berths.
Resource use	High	Significant earthworks including importing of materials.
ENVIRONMENT Beneficial impacts & opportunities		
Coastal recreation & navigation	+	Possible development of angling opportunities on new breakwaters

* Note a high rating for technical practicability is good, while a high rating for adverse environmental impacts is bad.

+ Beneficial impacts

3.7 Cumulative Impacts of Boating Activity on Estuarine Waterfowl

3.7.1 Background

There is a high probability that a number of developments will take place within the Colne Estuary either simultaneously or over an extended period of time. Focussing on discrete developments may give an inaccurate assessment of the true impact on the Estuary. Cumulative impacts are therefore considered to be a critically important issue, but one which cannot easily be addressed. Cumulative impacts could arise for a number of reasons:

- Cumulative impacts resulting from simultaneous construction activities
- Cumulative operational impacts resulting from an increase in boating and boating related activity in the Estuary
- Cumulative impacts resulting from boating and other activities taking place on the Colne e.g. fisheries, mineral working, housing development.

There are a number of environmental issues for which cumulative impacts will be of concern, e.g. birds, the landscape, residential amenity (e.g. noise), water quality, fisheries, the transport network. All these issues will have a different capacity to accommodate an increase in development/boating activity. Defining the environmental 'carrying capacity' of the Colne Estuary is beyond the scope of this study and would in any case be too complex to accurately define, and possibly too nebulous to apply.

The issue that is considered to be key importance is disturbance to birds. The study has therefore briefly examined the potential cumulative impact on birds from boating activity, and made recommendations for research that would assist in providing further evidence on this issue.

3.7.2 Disturbance to Birds

Species of estuarine waterfowl, and individuals within species, vary greatly in their susceptibility to disturbance and this susceptibility is likely to vary with the type of disturbance, age, season, weather and the degree of previous exposure (habituation).

The immediate impact of disturbance is for birds to fly away. In response they could either (i) increase their energy intake at their present (disturbed) feeding site when undisturbed or (ii) move to alternative feeding sites. Any overall reduction in their energy intake as a result of these responses will have an effect on their energy budgets and hence survival. Moving to alternative feeding sites may reduce their feeding rate with consequences for the population of that species and competition with other species. Breeding and roosting estuarine waterfowl also face sometimes serious disturbance from recreation, although timing is limited to the relevant season, varying between species.

Particularly susceptible periods to disturbance in the annual cycle of feeding estuarine waterfowl are cold winters (for non-migrants) when feeding opportunities are reduced, and during spring and autumn when energy requirements are high. During spring and early summer direct disturbance of breeding and roosting estuarine waterfowl can impact on reproductive success and offspring survival.

As reported in Section 2.2, local knowledge and appropriate data on preferred and sensitive areas for estuarine waterfowl breeding, roosting and feeding in the estuary is of good quality (see also Figure 2.1). Similarly there are suitable data of good quality for relevant species and population size and their annual patterns. The national and international status of the relevant species is known, as is the significance of the Colne Estuary populations. The impact of disturbance on several specific species is known, although the significance of boat movements of different types is less frequently reported. Additional desk study literature review would better inform the significance of boat disturbance on the estuarine waterfowl species reported in the Colne Estuary.

As noted in Appendix B, no definitive survey of the number and type of leisure boating craft has ever been undertaken for the Colne Estuary. A desk based survey of boating activity in the Colne Estuary was undertaken for this study. Neither of the Harbour Authorities at Colchester or Brightlingsea nor any of the clubs/associations approached have detailed information. However, it was evident from the survey that sailing dominates the local leisure boating scene, with a number of other activities recorded including wind surfing, water-skiing and other power boat use.

It is recommended that further survey work, possibly including field observation of boating activities in the estuary, is undertaken to provide a baseline from which to assess the significance of changes in boating in the estuary from additional boat movements from new developments. This would preferably include:

- Number of boat movements at a number of key locations
- Frequency of certain boat types (eg dinghies, yachts, power boats, jet skis)
- Weekly and annual variation in boat movements
- Pattern of boat movements at key sensitive locations (eg Pyefleet Channel, Brightlingsea Creek).

Disturbance to estuarine waders is generally highly localised in time and space, with recreational disturbance usually concentrated in the upper shore and restricted mainly to daylight hours, especially weekends in summer. The recommended additional survey would confirm this for the Colne Estuary.

The current impacts and additional cumulative effects of powered and unpowered boating on estuarine waterfowl populations is insufficiently understood. However, of particular concern are activities in proximity to nesting and breeding birds, together with feeding and roosting areas, particularly during spring and autumn migration. There are a number of areas that have particular relevance, as detailed on Figure 2.1.

Recommendations for development opportunities are therefore as previously stated, notably:

- Upstream of Langanhoe Point, small scale and low disturbance activity would be most appropriate. This would limit large-scale movement of boats in the very sensitive and constrained middle reaches of the estuary.

- Encroachment up channels (especially Pyefleet and Brightlingsea) or onto intertidal should be discouraged.

Turning to the case studies assessed above, certain developments selected for assessment and other feasible developments would be appropriate both in isolation and combination. All of the small scale developments upstream of Langanhoe Point - Hythe basin, Rowhedge pontoons and Fingringhoe pontoons, are considered independently to be of sufficiently small scale to minimise disturbance in the middle estuary. Combinations of these are also likely to be of sufficiently small scale, subject to more detailed information on the number and nature of boating activities currently in the middle and upper estuary. The large scale locked basin marina at Fingringhoe is considered to significantly increase the number of boating movements in the middle estuary and, subject to more detailed information, therefore significantly increase the potential for and significance of bird disturbance in the middle estuary.

As previously discussed, increased boating activities in Pyefleet Channel should be discouraged and further development is considered unsuitable.

Development at either the James & Stone shipyard or Brightlingsea Boatyard would have minimal impact on bird disturbance in the constrained creek mouth and the lower estuary. Provided boating activities were discouraged in the upper reaches of Brightlingsea Creek, moderate to large scale developments, as assessed should, subject to more detailed information on the number and nature of boating activities currently in the creek mouth and lower estuary, minimise disturbance in the lower estuary.

Marina or harbour development at Seawick, as assessed, is neutral in terms of bird disturbance in the Colne Estuary, in isolation or combination with other developments. Subject to mitigated construction activity, only a short length of sensitive sand/shingle habitat would be lost, and there would be no direct disturbance of estuarine waterfowl in the indicative sensitive wildlife areas.

4 ENVIRONMENTAL IMPACT ASSESSMENT GUIDANCE

4.1 Background

4.1.1 Environmental Impact Assessment

Environmental impact assessment (EIA) is a technique for ensuring that the likely effects of new development on the environment are fully understood and taken into account in the design and decision making process. The outcome of an EIA is an environmental statement (ES) that is submitted with a planning application. The Town and Country Planning (Environmental Impact Assessment) Regulations 1999 (S.I. 1999 No. 293) were required because Council Directive 97/11/EC extended the range of development covered by EIA, and made a number of small but important changes to EIA procedures. In addition, the applications for harbour revision orders may require an EIA under the Harbour Works (Environmental Impact Assessment) Regulations 1999.

The Essex Guide to Environmental Impact Assessment (Essex County Council, 2000) provides a comprehensive guide to EIA procedures. It is not the intention to repeat the information provided in this publication. Rather, this section provides a brief background to how the EIA procedures apply to leisure boating developments. It also identifies the scope of issues that are likely to be of relevance to leisure boating development.

4.1.2 Other Forms of Environmental Reporting

Whether a formal EIA is required or not, there may be a need for the applicant to supply environmental information with the application. The scope of environmental issues identified in Section 4.5 of this report may also be applicable to planning applications not requiring an EIA. In addition, developments that may compromise the conservation objectives of a European Site (cSAC, SPA) may require an 'Appropriate Assessment' under the Conservation (Natural Habitats, &C.) Regulations 1994.

4.1.3 Mixed-Use Developments

Marinas and other leisure boating facilities may often be associated with other land uses such as housing or commercial development. In preparing this guidance, it is assumed that leisure boating will be the dominant element.

4.2 Screening Procedures

4.2.1 *Introduction*

Screening is the process of deciding whether a development proposal should be subject to EIA. Formal procedures for screening are set out in the 1999 Regulations and further guidance is provided in Circular 02/99. Reference should be made to Part 3 of the *Essex Guide to Environmental Impact Assessment*. A brief summary of how the Screening procedures apply to leisure boating is provided below.

The full list of Projects that are subject to EIA are identified in Schedule 1 and Schedule 2 of the EIA Regulations. If a project matches the description contained in Schedule 1 then EIA would be mandatory. Projects identified in Schedule 2 may require EIA depending on the likelihood of significant effects on the environment. Schedule 2 sets out criteria and thresholds for determining whether a project should subject to screening. Irrespective of the criteria and thresholds, all developments listed in Schedule 2 that are located in a 'Sensitive Area' must be subject to screening. Sensitive Areas applicable to the Colne Estuary include:

- Sites of Special Scientific Interest, and any consultation areas around them (where these have been notified to the local planning authority).
- Land to which Nature Conservation Orders apply.
- Special Protection Areas, Special Areas of Conservation, Ramsar Convention site, National Nature Reserves.
- Scheduled Ancient Monuments.

4.2.2 *Types of Development that may Require EIA*

There are no Schedule 1 developments specifically relating to leisure boating. Schedule 2, column 1 makes reference to 'marinas'. With respect to marinas, the following rules apply:

- All applications for marinas within a Sensitive Area must be subject to screening.
- Outside Sensitive Areas, only marinas where the area enclosed by water exceeds 1000m^2 should be subject to screening.

No definition of marina is provided and it is therefore left to the discretion of the local planning authority to determine whether a development constitutes a marina. The definition is important as it determines what type of leisure boating development can be subject to EIA. The Phase 1 report provided a number of definitions. The National Yacht Harbours Association (1975) state that:

'A marina is a facility for the berthing of pleasure craft providing direct walkway access to each boat, an adequate depth of water at all times, car parking, toilet facilities, services and other amenities.'

While the Royal Yachting Association (1997) adopts a slightly different approach:

'A marina berth is defined as a pontoon, quay or river berth where it is possible to walk ashore at all states of the tide.'

In summary, the main elements of a marina are:

- A yacht harbour which provides weather protection, a system of berths with access walkways and means of maintaining adequate depths of water such as by dredged basin and/or an impounding system and entrance gate.
- Shore facilities for direct services to users including car parks, water, electricity, toilets, refuse collection and attendance, administration and security.
- Facilities for indirect services including those for boat maintenance, spares, fuel and boat sales.
- Marinas may also include or have associated with them: ancillary facilities including yacht club, catering facilities, hotel, shopping, recreational facilities and residential developments.

4.2.3 *Other Types of Development*

Boating development is often associated with other types of development such as housing and other leisure activities. Table 4.1 provides an extract from Schedule 2 of the possible developments which could have relationship with leisure boating.

Table 4.1 Other Types of Development that may Require an EIA

Description of Development	Screening Thresholds
Construction of harbours and port installations including fishing harbours (unless included in Schedule 1)	The area of the works exceeds 1 hectare
Inland-waterway construction not included in Schedule 1, canalisation and flood-relief works	The area of the works exceeds 1 hectare.
Dams and other installations designed to hold water or store it on a long-term basis (unless included in Schedule 1)	The area of the works exceeds 1 hectare.
Urban development projects, including the construction of shopping centres and car parks, sports stadiums, leisure centres and multiplex cinemas	The area of the development exceeds 0.5 hectare.
Holiday villages and hotel complexes outside urban areas and associated developments	The area of the development exceeds 0.5 hectare.
Theme parks	The area of the development exceeds 0.5 hectare.
Any change or extension to a development listed in Schedules 1 or 2, where that development is authorised, executed, or in the process of being executed and the changes may have significant adverse impacts on the development.	Refer to relevant criteria in Schedules 1 and 2.

4.2.4 *Screening Procedures*

The determination of whether or not EIA is required for a particular development can take place at a number of different stages:

- The developer may voluntarily decide to submit an environmental statement (ES) with the planning application.

- The developer may request a screening opinion from the LPA.
- The LPA may determine that EIA is required following the receipt of a planning application.
- The Secretary of State may determine that EIA is required for an application called in for determination.
- The Secretary of State may direct that EIA is required at any stage prior to the granting of consent for particular development.

The Government strongly advises developers to consult LPAs as early as possible in cases where there is any question of EIA being required. This is an informal procedure and it is important to note that any informal view from an authority has no legally-binding effect. This may be done before any planning application has been submitted or after.

Developers can formalise this process by requesting a screening opinion from the LPA. The developer's request should include:

- A plan indicating the proposed location of the development.
- A brief description of the nature and purpose of the proposal.
- A summary of the possible environmental effects, giving a broad indication of their likely scale.

Circular 02/99 'Environmental Assessment' implies that the documentation required to support a request for a screening opinion should be brief and provide a summary of the key issues to be considered. Nevertheless, a certain amount of preparatory work will be required to define the works involved and to identify the type and scale of possible environmental effects. The information supplied should be sufficient to enable the LPA to form a judgement and give a ruling on the need for EIA.

In making the screening opinion determination, the LPA must take into account the relevant 'selection criteria' in the Regulations. These criteria comprise:

- Characteristics of the development (size, cumulation with other projects, use of natural resources, production of waste, pollution and nuisances, and risk of accidents).

- Location of development (environmental sensitivity of geographical areas likely to be affected by development, including existing land use; the relative abundance, quality and regenerative capacity of natural resources in the area; and the absorption capacity of the natural environment).

- Characteristics of the potential impact (extent; transfrontier nature, magnitude and complexity; probability; and duration, frequency and reversibility).

The LPA must adopt its screening opinion within three weeks of receiving a request, although this period can be extended if the authority and developer so agree in writing. Subsequently, the procedure is as follows:

- The LPA adopts a screening opinion, stating the full reasons for their conclusion (a copy is made available for public inspection).

- If the LPA's opinion is that EIA is required and the developer disagrees, or where an authority fails to adopt an opinion in the agreed period, the developer may request the Secretary of State to make a screening direction.

- The Secretary of State makes a screening direction within three weeks, or such longer period as may reasonably be required.

The decision of the Secretary of State is final, but can be subject to judicial review.

4.2.5 *Determining Whether an EIA is required for a Marina*

Indicative thresholds and criteria to assist LPAs in determining whether Schedule 2 development requires an EIA are provided in DETR Circular 02/99 'Environmental Impact Assessment'. With respect to marina developments Paragraph A32 states:

'In assessing whether significant effects are likely, particular regard should be had to any wider impacts on natural coastal processes outside the site, as well as the potential noise and traffic generation. EIA is more likely to be required for large new marinas, for example where the proposal is for more than 300 berths (seawater site) or 100 berths (freshwater site). EIA is unlikely to be required where the development is located solely within an existing dock or basin.'

It is stressed that the thresholds mentioned above are indicative. The key test is whether significant effects on the environment are likely to occur. Paragraph 37 of Circular 02/99 is of particular relevance to the Colne:

'Special considerations apply to Sites of Special Scientific Interest (SSSIs), especially those which are also international conservation sites. In practice, the likely environmental effects of Schedule 2 development will often be such as to require EIA if it is to be located in or close to such sites, including classified and potential Special Protection Areas (SPAs) under the Wild Birds Directive (79/404); designated and candidate Special Areas of Conservation (SACs) under the Habitats Directive (92/43); and Ramsar sites (wetlands of international importance).'

4.3 Preparation and Content of an ES

4.3.1 Information to be Included Within an ES

The EIA Regulations set out the information to be included in an ES (see Table 4.2). The nature and extent of information to be included within a particular ES will, however, be dependent on the findings of the scoping process, as outlined below.

4.3.2 Scoping

The new EIA Regulations include a provision to seek a formal opinion from the LPA on the scope of an ES, known as a 'scoping opinion'. This provision is not compulsory, but allows the developer to be clear about what the LPA considers the main effects of the development are likely to be and the topics on which the ES should focus. The request for a scoping opinion can be made at the same time as the screening opinion and a similar level of information can be provided. The LPA should adopt a scoping opinion within 5 weeks of receiving a request.

Alternatively, or in addition to seeking a scoping opinion from the LPA, it is considered good practice for the developer to prepare a 'scoping report' which should be submitted to the LPA and key consultees in draft for comment. Whilst there is no obligation on the developer to consult anyone about the information to be included in an ES, it is considered good practice to undertake early consultation with statutory and non-statutory bodies who have an interest in any proposals. Interested parties can then be invited at an early stage to identify any concerns they may have with the proposed development, identify the most environmentally favourable site and sources of and gaps in information.

Table 4.2 Information to be Included in an Environmental Statement

This is a reproduction of Schedule 4 of the EIA Regulations (paragraphs 81-85 and 91).

Part 1

1. Description of the development, including in particular:
   a) a description of the physical characteristics of the whole development and the landuse requirements during the construction and operational phases
   b) a description of the main characteristics of the production processes, for instance, nature and quantity of the materials used
   c) an estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation etc) resulting from the operation of the proposed development.
2. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.
3. A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors.
4. A description of the likely significant effect of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:
   a) the existence of the development
   b) the use of natural resources
   c) the emission of pollutants, the creation of nuisances and the elimination of waste
   and the description by the applicant of the forecasting methods used to assess the effects on the environment.
5. A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse affects on the environment.
6. A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.
7. An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.

Part 2

1. A description of the development comprising information on the site, design and size of the development.
2. A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects.
3. The data required to identify and assess the main effects which the development is likely to have on the environment.
4. An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.
5. A non-technical summary of the information provided under paragraphs 1 to 4 of this Part.

The nature and extent of scoping reports vary but may include the following details:

- Need for scheme
- Scheme description including construction and operational activities
- Review of environmental baseline information
- Identification of potential key environmental impacts
- Proposals for methods of impact assessment.

Section 4.6 below provides an explanation of the issues that are likely to be of relevance to a leisure boating development.

4.3.3 *Environmental Impact Assessment Process*

The procedures for undertaking EIAs are now well established following their incorporation in planning legislation in 1988. Procedures are described in Circular 02/99 and cover consultation requirements, publicity and procedures for public inquiries. The preparation of ESs is covered in the *Essex Guide to Environmental Impact Assessment* and Appendix D of that document contains a comprehensive bibliography of other EIA publications.

Good practice guidance emphasises that EIA should be an integral part of the design process, whereby proposals are reviewed iteratively to reduce as far as practicable any significant environmental effects. This can be done by amending designs and by introducing mitigation measures, but relies for its success on close working between planning, environmental and engineering specialists. Given suitable design and mitigation, many of the potential effects may be alleviated or minimised.

The assessment should encompass:

- The potential sources of direct and indirect significant impacts which may occur during the construction phase.

- The potential sources of direct and indirect significant impacts which may occur in the operational phase after the development is completed.

- The cumulative effects of capital and maintenance dredging in the area.

Appropriate mitigation work for the proposed scheme should be established for those significant impacts which have been identified. Requests and advice from consultees and other interested bodies with regard to the implementation of mitigation measures should be taken into consideration throughout the environmental assessment process.

Residual effects (those effects of the scheme which cannot be mitigated) should be identified and their significance determined. The significance of residual impacts is usually given a rating for each of the impacts identified. Usual practice is to categorise the impacts into the range severe, major, moderate, minor and negligible. The ratings are developed taking into account the magnitude/scale of the impact and the sensitivity of the receptor. For example, a small impact on an internationally designated species may have the same rating as a large impact on a commonly occurring species.

4.4 Additional Legislation Pertaining to Environmental Assessment

4.4.1 Appropriate Assessment

There are a number of other European Community Directives which require the assessment of effects on the environment. For example, developments which will affect a Special Protection Area (SPA) designated under the Wild Birds Directive (79/409/EEC) or Special Area of Conservation (SAC) designated under the Habitats Directive (92/43/EEC), must be subject to an assessment of those effects in accordance with the Conservation (Natural Habitats & C.) Regulations 1994 (SI 1994/2716).

The Habitats Directive requires licensing and consenting authorities to consider all aspects of a project which they are being asked to approve. If the proposed scheme under consideration is likely to damage an SSSI, a candidate or designated SAC or a proposed or designated SPA, English Nature are required to be consulted. It is possible that English Nature may request that an "appropriate assessment" should be undertaken in accordance with Regulation 48 of the Conservation (Natural Habitats, & C.) Regulations 1994. The "appropriate assessment" should comprise a review of the potential impact which the proposed development may have on the areas of nature conservation interest in the study area.

These requirements and EIA are all independent of each other in that the requirement for one does not mean another automatically applies. The individual tests set out in each system still apply. However, there are clearly some links between them and developers will benefit from identifying the different assessments required at an early stage and co-ordinating them to minimise undesirable duplication where more than one regime applies. Advice on the links between the EIA system and the requirements of the Habitats Regulations is offered in PPG9 (Nature Conservation).

4.4.2 *Harbour Works*

Because of the process prescribed by the Harbours Act 1964 (harbour revision orders), works within harbours are projects outside general planning control, and are therefore not governed by the Town and Country Planning EIA Regulations. However, under the Harbour Works (Environmental Impact Assessment) Regulations 1999 similar procedures apply. EIA may be required with an application for a harbour revision order. The Secretary of State shall take into account the environmental information submitted when deciding whether to confirm the order.

4.5 Scope of Issues to be Covered in an EIA of Marina Type Development

This issues covered in any EIA will depend on the characteristics of both the development and the receiving environment. This section provides a generic overview of key issues that may need to be addressed for a marina type development (other land uses such as commercial or housing development have not been considered). In summary, these issues include:

- Hydrodynamics
- Geomorphology
- Water Quality
- Landscape and Visual Impacts (also Townscape)
- Ecology – sub-divided as necessary
- Traffic and Transport
- Amenity and Recreation
- Waste Management and Contaminated Land
- Noise and Vibration
- Air Quality
- Cultural Heritage
- Socio-economics or Community Effects

In addition to the above, planning policy should be reviewed.

The potential effects are divided into three categories, which represent the three major groups of receptors that may be affected by the proposal, namely:

- Effects on the Water Environment and Ecology
- Effects on Land and Resources
- Effects on Human Activities.

For each of the groupings, the potential short term and long term effects of the development are identified.

4.5.1 *Effects on the Water Environment and Ecology*

A summary of potential short and long term effects which may arise are detailed in Table 4.3.

Table 4.3 Potential Short and Long Term Effects on the Water Environment and Ecology

Issues	Sources of Effect	Potential Effects
Short Term Effects		
Tidal flows and velocities Shoreline and coastal structure	Dredging of sea bed Breakwater siting Ship and boat wash	- Changed tidal flow, wave generation and current patterns - Changed stability of the bed/banks - Deposition /siltation on the bed/banks - Resuspension of contaminants - Changed suspended sediment load - Changed bed morphology - Changed channel size
Water quality	Dredging of sea bed Accidental spillage of pollutants	- Changed turbidity - Change in oxygen content - Potential pollution from accidental spillages
Ecology and nature conservation	Dredging and change of sea bed characteristics & increased turbidity Noise disturbance	- Altered habitat in terrestrial, intertidal/subtidal areas - Change in invertebrate, plant, and animal biomass - Disturbance/loss of sensitive species - Effects on bird breeding, roosting and feeding - Effects on fish spawning and behaviour
Long Term Effects		
Tidal flows and velocities	Loss of intertidal/subtidal area	- Changed tidal flow, wave generation and current patterns - Changed sea bed morphology

Shoreline and coastal structure	Change to local sea bed bathymetry Ship and boat wash Maintenance dredging	- Changed stability of the sea bed - Degradation/erosion of the sea bed - Changed suspended sediment load - Resuspension/redistribution of contaminated sediments
Water quality	Altered tidal flows and sea bed dynamics	- Changed turbidity and increased suspended solids - Change in oxygen content - Change in nutrient balance
Ecology and nature conservation	Direct land take and loss of area Indirect loss of aquatic habitats through changes to bed structure or smothering	- Lost and/or altered habitats - Change in species diversity and composition - Loss of sensitive species - Effects on the integrity of internationally, nationally, or locally designated nature conservation sites

Short term influences on the coastal system will largely result from construction activities such as dredging and placing of aggregates. These may result in resuspension of sediments and affect the depositional/erosional characteristics of the local or regional area. Studies should be undertaken to identify the most environmentally sensitive dredging and aggregate placing methods, and the phasing of construction works to minimise influences on sensitive receptors such as migrating birds, fish and shellfish. Likely dispersion of the dredging plume should be established from reference to existing information on similar projects and through reference to the detailed tidal studies (see below).

Long term effects of the boating development on flow patterns and velocities, both locally and regionally, should be established through detailed assessment of the existing conditions and the potential for disruption or change to these. Changes to the shoreline and coastal structure as a result of the development are closely linked to the hydrodynamic characteristics, and these studies should be undertaken in conjunction with the tidal flow assessment.

Studies should include assessment of any potential for changes to tidal and sub-tidal morphological characteristics and should establish the likely scale of any changes. Having undertaken the initial assessment, the need for more detailed modelling should be appraised against the magnitude of any influences found.

Water quality is largely dictated by tidal flows and the interaction of wastewater and/or riverine inputs to the system. Having established the likely influence of the development on flows and sub-tidal structure, an assessment of the likely implications for discharges to the area should be undertaken. As above, if found to be necessary, further more detailed assessment and potentially modelling should be specified.

Ecological effects will primarily be related to the potential for loss of sensitive or important habitats, and consequent effects on their communities or species. The above studies on tidal patterns, coastal morphology and water quality should be used to assess the likelihood of potential impacts on both designated and non-designated habitats, communities and species.

4.5.2 *Effects on Land and Resources*

A summary of potential short and long term effects which may arise are detailed in Table 4.4.

Table 4.4 Potential Short and Long Term Effects on Land and Resources

Issues	Sources of Effect	Potential Effects
Short Term Effects		
Waste management and contaminated land	Ground disturbance Disposal of generated wastes Provision of waste facilities on site	- Disruption of potentially contaminated land - Off-site disruption from waste disposal vehicles - Soil and water effects from waste disposal options - Local disruption from sewerage laying
Long Term Effects		
Land use	Loss of land area	- Loss of land value or amenity
Waste management and contaminated land	On site sanitation Runoff from paved areas, including refuelling and maintenance areas	- Pollution of local waterbodies

Short term effects may result from disturbance of potentially contaminated land. A desk study should be undertaken to identify potential historic contaminative uses of the area. If potential for contamination exists, a number of actions should be specified to determine the likely extent of the contamination, and the possibility for disturbance and migration of contaminants during construction. These may include site walkover and monitoring, which will allow prediction of the risks to humans (particularly during construction), controlled waters and construction materials.

Other waste management issues may involve the removal and disposal of dredged material. The various options for disposal should be identified and evaluated, and the most environmentally sustainable option should be established, in line with relevant Duty of Care regulations. The provision of toilet facilities on site for construction workers should help to prevent pollution from this source.

Long term effects relate to the control of site generated wastes. Waste waters generated on site should be limited to surface water runoff from paved areas, that should be subject to suitable Environment Agency discharge consents. Maintenance and refuelling areas should be bunded with the drainage segregated for interception and further treatment as necessary prior to consented discharge. All sewage, including that pumped out from boats should be routed to an appropriate sewerage system for off site treatment.

4.5.3 *Effects on Human Activities*

A summary of potential short and long term effects which may arise are detailed in Table 4.5. Short term effects on human activities focus on the direct implications of construction on the local community. Noise and air quality (dust) effects should be assessed with reference to construction activities, plant to be used and project phasing. Sensitive receptors within the sphere of influence of the development should be identified, and a quantitative assessment made of the likely effects of the various activities, given known noise and dust generation capacities. Many of the potential implications of the development can be mitigated, for instance by specification of low noise plant and the use of noise attenuation hoardings, and the use of dust suppression techniques where applicable.

Table 4.5 Potential Short and Long Term Significant Effects on Human Activities

Issues	Sources of Effect	Potential Effects
Short Term Effect		
Amenity and recreation	Construction activity in study area	- Disruption to public rights of way - Disruption to boating activities
Noise and vibration	Construction traffic, piling and aggregate placement	- Disturbance to local sensitive receptors, including inhabitants and birdlife
Air Quality	Dust generation	- Nuisance to local residents
Cultural heritage	Ground disturbance (see also Landscape and Visual)	- Loss of archaeological features - Discovery of previously unknown features
Socio-economics	Employment opportunities and expenditure on local goods and services Disturbance to local residents Disturbance to local commercial fisheries	- Direct local employment during construction - Local economic benefit from construction workers - Influx of workers and use of local services
Landscape and visual (and Townscape)	Construction activities	- Loss of vegetation and other landscape features - Views of construction works
Traffic	Additional traffic	- Higher traffic flows
Long Term Effects		
Amenity and Recreation	Improved local boating facilities. Access to coastal footpaths and seawalls	- Increased number of berths and facilities to encourage greater use of area - Potential navigation/safety issues from increased boat numbers/movements - Change to public rights of way
Noise and vibration	Operation of facility, and vessels. Traffic noise.	- Limited for sailing vessels. Motor boats and jet skis have potential for significant noise disturbance.
Air quality	None unless significant traffic is generated	

Cultural heritage	Presence of development	- Visual impacts on sites of heritage interest e.g. conservation area
Socio-economics	Employment opportunities and expenditure on local goods and services Effects on other activities such as fisheries. Inmigration.	- Direct local employment - Indirect local economic benefit from increased visitors - Change in community character due to immigration.
Landscape and visual amenity	Presence of development in sensitive location	- Alteration in landscape character - Views of site and boating activity in scenic area - Nuisance from increased lighting
Traffic	Additional recreational and business traffic	- Higher traffic flows and disruption locally - Increased demand for car parking

Implications for amenity and recreation in the area should be assessed. Any recreational uses that are identified during the baseline environmental review should be assessed, and the effects of the development on them determined. This may include the effects on navigation of increased numbers of boats and boat movements, and whether this adversely affects other recreational activities. Mitigation measures should be developed to alleviate any problems identified.

Depending on the likelihood of archaeological remains on the site, as determined in the baseline study, a watching brief and/or prescribed methods should be specified during the construction works to allow the identification and removal or protection of remains.

Given the sensitivity of many coastal locations that would be desirable for leisure boating development, the assessment of landscape and visual impacts are likely to be essential for most types of leisure boating development.

An examination should be made of the short and long term employment and economic implications of the scheme, together with the disadvantages to the local community from the influx of construction workers. An assessment may be required to identify the socio-economic impacts of the development during operation of the development.

Traffic generation and the implications on the local roads network should be assessed for both the short term construction phase and long term operation. Construction traffic movements should include import of materials and site workers, and disposal of waste materials. Phasing of the development should be studied to minimise traffic effects at key periods.

4.5.4 *Cumulative Effects of Local Developments*

In line with current and emerging EIA legislation, it may be necessary to assess cumulative effects of a development in combination with other development proposals in the vicinity. Information should be sought from the LPA on other potential developments, and where information is available on these, the combined effects should be considered. Depending on the nature of other planned developments, key cumulative issues may include navigation, traffic, water quality and ecology. Additional mitigation measures may be required to attenuate potential combined effects. Co-operation between developers over the phasing of construction can be an effective way of ensuring that major activities do not take place simultaneously.

4.5.5 *Monitoring*

Subject to the evaluation of potential environmental effects, and the specification of suitable mitigation measures, it may be necessary to establish a monitoring programme. This may be necessary if the predicted effects could lead to significant problems within the vicinity of the proposed development, and mitigation has been specified to avoid impacts. Monitoring should, therefore, act as a post scheme audit to ensure that mitigation measures are effectively applied.

5 SUMMARY AND RECOMMENDATIONS

5.1 Summary of Key Issues Raised

The study was approached from a number of perspectives including the examination of ecological and landscape sensitivities, the examination of case studies using the multi-criterion assessment methodology and the analysis of the boating market. Key issues identified during the study included:

- The Colne is of very high ecological and landscape value and all development activities must recognise the areas sensitivity. Ecological designations include SPA, cSAC, Ramsar site, NNR and SSSI. Boating activity need not be incompatible with wildlife objectives, however, the area's international importance to birds means that special care must be taken to ensure that boating does not compromise wildlife objectives.

- Cumulative impacts on birds from boating activity is a potentially significant issue. Further research would be required to establish current boating activity and the potential impacts on bird behaviour.

- According to the market analysis (Appendix B), leisure boating is a key element of the local economy. As many as 350 people are directly employed in the leisure boating industry, predominantly in Brightlingsea and West Mersea. This level of employment equates to approximately £5 million in salaries and wages. Significant indirect and multiplier effects have also been identified.

- The market analysis indicates that there is a very high demand for berthing spaces in West Mersea and Brightlingsea. National trends indicate a preference for marina type developments which provide continuous access to boats and to the water. Motorboats are increasingly popular.

- The boating facilities on the Colne predominately consist of floating pontoons and swing moorings. In comparison to other parts of the UK, facilities are generally very basic. It is possible that failure to provide improved facilities could reduce activity on the Colne and damage the leisure boating economy.

- Marina type developments are unlikely to be economically viable in isolation. Developers are likely to use the marina facility to create an attractive environment, stimulate activity in the area and raise property values. In

many circumstances the combination of marina and shoreside residential, retail and other developments is likely to result in significant environmental impacts. The methodology would need to be extended to test the feasibility of such developments. Proposals of this nature should be subject to EIA and, possibly, Appropriate Assessment.

- The multi-criterion methodology has been used to examine a number of theoretical leisure boating developments. It is considered that the methodology is sufficiently robust to provide a rational means of determining the types of development that are feasible on the basis of technical practicability, economics, and environmental impact. The results can therefore be used to develop strategic planning guidance for leisure boating development. The methods can also be used to examine planning applications against the assessment criteria. However, the acceptability of planning applications will depend on compatibility with development plan policies and may be strongly influenced by public opinion.

5.2 Conclusions of Assessment of Case Studies

Within the case study areas a number of types of development were proposed for assessment. These varied from small scale marginal pontoon developments at Rowhedge and Fingringhoe to swinging mooring developments in Pyefleet Channel and a variety of basin developments. Basin developments varied in number of berths and tidal access. Where full tidal access is not practicable, an impounded body of water behind a barrage was considered for the Hythe and locked basins at Fingringhoe and Rowhedge. Where full tidal access is practicable, a dredged pocket marina was considered for Pyefleet Channel, quayside development for Brightlingsea at two locations, and a harbour marina for Seawick.

A dredged pocket marina in the Pyefleet Channel was considered expensive to maintain and to have prohibitive environmental impacts. This development was not assessed in detail. Due to restrictive land availability and lock access difficulties, a locked basin marina at Rowhedge was not assessed in detail. Of the remaining developments, a single scheme was selected at each case study area to enable multi-criterion assessment to be demonstrated. The developments as assessed are listed in Table 5.1. The assessed ratings for each criteria for the selected developments are summarised in Table 5.2.

Table 5.1 Developments Subject to Multi-Criterion Assessment

Case study area	Selected development	No. berths
Pyefleet Channel	Swinging moorings	100
Brightlingsea	Quayside marina development	450
Hythe	Impounded waterbody behind barrage	20
Rowhedge	Marginal pontoons	15-35
Fingringhoe ballast quay	Locked basin marina	500
Seawick	Harbour marina	700

In terms of practicability, all the assessed developments were feasible. Development at the Hythe was assessed adversely due to the long distance upstream and the need for a locked basin and tidal requirements limiting access. Feasibility of the Hythe development is also subject to the resolution of possible water quality problems, the possibility of dredgings being contaminated and potential flood control issues. The locked basin development at Fingringhoe would have significant practicability issues associated with the large scale earthworks required to lower ground level if these were outside existing aggregate extraction operations. All other developments are without particular practicability constraints.

Several of the assessed developments on their own would require moderate to large scale construction activity but all could give added value to associated developments, either existing or new. While this may be entirely practicable, such developments entail greater capital expenditure. The construction of a harbour marina and harbour entrance channel at Seawick would contribute significantly to a total estimated construction cost of £10 million. Similarly a barrage and lock at the Hythe, lock at Fingringhoe, and sheet piled quay at Brightlingsea would contribute significantly to total estimated construction costs of several million pounds. Notwithstanding maintenance dredging costs, a significant proportion of the revenue generation potential of each berth would be spent on operating costs required to command top berthing fees. None of these developments would create a return on investment over a twenty year period.

Smaller scale developments, requiring less construction activity, such as swinging moorings and marginal pontoons, as assessed for Pyefleet Channel and Rowhedge respectively, have lower construction and operational costs. The revenue generated from such mooring would be lower per berth reflecting the poorer quality of facilities.

The assessed schemes do not include revenue that could be generated from other activities or land uses. Leisure boating facilities may often be associated with housing or commercial development. These other land uses can radically change the economic viability of a development proposal. Several of the assessed schemes, including Brightlingsea, may only be feasible if constructed as part of a larger urban development. This does not mean to say that all boating development must contain other land uses; where there is a natural harbour and little civil engineering is required, and where high demand can command premium berthing charges, boating facilities alone may be economically viable. Each scheme must be assessed on its merits.

The type and significance of adverse environmental impacts varies with the location and scale of the assessed developments. The high sensitivity character area at Pyefleet Channel has the highest impact ratings of the assessed developments in terms of conservation-orientated criteria; ecology, landscape and visual amenity, and fisheries. The lower sensitivity character areas (due to their existing industrial nature) at Brightlingsea, Hythe and Rowhedge would be subject to a wider range of impacts but to a lesser extent.

Large areas of the Colne Estuary are designated for nature conservation, most notably the intertidal mud flats which are important feeding grounds for large numbers of estuarine waterfowl, including several protected species. Designation includes variously, international; SPA, RAMSAR, cSAC, and national; NNR, SSSI. Direct bird disturbance may occur during construction activities, eg at Seawick, or during boat movements. The potential significance of disturbance of important species of breeding, roosting and feeding estuarine waterfowl in such a highly designated estuary from construction activities and boat movements is great, although as noted in Section 5.3 additional studies are recommended to validate the assessments undertaken. Boat movements are assessed as particularly significant in the Pyefleet Channel and in the middle estuary where the intertidal mud flats are closer to the navigable channel. This is potentially significant for developments in the upper-middle and upper estuary, notably Fingringhoe, Rowhedge and Hythe, where the number of boat movements would influence the severity of the impact between medium and high. The rating for swing moorings in Pyefleet Channel is severe, reflecting the location of the moorings in an internationally designated creek. For this reason alone development of this scale in Pyefleet Channel is assessed as unsuitable.

Other criteria are rated high on a more development-specific basis. A harbour marina at Seawick was assessed as having high impact on coastal recreation and navigation, community and resource use. These ratings reflect the large scale of the development, which was considered as out of setting with the current land use.

A barrage at The Hythe was also assessed as having high impacts on watercourse characteristics, due to impacts associated with impounding of river water behind a barrage. With suitable mitigation, impacts on water quality from potentially polluting discharges to the waterbody would be reduced to low. The waterbody would also potentially offer benefits in terms of recreation, ecology and, arguably, visual amenity.

Pontoons at Rowhedge and a locked basin at Fingringhoe were both assessed favourably for adverse environmental impacts. Assuming that the marina basin and earthworks associated with landscaping were completed during aggregate extraction, construction impacts at Fingringhoe would be low in scale. Given suitable landscaping, operational impacts would be restricted to boat movements and occasional dredging of the channel. The small scale of the development at Rowhedge precludes significant construction impacts and would reduce the significance of boat movements and operational impacts.

Development of a marina at the James and Stone site in Brightlingsea would cause a low to medium impact on most environmental criteria due to the developed nature of the quay in an estuary of considerable environmental sensitivity. In principle, boating developments in Brightlingsea are considered to be in setting with current land uses, and the use of a previously developed site tempers the significance of adverse environmental impacts. This statement largely depends on the design of the development, which if sensitively implemented could improve townscape character. Development at the Brightlingsea Boatyard site would provide fewer berths at a higher net present value, with similar practicability and adverse environmental criteria ratings.

It must be stressed that the methodology is strategic and quantitative, being based on professional judgement, not detailed analysis. Any major development should be subject to EIA to establish more accurately the implications of proposals and their acceptability.

Table 5.2 □□ Summary of Assessed Values

Category	Pyefleet Channel	Brightlingsea	Hythe	Rowhedge	Fingringhoe	Seawick
PRACTICABILITY						
Construction simplicity	Medium	High	Medium	High	High	Medium
Operational simplicity	High	Medium	Low	High	High	Medium
Operational reliability	Medium	High	Low	Medium	Medium	Medium
Long term security	Medium	Medium	Medium	High	High	Medium
COST						
Net Present Value	£370k	-£6,300k	-£5,700k	-£79k	-£3,700k	-£9,300k
ENVIRONMENT: Adverse impacts						
Ecology	Severe	Medium	Medium	Medium	High	Medium
Water quality	Negligible	Negligible	Low	Negligible	Negligible	Negligible
Watercourse characteristics	Negligible	Low	High	Low	Medium	Medium
Landscape & visual amenity	High	Medium	Negligible	Low	Low	Medium
Cultural heritage	Negligible	Low	Low	Negligible	Negligible	Low
Coastal recreation & navigation	Low	Low	Low	Low	Negligible	High
Agriculture	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible
Fisheries	High	Medium	Low	Negligible	Negligible	Low
Community impacts	Low	Medium	Low	Low	Low	High
Resource use	Low	Medium	Medium	Low	Low	High
ENVIRONMENT: Beneficial impacts & opportunities						
	None	Recreation Landscape	Recreation Landscape Ecology	Landscape	Landscape	Recreation

5.3 Recommendations for Further Studies

To confirm and reinforce the conclusions of this study further studies are recommended.

5.3.1 Review of Multi-Criterion Assessment

In order for the assessment methodology to be effective, it is essential that the it is widely accepted by stakeholders, and adaptable to a variety of scenarios within the Colne, and estuaries elsewhere. Consultations with local authority officers within Colchester Borough Council, Tendring District Council and Essex County Council are to be carried out by the Essex Estuaries Initiative to seek agreement on its use and refine it where necessary.

The results represent the first application of the multi-criterion assessment. It is likely that the methodology will need to be adapted where it is to be used to assess developments encompassing non-boating activities such as housing.

5.3.2 Consultations and Development Briefs

The acceptability of development on the Colne will often depend on local considerations including design characteristics and public opinion. The methodology is strategic in nature and does not include these issues within its scope. There is a need for the local planning authorities to prepare development briefs/design guidance for areas likely to be subject to development. Such guidance should ideally be prepared in consultation with interested organisations (eg the Colne Estuary Advisory Group), and the public to establish their views on the appropriate scale and type of development.

5.3.3 Cumulative Impacts on Birds from Boating Activity

It is recommended that further survey work, possibly including field observation of boating activities in the estuary, is undertaken to provide a baseline from which to assess the significance of changes in boating in the estuary from additional boat movements from new developments. This would preferably include:

- Number of boat movements at a number of key locations
- Frequency of certain boat types (eg dinghies, yachts, power boats, jet skis)
- Weekly and annual variation in boat movements

- Pattern of boat movements at key sensitive locations (eg Pyefleet Channel, Brightlingsea Creek).

As general rule, disturbance to estuarine waders is highly localised in time and space, with recreational disturbance usually concentrated in the upper shore and restricted mainly to daylight hours, especially weekends in summer. The recommended additional survey would confirm this for the Colne Estuary.

The current impacts and additional cumulative effects of powered and unpowered boating on estuarine waterfowl populations is insufficiently understood. However, of particular concern are activities in proximity to nesting and breeding birds, together with feeding and roosting areas, particularly during spring and autumn migration. There are a number of areas that have particular relevance, as detailed on Figure 2.1.

5.4 Policy Recommendations

The multi-criterion-assessment methodology can be used to assist in developing leisure boating policies for the Colne. However, the methodology would need to be applied to a wider range of development scenarios to provide sufficient evidence to justify policy recommendations. Furthermore, for mixed-use developments, policies would need to be formulated in combination with other policy areas, particularly housing. On the basis of the case studies examined, the following policies should be considered by the Councils:

1. The Councils should recognise the importance of leisure boating for the local economy and community and, in principle, encourage the provision of appropriate new facilities subject to strict environmental criteria.

2. Where applicable, all planning applications for new leisure boating facilities should be subject to environmental impact assessment (EIA) procedures and, where they are likely to have a significant effect on a European Site (SPA, cSAC), Appropriate Assessment.

3. Small to medium size marinas should be encouraged on the developed watersides of Brightlingsea and the Hythe in Colchester. Strict criteria regarding environmental impact (with particular emphasis on ecology and landscape) and the type and scale of shoreside development should be applied to these marina developments. The Councils should produce updated development briefs for these sites in consultation with the local community.

4. Planning applications for marina development or the intensive use of floating pontoons or swing moorings should normally be refused in undeveloped areas of the Mersea Quarters and the Colne, including its Creeks.

5. The small scale installation of floating pontoons in tidal waters or of fixed or swinging moorings should be restricted to areas where such facilities already exist, or on sites previously developed including:

   - Fringrinhoe Quay
   - Rowhedge ABP Site
   - Wivenhoe.

6. The increased use of fore and aft moorings should be encouraged to increase density in existing channel locations, although further encroachment up channels (especially Pyefleet, Strood and Brightlingsea) or onto intertidal areas should be discouraged.

APPENDIX A - STUDY BRIEF

Terms of Reference

The contract will be undertaken in two phases. The first phase is clearly defined, but the detailed elements of the second phase, especially as regards new studies will emerge from the findings of Phase I. The tasks are listed below.

Phase I tasks:

1.1 Undertake an information audit, to identify and catalogue relevant scientific literature and reports, market studies, planning reports and studies, and other relevant information. The local authorities, English Nature, Environment Agency, CEFAS, Universities and others should be approached in this regard.

1.2 Select a set of common assessment criteria (working closely with the project management team) to facilitate comparative analysis of the case studies (of three key sites – see phase II), and also to facilitate the development of generic guidance for the assessment of applications for development. *[These criteria will include a number of generic criteria which will be developed by the steering group of the MAYA project to facilitate comparative analysis between the six pilot projects].*

1.3 Prepare a market analysis of the leisure boating sector, considering current and future demand for marinas, floating pontoons, mud berths and moorings (drying and deepwater), and related shoreside facilities (e.g. chandleries, boat building and repairs, housing). The report should consider UK and European trends, and make recommendations regarding opportunities and constraints for such development in the Colne Estuary (including Brightlingsea Creek and Mersea Quarters). In undertaking this study the consultants should conduct stakeholder interviews so as to incorporate a wide range of views.

1.4 An analysis of the information identified in the audit (task 1.1) should be undertaken, so as to identify new studies for phase II of the project.

Phase II tasks:

2.1 Undertake new studies to provide the best possible level of baseline data which can be assembled within the constraints of the budget. These studies are likely to be concerned with (but are not limited to):

- Economic impacts
- Environmental impacts (especially relating to bird disturbance and hydrodynamic effects)
- Impacts on landscape - urban and rural
- Additional market research

2.2 Hold (with the assistance of the project management team) a stakeholder workshop (comprising primarily policy-makers and regulators) to provide a broad-based input to the main report.

The Main Report will:

- Test the common assessment criteria selected under task 1.2, as regards their suitability as a framework for the assessment of applications for development (and taking into account questions of 'cumulative impact')

- Make recommendations for the case study sites (two 'brownfield' and one 'wilderness' location) regarding boating-related development, taking into consideration the likely positive and negative impacts of transport, economic, social, land-use and environmental, and other pertinent issues, and the desirability or otherwise of producing supplementary planning guidance

- Make recommendations regarding new policies for sustainable leisure boating-related development on the Colne Estuary (including Brightlingsea Creek and Mersea Quarters)

- Set out guidelines for planners and developers regarding the appropriate content and level of detail of environmental appraisals in connection with leisure boating-related development in the Colne Estuary (including Brightlingsea Creek and Mersea Quarters).

APPENDIX B - BORTING MARKET ANALYSIS

PREFACE

This section was prepared by Dr Arwel Edwards and follows the work undertaken in Phase 1. Four issues are addressed:

- The amount and type of boating activity taking place in the Colne Estuary
- The direct and indirect impacts on the local economy from leisure boating
- The potential socio-economic impacts (both positive and negative) that could result from future developments (or indeed, not developing new boating facilities)
- To further consider the recommendations made in Phase 1 for promoting new activities in the Estuary such as heritage themes and events.

6 MARKET ANALYSIS

'Our river is less developed, less commercialised than others, and this lends it a special charm. It adds to the particular character of the sailing, and attracts local people on a limited budget. They cope with the mud, and in general prefer to manage without marina berths, water-taxis and shoreside facilities.

Some growth is envisageable, but major capital schemes like impounding the river, or creating a substantial marina would need to be weighed against the likely return, and in the light of better facilities close by. There is scope for a number of schemes which would help people make the best of the resource we do have, and attract more visitors than come here already. Such schemes might not pay their way simply in terms of a return on capital. But in adding to the character of the riverside scene, they would add to the quality of life and general prosperity and well-being of the riverside communities.'

Alan Tyne (Wivenhoe
Sailing Club, July 1997)

6.1 The Amount and Type of Leisure Boating Activity Taking Place in the Colne Estuary

Five aspects are considered, namely the numbers and types of leisure boating craft, leisure boating moorings, leisure boat launchings, leisure boating organisations, and

instructional activities. Information on these was obtained from a wide range of documentary, questionnaire and field survey sources.

6.1.1 *Numbers and Types of Leisure Boating Craft*

No definitive surveys of either of these categories for the UK as a whole, its regions or individual estuaries have ever been undertaken. The only known information was provided in Section 4.3.2 of the Phase 1 Interim Report.

Neither of the Harbour Authorities at Colchester or Brightlingsea or any of the clubs/associations noted below in Section 4.2.4 have any information on this topic.

Illustrative of this problem concerning the availability, quality and reliability of data is a recent report of the British Marine Industries Federation (BMIF). *The 1998 British Watersports Survey*, conducted by Market Research Solutions, involved telephone interviews of over 7,000 people, analysis of the responses and provision of a report of 120 pages to BMIF. This report has been rejected by BMIF as unsound and statistically questionable and has been withdrawn. A new study is now being contemplated by BMIF.

6.1.2 *Numbers and Types of Leisure Boat Moorings*

Information for England, Scotland and Wales was provided in the Phase I Report (Section 4.3.2) and key data from this are provided below to provide a context for the Colne Estuary and the County of Essex (Table 1.1).

Table 6.1 Coastal Moorings by Type in England, Scotland and Wales, 1981 and 1991

Category	1981		1991		Change	1981-1991
	Number	% Total	Number	% Total	Number	% Change
Buoy	41,411	67.7	29,811	43.3	-11,600	-28.0
Quay	1,744	2.9	3,186	4.6	+1,442	+82.7
Marina	14,137	23.1	26,429	38.3	+12,292	+86.9
Other	3,875	6.3	9,490	13.8	+5,615	+144.9
TOTAL	**61,167**	**100**	**68,916**	**100**	**+7,749**	**+12.7**

(Source: Phase I Report, Table 1.6

Table 1.2 gives the known data for the Colne Etuary and the County of Essex for three years; no post 1993 data are available.

Table 6.2 Coastal Moorings in the Colne Estuary and the County of Essex 1981, 1987 and 1993

Estimated number of moorings												
	1981		1987		1993		Totals 1981		Totals 1987		Totals 1993	
Category	WM	B'Sea	WM	B'Sea	WM	B'Sea	WM + BS	Essex	WM + BS	Essex	WM + BS	Essex
Pile & Buoy	225	168	240	190	150	200	393	4972	430	4160	350	4491
Quayside	-	-	-	-	-	-	-	150	-	200	-	301
Marina	-	-	-	-	-	-	-	1060	-	1490	-	2285
Pontoon + Other	-	25	-	-	46	200	25	395	-	1805	246	1060
Total	225	193	240	190	196	400	418	6577	430	7655	596	8137

Source: Motor Boat and Yachting, Occasional Supplements; the data for the County of Essex was given in Table 1.7 of the Phase 1 Interim Report.

WM = West Mersea; B'Sea = Brightlingsea

It is evident that the Colne Estuary has a very different pattern of moorings to that of either the County of Essex or of England, Scotland and Wales (Tables 1.1 and 1.2). While there was a growth in numbers of all moorings (+43%) in the estuary, there was a conspicuous absence of the creation of marina moorings between 1981 and 1993, a feature that has continued to the present day. However, there has been some provision of pontoon moorings.

6.1.3 *Leisure Boat Launchings*

Individual clubs/organisations, associations or businesses do not keep any record of launchings and so there is no overall picture for the Estuary, whether by launching site, by type of boat or by time of year. The one exception is provided by the Hardmaster at Brightlingsea waterfront who has provided the following data from April to November 2000:

- 130 season ticket holders (107 residents of Brightlingsea; 23 non-residents)
- 241 boats launched (power 149; dinghy 14; sail 17; hard 61)

6.1.4 *Water Activity Clubs and Associations*

Eighteen water activity clubs/associations/organisations have been identified from documentary and interview sources in the Estuary (Table 1.3) and expanded information is provided in the Appendices.

Table 6.3 Colne Estuary Leisure Boating Water Activity Clubs and Associations

	Club/Organisation	Number of Members or Participants	Types of Boats		
			Sail	Motor	Other
1	Alresford Creek Boat Own Association	ca50	nk	nk	nk
2	Brightlingsea Sailing Club	ca 700	100%	0	0
3	Brightlingsea Power Boat + Waterski Club	ca 60	0	100%	nk
4	British Sub Aqua Club				
	a Colchester Garrison	ca 9	na	na	na
	b. Colchester Leisure Centre	100-120	na	na	na
	c. Medusa	10	na	na	na
	d. Brightlingsea	14	na	na	na
5	Colne Sea Cadets	ca 35	1 pulling boat		
6	Colne Yacht Club	ca 750	0	nk	nk
7	Dabchicks Sailing Club	ca 450	0	95%	<5%
8	Essex CC Youth Services				
	a. Brightlingsea Marine Activities Centre	ca 2,000	18 sail/power boats		
	b. East Mersea Youth Club	ca 40,000 pa	0	nk	nk
9	Essex University				
	a. Sail Club	46	0	nk	nk
	b. Windsurf + Rowing	33	na	na	na
10	J Lawrence Traditional Boat Charter	ca 40-45 persons (6 trips x 7 pax)			
11	N London Sail Ass/N London Youth Sail Trust	ca 240	na	80	20
12	Scouts Offshore	700-800			
13	Scuba 65	ca 70	0	na	na
14	Sea Scounts				
	a. 12th Colchester	ca 40	0	na	na
	b. 17th Colchester	ca 15	0	na	na
	c. 26th Colchester	ca 80 (incl. Venture Scouts)			na
	d. Mersea Island	ca 15	0	na	na
15	West Mersea Windsurf Club	nk	na	na	na

16	West Mersea Yacht Club	980	0	nk	nk
17	Wivenhoe Sailing Club	240*	33	nk	nk
18	Willow Lodge Social + Sailing Club	700	na	na	na

* including family membership (360 individuals in Wivenhoe Sailing Club)

It is evident that sailing dominates the leisure boating scene. The local sailing and yacht clubs (Brightlingsea, Colne, Dabchicks, West Mersea and Wivenhoe) provide venues for usually older and more experienced sailors and users who, unlike those mentioned in the following paragraph, generally own their own vessels. In this context, they have an important social function for boat owners, families and friends not only on a one-to-one basis but also for larger group functions. They provide a contact and information point to the wider leisure boating scene within the UK, and a point of welcome for visiting boats. They also offer training courses (RYA) and practical experience to both young and older people. Finally, they are very important in organising local boating regatta events and in attracting national/international boat racing events which have important financial benefits for the wider community of the Estuary. Unlike a number of yacht/sailing clubs elsewhere, they do not have an associated sub-aqua membership or appear to encourage membership from the participants of power boating, jet-ski or water-ski activities.

While sailing dominates the leisure boating scene there are, nevertheless, a number of other activities including water-skiing, wind-surfing and scuba. The breadth of activities is impressive especially for young people. The Sea Cadets, Sea Scouts, Scouts Offshore, Essex University, and the support of Essex County Council Youth Services (in Brightlingsea and East Mersea) and the North London Sailing Association (formerly Haringay Sailing Association) offer many opportunities to experience a wide range of leisure boating experiences and basic training skills. They provide dinghy and larger sailing vessels (Scouts Offshore have three Oyster 49 sail training vessels, for example) and cover water-skiing, power boating, canoeing and wind-surfing. Here, it is the organisations and not the individuals which own the vessels in which leisure boating takes place. Some of these organisations stay within or in close proximity to the Colne Estuary but Scouts Offshore, for example, sail to the Baltic, Ireland, France, Spain, Portugal and the Mediterranean. At least two of the above, Essex County Council and the North London Sailing Association, have residential facilities for participants.

A number of leisure activities operate on an informal 'ad hoc' basis of membership and do not have club premises. These include Brightlingsea Waterski Club, Scuba 65 and, it is understood, West Mersea Windsurf Club.

There is one seeming anomaly in the above list, namely, Willow Lodge Social and Sailing Club in West Mersea. While a large number of its members have boats or a boating interest, it is primarily a social rather than a sailing club.

6.1.5 *Water-related Instructional Activities*

Water related instructional activities are carried out through a variety of methods, locations and institutions but all have a common pattern of initial theoretical classes followed by practical teaching and learning. The location depends upon the specific activity. The activities of the sub-aqua clubs are centred on swimming pools for theory and initial training classes. These are followed by dives in fresh or salt water bodies, eventually leading to the award of PADI qualifications. Unfortunately, the muddy waters of the Estuary do not lend themselves to local practice. Pulling boat rowing (Sea Scouts) and canoeing takes place on the sheltered waters of the Colne and its tributaries while other rowing, for example sculling, take place on sheltered inland waters.

Leisure boating dominates water activities and hence instruction in the Estuary. These are organised through the sailing/yacht clubs/organisations identified above where a range of accredited courses are taught. Yacht sailing instruction begins with classes on land and moves onto water, at first in the locality but later, as in the case of Scouts Offshore, to more distant places. Two local institutions also offer courses, the Colchester Adult Community College and the Nottage Institute at Wivenhoe (Table 1.4), the former offering two courses. The Nottage Institute is by far the leading centre and, in the academic year 2000/01, has fifteen courses which vary in duration from one day to 34 evenings. Attendance is as shown in Table 1.4.

Table 6.4 Water Activity Instruction Courses in Colchester and The Nottage Institute

Course Number	Course Title	Enrolment
Adult Education College		
T 467	RYA day-skipper	18
T 468	TYA yachtmaster	14
The Nottage Institute		
1 + 2	RYA day-skipper shorebased	26
3 + 4	RYA/DTp yachtmaster - offshore	11
5	RYA/DTp yachtmaster - ocean	5
6	RYA diesel engine maintenance	5+
7	RYA small craft first aid	5+

8 + 9	TYA/DTp operators VHF licence	8+
10	Small craft engine maintenance - upgrade	2+
11	Practical boat construction in wood	10
12	Meteorology	9+
13	Rigtuning/sail trimming	5+
14	Traditional boat skills	15
15	Skipper's workshop	na
	Total	**101+**

6.2 Direct and Indirect Impacts on the Local Economy from Leisure Boating

Direct impacts are measured through a range of variables, relating to location, business type, employment structure and finance.

6.2.1 *Numbers and Locations of Leisure Boating Businesses*

Documentary sources were first consulted. These included the most recent issues of yachting journals (*Motor Boat and Yachting, Yachting Monthly, Sailing Today*), the BMIF *Yearbook* (1999-2000), Sell's *Marine Industry Buyers Guide* (21st ed, 1999), BT's *Yellow Pages* and local *Trade Directories*. This survey provided the names, addresses and telephone numbers of 43 businesses. Subsequent on-site enquiries established that four of these were no longer trading, that three were wrongly classified as leisure boating (they were in outdoor clothing), and that four others had relocated within the Estuary. This first list of 39 was then checked, amended and added to through on-site interviews and telephone inquiries. 19 additional businesses were identified and details of the 58 businesses (plus the two harbour administrations) are shown in Appendix B1 and B2.

The geographical distribution is as follows :

Table 6.5 Colne Estuary - Number and Locations of Boating Businesses

Settlement	Number of Businesses
Rowhedge	1
Wivenhoe	6 (+ 1 harbour administration)
Fingringhoe	1
Brightlingsea	22 (+ 1 harbour administration)
West Mersea	17
Colchester	11
Total	**58 (+ 2 harbour administration)**

Clearly, businesses are heavily concentrated into the two saltwater centres of Brightlingsea and West Mersea and within these there is an inevitable focussing onto the waterfronts. Such locations have become the foci of additional non-boating demands for alternative leisure/recreation uses, for such other land uses as housing/retail/entertainment, for car parking, and office/commercial premises.

6.2.2 *Business Classification*

Some businesses are easily identifiable within a specific category, but many are not. For example, James Lawrence Sailmakers operate a minor chandlery related to their principal activity of sail making and repair, French Marine Motors have a small chandlery related to their marine engineering business. In another example, there are three separately registered companies (L H Morgan & Sons (Marine) Ltd; L H Morgan Marine & Sons (Marine) Ltd; and Superspeed Trailers) which function at 32-42 Waterside, and trade in boat sales, new and used, boat storage, boat repair, engines, outboard, chandlery, trailer manufacture/sales and repairs, and so on. This makes a rigorous classification difficult but the following trade distribution can be suggested (Table 1.6).

Table 1.6 Colne Estuary - Leisure Boating Business Classification

Business Type	Number of Businesses
Boat design	2
Boat design and build	2
Component manufacture	4
Chandlers	4
Marine engineering/repair	27
Shipwright/carpenter	2
Sail makers + repair	2
Marine upholstere	1
Covers and hoods	1
Marine surveyors	3
Boat sales	4
Boat moorings	2
Boat hire	2
Marine insurance	1
Boat lifting	1
Total	**58 (+ 2 harbour administration)**

This is an impressively wide range of businesses and attests to the continuing strength of leisure boating supply and support businesses. Nevertheless, some major closures have occurred during the last decade (for example, the James & Stone yard at Brightlingsea and local yards at Wivenhoe) which have seriously weakened the sector.

6.2.3 Business Size

Interviews were held with 23 of the above businesses (40% sample). These were chosen to include all six geographical locations, the spectrum of size-bands, and a cross-section of business types.

In this estuary, the leisure boating industry is dominated structurally by small firms (Table 1.6).

Table 6.6 Colne Estuary - Firms by Band Size

Size Band [a]	No. of Firms [b]
1-5	16
6-10	2
11-15	2
16-20	2
21+	1
Total	**23**

(a) number of staff

(b) number of firms surveyed

The majority of businesses are clearly in the smallest category and eleven of these sixteen firms employed only one full time (usually the owner) and one part time person. Small businesses form the 'seedcorn' for growth into medium and larger enterprises but, from the interviews, there was little evidence of this happening at the present time. A number of reasons were suggested: the leisure boating sector in the Estuary was seen as being in a somewhat 'static' state as a result of a lack of investment in infrastructure and new developments; the greater expansion of powered leisure craft rather than sail leisure craft; the lack of interest and support from local authorities and business/enterprise agencies in leisure boating; and increased competition from businesses established in neighbouring localities (for example, Ipswich). The presence of a number of abandoned boating yards/premises at Brightlingsea and Wivenhoe, some of which were clearly large businesses, attests to the problems this sector has faced during the past decade.

On the positive side, however, the size-band with the greatest employment was not the smallest band but the small-to-medium level of 11-15 workers (Table 1.7). Research on small firm structure and development shows that this is very much the 'incubator' level for companies to expand into larger companies if the leadership, management and prevailing economic/financial conditions are favourable. Against this, however, many companies of this size depend upon the dynamism and ability of a single individual owner and may well founder if his/her abilities and expectations are not fulfilled. It is here that support from banks, local authority and central government agencies are crucial.

6.2.4 *Employment by Business Size*

These 23 businesses generated the employment noted in Table 1.7.

Table 6.7 Colne Estuary - Firm Band Size and Employment

Size Band[a]	No. of firms [b]	Employment©				
		MFT	MPT	FFT	FPT	Total
1-5	16	17	3	3	9	32
6-10	2	10	2	2	6	20
11-15	2	40	2	7	4	53
16-20	2	15	-	2	-	17
21=	1	20	-	1	-	21
Total	**23**	**102**	**7**	**15**	**19**	**143**
The two Harbour authorities		8	-	-	1	9

(a) number of staff
(b) number of firms surveyed
(c) MFT = Male Full Time; MPT = Male Part Time; FFT = Female Full Time; FPT = Female Part Time

Leisure boating shows an unusual employment structure when compared with that for the wider working population of the UK in that such a high proportion of jobs are taken by full time males and there are more part time than full time female workers. While this sector is not a major employment provider in the Estuary its local significance cannot be underestimated. It provides important local employment in smaller settlements; indeed, some companies are the principal employers. The diverse range of business types requires an extremely wide range of skills for both males and females. They provide employment, especially blue-collar jobs for men (full time), in a service economy in which female employment and requirements are of increasing importance. Local part-time employment is important for those with

school children or dependent relatives and who need to be near their homes. Finally, locally employed people, unlike those who travel to work elsewhere, support local businesses - whether fish and chip bars or pubs at lunchtimes, or through the purchase of food and other items when going to and from work - that is, their local jobs retain a far higher proportion of their wages within the local economy and community and hence help to support local employment.

6.2.5 *Pro-rating' of Employment*

In the absence of a 100% survey of all 58 businesses, it is possible to 'pro-rata' the employment data from the 23 surveyed firms up to the total of the 58 known firms (Table 1.8). It is recognised that this is a hypothetical calculation but, nevertheless, it can be broadly accepted as indicative of the overall pattern of employment within the Estuary in this sector.

Table 6.8 Colne Estuary - 'Pro-rating' of Employment

Employment in the 23 businesses (Table 1.7)		**Employment pro-rata'd for 58 businesses (excl. Harbour)**
Male full time	102	257
Male part time	7	18
Female full time	15	38
Female part time	19	48

PLUS

Multiplier for 23 surveyed businesses = 29 additional jobs

Multiplier for 35 'pro-rata'd businesses = 74 additional jobs

6.2.6 *Key Employment/Business Details*

This section elaborates on the activities noted above.

Harbour/Marina Administration

In the Estuary, responsibilities for the administration of the waterways and leisure boating rest with Colchester Port Harbour Office and Brightlingsea Harbour Office. The former, employing six full time males (harbour master, two pilots, three 'blue collar workers') has overall responsibilities for the Estuary in terms of pilotage, buoyage, dredging and overall river care. It controls 24 old moorings at Rowhedge and rents mooring space at Wivenhoe to Wivenhoe Sailing Club which, in turn, allocates moorings to its members and visitors.

Brightlingsea Harbour Office employs two full time males (harbour master, assistant master) and one part time female (office). It owns ca 400 moorings and supervises ca 50 additional moorings which are owned by others. Around 200 of these are pontoon or pile moorings and the rest are fore and aft or mud moorings. Neither of the Harbour authorities has any responsibilities for launching leisure boats which remain with individuals, local boat clubs and the Hardmaster at Brightlingsea.

Boat Design (+Build)

The two design businesses produced boat designs for very different markets. One designs only production off-shore power cruisers for industry and undertakes no private commissions. These 32' to 62' boats are manufactured elsewhere and none of its business is Estuary based. The second designs sailing off-shore cruisers (90%), keel boats (5%) and powered off-shore cruisers (5%). Only about 2% of its business is Estuary based, about 60% comes from the Orwell Estuary and the remainder is world-wide. It was suggested that design commissions for 30-40 vessels per annum were needed to support a viable business although, as is common throughout the leisure boating industry, one very large commission can provide adequate employment for up to two years.

The two design and build companies design more traditional vessels for private individuals or companies. One specialises in wooden boats and indicated that 1 larger or up to 6 smaller commissions per annum are required to support a viable business. The second business designs and manufactures fibreglass boats but also supplements this with canoes and dinghies. In both cases only a small proportion of their business comes from the Estuary, in one case 20% in the other 15% and their trade comes from other estuaries in Essex and especially southern England. Both felt that demand from Estuary sources was fairly static.

Component Manufacturers

These covered a variety of businesses with an excellent spread of employment levels: 21 (20 full-time males), 15 (all full-time males), 12 (9 full-time males, 1 full-time and 1 part-time female), and 2 other businesses (both with 1 full-time male and 1 part-time female). They include the manufacture of mouldings for motorboat and sailing boats, rudder fittings, masts and spars, stainless steel fittings, various rigging fitments and yacht upholstery (see below). One small manufacturer derives 95% of his business from the Estuary but this was a decreasing market. The largest business derives only about 12% of its business from the Estuary, the remainder going to companies in Kent and Oxford. About 75% of its output is of dinghies, 20% of catamarans and 3% keelboats. The second largest, producing around 10 boats per

annum, derives no business from local sources and exports its products world-wide. 60% of its output is of sailing off-shore cruisers and about 40% for power off-shore cruisers.

Chandlers

Only four chandlers are recorded from the survey but, in fact, this is a considerable understatement of their presence. This is because, as noted earlier in the opening section on 'business classification', a number are attached to larger businesses. Secondly, single function chandleries (that is, concerned solely with the selling of nautical items) are becoming increasingly rare. Instead, many also have a boat sales function (new and second-hand), may also have an increasingly extensive clothing section (leisure + fashion), have a range of tourist items, and may derive a varying proportion of their business from internet and mail order sales. There is also a growing market in second hand chandlery goods (for example, Merchant Marine in West Mersea are yacht brokers, sales and deal in recycled chandlery).

In the Estuary, the largest chandlery sells a wide range of boats with motors (motor boats, sports boats, sports cruisers, jet skis) and specialises in goods for these as well as commercial fishing boats, but not for sailing boats. Only about 30% of its business come from local owners, the remainder from the UK as a whole. A second chandlery specialised in sailboats but here a higher proportion of its customers (ca 60%) are local.

Marine Engineers and Repair

These provide the core of leisure boating businesses and the fact that they account for almost one-half of all businesses is a reflection of the long tradition, generally excellent service provided and continued importance of boating in the Estuary.

Employment in this sector varies from one company with 17 persons (15 full-time males and 2 full-time females) to 2 persons (one full-time male, one part-time female) but the majority of firms employ less than 5 persons. Their skill requirements vary, including engine repair/servicing, boat maintenance, 'good customer relations', carpentry, minor laminating skills, and making parts to order. For most, over 50% of their business comes from the Estuary (in one case 85%) and average around 70%.

A distinction needs to be made between the engineering requirements of sail and powerboats. The former usually generate two types of activity, the first involving small repairs such as the replacement of broken parts, the fabrication of simple new equipment which can usually be done locally and, secondly, the servicing of diesel engines. While some engine servicing can be done locally and on board, those in

larger vessels frequently must be serviced by specialist engineers from main heavy goods vehicle garages which tend not to be based in marinas or small waterfront settlements. Powerboats on the other hand are often powered by petrol engines and local on-site servicing is more frequent.

Estimates of numbers of boats needed to maintain a viable business vary greatly. The two smallest businesses both felt that they would need to service between 100 and 150 boats per annum while the largest company mentioned a figure of 600 to 700 boats, a good proportion of which needed to be large vessels (13 metres +).

Marine electrical and electronics supplies and servicing forms a highly specialised engineering sector and no specialist firms were identified within the Estuary.

Sail Making and Repair; Spray Hoods

Two businesses were identified in sail making and repair, one of which is locally owned, the other with headquarters in nearby Ipswich. This is a somewhat different sector from many others for a number of reasons: it provides employment for both males and females with the same skills (machining); it uses machining skills that are transferable to and from other fields (garment and upholstery manufacture); and thirdly such additional skills as professional marketing and design are required.

The principal skill requirements are those of designing, cutting and sewing/machining cloth. The first two are now becoming highly computerised while the latter is a generally less skilled occupation. Wages for machinists range from £175 to £250 per week on average while designers and marketing personnel command much higher wages.

Surveys indicate that a minimum 'pool' of 500 boats and ideally 1000 boats are needed to support a viable business. One business stated that a throughput of ca 100-125 boats per annum was needed to support a viable business but it could also take two persons up to two weeks to design, cut and machine a set of sails for one larger vessel. The two local firms indicated that only about 35-40% of their trade came from the Estuary and the remainder from elsewhere in the UK, Europe and world-wide clients. One indicated that its Estuary based business was increasing, the other that it was decreasing. Between them, they manufactured sails for the six identified categories of sailing leisure craft, but one company specialised more in the production of sails for more traditional sailing boats.

There was one local company which manufactured marine sprayhoods only (not sails) while one of the two sailmaking companies also manufactured some sprayhoods. The skills are similar in both types of business, that is, industrial sewing machining. The one local company thought about 30% of its business came from the Estuary and much of the balance from the Ipswich area. About 35% of its output was for off-shore sailing cruisers, about the same percentage for off-shore yacht racers, and the remainder was divided between keel boats, dinghies and sports boats.

Yacht Upholsterer

This business involves the making of upholstery for leisure craft and so measuring, cutting, sewing-machining and fitting skills are needed. Less than 1% of output meets demand from the Estuary and the seven workers (four full time) manufacture upholstery for around 30 Oyster sail boats per annum (48-100 feet length). This sole concentration on yacht upholstery is somewhat unusual since, for many similar companies, demand from leisure boating vessels is rarely sufficient to provide full-time employment and additional business comes from making domestic and caravan/recreational vehicle and other upholstery.

Marine Surveyors

One long-established marine surveying business was located in the Estuary but 95% of its business came from elsewhere. Around 70% of its business related to the survey of off-shore sail cruisers and about 30% from off-shore power cruisers.

Boat Sales (New and Brokerage)

Distinctions need to be made between sailing and powered leisure boat, and between new and second hand or brokered vessels although, in reality, the lines between become rather blurred.

The markets for sailing yacht and powerboats are very different and over the past 20 years or so there has been a very strong swing from sailing to powerboats throughout the world. In many marinas and especially on the south coast of England more than 50% of marina berths may now be occupied by powerboats. For example, in November 2000 the balance between them was as shown in Table 1.9 for selected marinas.

Table 6.9 Boat Numbers and Percentage Sail/Power in Selected Boat Centres

	Total No. Boats	Sail (%)	Power (%)

Swansea	367	43	57
East Cowes	275	60	40
Port Solent	700	30	70
Woolverstone	310	80	20
Ipswich Haven	180	70	30

Even during the economic and leisure boating recession of the 1990s, sales of the more expensive power boats held up well and it is to this sector that any plans for the future revitalisation of leisure boating in the Colne Estuary must pay particular attention in terms of berthing, slipway and support facilities.

There are additional contrasts in the markets of the two types of vessel. Purchasers of sailing vessels tend to undertake careful research before purchasing another boat, often over a considerable period of time. Because sailboat owners spend considerable time working on their vessels, they have much more direct social and verbal contact with fellow yachters and so discussion of the merits and otherwise of individual types of boat is widespread. Buyers will usually have had some sailing experience, perhaps as a crew member on a friend's boat or perhaps on a flotilla sailing holiday. Very many will have started their sailing experience on small boats and then slowly graduated to larger vessels reflecting increased knowledge, confidence and possible changing domestic circumstances. Many may also, prior to or soon after purchase, take accredited courses on navigation, helmsmanship and so on. They will accept that sailing is determined by highly variable tide, wind and weather conditions and involves a considerable degree of skill. Powerboat purchasers have both similar and also different requirements. Many will start with a smaller boat and then move up to a larger one. Boat usage will, of course, be determined by tide, wind and weather but the constraints will be less except in more extreme conditions and the purchaser will expect to have more freedom of and opportunity for movement. A major difference is that many purchases are made on impulse and tend to reflect attitudes and values more akin to those used in buying a car or a caravan or recreational vehicle. Well appointed ground floor showrooms with a range of boats and immediate access to water to test run a power boat are essential.

Information on new sailboat sales is rather difficult to evaluate in terms of their impacts upon local economies. One very large value sale can provide enough commission to take a business through a 12 month period. On average, however, it was suggested that the sale of a minimum of eighteen to twenty new 30 to 35 foot sailing boats per annum would provide adequate income for a viable business. In periods of economic expansion, figures of six times this level have been achieved by vigorous selling at locations where a nautical centre is well established. In times of recession, sales of new sailing boats tend to be done either direct from manufacturers or from brochures and visits to manufacturers' works. Very few local sales offices hold a stock of new boats on a purely speculative sales basis but most have access to demonstration boats and a high proportion of sales are initiated through photographs, brochures and personal contacts and recommendations.

Brokerage involves the sale of used boats. Through the use of leisure boating journals and the internet, it is now usual for brokers to negotiate sales well beyond a local area to wider geographical areas covering the UK, Europe (especially the Mediterranean) and even the West Indies and Australia. Interviews with brokers resulted in a general consensus of opinion that it needed sales of a minimum of 30 sailing vessels each year to maintain a viable business. One or two of these, however, need to be large and more expensive vessels to give an above average rate of commission in absolute terms. Three brokers also suggested that around 5% of a local pool of 600 sailing boats was needed to support a viable brokerage business.

Space requirements for sail brokerage are different between sail and powerboat sectors. A reasonable amount of wall space to display photographs and boat details is important and these displays ideally need to be within the office and also visible from outside to attract the interest of passer by. Brokers of sail vessels rarely purchase boats from previous owners for onward sale while this is far more common with powerboats and, hence there is a need for large showrooms at ground level. Hard data on brokerage sales, and hence of economic impact, is difficult to obtain. This is because of reasons of confidentiality, because the success of business depends upon the personal attributes of the broker, because the business is extremely cyclical in reaction to economic fortunes, and because the sale of a few very expensive boats can help cushion leaner periods of inactivity.

6.2.7 Financial Impacts of Employment

Businesses generate a range of financial impacts into local economies, both directly and indirectly. These might include local authority revenues from the businesses themselves and from the homes of those who work in these businesses, income tax contributions to central government, the salaries paid to employers and employees and their expenditure into local shops and businesses, the revenues derived from visiting yacht owners, and so on. It is, of course, impossible to obtain details of any of these but the following provide some indication of selected indicators.

Salaries into the Local Economy

Local businesses were asked to provide the average weekly wage of their employees. Almost without exception the quoted figures were:

Male full time	£200-250 (average £250)
Male part time	£ 8 per hour
Female full time	£150-200 (average £175)
Female part time	£ 5 per hour

On this basis, using the pro-rated figures of Table 1.8, the annual wages would approximate

Male full time	£250pw x 52wks = £13,000pa x 257 employees	=	£3.341,000
Male part time	£8ph x 20hrs x 46 wks = £7,360pa x 18 employees	=	£132,480
Female full time	£175pw x 52wks = £9,100pa x 38 employees	=	£345,800
Female part time	£5ph x 20hrs x 46wks = £4,600 x 48 employees	=	**£4,040,000**

In addition, there are the salaries of the estimated 65 owners/partners (60 male, 5 female) of the 35 local businesses. A few owners of the very small businesses indicated that their take-home pay was in the £10-15,000 size band, a number indicated £20-25,000 while a small number were willing to disclose that their annual salaries exceeded £50,000. Given this variability, it is not unreasonable to assume an average of £25,000 per annum which, if multiplied by 65 persons

Subtotal B = **£1,625,000**

Finally, there are those employed in the two harbour administrations. In the Colchester Office, the principal concern (as noted earlier) is less with leisure boating than with commercial shipping, pilotage, buoyage, dredging and overall river care. Given this, the annual wage of one 'blue-collar' employee has been apportioned to leisure boating in that some activities are clearly of benefit to leisure boat owners. Brightlingsea Harbour Office, on the other hand, is more concerned with leisure than commercial shipping and river channel maintenance.

The following calculations therefore are assumed:

Colchester :	1 MFT			
Brightlingsea:	1 MFT; 2 MPT; 1 FPT	**Subtotal C**	=	£45,320
		Salaries/Wages total (A+B+C)	=	£5,710,320

Boating Income into the Local Economy

Two sources of information are used:

1. Subject to the reservations noted earlier concerning this report, the 1998 *British Watersports Survey* (commissioned by the British Marine Industries Federation) established from a survey that:

   - enthusiasts spend an average of £682 per annum on their boating hobby but over half of these spend less than £500
   - typically a boat owner can expect to pay £529 for storing their boat.
   - on average owners spend £748 on the maintenance and running of a craft.

   (NB the above figures do not include a multiplier element)

2. J A Edwards' longitudinal survey to track expenditure patterns generated by marina boat owners. This information was provided in the Phase I Report and established the following expenditures:

Service/repair	£635pa
Chandlery	£369pa
Petrol/ Diesel	£163/ £123

These data differ from the 1998 survey in that they refers to 1995 (not 1998), they contain a multiplier element and, thirdly they are for marina boat owners who tend to have larger and more expensive boats which require greater maintenance and updating of equipment. This last point is of great importance in the context of the Colne Estuary where there are no marina moorings (although there are pontoons)

and most boats are smaller and are on buoy/pile and buoy moorings. Smaller boats which are then taken on-shore for the winter season necessarily incur lower costs in service/repair and chandlery.

The following types and income levels into the local economy can thus be suggested:

1	Mooring income: 596 boats			
	Mooring rentals : Pontoons £17.0/ft; Piles £9.41/ft; Average boat size 28 feet;			
	Assume 596 boats x 28 feet x £14.0/ft rental	=	£233, 632	Subtotal A
2	Sail boat annual costs: Assume 596 boats x £500pa	=	£298,000	Subtotal B
3	Motor boat annual costs:			
	Assume 150 boats (launched at the Hard) x £748pa	=	£112,200	Subtotal C
	Boating expenditures total (A+B+C)	=		**£644,000**

There is little doubt that this is a significant underestimation in the absence of reliable data from more detailed field surveys.

Other impacts

There are a variety of other impacts of leisure boating which contribute to a local economy. These are identified in Section 4.5 of the Phase I Report and include visitor boats, insurance cover premiums, brokerage commissions, eating out/food/drink, local authority taxes (of local businesses) but not utilities (since there are no serviced marina pontoons). These have not been calculated for this study.

6.2.8 Economic Multipliers

The businesses and activities identified above have a range of indirect impacts which can be assessed through a method referred to as economic multipliers. The multiplier is an economic phenomenon created when outside or new money is injected into the economy. The multiplier identifies how many times each new unit of money (£ sterling/ $dollar/peseta etc) is spent and re-spent within the local economy and the magnitude and impact of the multiplier is contingent upon the economic self-sufficiency of the area. New construction, existing and new businesses, tourist

visitors provide a few examples of the activities in which economic multiplier analysis has a role to play. While such studies are easier in clearly defined economic units (such as an island), they are exceptionally difficult to calculate in 'open' economic systems such as that of the UK. Problems are compounded even further when studying spatial units, such as an Estuary, below the national level and for which no published data are available. Notwithstanding these problems, they are applied in a very limited (but hopefully indicative) way in this and the next subsection.

The following quotations refer to some views given on the employment and fiscal multipliers of marinas in the United States:

'Studies indicate that a marina creates jobs creates directly, for the people who work there, and indirectly, through spending in the community by marina patrons. This total employment in the community equates to 0.3 jobs per berth, or 60 jobs for a 200-berth marina, and an estimated payroll in excess of $1 million. Communities will generate revenues as well from the property taxes on the marina's land and any improvements made through construction. Other tax revenues from the retail sale of boats and related equipment and parts, purchases of goods by marina residents and additional sales generated from these purchases (secondary effects) (U.S. National Marine Manufacturers Association, 1994).

***Marinas as well as passive and active recreational access can have significant economic benefits to the** immediate and surrounding communities. Estimated multiplier values for non-tourist oriented recreational marinas in the continental United States typically range between two and three. Every dollar spent at the marina generates two to three dollars of income for the community at large. For tourist oriented facilities in resort destinations where tourism is the mainstay of the economy, such as the Riviera, Virgin Islands, Fiji or Tahiti, the multiplier is often significantly greater, and has been estimated at values as high as ten to fifteen' (Natchez, 1996).*

Within the UK, most multiplier studies have been undertaken in the field of tourism, especially during the 1960s and 1970s. These studies suggested that employment multipliers varied from 1.1 to 1.95 with a consensus of 1.25 average. If this figure is taken, then the employment multiplier for leisure boating businesses in the Colne Estuary would be as follows:

(a) 23 surveyed businesses: 102 MFT + 15 FFT = 117 x 1.25 = 146 - 117 = **29 additional jobs**

(b) 35 'pro-rated businesses': 257 MFT + 38 FFT = 295 x 1.25 = 369 -295 = **74 additional jobs**

(These may be added to the figures provided in Table 1.5)

These additional economic multipliers jobs are in such diverse sectors as transport (public and private), retail, entertainment/leisure/recreation, central and local government, commerce, and so on. Secondly, some studies have been made of the financial multipliers of salaries. Again, a range of figures are suggested in the literature but the one that emerges most frequently is 1.95. On this basis, the financial multiplier for salaries/wages noted earlier would be £5,424,800

6.2.9 *Local Businesses*

The second method adopted of indicating indirect impacts is through surveys of non-leisure boating businesses within centres of these activities. Here, a selective survey was made of a range of 43 non leisure boating businesses (Table 1.10) to determine the extent to which they did or did not benefit from the presence of local businesses and participants in leisure boating. They were selected from the five smaller settlements around the Estuary and Colchester was excluded.

Table 6.10 Non Leisure Boating Businesses Interviewed

Type of Business	Number Interviewed
Fish & Chips	2
Estate Agents	9
Pubs	6
Cafes	2
B & B/Guest/Hotels	4
Newsagents	3
Bookshops	2
Food stores	5
Off Licence	1
Florist	1
Travel Agents	1
Hardware	1
Electrical Retailers	1
Cycle Shops	1
Hair Salons	1

Insurance Company	1
Greeting Card Shop	1
Social Club	1

Fish and Chips

Both businesses stated that they benefitted from boater and local business worker purchases, but the one thought the figure was 2-3%, the other 10%. In both cases, there was an increase in summer business from boaters and the occurrence of a special event (for example, the Mirror Championships) boosted takings greatly.

Estate Agents

Eight of the nine stated that leisure boating participants had no influence whatever on the housing market either in rental or in purchasing. The final one considered that, at most, 10% of sales in very specific locations might be influenced by boaters when visiting or who might be considering retiring to the Estuary. When questioned about the new riverside development at Old Wivenhoe Quay (£135,000 to £275,000), estate agents stated that there were buyers from the local area and, to their knowledge, none owned boats. The proposed new development at the old James & Stone boatyard at Brightlingsea with its proposed 'marina' moorings might, however, change current attitudes.

Public Houses

It is evident that proximity to waterfront moorings is critical to the influence of leisure boating participants and businesses. Four of the six interviewed stated that none of their trade came from boat users and this was because of their distance from the waterfront. The remaining two had waterfront or near-waterfront locations. In both cases, over 50% of their trade came from boat users and workers, with a surge in summer months. The pub in Brightlingsea also commented that shipyard and other workers from chandleries etc provided a constant trade throughout the year.

Cafes

The two cafes, in Brightlingsea and West Mersea, stated that up to 30% of their summer trade came from boaters. This was concentrated into the months of April to September.

B&B/Guest Houses/Hotels

The four premises, in Brightlingsea, Wivenhoe and West Mersea, suggested that only a minor share of their annual business came from boaters, this ranging from 2% to 10%. Most of this trade came during the summer months and the presence of Regatta weeks and special national/international sailing events and regattas brought in many new visitors. Additional business came to one hotel from special dinners for the local Yacht Club.

Newsagents

No more than 3% of annual turnover was estimated to come from leisure boat users.

Bookshops

One stated that there was no influence, the other less than 10% with the comments that ' boaters come in and browse', that 'boating is expensive and they don't have extra cash to spare', 'they don't have the space to store books on their boats' and 'the continental visitors tend to buy more than the locals'.

Foodstores/Wine Merchant

Three of the five opined that there was no influence while one, in close proximity to a waterfront, suggested that 10% of its business came from boaters. This was in groceries, confectionery and alcohol - but demand varied according to the weather. Two specialist shops, organic and delicatessen, felt that none of their trade came from this source, but location was a critical element. The wine off licence thought that most boaters brought their own supplies with them and give little local trade.

Social Club

The Willow Lodge Social and Sailing Club in West Mersea is unusual in a number of respects. It is located on the waterfront at West Mersea but has a different role from other Sail and Yacht Clubs in that it does not seek to challenge them in organising any activities connected with sailing. With 700 members (80% of whom are also members of the local Dabchicks and West Mersea Yacht Club), it serves food and drink to both the general public and members during the day but, after 6pm, only members may buy only drinks without food. It is very much a social club for local people to come to if the local sail/yacht clubs are closed (winter evenings) and local pubs are seen as too noisy.

Other Businesses

Only one of these, the bicycle shop, considered that leisure boaters played no share in its annual business turnover. The remainder averaged 5%, within a range of 1% to 10%, and with business concentrated into the summer months/boating season.

6.3 Potential Socio-Economic Impacts from Future Developments

In this section three differing approaches are used to respond to the economic requirements of the brief (an assessment of the social impacts, other than as identified below, requires different approaches and methodologies). The first approach identifies 13 types of impact which were described in the Phase 1 Report; the second analyses the impacts of potential future developments by specific locales as evidenced from the results of a survey of local leisure boating businesses; the third draws upon the experiences of actual developments elsewhere to exemplify possible impacts (positive as well as negative) if certain types of development takes place within the Estuary.

6.3.1 The Range of Potential Impacts

The Phase I Report, subsections 4.5 and 4.6 (pp.48-56), identified and analysed a wide range of key impact areas which have emerged from previous research studies. They need not be repeated in this Phase II Report but they included:

There are seven sources of economic impact:

1. residents' berthing income
2. visitors' berthing income
3. marine insurance commissions
4. new and used boat brokerage commissions

5. residents' local expenditures
6. visitors' expenditures
7. utilities expenditures

There are six types of shore-related facilities:

1. boating services
2. boat related services
3. commercial marine leisure
4. marine eventing
5. marine related manufacturing
6. non boating but related/dependent waterside activities

6.3.2 *Evaluation of the Potential for Development of Different Locales Within the Colne Estuary - Survey Responses*

The 23 leisure boating businesses surveyed for Section 2 of this Phase II study were also invited to express views on a number of potential locations for possible leisure boating developments. The responses were as follows:

Seawick

This was seen as a potential site for water-ski and jet-ski activities if suitable launching ramps and parking facilities could be provided. No potential was envisaged for sail activities because of its exposure to North Sea weather and tides.

Pyefleet Channel

Inadequate land access and tidal mud flats were seen as major constraints to any major development. There were overwhelming opinions that the current aspects of a quiet, natural creek should prevail but that there might be scope to improve the moorings through the provision of pontoons. Two respondents thought that jet-skis should be banned entirely from the Channel to maintain its tranquillity.

West Mersea

A number of major problems were identified both on and off the water. On the water, there was a widespread view that moorings were 'bursting at the seams', that 'the moorings are a huge muddle', that 'the moorings are so crowded than you can no longer easily sail a boat, even at high tide', and that 'there are too many boats on swinging moorings'. The above suggest that there is a need for a detailed study of the provision, locations and usage of moorings to ensure that they are being used to the best advantage of the water areas, of their owners, and of their users. A number of responses favoured the provision of moored pontoons (removed in winter) to assist in accessing boats.

On land, the overwhelming volume of complaints referred to the totally inadequate provision of vehicle parking areas and, in this, obstructionist/negative attitudes of English Nature and the Local Authority were repeatedly mentioned. Evidence of this was provided by one business which had been forced to relocate from the waterfront to an inland location because of the impossibility of parking availability for himself and clients during peak weekends and warm weather. It was suggested that the Local Authority could assist greatly by designating more dedicated parking spaces/areas to local businesses and to boat users rather than allowing sightseers/visitors 'to come and sit in their cars, read a paper, drink tea from their thermoses, and let their dogs run around and foul the place'.

A number of businesses expressed the view that West Mersea would gradually fade away as a boat service and repair centre unless a marina was constructed to provide an injection of confidence and new activities (including motor boating) into the industry.

Brightlingsea

This was universally seen as the centre with the greatest current potential in the Estuary for leisure boating development. The proposed James + Stone development received little favourable comment for the reasons mentioned in the Phase I Report (p.58) although two persons supported the plans. A number of businesses commented that ' the waterfront was a complete mess' and that ' there was a need for a plan with vision to take account of all the people and businesses of Brightlingsea, not just the developers with the most money'. In spite of the closure of the James + Stone yard, there was a general feeling of some confidence but a recognition that this might be illusory. There was extensive belief that a marina, somewhere in the vicinity of The Wharf, was essential for the continued prosperity of leisure boating while it would also reduce off-line moorings. The lack of moorings, support and facilities for visiting boats was mentioned while one response stressed the need to link the waterfront with the shopping centre. Again, poor parking was mentioned.

Alresford Creek

There were mixed responses to this potential location for a new leisure boating facility. The majority view was that any development would be hampered by poor access, high infrastructure costs, distance from both Alresford (to the north) and Brightlingsea (to the south) while some mentioned the natural beauty of the Creek area. One respondent thought the area had some potential but that this was limited, stating 'if a development too place, what does the place have to offer ? - if you have a family boat, what attractions and facilities are there on land for those who don't want to sail or who cannot sail because of adverse tide or weather conditions?' Others pointed to some positive aspects: easy access at most states of the tide, the presence of water-filled old sand and gravel pits, sufficient land for a major development of 340-400 berth marina, housing, offices etc.

Ballast Quay Farm

There was no support for any development here although one person thought there might be potential for some pontoons to improve boat facilities. The suggestion that the water-filled sand and gravel pits to the south of the works (and near the river) attracted some interest but it was felt that this would need to wait until extraction at the site had been finished.

Rowhedge ABP site

There was little support for development here except that a number thought that some pontoons, river dredging and better pile mooring arrangements could be considered.

The Hythe/Colne Harbour

Many respondents spoke favourably about this proposed development, but none could see any potential for leisure boating within the suggested Colne Harbour regeneration scheme. The principal obstacle mentioned was the proposal to close access between the Hythe and the Estuary following the construction of a barrage across the River Colne. Tidal and silting were considered to be major constraints.

Wivenhoe

Through an oversight, no specific mention was made of Wivenhoe. However, a number of respondents did comment voluntarily while others were asked to express views when interviewed. This village was universally praised for its attractive historic form, especially at the waterfront while a number thought that the new housing development at Old Wivenhoe Quay had enhanced the quality and range of housing. Against this, however, two major problems were identified. First, was that of the derelict waterfront ('shamefully neglected' was one printable comment) which, like that at Brightlingsea, needs to be addressed. Some suggestions for improvements have been made by Alan Tyne of Wivenhoe Sailing Club (July 1997):

- A dedicated area for berthing and repair0f fishing-boats and storage of gear mudberths alongside the quay between Cook's jetty and the Barrier
- A small yacht-pond with a cill and flap-gate
- Launching and hauling-out facilities
- Boat repair and winter-storage facilities
- Berths for visitors.

He concludes: *'Facilities in any typical small town in Holland, or even at Woodbridge, Tollesbury or Walton-on Naze, would repay some careful study'.*

6.3.3 *Experiences Elsewhere - Complementary Case Studies*

'Every estuary, every existing coastal settlement and every potential waterside development has unique features and so each and any future development will have unique socio-economic impacts'.

The above is a very obvious, indeed almost trite, statement, Nevertheless, the experiences of developments which have taken place elsewhere may contain elements which may have some comparability and hence relevance to the above locations identified within the Colne Estuary. The following have been selected:

- The flood defence barrage at Wivenhoe
- The proposed Colne Harbour redevelopment
- A potential marina development
- A possible waterside development.

The following analysis draws upon three sources: documentary sources in the public arena, the author's personal research findings from studies of waterfronts and marinas in the United Kingdom, and questionnaire responses from leisure boating businesses in the Estuary carried out in Autumn 2000.

Wivenhoe Flood Defence Barrier : The Case Study of the Weir-Barrage on the River Tawe

Three respondents in the local questionnaire survey mentioned the role of the flood defence barrier at Wivenhoe, completed during the 1990s. Currently, the only commercial shipping passing through is ca 5 barges per annum (sand to Guernsey) which are ca 60 metres in length. They wondered if there was some way in which this could be converted into a barrage with a long lock for commercial and leisure boats or, if commercial shipping ceased, a shorter lock purely for leisure boats. It would negate the need for the proposed smaller barrier between Rowhedge and The Hythe and, if accompanied with initial dredging, would open the upper part of the Estuary from Wivenhoe into Colchester for very substantial leisure boating and watersports development, residential, commercial and industrial development.

A parallel example to this suggestion is the weir-barrage plus lock across the mouth of the tidal River Tawe at Swansea (See Appendix B4). Opened in 1992 at a cost of £17.5 millions, it qualified for an EEC grant of £6.5 millions. It is 102 metres wide and has a 12.5 metres x 30 metres long lock giving with a small scale hydrogenerator in its east abutment. The lock floor level (4.5 metres above OD) was chosen to permit passage of craft of 1 metre draft for 85% of the mean tide cycle. This development has had major positive hydrologic and economic benefits for the River. For example:

- It has enabled the Swansea Yacht and Sub-Aqua Club (adjacent to the Marina and ca 400 metres up-river from the barrage) to install pontoons for all its 200 boats in the river.

- Swansea Marina has plans to dredge its lock to enable boats to access/egress the River without using the lock, thereby saving boating time, lock maintenance costs, staff time as well as enabling deeper draught vessels to access the Marina.
- Summer boat pleasure/sightseeing trips upriver from the Marina have started.
- A 'riverpark' of walkways/cycleways/industrial heritage features some three miles upriver has been developed, this linking with the foreshore cycleway around Swansea Bay.
- Draft plans have been made for residential/commercial/industrial/leisure development on hitherto derelict, abandoned and neglected sites on the east side of the river in Swansea Docks immediately above the barrage.

Proposed Development at Colne Harbour : The Case Study of Swansea Maritime Quarter

Details of this proposal were published in a Public Consultation Document Colne Harbour - Urban Design Framework (1999). Research in 1989 established that there were 221 water redevelopment schemes in the process of completion, 181 in England, 25 in Wales and 15 in Scotland. This subsection uses the case study of Swansea Maritime Quarter to illustrate developmental aspects which might be considered of relevance for Colne Harbour.

A 1975 study set out economic, social and environmental policy objectives in an ambitious urban regeneration programme which was one of the first of its kind in the United Kingdom. It identified three main elements in respect of the renewal process:

- Rehabilitation of the Conservation Area for housing and commerce
- Development of the water area for recreational use, including a marina facility, and
- Redevelopment of the derelict land parcels adjoining the South Dock, riverside and foreshore.

Table 6.11 Expenditure on the Maritime Quarter 1975-1999

Development Investment		£	Public Sector Support Expenditure		£
i	Private Sector Residential	25,850.000	i	Local Authority	9,200,000
ii		17,000,000	ii	Urban Dev Grants	2,141,750
iii		13,450,000	iii	ERDF	1,925,000
iv		4,361,400	iv	Other Grants	861,750

	Total	**60,661,400**		**Total**	**14,129,000**
v	Potential Private Invest	28,000,000			
	TOTAL DEVELOPMENT INVESTMENT (incl. potential expenditure)	**88,661,400**			

There were a number of positive impacts of redevelopment. With respect to housing, a mixture of types were included housing, commercial, industrial and leisure uses. As a result of its ownership of almost all land in the Maritime Quarter, Swansea City Council has been able to achieve an unusual residential mix of four housing types. This has been a very positive achievement especially for older persons and single parents in such a location. In 1974 the Maritime Quarter contributed 1.23% of Swansea City Council's total taxation income but by 1986 this had increased to 2.89%.

There were a number of negative impacts of redevelopment. In 1974 Swansea's Maritime Quarter was one of the most derelict parts of Swansea's inner city, featuring derelict dock basins, redundant buildings and old quay sides. One of the Council's first actions was to acquire the ownership and leases of most buildings and land around the Dock so that comprehensive and integrated development planning could take place. The process of local land clearance had dramatic impacts upon local businesses and employment.

Table 6.12 Firms and Employment in the Old South Dock Quarter, 1974-1986

Year	No. of Firms	Employment				
		MFI	MPT	FFT	FPT	Total
1974	35	807	17	200	77	1101
1976	17	402	15	142	42	601
1981	6	216	0	77	26	319
1986	26	289	44	153	52	538

It can be seen that 29 businesses disappeared within seven years; of these 10 ceased trading completely and 19 were re-established elsewhere. The loss of local full-time male employment was particularly hard since it occurred at a time of heavy redundancies in old-established industries and so very few alternative employment opportunities were available.

Similar business and job losses occurred around some parts of Cardiff Bay with the decision to construct a new barrage there.

On the other hand, the highly successful and impressive waterfront redevelopment of Granville Island in Vancouver, British Columbia has taken place without the extensive clearance of varied land uses that seems to be a pre-requisite in the United Kingdom. Established industries have been maintained, including a cement works, ship chain-making works, wood and metal fabrication workshops, in the middle of new shopping centres, theatres, art and craft galleries, restaurants, farmers' markets. Nor was there felt a need to tear down all old buildings made of corrugated sheeting or wood or to remove old overhead service water and gas pipes to make way for new 'glitzy post-modern' constructs favoured by so many developers, planners and politicians.

As noted above, the pattern of residential types is most unusual in that, currently, there is an almost equal balance of private and other housing units. However, the proposed development of up to 1,000 units on the former Spontex industrial site (30) will change this distribution. Site 30 is owned by the company and it is seeking to maximise any development through high density development for the private sector without (currently) any provision of social housing.

6.3.4 *Marina Developments : Two Case Studies of Neyland and Swansea*

The questionnaire survey resulted in a number of responses in favour of a fully functional marina, in addition to the proposed development at the former James + Stone Yard at Brightlingsea. Two alternative sites were mentioned, one in the vicinity of The Wharf at Brightlingsea, the other in the vicinity of Alresford Creek. For both, the problems of accessibility were mentioned as well as the need to link a marina with additional features including residential, commercial, leisure and entertainment facilities.

Neyland Yacht Haven (01646 601601) is located at Brunel Quay on the upper reaches of the River Cleddau (Milford Haven Waterway). Opened in 1985 by Camper and Nicholsons, it was taken over by Yacht Havens in 1991 and now provides 360 berths. Of these 160 are accessible at all states of the tide and 150 are only accessible 3 hours or more either side of low tide assuming a 2 metre draft boat. In November 2000, only 160 berths were let on an annual rental while most of the others were let on daily/weekly or seasonal terms. In annual berthing charges, Neyland is one of the cheaper marinas in the United Kingdom being marginally cheaper than Swansea. although its lift/hold/relaunch charges were high.

By 1991 it had generated 153 new jobs (96 MFT; 15 MPT; 30 FFT; 12 FPT) and 23 new businesses with the following relationship to the marina:

Directly involved in marina operation	1	
Very strong dependence (>50%) on marina		8
Lesser dependence (<50%) on marina presence		8
Direct links to marina presence	6	

Concurrent with the building of the marina, construction began of an adjacent residential complex of houses (34 of which have berths), apartments, shops, cafes/restaurants. This coincided with the marina/waterfront boom of the later 1980s and early 1990s and demand was extremely high. By the mid 1990s demand had collapsed and, with it, prices plummeted. By today, demand has returned, prices have risen again and more development has taken place.

Swansea Marina (01792 470310) opened in 1982 on the site of the old and abandoned South Dock. This is a marina which has had more than its fair share of vicissitudes in its operational management. When first established, it was leased to a private company Lymington Yacht Havens who ran it until 1993. It was then leased to the British branch of a well-known American marina management company (Westrec) but this proved to be a total financial and management disaster. In ca 1995 an interim management group was set up who managed the marina on behalf of the Council on a temporary basis while the Council considered the options of either returning management to the private sector or of bringing it in-house. In 1998, Swansea City Council re-assumed management control and a 'hybrid' management structure has evolved with a private business ethos and structures but which is also compliant with Local Authority rules and regulations. The Marina Manager does not work to a Council Committee but to a specially created group of four senior Council Officers and four elected politicians. Its budget is 'ring-fenced' and it aims to create a funding surplus which it wholly reinvests in marina services and facilities.

Berthing occupancy stands at 398 which represents maximum occupancy. 466 boats were in the marina in August 2000, a high figure as a result of visiting boats. There has been a steady growth in vessel numbers and berthing occupancy over the past three years (1997 - 357 berths; 1998 - 359 berths; 1999 - 392 berths). Further pontoon space is available at the west end of the marina once dredging is undertaken. The balance between sailing and motor vessels is 43% former and 57% latter. There are an additional 200 boats berthed on pontoons on the River Tawe immediately to the north of the marina lockgates with Swansea Yacht and SubAqua Club. Like others not in the most favoured waters of south England, this marina has to compete with others for its berth-holders. (This is reflected in the graph that has prepared which compares its annual berthing and lift hold/relaunch charges with those of 9 other marinas around the coastlines of the United Kingdom - see Appendix B4).

6.3.5 *A Waterside Development*

In 1994 Dr J A Edwards undertook an economic impact analysis of Poole Harbour for the Harbour Commissioners. Like the Colne Estuary at the present time, the boats in Poole Harbour at that time (ca 6,000) were almost all on swinging moorings and the Harbour Commissioners were concerned to establish whether a proposed Boat Haven at Poole Quay could succeed as a commercial project, whether it would have an adverse impact upon the old town's traders, and what effects it would have upon the mooring patterns. The study established that:

- The proposed Boat Haven would create new market opportunities for marine support businesses, tourism and leisure facilities.
- Old Poole traders would not be at risk from the proposed development
- Local marine support businesses approved of the concept of the Boat Haven, but would need to be supported by the new Poole Harbour Commission policies to help them change and benefit from new market opportunities
- A comprehensive review of mooring policies was required to control the number of swinging moorings and to minimise any adverse effects of changes on existing businesses
- The proposed Boat Haven should generate increased demand for services to bring 20 small businesses into existence over a 10 year period, and provide employment for 90 direct labour operatives
- The economic benefits from this were estimated to be equivalent to £1.3 millions per annum for the local community
- It was estimated that the new boat owners in the proposed Boat Haven would spend £900,000 per annum in the local economy

- The construction of improved and sheltered visitor berths should safeguard an annual spend in Old Poole of £250,000 per annum

BUT:

- If the concept of the Boat haven was abandoned, the economy of Old Poole would stagnate as levels of visiting yachts declined (there was a decline of visitor boat nights from ca 6,000 in 1981 to ca 4,000 in 1993). To a considerable extent, this was because of the lack of investment in water-based (pontoon) and on-shore yacht service facilities.
- Environmental pressures might bring about a reduction of harbour moorings, causing some casualties within the marine support industry.
- As a result, some 90 new jobs would fail to be created and the Poole economy would forgo the estimated economic benefits of an injection of ca £2.2 millions per annum into the local economy.

6.4 Further Recommendations for Promoting New Activities and Events

6.4.1 Heritage Themes

Recommendations were made in Phase 1 for promoting activities with a heritage theme. These have not been considered further in this report.

- Working Tide Mill, Thorrington (Essex CC)
- Wivenhoe - Nottage Institute
- Wivenhoe - Wivenhoe + Nottage Yacht Owners
- Colne Smack Preservation Society
- B'Sea Wildfowlers + Preservation Society

6.4.2 Water-Related Events

Marine eventing has emerged as one of the most rapidly growing areas of water-based activities and is of particular importance in attracting visitors (and hence income) from elsewhere into a locality. For example, the 1995 Plymouth Classic Boat Rally, 29-30 July, centred on Clovelly Bay Marina attracted 64 entries while the Royal Plymouth Corinthian Yacht Club held two events in August 1995, the Optimist Class attracting 300 boats for 1 week while the Laser class event attracted ca 75 boats.

It is evident, from the experience of recent years, that the Estuary and its clubs are able to successfully host water based events. The scope for water events other than sailing within the Estuary is somewhat limited but the experience of other areas suggested that there are opportunities. There are some general requirements which are critical to the success of hosting major yachting events, including:

- The enthusiasm of hosts.
- The quality, range and efficiency of on-shore facilities and services.
- The presence of adequate numbers of safety boats.
- The provision of craneage from a vertical dock to augment slipway facilities.
- Sponsorship of events.
- Car parking availability is increasingly important, especially for dinghy events where the boats are trailered to the race venue.
- Varied social functions are a key aspects of sailing (and power boat) events. Some classes, particularly dinghies, attract younger, less affluent participants. Their requirements for cheap local eateries and for events such as discos and barbecues, may contrast markedly with the demands for dinner dances and other functions made by some of the bigger (and older) yacht owners.
- Accommodation provision is critical and varies. Summertime dinghy championships often require camping sites and facilities; bed and breakfast and self-catering accommodation is also a common choice, while hotel accommodation may be sought by older and more affluent groups.

Three types of activity are noted with some indication of their requirements.

6.4.3 *Dinghies*

These are the most commonly raced, especially during the summer season. A week-long national championship may attract well over a hundred boats. On-shore storage for between races is necessary for all dinghy classes, with suitable slipway type launching access. The amount of space required obviously varies according to the size of the event and dinghy type. The dinghy classes do not need specialised facilities such as cranes for mast stepping.

6.4.4 *Keelboats and Cruiser Racers*

Small keelboats are less easily handled on-shore than racers. Boats such as Dragon and Olympic Soling may require special launching and mast stepping facilities. Keelboats are, however, often kept on the water during events to minimise this problem, so the provision of moorings replaces on-shore storage as a major concern.

6.4.5 Alternative Water-Use Events

Salt-water villages and towns often have local water-based events which local Councils and businesses try to maintain and promote. Bath tub races, raft races, etc. can create a positive tourist attraction as well as providing an opportunity for both fund raising and local participation.

6.4.6 Commercial Marine Leisure Activities

Evaluation of markets in the UK and overseas has revealed a trend towards the commercial development of Marine Tourism. This category of business involves the provision of marine recreational services by companies operating commercial vessels. It includes corporate entertaining, yacht and power charter, sailing schools, flotilla cruising, sea angling, jet skiing, board sailing, wildlife viewing and sea trips to cultural and historic sites.

B1 - LEISURE BOATING WATERSPORTS + SPORTSCLUBS + ASSOCIATIONS

Alresford Creek Boat Owners Association.	01206 825163
Brightlingsea Sailing Club, Waterside, Brightlingsea.	01206 303275.
Brightlingsea Powerboat and Waterski Club.	
C/o Morgan Marine, Brightlingsea.	01206 302008
British SubAqua Club	
Colchester Garrison	01206 783059
Colchester Leisure	01206 570748
Brightlingsea	01206 396521
Colne Sea Cadets, The Lightship, Colchester.	01206 798895
Colne Yacht Club, Waterside, Brightlingsea.	01206 302594
Dabchicks Sailing Club, 143 Coast Road, West Mersea.	01206 383786
Essex County Council Youth Services,	
- Brightlingsea Marine Activities Centre	01621 776256
- East Mersea Youth Club	01206 383226
Essex University Sailing Club, Waterside.	01206 863211
J Lawrence Traditional Boat Charter,	01206 302863
North London Sailing Association,	
Old Customs House, 126 Sydney St, B'Sea.	01206 302020/ 02085275544#6125
Scouts Offshore, The Lane, West Mersea.	01206 385071
Scuba 65, 35 Broomfield Cresc. Wivenhoe.	01206 824144
Sea Scouts, Colchester (12th,17th,26th);	
Mersea Island; The Lane, West Mersea.	01206 303305
West Mersea Windsurf Club.	(No details obtained)
West Mersea Yacht Club, 116 Coast Road, West Mersea.	01206 382947
Wivenhoe Sailing Club, Walter Radcliffe Way, Wivenhoe.	01206 822132
Willow Lodge Social + Sailing Club, West Mersea.	01206 383568

APPENDIX B2 - LEISURE BOATING BUSINESSES IN AND AROUND THE COLNE ESTUARY

ROWHEDGE

Fabian Bush, The Old Yacht Store, 49 High St, Rowhedge. 01206 728577. Designers + naval architects, boat builders, boat repairs + slipping

WIVENHOE

Britannia Boat Co. Berry Ho, The Quay. 01206 827889/823214. Boat builders + repair.
D M Cannell + Associates, River House, Quay Street. 01206 823337. Marine surveyors,
Colchester Borough Council, Colchester Port, Harbour Office, Walter Radcliffe Way. 01206 827316. Waterway + harbour authorities.
P N Davies, 98 The Avenue. 01206 823289. Marine surveyor.
Marine Traders Yacht Brokers, 'Halyards', 3 Parkwood Ave, 01206 822671.
Hart Nethercraft, 23/24 Wivenhoe Industrial Estate. 01206 822017. Marine engineering.

FINGRINGHOE

Chris Rowe Engineering, Ballast Quay Road. 01206 729227. Manufacturer new and used boat sales

BRIGHTLINGSEA/ ST. OSYTH

Brightlingsea Harbour, Harbour Office, 4 Coppperas Road. 01206 302200. Pilotage, moorings, harbour administration.
D B Marine, Unit 47, The Shipyard Estate. 01206 304391. Marine engineers.Engine sales, service, repairs.
Collyer-Smith Marine, Morses Lane Industrial Estate, 01206 306788. Chandlers, engine sales, spares + service, clothing
East Coast Marine, Tower St. 01206 302275. Boat lifting/crane.
*G Eels..... 01206..... Boat repairs/chandlery.
Flag Wharf Boat Yard, B'Sea Creek. 01255 821211. Boat repairs/marine engineering.
French Marine Motors, 61-63 Waterside. 01206 302133. Marine engineers.
M Goodwin, Boat Workshops, St John's Road. 01206 826171. Boat repairs.
Great Eastern Marine Ltd, The Old Shipyard. 01206 303536. Boat repairs + slipping, new and used boat sales, boat makers.
Heron Yacht Services, Sampsons Road. 01206 303695. Chandlers/main order.
* J Hickman, ... 01206 302587. Boat repairs, marine engineering.
Kevins Water Taxi Services, 48 Silcott Street, 01206 303630. General boat repairs. B'Sea water taxi.
James Lawrence Sailmakers, 22 Tower St. 01206 302863. Sailmakers + repairs, chandlers.

L H Morgan + Sons (Marine Ltd), 32-42 Waterside. 01206 302008. Boat sales, new and used; boat storage.
L H Morgan Marine & Sons (Marine) Ltd, 32-42 Waterside. 01206 302003. Engines(outboard, petrol; inflatables, motor cruisers, sports boats, ski boats).
St Osyth Boat Yard, Mill St, St Osyth. 01255 820005. Boat repairs, storage.
St Osyth Boatbuilders, The Quay, Mill St, St Osyth.01255 820477. Boat repairs, marine engineering.
Sailspar Ltd, Tower St. 01206 302679. Mast and spar manufacturers. Riggers and general fabricators.
Shoremark Diving, 8-10 High Street, 01206 308124 or 308125. Chandlery/dive shop/school.
J Spencer, 22 Waterside. 01206 302911. Yacht services, boat builder.
Superspeed Trailers, 32-43 Waterside. 01206 305151. Manufacturer trailers, parts + accessories, new + used boat sales.
*T Boats (Scales Bros), Lime St. 01206..... General boat repairs + services.
Teliga Yacht Marine + Marina Services, 22 Marennes Crescent, 206 304414.Marine services.
White Formula Ltd, Unit 4 Shipyard. 01206 302724. Boat builders + repairs.

WEST MERSEA

A H Bird, 1 Norfolk Ave. 01206 383000. Moorings contractor.
A B Clarke + Sons, 124 Coast Road. 01206 382706. Marine engineers.
P B Clarke, 128 Coast Road. 01206 385903. Boat builder + repairs.
Garen-Ocean Sailmakers, 130 Coast Road. 01206 384412. Sail makers + mender.
* D Gladwell, Diadem Houseboat. 01206..... Shipwright/carpenter
Holman + Pye, 21 City Road, West Mersea. Yacht designers.
Malseed Marine Engineering, 110 Coast Road. 01206 382457. Marine engineers.
D Mills, 4 Empress Drive. 01206 382161. Shipwright/carpenter.
Merchant Marine, 122 Coast Road. 01206 381600. Yachtbrokers, recycled chandlery.
R Parkinson Marine, Unit 6B Haycock Lane. 01206 385008. Engines/outboard motors, sales, repair, service.
Passmore Upholstery, 62 East Road. 01206 383314. Yacht upholsterers.
David Royce Sprayhoods, 110 Coast Road. 01206 384032. Sailmaker + hoods.
West Mersea Marine Engineering, 128 Coast Road. 01206 384350. Marine engine repairs.
Seaway Yacht Sales, The Old Oyster Shed, Coast Road. 0 1206 385083. Yacht brokers.
* R Smith (Tomato Boats).....01206..... Boat repairs, marine engineer.?
West Mersey Marine, 110 Coast Road. 01206 382244. Boat moorings.
Wyatt's Chandlery, Waterside, 128 Coast Road. 01206 384745. Yacht chandlers.

COLCHESTER

J A Bennett + Assoc, 143 Hythe Hill, 01206 794886. Naval Architects, designers of sail and power craft and commercial craft.
Bushdale Ltd, Grange House, Great Horkesley. 01206 271570. Boat hire + charter.

C+M Enterprises, Tower St, 01206 303629. Marine consultancy/individual projects.
Class Fibre, Unit 4/5 Oyster Haven, Haven Road. 01206 867616. Manufacturers of grp mouldings, motor boat and sailboards.
Colvic Craft PLC, Earle Colne Business Pk, Earle Colne. 01787 223993. Moulders of fibreglass hulls and decks from 38' to 60', both power and sail.
Dedham Boat Hire, Boat House, Mill Lane. 01206 323153. Boat hire.
Oliver, The Kennels, Rectory Road, Gt Bromley. 01206 251255. Boat repairs + slipping.
Rosebak Marine Ltd, Ewer House, 44-46 Crouch St. 01206 564243. Boats + small craft.
Watersports, 13 Peartree Centre, Dugaid Ave. 01206 384296. Surfboard, chandlery.
F Wright Mobile Weldings, 7 Clay Lane. 01206 844869. Boat builders + repairs.

APPENDIX B3 - QUESTIONNAIRE

COLNE ESTUARY LEISURE BOATING SURVEY - 2000

Name of business.....

Address:.....

Tel: ..... Fax..... e-mail.....

Contact name:..... web-site.....

Type of business.....

SIC/MLH.....

Year established..... Relocated to..... When ?.....From?.....

Locally owned ?Yes/No..... If not, main HQ ?.....

Number employed:

Winter MFT..... MPT..... FFT..... FPT..... Total

Summer MFT..... MPT..... FFT..... FPT.....Total

Skills required: 1 2 3 4 5

MFT.....

6 7 8 9 10

.....

Av wkl wge.....

.....

MPT .....

Av wkl wge.....

FFT .....

Av wkl wge.....

FPT .....

Av wkl wge.....

Is your business **totally dependent** on Colne Estuary based boating ? Yes/No

If 'No', what percentage is dependent ? .....

Is this percentage : (a) remaining static, or (b) increasing, or (c) decreasing?

Where does your non-Estuary business come from ?.....

What percentage of your business is dependent upon the following **type of craft?**

Sailing leisure boats

(a) off-shore cruisers.....

(b) off-shore racers.....

(c) keel boats.....

(d) catamarns.....

(e) dinghies.....

(f) windsurfboards.....

Power leisure boats

(a) off-shore cruisers.....

(b) sports boats.....

(c) hydroplane racers.....

(d) jet-ski boats.....

Human-powered leisure boats

(a) canoes.....

(b) rowing boats.....

Wave-powered leisure boats

(a) surfboards.....

About how many vessels are needed to support you as a viable business ?.....

Are there any specific types of leisure boating business that you think are needed to strengthen this sector in the Colne Estuary ? If so, what ?.....

The Phase 1 Consultant report identified the following potential locations for possible leisure boating development. I'll read them out first to you and then ask you to give your views on each:

	PROS	CONS
1. Seawick		
2. Pyefleet Channel		

3. West Mersea :

Strood Channel

Salcott Channel

4. Brightlingsea
(WharF at the Creek)

5. Alresford Creek
S of Creek ca
Moverons farm

N of Creek ca
Alresford Lodge

6. Ballast Quay Farm
(S of Rowhedge)

7. Rowhedge ABP
site

8. The Hythe

Finally, what constraints do you see to future leisure boating development in the Estuary?

B4 - DATE ON OTHER MARINAS IN THE UK