

**SCOTTISH
NATURAL
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COMMISSIONED REPORT

Commissioned Report No. 215

Landscape/seascape carrying capacity for aquaculture

(ROAME No. F04NC12)

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Grant, A. (2006). Landscape/seascape carrying capacity for aquaculture. Scottish Natural Heritage Commissioned Report No. 215 (ROAME No. F04NC12).

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Landscape/seascape carrying capacity
for aquaculture

Commissioned Report No. 215 (ROAME No. F04NC12)
Contractor: Alison Grant in association with Carol Anderson
Year of publication: 2007

Background

Finfish and shellfish farms continue to increase in terms of both number and size. Often applications for aquaculture leases are considered individually, and their effects on seascape character and visual amenity can be difficult to assess at a strategic level.

This report aims to develop an approach to assessing the capacity of seascapes to accommodate existing and potential future aquaculture development. The capacity assessment provides the basis for considering future individual lease applications within a more strategic understanding of how proposals can best be accommodated within the context of the wider seascape. The resulting methodology is outlined, along with two case studies, which explain how the methodology can be applied.

Main findings

- An analysis of landscape issues relevant to aquaculture development was included in the report, providing a comprehensive assessment of the type of potential effects which aquaculture development might have on visual and seascape character.
- A methodology which outlines in some detail both the process and background to recommendations was developed, providing a detailed 'trail of reasoning' for those who would use the capacity assessments in the future.
- The methodology was tested in an area where there is a great deal of existing aquaculture development, and in a seascape where there were no existing leases, and proved to be robust in both situations.
- The methodology leads to recommendations on the capacity implications of existing leases and gives guidance on the landscape and visual capacity for future lease applications.

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Acknowledgements

The consultants wish to thank the steering group of SNH staff, comprising Cathy Tilbrook, Laura Campbell, Simon Brooks and Nigel Buchan, who provided helpful advice and comments during the preparation of this report.

The views contained within this report represent those of the consultants and do not necessarily reflect the policies and views of SNH.

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1 INTRODUCTION

This report is divided into five key sections followed by annexes. It begins with an introduction, followed by a description of the methodology for undertaking the capacity assessment. This is then followed by two case studies, one undertaken for each of the two study areas within which the methodology was tested. The report finishes with conclusions, which describe the findings and wider lessons learnt from applying the methodology to the test areas.

1.1 Background

This study was commissioned by Scottish Natural Heritage in October 2004 to fulfil a requirement within the Strategic Framework for Scottish Aquaculture (Scottish Executive, 2003). An extract from the brief, outlining the project, is included as Annex One to this report, and required the consultant to:

- Develop a recommended methodology for assessing the capacity of landscapes/seascapes for aquaculture development.
- Test the likely methodology in two pilot areas.
- Describe clearly the recommended methodology.
- Assess the landscape/seascape capacity for aquaculture of the two pilot areas.

The methodology proposed in this report is informed in part by a review of other, very helpful reports undertaken to consider how best to accommodate development in coastal waters and seascapes. The findings of this literature review are included in Annex Three.

The purpose of this report is to present a methodology to assess seascape capacity for aquaculture development which can be used by landscape architects to present the analysis and train of thought which leads to the capacity recommendations.

The methodology is not intended to be prescriptive, but it has been designed to be replicable. While it aims to reflect current thinking about sensitivity and capacity assessment, the authors recognise that this is an evolving area of expertise. Future capacity assessments should aim to build on the transparent and systematic approach outlined in this method, while taking on board new thinking as and when it is developed.

1.2 An introduction to capacity assessment

Landscape capacity is described as 'the degree to which a particular landscape character type or area is able to accommodate change without significant effects on its character, or overall change of landscape character type. Capacity is likely to vary according to the type and nature of change being proposed' (Swanwick, C. and Land Use Consultants, 2002, page 53).

This section begins by outlining the process of capacity assessment, and then goes on to explain how professional judgements were incorporated into the assessment process and recommendations within this study. This is followed in Section 2 by a detailed description of the methodology developed to meet the objectives of the brief.

1.2.1 The process of capacity assessment

Unless otherwise stated by the client, landscape capacity assessment aims to sustain the significant characteristics of the existing coastal character. The process of assessing capacity therefore invariably begins by considering the attributes of the development, which in this case is aquaculture. A summary of trends in aquaculture, which informed the consultants understanding of the nature of the development, can be found in Annex Two.

The scope of the landscape needs also to be defined at the outset. In this case, the term 'seascape' is used to encompass the geographical reach of the area of land likely to be affected by aquaculture development. Throughout the report the word 'seascape' refers to the visual and physical conjunction of land and sea, which combines maritime, coast and hinterland character.

Once the attributes of the development have been identified it is possible to consider which characteristics of the seascape are most likely to be affected by the development, either positively or negatively. This informs the survey, analysis and assessment of landscape character, which forms the basis of a sensitivity assessment. Recommendations on the ability of the seascape to accommodate the development then follow.

In theory it would seem possible to undertake a coastal character assessment, allocate a 'coastal character type' to each area and award a rating reflecting the sensitivity of the character type to a particular development. This rating would then be allocated to all other coastal characters assessed as being of the same type.

In practice it is not quite as straight forward. This is largely because capacity does not relate to physical and experiential character alone. Issues such as visibility and visual composition, the setting of key features and settlements, a judgement on aesthetic quality and 'ambience' only relate in part to landscape character, and require a degree of professional judgement to assess and express their significance. This is recognised in paragraph 6.1 of the recent publication 'Topic Paper 6: Techniques and criteria for judging capacity and sensitivity' (Swanwick, Carys, 2004), which indicates that current thinking is that 'turning a sensitivity study into an assessment of capacity...' (*combines*) 'the assessment of sensitivity of different types or areas of landscape' (*with*) 'an assessment of the more subjective, experiential or perceptual aspects of the landscape and the value attached to the landscape'.

The criteria for assessment therefore needs to reflect the full scope of the issues which will help determine capacity. It is important that the methodology, which combines analytical survey, professional assessment and judgements, clearly expresses the background to each decision. The methodology therefore incorporates a well-explained 'trail' of reasoning which explains where analysis, assessment and professional judgements are being brought into play. This underpins recommendations, ensuring that they are clearly explained and justified.

Therefore the approach which has been adopted combines consistency and rigour with more explanatory and descriptive analysis. The assessments which are produced as a result should be consistent and informative and lead to a set of clearly justified recommendations.

2 PROPOSED METHODOLOGY

This section of the report presents a detailed explanation of the methodology.

2.1 Summary of approach

While there are common strands of approach within most landscape capacity assessments, the process of landscape capacity assessment is tailor made each time to address the specific needs of the brief, the landscape and the type of development. This methodology has therefore been developed to meet the needs of assessment in relation to accommodating aquaculture development in coastal areas, and will not necessarily be applicable to other forms of development.

The method of capacity assessment for aquaculture developed to meet this brief can be divided into six broad stages:

- Undertake a desk study, principally to identify the attributes of aquaculture development, produce development scenarios and identify the pilot areas for testing the methodology.
- Identify the character areas within the pilot areas (in this report called 'coastal character areas') and any further subdivisions (in this report called 'local coastal character areas') required to ensure coherent assessment and clear presentation of findings.
- Carry out a survey and analysis of relevant coastal character issues within each coastal character area.
- Identify opportunities and constraints in relation to aquaculture development.
- Assess the sensitivity of the individual coastal character areas to potential aquaculture development.
- Produce final conclusions on capacity which are accompanied by any guidance which would help to accommodate aquaculture development in the seascape.

2.2 Initial desk based preparation

2.2.1 The attributes of the development

Aquaculture development is made up of two key components: the water based structures, encompassing the cages, lines or racks and the infrastructure required for feeding and harvesting the fish, and any shore base which may include sheds, a jetty, storage yard and parking space. An analysis of attributes is summarised below, and is based in part on the summary of Trends in Aquaculture in Annex Two.

2.2.1.1 Finfish cages and offshore infrastructure

Cages for finfish can be square in shape, but are more likely to be circular. The more popular circular cages can be up to 100m circumference. Newer structures are designed to lie low in the water.

The structures are therefore geometric in shape, which contrasts with organic shapes and more irregular forms. They are generally clustered together, regularly spaced and often set in a grid like pattern, which reinforces their geometric form. The materials most commonly used are a combination of metal and dark

plastic, which can make the structures less visually intrusive, although this tends to vary according to light conditions. Sometimes each cage has a feed hopper, which can reinforce the regularity of the pattern and if brightly coloured, can be visually prominent.

Most finfish farms are accompanied by barges used for feed storage and sometimes accommodation for workers. These can be moored boats or specially designed floating feed barges which look rather like boats from a distance. They can be visually very prominent: old boats are often painted bright colours and rather derelict looking, while purpose built feed barges tend to be more muted in dark grey, but can at their largest appear like enormous sheds or floating metal containers, while more modest structures appear like moored boats in the water.

Some barges generate power, which can be heard as a low noise, while some cages are lit, producing an eerie underwater glow at night.

2.2.1.2 Mussel lines and offshore infrastructure

Some mussel lines are suspended from rafts, which are similar in character to square cages, with similar attributes.

Early mussel lines were ropes suspended from a range of floating buoys and objects, but these are now being superseded by lines of large grey black plastic buoys. These are generally distributed evenly along ropes, but there is no set distance between buoys or between lines; the distances will depend on the site conditions.

Mussel lines appear as a line of dots in distant views, which can be very prominent when they are carrying little weight, and more submerged in the water when they are laden with mussels. They tend to be less visually intrusive than finfish cages, as they occupy less water surface, and do not appear as a solid block or barrier, but they are often located much closer to shore in sheltered bays.

They have a regular appearance, with lines appearing very prominently from some angles, and from low viewpoints can quickly appear to fill a bay. As with cages, they are relatively industrial in character, particularly the large installations, due to the vast expanse and regularity of the buoys and their formal arrangement. The larger installations are increasingly accompanied by rafts housing supporting infrastructure.

2.2.1.3 Structures common to both finfish and shellfish farms

All structures are accompanied by brightly coloured buoys, to ensure that water based traffic is aware of their presence.

During site surveys, it was noted that in Argyll, all farms of moderate size upwards are likely to be accompanied by rafts and barges which house infrastructure, including accommodation for harvesting and processing as well as storage. This includes moderately scaled mussel lines installations, which are no longer low key, rather unobtrusive structures.

All farms generate marine based traffic from a shore base, and this will increase movement and noise.

Shore bases tend to be located in established settlements, as they require a jetty. Sometimes new bases are established, and include a pier or pontoons, buildings, a storage yard and car parking. In areas with existing settlement they are likely to be less intrusive than in more remote locations, and their design is, as with other built development, usually expected to fit with planning policies.

2.2.1.4 Oyster trestles

Oyster timber or metal trestles are sited in the intertidal zone, where they are submerged except at low tide, when the handler can gain access to turn and clean the oyster bags. They are therefore only visible when the tide is out.

The trestles occupy the foreshore, and therefore restrict access at low tide. They are rectangular in shape, and often arranged in rows and columns, creating a geometric pattern. While smaller farms are generally managed by hand, access to larger farms can involve wheeled vehicles, which churn up the foreshore, creating a more managed and fragmented character.

2.2.2 Development scenarios

Development scenarios are used to focus thinking on the potential effects of development on the seascape, particularly during the opportunities and constraints analysis, the sensitivity assessment and the assessment of capacity which is described in the conclusions.

Development scenarios are therefore indicative rather than prescriptive. They represent the general size, range of components and layout of developments. They cannot however, aim to cover all variables in the design, size and layout of aquaculture structures.

In all cases, it was expected that good siting and design guidance would be followed, as described in Grant (2000), although it was recognised that larger structures, a more recent trend, was perhaps not adequately catered for by this guidance.

The scenarios reflect recent trends towards larger scale structures with more mechanisation (see Annex Two). There is also a trend towards moving to more exposed sites, particularly for finfish farming, where flushing is greater.

Three broad scenarios were used, differentiated by size:

2.2.2.1 Small scale

- Up to six cages or rafts with no offshore storage or other infrastructure. It is thought that there will be very little demand for this scale of development.
- Up to four mussel lines or rafts occupying not more than half the length of a bay, with no offshore infrastructure.
- Oyster trestles which occupy up to one tenth of a bay when the intertidal is revealed at low tide.

2.2.2.2 Modest scale

- Between six and twelve cages or rafts, up to 22m diameter, with one feed barge or small feed hoppers attached to each cage, but no other offshore infrastructure.
- Up to six mussel lines or rafts, occupying up to two thirds of the length of a bay, with associated offshore infrastructure.
- Oyster trestles or similar which occupy up to one quarter of a bay when the intertidal is revealed at low tide.

2.2.2.3 Large scale

- More than twelve cages or rafts, often over 20m diameter, with a feed barge and possibly additional water based infrastructure.
- More than six mussel lines or rafts, occupying more than two thirds of the length of a bay, with associated offshore infrastructure.
- Oyster trestles or similar which occupy more than one quarter of a bay when the intertidal is revealed at low tide.

When relevant, in the conclusions sections within the assessments, reference is made to the appropriate development scenarios.

2.2.3 Identifying an appropriate map scale for site work and presentation

A scale of 1:100 000 was identified as the most appropriate scale for the presentation of both contextual information and cumulative assessment. This scale is appropriate for presenting the necessary strategic overview while providing a suitable level of detail.

For detailed assessment and presentation of findings in the individual study areas, consideration was given to using both 1:25 000 and 1:50 000 scale maps. Initial assessment was undertaken using the 1:25 000 scale mapped information. This provided useful detailed information of physical features along the coastline and hinterland. However, in terms of presentation the information provided was generally too detailed, and it was considered that the 1:50 000 map scale gave the best visual representation of the level of detail required to present the more strategic assessment required to undertake this type of study.

The 1:50 000 scale ensured that the study areas were always viewed in context and that the relationship with neighbouring areas of hinterland and seascape character was always properly illustrated, while at the same time the detail of the articulation of the coastal edge, key features and visual analysis could be conveyed. 1:50 000 is also the scale used by Highland Council for the production of fish farm framework plans.

In conclusion, while the 1:25 000 maps were sometimes used during site visits to help identify features, 1:50 000 scaled maps were used to present the findings.

While the original work has been undertaken at the scales identified as most appropriate as indicated above, the maps which are copied into this report are reductions of the originals for illustration purposes only.

2.2.4 Selecting the pilot areas

For the purposes of this study, two pilot areas were selected to test the methodology and to be incorporated in this report as case studies. The selected areas aim between them to encompass most of the range of character types along Scotland's coastline, and include areas of well developed coast, relatively remote land and land both within and outwith NSAs.

2.2.4.1 Pilot area one: Argyll: North Firth of Lorn/South Loch Linnhe

This area includes the fjord landscapes of Loch Etive, the relative remoteness of the Isle of Luing, the inhabited mainland, and coastlines which range from indented coasts, peppered with skerries, to the relatively simple forms of more even slopes and coastal edges. There are many existing aquaculture developments within this area, which allowed the methodology to be tested in relation to existing development and potential existing over-capacity in landscape terms.

2.2.4.2 Pilot area two: Galloway: The coast from Luce Bay to Fleet Bay

This area includes the expanse of Luce Bay, the prominent headland and cliffs of Burrow Head and the more intimate coastline and shallow sandy reaches of Wigtown Bay, including the tidal islands of the Fleet Estuary. It provides a distinct contrast to the Firth of Lorne, and there are no known aquaculture leases within this area. This allowed the methodology to be tested without reference to existing aquaculture development.

2.3 Identifying character-based subdivisions

To assist in the analysis and presentation of findings, and to remain consistent with the recommended approaches to capacity assessment outlined in recent publications (Swanwick, Carys and Land Use Consultants, 2002; The Landscape Institute and the Institute of Environmental Management and Assessment, 2002) it is appropriate to base assessment and recommendations on areas of consistent character.

To increase understanding and accessibility, these areas should relate to geographically coherent locations which are not only similar in overall landscape character but are recognisable as one entity which can be referred to by name. It is also important, simply for ease of reporting, that the areas can be accommodated on one A3 map at a scale of 1:50 000.

The pilot areas were used as the basis for the subdivisions used in the present study, but the methodology allows for subdivisions to be identified within any stretch of coast.

2.3.1 Coastal character areas

Within the pilot areas, coastal character areas were identified which reflect both a consistency in overall character at a strategic level and known geographical areas. They are usually a single loch system, a stretch of coastline with a consistent overall character, or a whole island. These areas have usually been named after the geographical location of the area.

2.3.2 Local coastal character areas

The coastal character areas have been further subdivided into areas of consistent and distinct coastal character. We have called these areas 'local coastal character areas', and we have taken into account the following attributes when identifying the areas:

- Physical landform, the degree of enclosure or open-ness and an assessment of both horizontal and vertical scale.
- The degree of influence of the sea and qualities which may be described as 'maritime' on the landscape and coast of the area, including coastal dynamics.
- The shape, scale and degree of fragmentation of the coastline.
- The presence of human artefacts, distribution of settlement pattern and amount of human activity.
- Landscape features, including historic features, and their setting.
- Experience of the coast, landscape and seascape, including the degree of remoteness and potential opportunities to appreciate wildness.
- Visual catchment.

In identifying these coastal character areas, we have mapped broad consistency of characteristics at 1:50 000 scale. Where there was doubt about identifying boundaries between the areas, we have given priority to those characteristics which specifically influence the character of the coastal edge, which is where aquaculture developments are most likely to be located.

2.4 Undertaking and presenting site survey and analysis

The first stage in this process requires thorough survey work, undertaken to identify opportunities and constraints for aquaculture expansion and inform the sensitivity analysis.

The preliminary site visit gave an opportunity to draw up an initial list of topics which would steer site assessment. This list of topics is shown in Tables 1A and 1B on pages ?? and ??. The topics focus on those issues of seascape character and visual assessment which are particularly relevant for assessing the potential capacity for accommodating new aquaculture development within the seascape.

The tables are laid out to try to distinguish between the different types of assessment made on site. A distinction is drawn between those aspects of the seascape which relate to physical character and are therefore relatively objective, and those aspects of character and visual assessment which are more subjective, and within which professional judgement plays a significant role. The distinction is never quite as black and white as it is presented, however, as all assessment – even the process of identifying and describing physical characteristics – involves sorting, assessing and prioritising information, all of which necessarily involves a degree of judgement. The layout of the table therefore indicates when physical character, experiential character, judgement and existing recognised values play the most significant role in analysis, not the only role.

The primary role of Tables 1A and 1B is to act as a prompt on site visit – they are simply a form of checklist. The site assessment should be comprehensive enough to ensure that all information required to carry out the later stages of assessment has been identified. The topics are therefore further subdivided into relevant issues, which have been paraphrased as bullet points in the tables and are discussed in more detail below.

2.4.1 Maritime influences

The physical, visual and perceptual influences of the sea vary from the exposed coastal areas, where maritime influences are considerable, to sheltered steep sided fjords, with little maritime influence, which could almost be fresh water lochs.

Maritime influences include natural processes, such as the dynamics of waves, tides and currents, exposure to the wind and the influence of the salt laden air on vegetation. They also encompass particular development and activities associated with the open sea, such as harbours and fishing, yachting, marinas, tanker haulage and inter island ferries.

Qualities such as the sense of space and distance, the quality of light and bright reflectivity are associated with the expansive horizon and exposure of the open sea, while the intricate pattern of islands, meandering coastlines and contrast between light and shade are more evident at the coastal edge and within the sheltered sea lochs.

The particular maritime issues which are likely to affect the capacity of an area to accommodate aquaculture development are indicated below.

2.4.1.1 Marine based activity

The amount of existing human activity, such as yachting, fishing, existing fish farms and ferries will influence the character of the coastal landscape in two ways. Firstly, through the presence of elements and associated infrastructure required to support the activities and secondly through the amount of movement and noise which is generated by the activities across the water and along the coastal edge.

Where there is a high amount of existing activity, it may on the face of it seem an appropriate area for aquaculture development. In general, the presence of the aquaculture infrastructure, along with the amount of extra noise, light and boat movements may be easily absorbed into the existing level of activity. However, where the existing activities are associated with recreation dependant on the attractiveness of the seascape or the experience of the seascape as a relatively unmanaged environment, the introduction of aquaculture may be less appropriate.

This topic is largely considered to be one appropriate for consideration as a physical characteristic of the coast, although the degree of noise, light and activity across the surface of the sea will influence the experience of the landscape character.

2.4.1.2 Existing aquaculture development

The aquaculture industry is well established in Scotland and therefore there are numerous sites which have already been developed for fin or shellfish farming, accompanied by the associated infrastructure. Many of these are well located and designed, but where this is not the case, poor decisions about location of development in the past should not be used as a precedent for continuing development in an area in the future.

The presence of existing development therefore should not automatically lead to the conclusion that future development will be acceptable. In addition, increasing existing aquaculture activity is likely to create effects

associated with the accumulation of development. Where a small number of individual developments may be acceptable in their own individual settings, the cumulative impact of all the developments in one area, or experienced when travelling through an area, may be more than the sum of the parts, resulting in a negative effect on coastal character or visual amenity.

As with other marine based activities, this topic is largely considered to be one appropriate for consideration as a physical characteristic of the coast, although the degree of noise, light and activity across the surface of the sea will influence the potential sense of place.

2.4.1.3 Natural dynamics

The natural dynamism of waves, tides, currents, wind and coastal processes is a key characteristic of seascape and frequently influences both the physical environment and experience of the coast. The presence of natural dynamics is strongly influenced by aspect and orientation, which is likely to govern exposure. Changing light and atmospheric conditions are also often most apparent at open sea locations, not least because of the reflectivity of the water, the expanse of visible sky and the vastness of views.

Aquaculture development has only a limited influence over these processes, some of which may also be physical limitations to future development. In terms of seascape, therefore, the key potential negative impact of aquaculture is likely to be on the opportunities which people have to appreciate these qualities, either through visual obstruction or distraction, or because of the contrast between the static presence of the fish farm and the dramatic dynamics of the natural processes, most notably in areas where there is an expansive, shallow intertidal reach.

These processes contribute to the physical and experiential character of the coast. Where they contribute to aesthetic quality, largely through visual drama of light interacting with the dynamic process, this requires professional judgement.

It was also noted, however, that the presence of natural processes may dominate character to such an extent that they contribute to the appreciation of relatively remote and wild character. Where this occurs, the effect is noted within the wildness section of the analysis.

2.4.1.4 Scale and distance

As explained in M. Hill *et al.* (2001), understanding scale and distance is particularly difficult in marine environments if there are no reference points against which size and distance can be judged. This is most likely to occur where views look out over a vast expanse of sea, where no landfall or structure of known dimensions is visible. There is therefore nothing against which size and distance can be measured.

In these scenarios, where large scale is a dominant characteristic, aquaculture is unlikely to affect this perception. It is likely that some large new aquaculture development will move well offshore, where faster moving water results in easier flushing of debris from the farms. These newest designs have very little surface structure, and are therefore likely to be difficult to see, but the infrastructure of lighting, if used, and feed barges may be discernable. The size of the feed barges is likely to be relatively small in relation to the expanse of open sea, and will probably be read as a small, but static, boat.

A related characteristic to the sense of scale is the perception of the sea as an uncluttered expanse of water, even and simple in character. This often contrasts with a more diverse coast and hinterland.

Aquaculture is therefore most likely to have a negative effect on character if a large installation is located where its size dominates small elements, such as tiny islets and skerries, or if the uncluttered expanse of the sea is an important element in visual composition, balancing out a cluttered and busy adjacent landscape.

Scale and expanse are analysed as a physical characteristic, but are often most keenly experienced as a sense of open-ness, exposure or, alternatively, intimate containment.

2.4.1.5 Experiential qualities associated with the presence of the sea

While many of the factors listed above demonstrate those aspects of seascape which we can ascertain with our eyes, the feeling of the wind, the sound of the waves, birds and wind, the smell of the salt laden air and the sense of being on the 'edge of land' all contribute to our experience of the sea.

The presence of aquaculture development rarely directly affects these attributes, although their presence may contribute to the appreciation of overall aesthetic quality or enhance existing remote or wild character.

2.4.2 Physical character of coastal edge

The articulation of the coastal edge is one of the key factors in considering the location and siting of aquaculture development. Promontories and bays, as well as offshore skerries and islands, offer features with which a new development can be associated. Enclosed bays offer visual containment, and long simple coastlines can be reflected in the simple, linear layouts related to shellfish lines in particular. Conversely, however, complex coastlines may often also have a high aesthetic quality, the indentations of intimate bays can be obscured or filled up by extensive development on the water surface and the presence of cages can obstruct the simple curvature of a coastline. Assessing the characteristics of the coastal edge therefore contributes to identifying appropriate locations for development and considering how much development may be located on the water before cumulative impact erodes the existing key characteristics of the coastal edge.

The particular characteristics of the coastal edge which are likely to affect the capacity of an area to accommodate aquaculture development are indicated below.

2.4.2.1 Shape and degree of indentation of the coastline

The shape of the coast, where land meets the sea can vary from long, simple, sweeping curves to highly complex and indented margins. The shape is emphasised by the contrast between land and sea, and is often a visually dominant line in views overlooking the coastal edge.

An irregular coastline, with indented bays and extended promontories contains many visual foci as the eye follows the line of the complex boundary between land and sea, resting at each promontory. Adding structures to the coastline – whether on land or in the adjacent sea – which are sited to emphasise these existing promontories tends to reinforce this characteristic. Generally speaking, this offers opportunities for aquaculture development to be located where the structures can emphasise this existing pattern.

Along more simple coastlines, the eye sweeps rapidly along the coastal edge to rest at the distant horizon. Aquaculture development located along these coastlines may interrupt the flow of the distinct transition between land and sea, and create an overly complex level of detail within a very simple landscape. In general, where aquaculture developments can be sited in a linear form they are more likely to reinforce the alignment of the coastal edge and be accommodated in this landscape.

These characteristics rely heavily on the physical components of the landscape, and are therefore included in any analysis of physical characteristics.

2.4.2.2 Fragmentation of the coastal edge

Allied to the shape of the coast is the degree of fragmentation, where skerries and small islands can create further visual foci and emphasise a more gradual transition from land to sea. This often creates a complex landscape and visual composition.

Such fragmentation offers opportunities to accommodate aquaculture which are similar to those found along the indented coast. Skerries and islands can provide some visual screening for cages. More significantly the characteristic pattern of intermittent land and water can be reinforced by cage and line patterns which are similar in size and distribution to the islands.

These characteristics rely heavily on the physical components of the landscape, and are therefore included in any analysis of physical characteristics.

2.4.2.3 Shoreline development

Some development is located directly on the shore or the coast, and influences the character of the seascape. Jetties, harbours, pontoons, some fishing infrastructure and boat houses are all the most obvious examples, but bridges, roads and often older settlements can also be located directly on the coast.

Aquaculture may be able to relate to this development by taking physical advantage of buildings and piers which can be used as onshore infrastructure, and by locating offshore installations where they can be visually associated with onshore structures, especially where a developed, busy environment is a key landscape characteristic.

These characteristics rely heavily on the physical components of the landscape, and are therefore included in any analysis of physical characteristics. In addition, however, the degree of development is likely to affect the sense of wildness and may be recorded in this analysis.

2.4.2.4 Key landscape features and landmarks

Features along a coastline, whether natural, such as prominent geological features or distinctive vegetation patterns; or cultural, such as historic sites, prominent archaeological remains, designed landscapes or distinctive settlement patterns, often require a setting which will include an element of sea, to retain their visual prominence or historic integrity.

Where such features are located, it may be difficult to accommodate additional development – whether onshore or offshore – as this may detract from the setting of the feature or, if appropriate, from their role as a visual focus.

These characteristics rely heavily on the physical components of the landscape, and are therefore included in any analysis of physical characteristics. However, where they became focal points in a view, their presence was also noted within the visual assessment, and if they were landmarks frequented by visitors, they were then also recorded as significant viewpoints.

2.4.3 Landscape character of the immediate hinterland

The character of the landscape adjacent to the shoreline will influence the potential sensitivity of the landscape to aquaculture development, as it both provides some of the character context and setting for any potential development and also the context from which land based views are experienced.

The particular characteristics of the immediate hinterland which are likely to affect the capacity of an area to accommodate aquaculture development are described below.

2.4.3.1 Topography and degree of relief

Low lying relief adjacent to water often has the effect of emphasising the sense of open-ness, as the containment provided by gentle slopes and low hills is often very subtle. Conversely, where the immediate coast or adjacent hinterland rises quite steeply, the sense of containment will be pronounced, and the perception is often of a less expansive stretch of water. Increased containment may also result in a sheltered environment, where there may be extensive reflections of surrounding mountains on a calm loch surface. Frequently, there is a sharp juxtaposition between vertical scale and the expansive horizontal plane of the water.

Aquaculture development does not affect the topography and relief of the hinterland, but may impinge upon the experience generated by the degree of enclosure, most notably if there are reflections on the loch surface which are interrupted by offshore installations.

The nature of the topography is recorded as a physical characteristic.

A rising hinterland very often also gives rise to more elevated views of the water surface, while more low lying relief offers opportunities for more foreshortened views from low viewpoints, an issue which is picked up in the visual assessment.

2.4.3.2 Vegetation pattern

Wooded vegetation adjacent to the shoreline, particularly on a southern shore, will often cast dark shadows along the water edge, which can reduce visibility. This may become a key characteristic of the coastal edge extending down from the hinterland.

More widely, woodland can create visual screening, or a composed setting, for both onshore and offshore structures, from key view points. However, where woodland is semi natural in character and organic in shape it may contrast sharply with the more industrial character of finfish farms in particular.

Vegetation cover which is more open in character may allow more visibility of structures, but may also offer a pattern or structure on land which can provide a setting or pattern which can be reflected in the layout and design of aquaculture development in the water, or associated land based infrastructure.

Vegetation pattern is analysed as a physical characteristic, but the role of woodland as a visual screen contributes to the visual assessment, and where woodland or vegetation is semi natural and perhaps difficult to traverse, it may enhance the sense of wildness.

2.4.3.3 Settlement pattern

Settlements tend to be clustered, scattered or even linear in pattern. In some areas settlement will be sparse, while some coastal areas are thriving port towns with a concentration of built structures and all the activity which goes with them.

It may be possible to relate the distribution and scale of aquaculture development to a similar pattern of built development on land, particularly in areas where settlement is characterised by a series of point features within the wider landscape.

Settlement pattern is analysed as a physical characteristic, although coasts overlooked by settlements feature in the visual assessment.

2.4.4 Judgements and values associated with seascape character

As part of the assessment process, professional judgements are made in relation to:

- identifying the significance and dominance of elements and their contribution to character;
- assessing the unity of the seascape; and
- assessing aesthetic qualities.

In addition, existing recognised values are recorded. These are usually areas designated for their landscape or historic value.

This part of the assessment draws on the previous analysis of physical and experiential character.

2.4.4.1 Unity of landscape character

Some areas of landscape character have a particularly strong unity, where the individual elements repeatedly come together to create a consistent pattern which is both physically logical and visually clear. Woodland planted on steep slopes, adjacent to level land which is cultivated, with a road sited between the two so that it avoids the most fertile land but takes advantage of the level terrain, can come together to create a landscape of strong unity. The resulting composition is usually also visually harmonious.

By contrast, some landscapes are fragmented in character, with disparate development and unrelated patterns of land use which do not have a coherent and systematic relationship with the opportunities provided by the underlying landscape resource.

Areas of strong landscape unity may still be of a pattern within which aquaculture development can be accommodated, but the location and siting of new development may be limited by the need to respect the unified character of the place. Alternatively, fragmented landscapes may be able to absorb new development into their rather chaotic structure more easily, although more constructively, location and siting of new development may be used to develop or consolidate or develop a more coherent landscape structure which reduces the amount of 'clutter' in the landscape.

2.4.4.2 Assessing aesthetic quality

'Aesthetic quality' is a value placed on the landscape by the assessors which relates to the overall aesthetic appeal of the seascape. In this report the term 'aesthetic qualities' is used to embrace those attributes of the landscape which enhance scenic quality (often considered to be largely only visual attributes) and other less tangible aspects of the seascape which contribute to a positive appreciation of the landscape. The assessment of these qualities draws partly on a process of landscape character assessment but focuses less on the distinctiveness of individual components or landscape types within an area and more on how they complement each other and interact both together and with other, less tangible aspects of landscape experience.

Key elements and areas of distinctive character which combine to contribute to the aesthetic appeal of a landscape and encourage a very positive appreciation of the landscape are identified in the assessment. Visual and other experiential attributes of the landscape play an important role in the appreciation of the landscape. Positive attributes such as atmospheric quality of light, harmonious composition, diverse and lively sequential experience and spectacular visual drama are likely to contribute to high aesthetic quality.

Aesthetic qualities are those aspects of the seascape which, in the judgement of the assessors, are most likely to be appreciated as beautiful. Some of these aspects may also be noted elsewhere in the assessment, where they play a different, if at times complementary, role. An element in the landscape can be both a distinctive characteristic and contribute to aesthetic quality. A spectacular panorama will contribute to visual amenity and contribute to the experience of aesthetic quality. Natural pattern may be appreciated as an aesthetic quality, but may also contribute to a sense of wildness.

The assessment focuses on identifying aspects of the seascape which contribute to aesthetic quality as part of the initial analysis. These are recorded as professional judgements. The sensitivity of these aspects to aquaculture development is addressed in the sensitivity assessment matrix.

2.4.4.3 Recognised values

The value of some areas or features is recognised through existing designations, which include landscape and historic designations. The appreciation of both may be sensitive to landscape change.

Some areas, identified as being nationally significant areas of scenic quality are designated as National Scenic Areas. Other landscapes have been designated because of the quality and coherence of their designed element and/or because they are considered to be areas of regionally important landscape value. Some roads are designated as scenic or tourist routes. All are recorded as part of the assessment process.

Landscape value alone, whether designated or not, does not preclude development. The potential impacts of aquaculture development on those qualities of the landscape which contribute to its value need to be identified. It will not always be the case that aquaculture development is incompatible with a landscape designation.

Archaeological or historical sites may also be of national, regional or local significance. They are often appreciated as landmarks in the seascape, and are therefore analysed as such in the assessment. In addition, however, the quality of their setting, and perhaps even the historic integrity of the setting, may affect the appreciation of the qualities for which they have been designated. Aquaculture development may affect the setting and character of such designated sites, and an analysis is therefore included within the assessment process.

2.4.5 Wildness

The coast offers particular opportunities to appreciate wildness, and the attributes which contribute to wildness may be easily undermined by the introduction of aquaculture development. This is acknowledged in the NPPG on coastal planning (Scottish Office Development Department, 1997, para 24) which states that 'the qualities of the isolated coast can be easily damaged but are difficult to recreate'.

The significance and fragility of this quality has resulted in a more detailed assessment within the site assessment (as shown in Table 1A), and in the sensitivity analysis, where it merits a separate row in the matrix, allowing explanations to be fully justified in reporting.

Wildness is usually encountered when a number of factors come together. These may include the perception of naturalness, the distance travelled from human habitation and infrastructure, perceived remoteness and solitude, quietness or tranquillity, inaccessibility through roughness or ruggedness of terrain, the sense of exposure to the elements and the dominance of natural processes in shaping the landscape and maintaining a sense of dynamism.

The coast is characterised by many features which have the potential to contribute to a sense of wildness. The sense of 'edge', where land meets sea, the presence of intensely elemental forces, the dominance of physical processes in shaping and constant reforming of the land, the relatively inconsequential role which humans have in controlling the sea and its force, combine to create an unmanaged and relatively unmanageable place.

Even small areas of coast can therefore appear relatively wild, particularly where these qualities combine with a lack of development and little evidence of contemporary human intervention. Identifying wildness therefore encompasses an understanding of the physical and dynamic aspects of the seascape, the perception of coastal character and how the seascape is experienced.

Aquaculture is a development which through its infrastructure, noise, activity and potential lighting is likely to affect the sense of wildness or remoteness from human activity found along some parts of the coast.

Key considerations in identifying and analysing wildness are indicated below, although it should be recognised that assessing the marine components of wildness is not a straightforward process.

2.4.5.1 Presence of natural processes

Seascapes, as noted above, are a focus for natural processes, being subject to the forces of wave, wind, tide and current, which shape the land and contribute to the sense of exposure. Where natural processes dominate, a sense of naturalness will contribute to any appreciation of wildness.

Natural processes and their contribution to landscape character are included within the analysis of physical character, but they also contribute to the experience of a place, and are therefore also recorded as a perception in relation to experiential characteristics.

2.4.5.2 Presence of development and human activity

A lack of contemporary development and obvious land management provides a key contribution to wildness. There may often be traces of past habitation or land use which add historical depth to sense of place, but essentially sense of remoteness or isolation depend on the experience of leaving development, artificial noise and light and intensive management of land behind.

These attributes are able to be analysed as a physical characteristic of the seascape.

2.4.5.3 Accessibility and rugged terrain

Coastline, seascape and hinterland which is relatively difficult to physically access is often more likely to be less developed and less populated, which in itself may contribute to a sense of wildness. However, inaccessibility, through either difficult terrain or distance from vehicular tracks also contributes to wildness in its own right, as the process of travelling is more arduous.

Accessibility can be recorded as a physical element, as tracks and footpaths are physical elements, but there can also be a perception of inaccessibility in areas which are less remote, due to the ruggedness of the terrain.

2.4.5.4 Intensity of wildness

Sense of wildness varies in degree, with some areas being highly accessible but containing extensive semi natural vegetation, while in contrast, other areas are very difficult to access, characterised by hostile terrain and very distant from human activity, with no evidence of contemporary development, remaining largely unmanaged.

We have therefore assessed the degree of wildness as increasing from simply a sense of naturalness, through to perceived remoteness in areas where there is little human activity or development, to a sense of isolation where physical distance from human activity, combined with quietness and inaccessibility also contribute to the experience of the landscape. Sense of wildness at its most intense is relatively rare, often requiring large tracts of land to consolidate the experience of distance from human intervention.

Judgements relating to the intensity of wildness, and its value and intactness are analysed as part of the assessment.

2.4.5.5 Wild land search areas

These areas have been identified by SNH in their policy document 'Wildness in Scotland' (SNH, 2003). They are not designated areas, and do not delineate wild land, but rather provide a starting point showing where the main areas of wild land are likely to be found. The search areas do not include smaller areas of land or coast, nor, for example, uninhabited islands.

The location and extent of wild land search areas is considered as a recognised value in the assessment process.

2.4.6 Visual assessment

The purpose of the visual assessment is to identify key viewpoints from which an area of coastal landscape is most readily visible and come to a judgement of how significant these viewpoints are.

Visual survey records areas of coastline which are overlooked by settlements, panoramic views which are revealed when travelling along a public road or access route, views from visitor attractions or landmarks which are accessible to the public and viewpoints which are recorded on maps and offer accessible vantage points.

The survey also identifies what is visible. For example, it will record landmarks which are focal points within the view, the orientation of the view and how the eye is reading the landscape.

While many factors in the visual assessment can be recorded as physical places and elements, professional judgement is used to identify which viewpoints are significant and to make a judgement on the quality of visual composition. Visual assessment therefore does not simply record from where the coast is visible, it also aims to identify key views and compositions which contribute to the appreciation of aesthetic quality.

Key considerations in identifying and analysing the visual assessment are indicated below, although it should be recognised that assessing the marine components of wildness is not a straightforward process.

2.4.6.1 Type of views

Views may be panoramic, glimpse views, experienced as part of a sequence of coastal vistas or suddenly and unexpectedly revealed. Some views may be overlooked by residential areas, may be visible from popular and accessible elevated viewpoints or contribute to the setting of a settlement, yet others require considerable physical effort to experience.

The assessment aims to identify all these types of views as part of the analysis of physical elements, but judgements are then made on their significance.

2.4.6.2 Significant viewpoints

The location, accessibility and quality of viewpoints all contribute to assessing the significance of viewpoints. Significance is assessed as a judgement, and factors which are taken into account include:

- views which contribute to the experience of a landscape or seascape designated for its scenic quality;
- views to and from features designated because of their historic or cultural significance;
- views from recreation facilities and informal provision;
- elevated viewpoints; and
- views from settled areas.

2.4.6.3 Landscape features

Landmarks and features are recorded as part of the analysis of physical factors. These features may be natural or man made, but have a strong visual presence or a significant role in visual composition, usually as a focal point in their own right and sometimes as a point of reference or emphasis within a wider context.

2.4.6.4 Visual composition

Assessment of visual composition is an important stage in relation to identifying whether aquaculture development will have a significant effect on views and visual amenity. Harmonious composition is generally associated with a balanced proportion of different elements within a landscape, often combining contrast and distinction of form within a strong, unifying pattern or backdrop. Fine panoramas occur where such composition can be appreciated from a single viewpoint. Alternatively, dramatic sequential experience can occur where a series of contrasting views are experienced in sequence, each enhancing the visual appreciation of the next.

The quality of visual composition and landscape elements which contribute to visual amenity were identified using professional judgement, and their sensitivity was assessed within the assessment of aesthetic qualities in the sensitivity matrices.

2.4.6.5 Transient qualities

Particularly in coastal locations, the effect of light, reflectivity, changing weather conditions, aspect and orientation all play a role in the appreciation of visual amenity. These are not factors which are easy to record systematically, although west facing views, for example are more likely to take in sunsets, and open coasts are more likely to be affected by fast moving changes in light.

The contribution made by transient qualities which contributed to aesthetic quality or the appreciation of wildness was recorded in the visual assessment as a professional judgement, and assessed under the relevant topic heading in the sensitivity assessments.

Table 1A Issues explored on site visits: landscape character

| Topic | Analysis of physical characteristics | Analysis of experiential characteristics | Judgements | Recognised values |
|-----------------------------------|---|--|--|---|
| Maritime influences | <ul style="list-style-type: none"> • aspect and orientation • existing marine based activities and aquaculture • maritime processes and dynamics • scale, distance and expansiveness of open sea | <ul style="list-style-type: none"> • sense of space and light • sense of exposure • sense of containment or open-ness • sounds associated with the sea, smell of the sea | <ul style="list-style-type: none"> • unity of landscape character • aesthetic qualities, including characteristics, experiences, and perceptions which create exceptional aesthetic quality • assessing significance of physical characteristics • assessing intensity and significance of experiential characteristics • identification of dominant physical or experiential characteristics • identification of aesthetic attributes • determining the extent of the relevant setting for significant features and landmarks • identifying relevant cultural associations with place | <ul style="list-style-type: none"> • landscapes and seascapes designated because of their scenic, landscape or recreational value • landmarks designated because of their cultural or historic significance • roads designated as scenic or tourist routes |
| Character of coastal edge | <ul style="list-style-type: none"> • shape and scale of coastline • degree of indentation and enclosure • presence of offshore islands • fragmentation of edge • deposition features, tidal variations • landmarks • shoreline development | <ul style="list-style-type: none"> • sense of exposure • sense of containment or open-ness | | |
| Character of immediate hinterland | <ul style="list-style-type: none"> • description of key elements of landscape character • topography and relief • vegetation pattern • existing settlement pattern • landmarks | <ul style="list-style-type: none"> • sense of containment or open-ness • presence of natural processes | | |
| Wildness | <ul style="list-style-type: none"> • presence of natural processes • presence of development/ human activity • actual accessibility • ruggedness of terrain | <ul style="list-style-type: none"> • sense of naturalness • perceived remoteness • sense of isolation | | |

Table 1B Issues explored on site visits: visual assessment

| Topic | Analysis of physical elements | Analysis of type of views | Judgements | Recognised values |
|-------------------|--|---|---|--|
| Visual assessment | <ul style="list-style-type: none"> • presence of the coastal edge • presence of the open sea • focal points or features within the views • aspect and orientation of view-point, character of seascape | <ul style="list-style-type: none"> • overlook from settled areas • views experienced as part of a sequence • elevated viewpoints • panoramas • sudden revelations • glimpse views | <ul style="list-style-type: none"> • significance of views and viewpoints • significance and dominance of compositional elements • quality of visual composition from viewpoints • significance of aspect and transient qualities such as quality of light and reflectivity | <ul style="list-style-type: none"> • views which contribute to the experience of a landscape or seascape designated for its scenic quality • views to and from features designated because of their historic significance • views from recreation facilities and informal provision |

2.4.7 Presentation of site survey and analysis

The survey and analysis information is presented as a series of bullet points of key characteristics within each coastal character area, supplemented by a map. The bullet points are expressed in the order in which the topics appear in Tables 1A and 1B.

Consideration was given to other forms of presentation, including a matrix format based on Tables 1A and 1B. The matrix, however, appeared overly complex and fragmented as a description of the character of the area, and the bullet point list seemed to strike the right balance between drawing out key points while bringing together an overall description of the character.

2.5 Opportunities and constraints

Following on from the site survey and analysis, opportunities for and constraints to aquaculture development are highlighted as a series of bullet points which relate to the local coastal character areas. Key features which influence these considerations are included on an accompanying map.

The purpose of including an opportunities and constraints analysis is to focus on the potential effect of aquaculture development in the individual local coastal character areas. The bullet points aim to draw out the analysis of potential effects prior to considering the sensitivity of the seascape to aquaculture development. The two stages are closely linked.

Opportunities and constraints are listed in an order which relates to the topics list in Tables 1A and 1B, that is:

- Maritime influences;
- Coastal edge;
- Character of hinterland;

- Wildness;
- Aesthetic quality;
- Visual assessment.

2.6 The sensitivity assessment

The issues explored on the site visit, and the analysis of opportunities and constraints are used in this methodology to inform the sensitivity of the seascape to the presence of aquaculture development.

Sensitivity assessment can be undertaken and presented in a number of ways. In David Tyldesley and Associates (2001), the sensitivity was assessed using a number of detailed criteria and measured on a five point scale. The rigour and consistency of this approach is very appealing. As a result the consultants have tried to adopt a similarly systematic approach to assessing and presenting assessment stages in this proposed methodology.

Sensitivity assessment involves professional judgement. Nevertheless, it can be approached systematically, and the trail of reasoning can be transparently presented.

In the approach adopted in this methodology, sensitivity to aquaculture development is assessed in each local coastal character area. The key topics against which sensitivity is assessed were identified from the list in Tables 1A and 1B and the experience of on site survey and analysis. The topics bring together landscape and visual issues which are most likely to be affected by aquaculture development under the following headings:

Maritime influences, which considers the sensitivity to change of the physical characteristics and experiential attributes which reinforce the presence of and particular dynamic qualities of the sea.

Character and experience of the coastal edge, which assesses the potential effect of aquaculture development on the physical characteristics and experiential attributes which particularly contribute to the distinctive character of the seascape.

Setting of landmarks and features, which considers the potential sensitivity of the character of the setting and appreciation of particular features – historic, cultural, geological or ecological – which have been recognised as significantly contributing to the seascape in previous analysis.

Experience of wildness, which assess the potential effect of aquaculture on the qualities of remoteness, isolation or wildness experienced in the local coastal character area, taking into account the particular characteristics which may contribute to the appreciation of this quality.

Aesthetic qualities, which assesses the potential effect of aquaculture development on the attributes and experiences of the seascape which contribute to the positive aesthetic appreciation of the landscape.

Key viewpoints, which considers the potential sensitivity of key viewpoints to potential aquaculture development.

The assessment is presented in a matrix for each local coastal character area, where a sensitivity rating for each of the key qualities is recorded on a five point scale:

- Very high sensitivity;
- High sensitivity;
- Some sensitivity;
- Low sensitivity;
- Not sensitive.

An explanation of the factors which have led to the sensitivity rating is recorded in each matrix.

While it is generally current practice to combine the sensitivities of each individual topic into one overall summary assessment, we have avoided amalgamating all the assessments of sensitivity into one overall sensitivity rating before making our conclusions. There are two reasons for this:

Firstly, we feel that the sensitivity matrix is already a summary of findings and we do not wish to summarise it any further: there is a danger that further summation of explanations does not allow the true complexity of these judgements to be revealed.

Secondly, in relation to the diverse range of potential aquaculture development an absolute summary of sensitivity is not useful: for example, the seascape may easily be able to accommodate oyster trestle development, while not being appropriate for finfish farm development.

We therefore have placed the overall assessment in our conclusions, not as an overview of sensitivity, but rather as the consultants' assessment of the potential capacity of the seascape to accommodate aquaculture development, drawing on the sensitivities recorded in the matrix. It should be noted that no weighting has been given to one type of sensitivity over another.

2.7 Coastal character area conclusions

The conclusions outline the capacity assessment. In this study the capacity is presented as a description of the potential of the landscape/seascape to accommodate the changes brought about by aquaculture installations. It considers where it might be appropriate to remove existing development as well as opportunities to expand or consolidate development.

For each coastal character area, conclusions are presented in text and map form at the end of each individual analysis. The text elaborates on the reasons for the capacity recommendations and outlines any guidance on appropriate scale and siting of development at a strategic scale within the coastal character area.

2.8 Strategic conclusions

The overall capacity for aquaculture development is presented in map form in the study area conclusions, which combines all the conclusions from the individual coastal character areas. This includes an overall assessment of the findings of the assessment.

This map illustrates the potential landscape capacity using the following categories:

- Areas where existing aquaculture development already reaches capacity in landscape terms and there are no further opportunities for development.
- Areas where there is already too much aquaculture development in landscape terms, and where it might be appropriate to consider removal of development should the opportunity arise in the future.
- Areas where there is no development and no potential for the landscape to accommodate aquaculture development.
- Areas where there is low potential for the landscape to accommodate aquaculture development.
- Areas where there is some potential for the landscape to accommodate aquaculture development.
- Areas where there is high potential for the landscape to accommodate aquaculture development.

2.9 Assessing cumulative effects

Presenting the findings of the sensitivity assessment for each individual local coastal character area on one map raises the possibility of undertaking an assessment of cumulative effects at the scale of the whole pilot area.

Cumulative landscape and visual effects have been defined as ‘additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments ... or actions... They may also affect the way in which the landscape is experienced.’ (The Landscape Institute and Institute of Environmental Management and Assessment, 2002).

A capacity study already incorporates some consideration of potential cumulative effects, at least within the individual assessment areas. Firstly, the assessment process discussed in this report considers the potential location and type of development appropriate for the individual local coastal character areas, and offers guidance which steers the amount of development appropriate to this localised landscape. Secondly, the sensitivity matrix allows comparisons to be made between the local coastal character areas within a whole coastal character area. There is an opportunity to adjust the recommendations at this stage, to take into account potential cumulative effects within the coastal character area as a whole. Such an assessment of cumulative effects was not undertaken in this report. This was because the coastal character areas were not primarily selected to take into account how people use or experience the coast, an issue which is likely to influence the selection of an area for cumulative assessment.

Potential cumulative effects across the whole of the pilot areas are only briefly considered in this report. This is largely because the consultants were not in a position to determine whether the pilot areas were the best geographical areas for this type of assessment (this would have meant some research into areas outwith the study areas). The consultants did identify some issues which are likely to inform an assessment of cumulative effects in relation to aquaculture development. These include:

2.9.1 Use and experience of the coast from the land

While the capacity assessment focussed on subdividing areas into character based units, people may experience the coast as a linear sequence, from a coastal road, railway or footpath which traverses several character areas. It may be that an appropriate area for assessment of cumulative effects is a stretch of coast between two key settlements, or which can be walked in a day along a coastal footpath. Alternatively, some areas are not experienced as part of a linear sequence, but rather as point locations which are visited after travelling through hinterland.

2.9.2 Use and experience of the coast from the sea

Experience of views from the sea again could be assessed from one point location to another, as a sequence. This may be appropriate for ferry routes, or key day long journeys used by recreational yachts.

2.9.3 Views and visibility

The sensitivity of views and visibility is identified within the capacity assessment process as a key issue. There may be additional sensitivities applicable when considering potential cumulative effects from a road, footpath or sea going route, particularly if the experience of a linear sequence through a number of character areas is being analysed. Sensitivities are likely to include elevated panoramas, revealed vistas, a sequence of glimpse views, views to particular land marks, views which introduce the coast or a coastal element for the first time in a journey.

2.9.4 Strategic pattern and association

It may be that at a more strategic level, a pattern of aquaculture development can be created, where development is associated with a particular landscape character type, or series of elements, on a regular basis. Aquaculture then becomes part of that character type, with which people become familiar. Potential cumulative effects could be managed in this way.

3 SEASCAPE/LANDSCAPE CAPACITY FOR AQUACULTURE: PART OF NORTH ARGYLL

3.1 Landscape context

The pilot area falls between Duntaffnage Bay, located just to the north of Oban, northwards to the sweeping curve of Cuil Bay. It embraces the east facing coast of the island of Lismore to the west, and extends inland to the narrow confines of the sea lochs of Loch Etive and Loch Creran.

As a whole, the area offers a diversity of landscape character, enhanced by a varied coastline and complemented by seascapes which range from the expansive to the intimate. Parts of the area are designated as a National Scenic Area (noted on the Survey Maps), and the area also contains small settlements, features of historic interest and areas designated because of their nature conservation interest.

There is extensive existing aquaculture development, particularly in Loch Etive and outer Loch Creran, and applications for licences continue to be received.

The whole area lies within the 'Sounds, Narrows and Islands' seascape character type identified in 'An assessment of the Sensitivity and Capacity of the Scottish seascape in Relation to Offshore Windfarms' (Scott, K.E. *et al.*, 2004). That study includes a strategic description of this character type, which is included in this report at Annex Four. Furthermore, the whole area also lies within the 'Sound of Mull/Firth of Lorn/Sound of Jura' Seascape Unit, and a copy of the description and assessment of sensitivity to this area to the siting of offshore wind turbines is included for information as Annex Five.

When explored in more detail, however, the study area can be divided into five clear subdivisions for the purposes of both analysis and presentation. The subdivisions are based on a strategic seascape character assessment, largely based on site assessment but assisted by the Landscape Character Assessment of Argyll and the Firth of Clyde (Environmental Resources Management, 1996). These 'coastal character areas' are indicated on the Context Map, which also forms the basis of the strategic landscape character and context plan for the assessment.

3.2 North Argyll coastal character areas

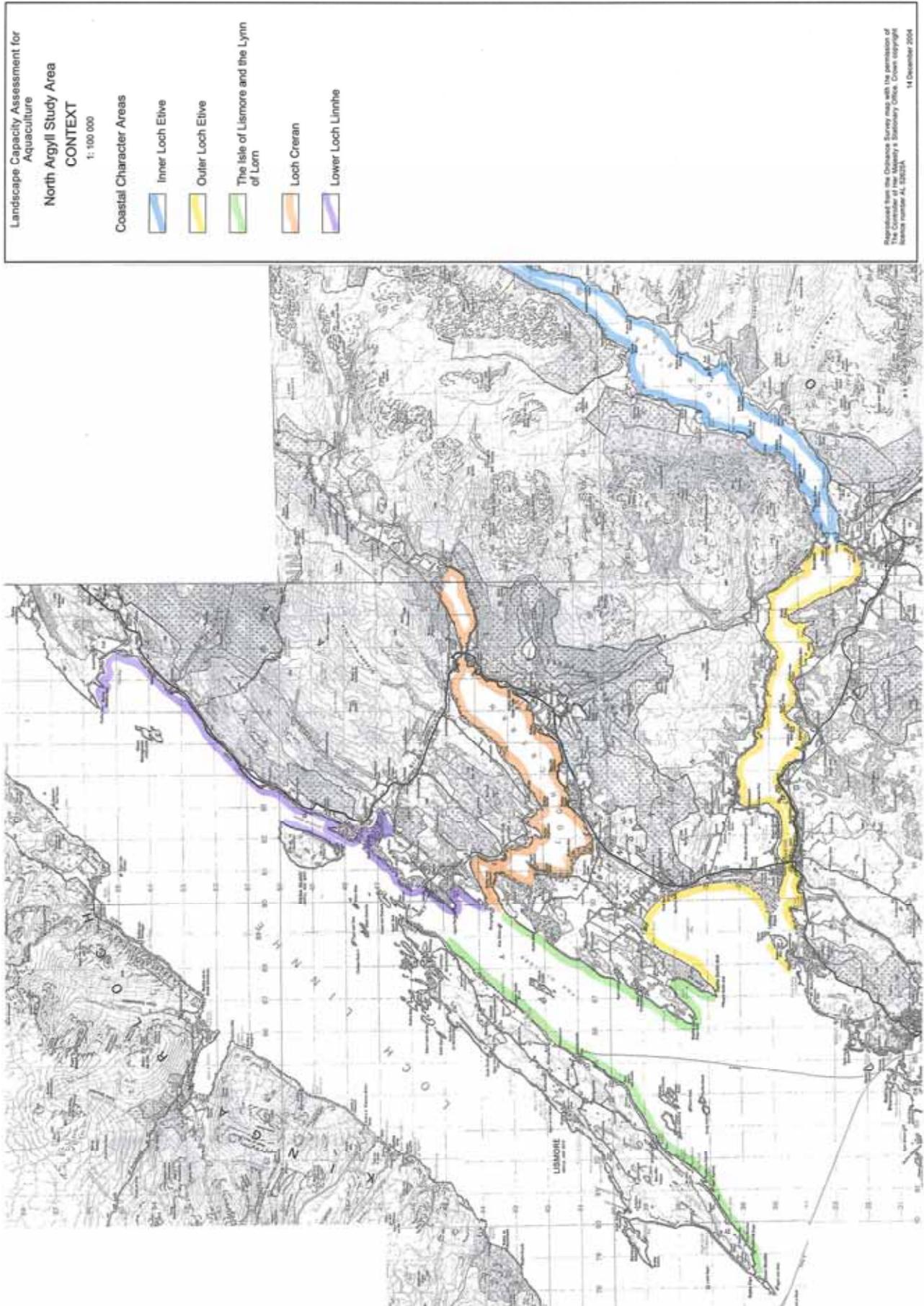
The assessors identified five coastal character areas:

- Inner Loch Etive;
- Outer Loch Etive;
- The Isle of Lismore and the Lynn of Lorn;
- Loch Creran;
- Lower Loch Linnhe.

3.2.1 Inner Loch Etive

The steep sided enclosed upper Loch Etive, which is narrow and fjord like in character, feels relatively remote and undeveloped, with little habitation and minimal access.

North Argyll Study area – Context



3.2.2 Outer Loch Etive

This long sea loch extends from its mouth, which embraces Dunstaffnage and Ardmucknish Bay, inland through the narrow straights of Connel to a sheltered but expansive series of bays

3.2.3 The Island of Lismore and the Lynn of Lorn

The long, low Island of Lismore encloses the Lynn of Lorn and provides a backdrop to the many islands which are scattered across these shallower waters. This is an area designated for its national scenic quality and the focus of numerous historic sites.

3.2.4 Loch Creran

The low profile of elongated ridges and a diverse vegetation pattern forms the hinterland to the narrow sinuous channel at the mouth of Loch Creran and the expansive bays of the middle loch, contrasting with the steep, wooded slopes which strongly contain the smaller inner loch.

3.2.5 Lower Loch Linnhe

Characterised by a relatively simple coastline from the Sound of Shuna northwards to Cuil Bay, this landscape is open to the expanse of Loch Linnhe to the west and north west.

3.3 Inner Loch Etive

3.3.1 Inner Loch Etive: site survey and local character analysis

Inner Loch Etive lies within a steep sided, enclosed glen creating a narrow fjord which extends far inland. For the purposes of this study, the coastal character area has been further subdivided into two local coastal character areas, indicated on the Site Survey Map. Key landscape and visual elements which are likely to influence the development of aquaculture within these areas are noted below.

3.3.1.1 Taynuilt to Rubha Bharr key landscape and visual elements

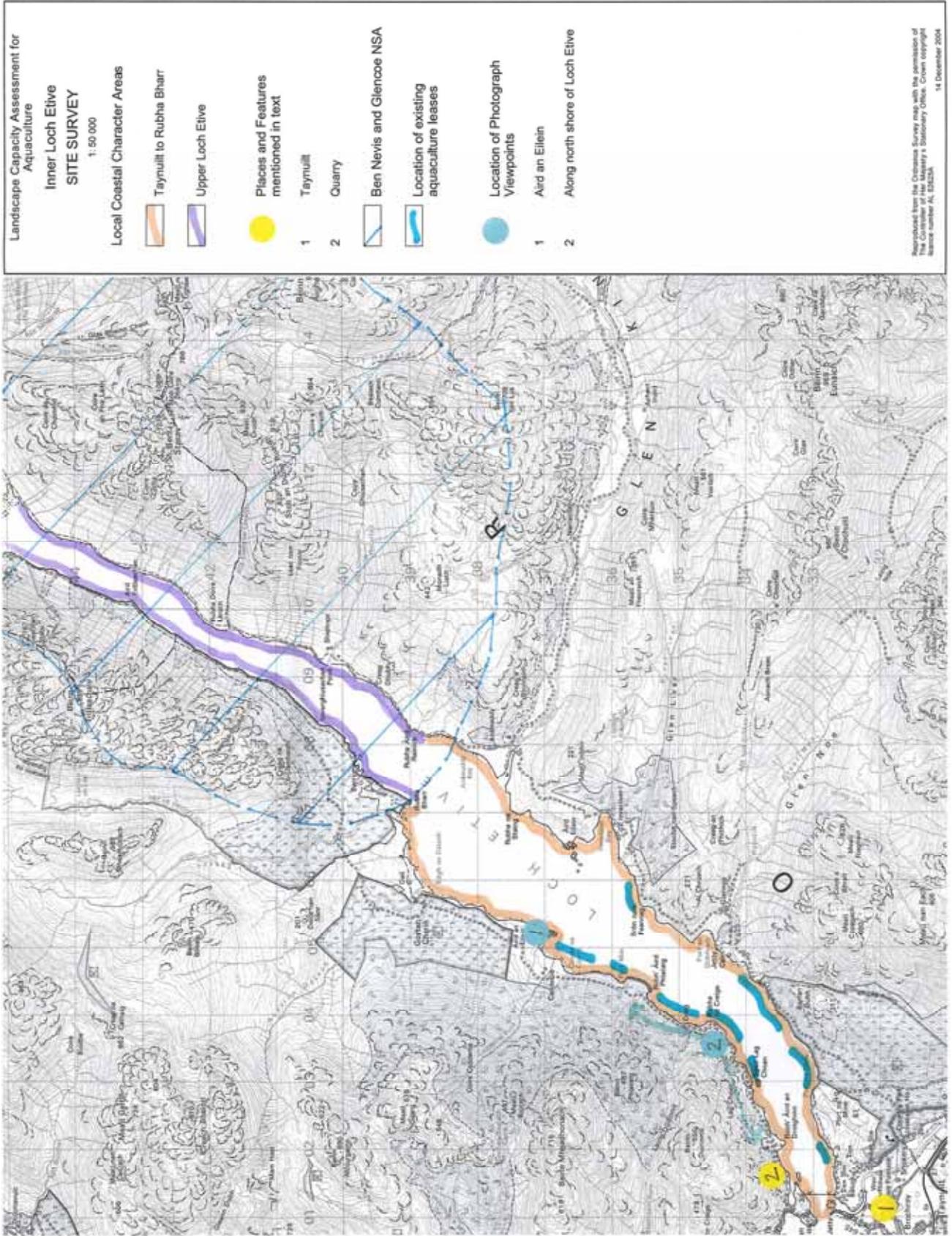
- Enclosed and sheltered, maritime character is limited to small intertidal reach and presence of shellfish lines and some modest marine based activity.
- Sheltered, narrow fjord with relatively still water, although occasional westerly winds funnel up the glen.
- Rocky coastal edge rises steeply from the water directly to high mountains creating strong enclosure.
- Indented shoreline, with well defined small scale bays emphasised by promontories and very occasional islands.
- Northern shore particularly wooded, with modest areas of semi natural woodland and some commercial forest.
- Quarry and shoreline development at south western end of loch create noise and disturbance, but remainder of loch relatively quiet and tranquil.

- Settlement very sparse.
- Accessibility limited to a rough track and boats.
- Rugged landscape with strong sense of naturalness.
- Relatively remote, with sense of isolation increasing as loch extends inland away from Taynuilt.
- Numerous existing shellfish lines occupy most bays and disrupt the unity of relatively natural, remote landscape composed of simple contrasting elements of rugged, vertical mountains and smooth, horizontal loch surface.
- Views focus along the length of loch, and are frequently elevated, encountering each bay individually in sequence.
- Drama of peaks rising directly from the water's edge and reflected in loch surface within frequent panoramic views.

3.3.1.2 Upper Loch Etive key landscape and visual elements

- Enclosed and sheltered, maritime character is limited to tiny intertidal reach.
- Sheltered, very narrow fjord with relatively still water, although occasional westerly winds funnel up the glen.
- Rocky coastal edge rises steeply from the water directly to high mountains creating strong enclosure.
- More regular shoreline, with subtly defined bays.
- Northern shore particularly wooded, with modest areas of semi natural woodland and some commercial forest.
- Quiet and tranquil with settlement limited to head of loch.
- Accessibility limited to a rough footpath and boats.
- Rugged landscape with strong sense of naturalness.
- Remote with strong sense of isolation.
- Landscape dominated by sense of naturalness and relative wildness.
- Overall aesthetic quality high, emphasised by simple contrasting elements of rugged, vertical mountains and smooth, horizontal loch surface and intactness of sense of wildness and semi natural features.
- Views focus along the length of loch.
- Visual drama of peaks rising directly from water edge and reflected in calm loch surface within frequent panoramic views.
- Close views from lochside track and occasional elevated views from mountain peaks.
- This area lies within the Ben Nevis and Glencoe NSA.
- Part of this area lies within a wild land search area.

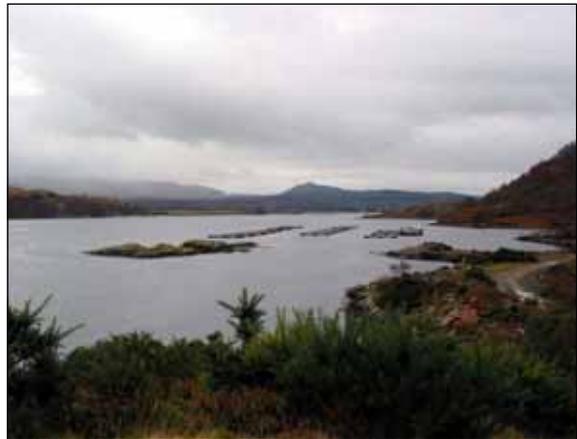
Inner Loch Etive Site survey



Upper Loch Etive View north from Aird an Eilein. This enclosed fjord becomes more remote and less developed as it extends inland



Taynuilt to Rubha Bharr Mussel lines and rafts in most bays from Taynuilt to Bagh na Dalach on the north shore



3.3.2 Inner Loch Etive: opportunities and constraints

There is already extensive shellfish farm development within inner Loch Etive, located south of Rubha Bharr. There are likely to be technical limitations for some types of aquaculture north of this point. Landscape opportunities and constraints which are likely to affect further development are noted below. Features identified in the opportunities and constraints presented below are shown on the following map.

3.3.2.1 Taynuilt to Rubha Bharr

Landscape and visual opportunities for aquaculture development:

- Irregular shoreline offers opportunities to locate structures in relation to bays and promontories.
- Shore based infrastructure can be located in nearby Taynuilt.
- Wooded shoreline limits views and provides a backdrop against which structures can be located.
- Area not highly populated and accessible largely by foot and boat, therefore not seen by large numbers of people.

Landscape and visual constraints for aquaculture development:

- Existing shellfish development already very extensive, occupying the full extent of the water surface of nearly every bay and the foreground to most views.
- Small scale of individual bays means that they can readily be 'filled up' with development: this has largely already happened.
- Organic forms and irregular shape characterise this landscape and geometric structures are therefore more prominent.
- Relatively remote, rugged character with a strong sense of naturalness and undeveloped character with few structures other than existing shellfish farms.
- Area lies within an SNH search area for wild land.
- Elevated panoramic views, embracing dramatic contrast between mountain and loch depend on simplicity of composition and drama of contrast for their aesthetic appeal.

3.3.2.2 Upper Loch Etive

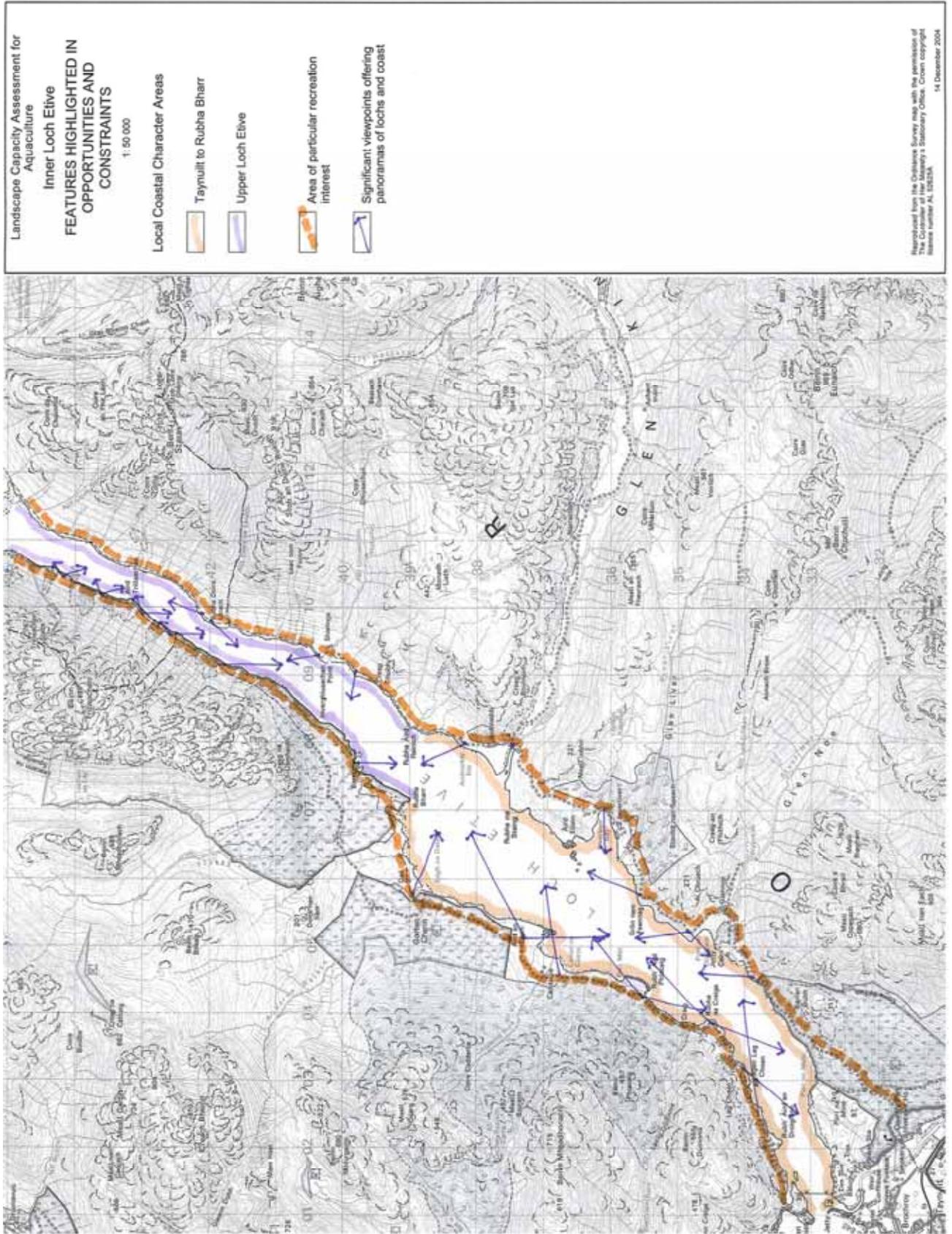
Landscape and visual opportunities for aquaculture development:

- Wooded shoreline limits views and provides a backdrop against which structures can be located.
- Area not populated and relatively inaccessible except by foot or by boat, therefore not seen by large numbers of people.

Landscape and visual constraints for aquaculture development:

- Even shape of shoreline, with relatively minor, subtle indentations limits opportunities for siting development in relation to bays and promontories.
- Organic forms characterise this landscape and geometric structures would therefore be more prominent.
- Small scale of subtle bays means that they can readily be 'filled up' with development.
- Relatively remote, rugged character with a strong sense of naturalness and undeveloped character with few structures.
- Sense of relative isolation and potential experience of solitude as well as rugged terrain and relative inaccessibility contribute to sense of wildness.
- Area lies within an SNH search area for wild land.
- Elevated panoramic views, embracing dramatic contrast between mountain and loch, depend on simplicity of composition and drama of contrast for their aesthetic appeal.
- Area designated as an NSA, reflecting the high scenic quality of the landscape.

Inner Loch Etive Features highlighted in opportunities and constraints



3.3.3 Inner Loch Etive: summary of the potential sensitivity of the local coastal character areas to aquaculture development

| Potential sensitivity of the seascape to aquaculture development | Taynuilt to Rubha Bharr | Upper Loch Etive |
|---|---|--|
| Maritime influences | Not sensitive Very little existing maritime influence, main elements associated with the management of existing fish farms. | Not sensitive Very little existing maritime influence. |
| Character and experience of the coast | High sensitivity Coast and hinterland characterised by organic form, with the exception of poorly designed forestry which is likely to be redesigned in the future. Intimate scale of small bays easily dominated by development. | High sensitivity Coast and hinterland structure and vegetation pattern characterised by organic form, with the exception of poorly designed forestry which is likely to be redesigned in the future. Intimate scale of small bays easily dominated by development. |
| Setting of landmarks and features | Not sensitive No particular landmarks and features. | Not sensitive No particular landmarks and features. |
| Experience of wildness | High sensitivity Remote and rugged landscape, generally undeveloped and relatively inaccessible, dominated by sense of naturalness which is compromised by existing shellfish lines. | Very high sensitivity Remote, rugged and relatively wild landscape, perceived as very isolated and inaccessible, dominated by sense of naturalness and lack of development with little evidence of human intervention, although future management of forestry will negatively affect this. |
| Aesthetic qualities | High sensitivity Aesthetic qualities include contrast between rugged vertical mountains and smooth, level loch surface, reflections in water, strong semi natural character and relative remoteness, which increases further inland. Fine panoramic views of loch and mountains, characterised by simple composition and visual drama. Existing aquaculture development compromises these qualities. | Very high sensitivity Area of exceptional aesthetic quality. Many qualities contribute to this, including contrast between rugged vertical mountains and smooth, level loch surface, reflections in water, strong semi-natural character and relative quietness and experience of solitude. Fine panoramic views of loch and mountains, characterised by simple composition and visual drama. |
| Key viewpoints | Some sensitivity Views from elevated footpaths. Existing shellfish lines impact significantly on sequential experience of travelling along loch shore. | High sensitivity Views from elevated footpaths and distant summits, after long walk in, along recognised through glen walking route. Although not seen by large numbers, this area is visited largely by those who value the views, and nowhere is hidden. |

3.3.4 Inner Loch Etive: conclusions

The conclusions from the capacity assessment are noted below together with accompanying guidance.

3.3.4.1 Taynuilt to Rubha Bharr

No potential to accommodate further aquaculture development in this local coastal character area was identified, largely due to the potential effect of development on the key sensitivities identified in the assessment, some of which are already compromised by the large amount of development already in place.

The existing development occupies locations which are considered sensitive for development. In particular it is noted that shellfish structures occupy the whole of the vast majority of the small scale bays within this landscape, dominating the water surface and obscuring the reticulated pattern of the shoreline. As a result, the lochside is experienced as a relentless sequence of developed bays, which are encountered one after the other when travelling along the north shore in particular. Frequent elevated views reinforce this impression.

The prominence of the development in this landscape is further emphasised by the geometric shape and industrial character of the fish farm structures, which contrasts with the relative naturalness of their surroundings. The area is of relatively high aesthetic quality, with visual drama provoked by the contrast between the rugged, rough textured verticality of the mountain sides and the smooth plane of the loch. The aesthetic appeal is further enhanced by the relative peace and tranquillity of the surroundings. The existing development detracts from all these qualities.

Should the opportunity arise to remove fish farms from this loch, the visual amenity, unity of the landscape character and the aesthetic quality of the loch would all be enhanced. Options include removing a small number of developments completely from, say, two bays on the north shore, thereby reducing the sense of relentless development encountered when travelling along this side. Alternatively, removing fish farms from the inner reaches of the loch would extend the area of less developed landscape character. Further expansion of existing fish farm installations should also be resisted.

3.3.4.2 Upper Loch Etive

No potential to accommodate aquaculture development in this local coastal character area was identified, largely due to the high sensitivities associated with the character, relative wildness and high aesthetic quality of this landscape.

3.4 Outer Loch Etive

3.4.1 Outer Loch Etive: site survey and local character analysis

Outer Loch Etive, which for the purposes of this study includes Ardmucknish Bay, lies within a generally low lying landscape, punctuated by more prominent steep sided hills to the north. For the purposes of this study, the coastal character area has been further subdivided into three local coastal character areas, as shown on the Site Survey map. Key landscape and visual elements which are likely to influence the development of aquaculture within these areas are noted below.

3.4.1.1 Ardmucknish Bay key landscape and visual elements

- Open and exposed seascape character dominated by expanse of sea and distant views to the open sea, Mull, Lismore and Loch Linnhe.
- Considerable marine activity on the water.
- Simple, sweeping coastline, with shingle and sandy beaches, becoming more indented and rocky south of Lednaig point.
- Bay defined by low lying landform, the steep slopes of the Garbh Ard point and the prominent peak of Ben Lora.
- Woodland encloses the north and western coasts, but rough grassland extends around Lednaig Point.
- Well developed shoreline and coast, including settlement at Benderloch, Dunstaffnage marina, an airfield, caravan sites and recreation facilities, some of which overlook the bay.
- Shoreline largely accessible with the exception of Garbh Ard.
- Views from the road are limited by woodland.
- Key historic features at Dunstaffnage castle, Lochnell House and archaeological sites at Port Selma.
- The peninsula of Garbh Ard lies within the Lynn of Lorn NSA.

3.4.1.2 Connel Narrows key landscape and visual elements

- Narrow, elongated channel of fast moving, tidal strait with subtle bays most prominent along the southern shore.
- Falls of Lora recognised as a major maritime feature.
- Maritime presence most reflected in the movement of boats, and occasional view of open sea.
- Contained by low but pronounced slopes, reflecting the continuous scouring of fast moving currents.
- Diverse vegetation pattern, including small cultivated fields and woodlands immediately adjacent to the coast.
- Well developed hinterland contrasts with the simple uncluttered water surface.
- Broadly linear settlement pattern extends along the coast.
- Narrow strait encourages views along the length of the water, particularly to and from the Connel bridge.

3.4.1.3 Lower Loch Etive key landscape and visual elements

- Sheltered but expansive loch with no view of the open sea.
- Maritime influence limited to presence of narrow intertidal strip and existing aquaculture development.
- Wide, open loch characterised by a series of sweeping, pronounced bays along both shores, occasionally further defined by scattered small islands.
- Pebble shoreline with occasional rocky inlets.

- Expansiveness further emphasised by low relief and gently undulating terrain of immediate hinterland.
- Vegetation pattern includes dense shoreline woodland, semi natural vegetation, and occasional small grazed field.
- Settlement along the north shore focussed around Achnacairn, Taynuilt and farmed alluvial fans while they are relatively sparse along the south shore.
- Key historic features at Ardchattan Priory, Achnacloich, Muckairn and the church at Achnaba.
- Several existing fin and shellfish farms occupy bays, with onshore development at Achnacloich and Taynuilt.
- Views often screened by shoreline trees, but where possible extend along the length of the loch or to opposite shore.
- Occasional panorama from elevated roads and the railway.
- Key view of loch from A85 which is first view of sea on approach from the east.
- Foreshortening ensures that bays on further shore appear less prominent than they really are.
- Harmonious visual composition around Abbots Isles, where expansive loch meets more intimate arrangement of islands.

3.4.2 Outer Loch Etive: opportunities and constraints

There is already extensive aquaculture development within Loch Etive, where there are both finfish and shellfish farms. Landscape opportunities and constraints which are likely to affect further development are noted below. Features identified in the opportunities and constraints presented below are shown on the following map.

3.4.2.1 Ardmucknish Bay

Landscape and visual opportunities for aquaculture development:

- Existing marine activity could absorb traffic associated with aquaculture.
- Expansive scale of seascape can accommodate some development, even of moderate to large scale, without dominating water surface.
- Well developed coastline with structures, noise and lighting strongly featured.
- Some visual screening provided by shore line woodland.
- Onshore development can be sited in existing settled areas.

Landscape and visual constraints for aquaculture development:

- Even, regular coastline limits siting options but structures could be aligned parallel to the coast.
- Protect the settings of historic features at Dunstaffnage castle, Lochnell House and archaeological sites at Port Selma.
- Some stretches of coast used for informal recreation.
- Marine based recreation features around Dunstaffnage.

- The foreground and focal points of key panoramic viewpoints should be avoided.
- Some coastline directly overlooked by housing and recreational developments.
- Garbh Ard lies within an NSA, although the focus of scenic quality lies to the west.

3.4.2.2 Connel Narrows

Landscape and visual opportunities for aquaculture development:

- Wooded shores intensify dark shadows.
- Onshore development could relate to existing infrastructure.

Landscape and visual constraints for aquaculture development:

- Falls of Lora and the Connel Bridge are key features.
- Static structures on the water surface likely to detract from drama of turbulent, moving water.
- Simple, uncluttered water surface of the narrow channel would be quickly dominated and fragmented by development.
- Water overlooked by housing and elevated views from the bridge.

3.4.2.3 Lower Loch Etive

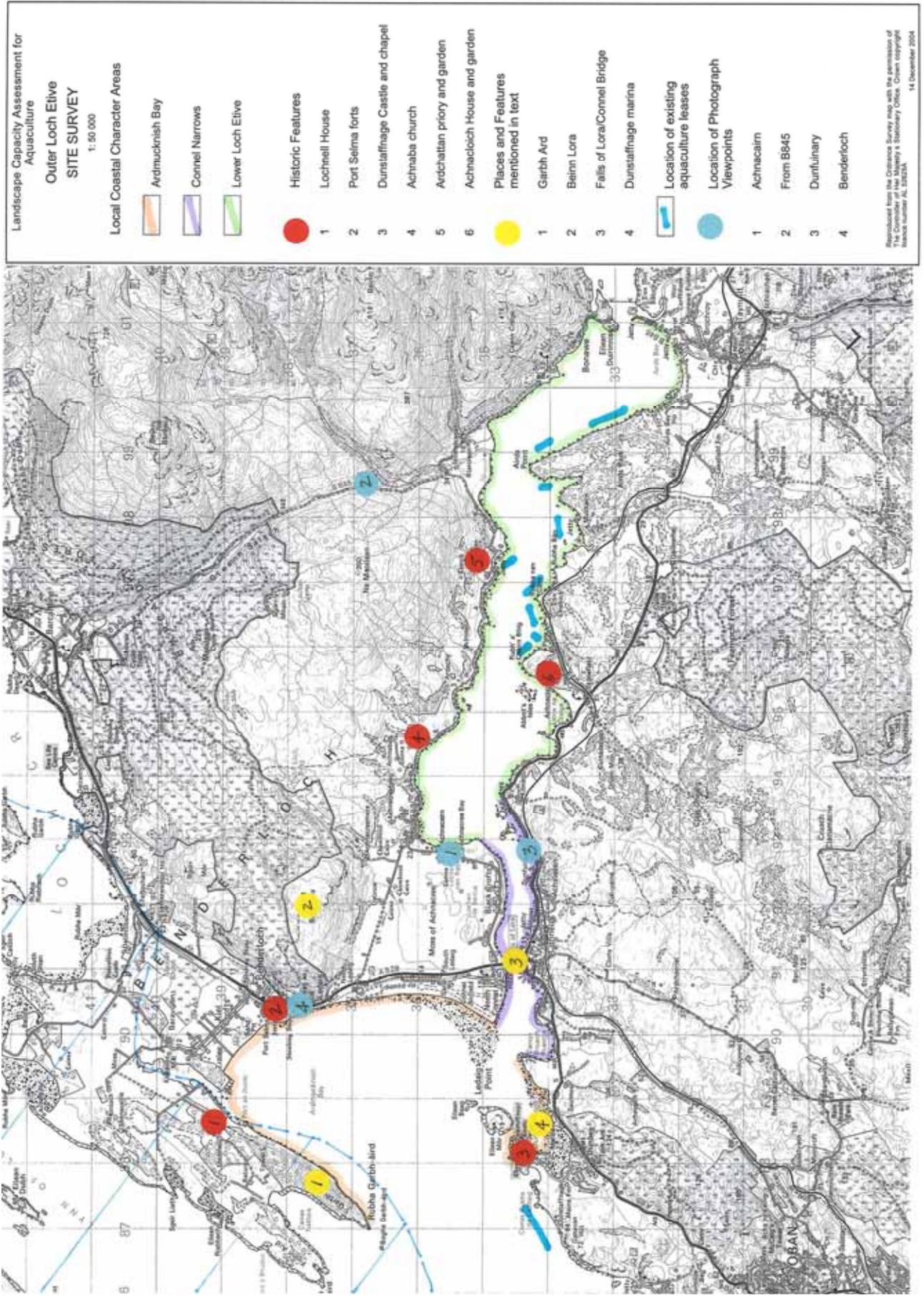
Landscape and visual opportunities for aquaculture development:

- Wooded shores intensify dark shadows on loch, particularly along backlit southern shore.
- Shoreline woodland limits visibility in some areas.
- Onshore development could relate to existing infrastructure.

Landscape and visual constraints for aquaculture development:

- Small scale of bays can readily be 'filled up' with development.
- Expanse of open water can be quickly narrowed by development encroaching from each shore.
- Protect the settings of historic features at Ardchattan Priory, Achnacloich and the church at An Acarsaid from aquaculture development to maintain the integrity of their setting.
- Abbot's Isles and Achnacloich of a relatively high aesthetic quality due to juxtaposition of expansive loch and more intimate pattern of islands, relative drama of verticality of slopes rising to Achnacloich and appearance of view as the first panorama of sea loch when travelling west along the A85.
- Some coastline directly overlooked by settlement.
- Avoid developing the majority of bays along the shoreline, as this will lead to an impact on sequential experience when travelling either along the public road or on the water.
- Occasional elevated panoramic view, embracing dramatic contrast between mountain and loch. Small scale development may be too small to really impact on this although the foreground should be avoided.

Outer Loch Etive Site survey



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Lower Loch Etive From Achnacree Bay: expansive inland loch sheltered by low relief with the rising mountains of Glen Etive beyond



Connel Narrows From Dunfuinary: the bridge is the focal point



Ardmucknish Bay From near Benderloch: vast, open bay with a long sweeping coastline from where the distant island of Mull and the open sea are visible on a clear day



3.4.3 Outer Loch Etive: summary of the potential sensitivity of the local coastal character areas to aquaculture development

| Potential sensitivity of the seascape to aquaculture development | Ardmucknish Bay | Connel Narrows | Lower Loch Etive |
|--|--|--|---|
| Maritime influences | Some sensitivity Development would not impact upon existing maritime influences, some of which, such as large scale of water surface and intense existing sea based activity, may make development easier to accommodate. But simplicity of open expanse of sea could be compromised by clutter. | Some sensitivity Static structures would detract from the rapid movement of water and tidal flow through relatively narrow channel which reflects maritime dynamics. Narrow, uncluttered water surface contrasts with developed hinterland. | Not sensitive Maritime influences very limited with no relationship to 'open sea', limited sense of maritime dynamics and relatively sheltered location. |
| Character and experience of the coast | Low sensitivity Greatest negative effect likely to be the juxtaposition of complex structures relative to the regular coastline, although lines and cages could be aligned to reflect the shape of the edge. Extensively developed coast could absorb noise, light, activity and structures. | Some sensitivity Regular coastline offers little opportunity for development to be associated with promontories and bays. Narrow stretch of limited water surface could become quickly dominated by structures. Extensively developed coast could absorb noise, light, activity and structures. | Some sensitivity Small scale bays could easily be 'filled up' with development. Larger bays and promontories should be the focus of any development, but extensive development already present in these areas. |
| Setting of landmarks and features | Some sensitivity Setting of designated historic features, including Dunstaffnage Castle, Lochmell House and the forts at Port Selma. | High sensitivity Setting of Falls of Lora, a dramatic and variable water feature, occupies an extensive stretch of this strait. | Some sensitivity Setting of key historic features, including Ardchattan priory, Achnacloch gardens and Achnaba church, all open to public and designated historic sites. |
| Experience of wildness | Low sensitivity Degree of wildness limited by well developed, accessible coastline and intense marine activity therefore not affected by development. Relative peacefulness of Garbh Ard would be affected by development. | Not sensitive Degree of wildness limited by well developed, accessible coastline, therefore not affected by development. | Not sensitive Degree of wildness limited by accessible coastline, offshore activity and scattered settlement, therefore not affected by development. More remote areas along south shore already contain aquaculture development. |

3.4.3 (continued)

| Potential sensitivity of the seascape to aquaculture development | Ardmucknish Bay | Connel Narrows | Lower Loch Etive |
|--|--|---|--|
| Aesthetic qualities | <p>Low sensitivity</p> <p>While the area contains no exceptional scenic qualities, the sense of space and open-ness of the sea is appealing and contrasts with the more enclosed character of the inner lochs.</p> | <p>Some sensitivity</p> <p>While the area contains no exceptional scenic qualities, there is some sense of drama related to the fast moving water.</p> | <p>Some sensitivity</p> <p>Interaction between mountain and loch creates visual drama of scale and contrasting form, often reflected in the calm sheltered loch surface. Attractive contrast between intimate islands, expanse of loch and rugged foreshore at Abbots Isle.</p> |
| Key viewpoints | <p>Some sensitivity</p> <p>Avoid the foreground and island focal point of key viewpoints, as well as areas overlooked by houses and recreation facilities. Scale of bay could visually accommodate some development, especially if located against a backdrop.</p> | <p>High sensitivity</p> <p>Views along the straits in both direction focus on the Falls of Lora, the Connel Bridge and their setting: development on the water may detract from this. Extensive overlooking of the straits by houses.</p> | <p>Some sensitivity</p> <p>Avoid foreground and focal points of key panoramic views of loch and mountains from the roads, and at Abbots Isle. Some overlook by houses. Greatest impact likely to be on sequential experience of travelling along loch shore: aim to ensure that undeveloped bays dominate over developed bays.</p> |

3.4.4 Outer Loch Etive: conclusions

The conclusions from the capacity assessment are noted below together with accompanying guidance.

3.4.4.1 Ardmucknish Bay

Some potential for the landscape to accommodate aquaculture development was identified in this local coastal character area:

- Development should be located away from the setting of key features and should avoid the foreground and focal points of key panoramic views, or views from settlements.
- Development should avoid shorelines used for informal recreation.
- Where possible, development should aim to use a wooded backdrop as an immediate setting.
- Structures should be aligned to reflect the regular, linear character of the coastal edge.
- Onshore development should be located within existing settled areas.

3.4.4.2 Connel Narrows

No potential for the landscape to accommodate aquaculture was identified in this local coastal character area, largely due to the high sensitivities associated with the setting of the Falls of Lora, views to and from the Connel Bridge, extensive overlooking of the straits by houses and the contrast between the uncluttered, narrow, natural dynamic of the water surface relative to the developed and relatively cluttered hinterland.

3.4.4.3 Lower Loch Etive

No potential to accommodate further aquaculture development in this local coastal character area was identified, largely due to the large amount of existing development already in place. This development largely occupies the most appropriate locations for development, and generally avoids the key sensitivities identified in the assessment.

The trout fish farm in the bay adjacent to Ardchattan priory is the most prominent and visually intrusive existing development. It is located within the setting of the priory, close to the shore with no visual backdrop and where it is suddenly revealed after a bend in the road, all of which contribute to its conspicuousness. Should the opportunity arise to remove this farm, the visual amenity of the loch would be enhanced.

3.5 Lismore and the Lynn of Lorn

3.5.1 Lismore and the Lynn of Lorn: site survey and local character analysis

The east coast of the Isle of Lismore overlooks the linear channel of the Lynn of Lorn to the north and the wide expanse of the Firth of Lorn to the south. For the purposes of this study, the coastal character area has been further subdivided into two local coastal character areas, as shown on the Site Survey map. Key landscape and visual elements which are likely to influence the development of aquaculture within these areas are noted below.

3.5.1.1 Lynn of Lorn key landscape and visual elements

- A linear stretch of water which to the north constricts at Port Appin and to the south opens out to the Firth of Lorn, with long views to the distant open sea.
- Relatively exposed, south west orientation, reinforces maritime character.
- Boats, including the Lismore ferry, and yachts frequent the strait, and there is a large finfish farm at Achnacroish.
- Blunt, steep cliffs and regular foreshore clearly define the junction of land and sea and create a narrow intertidal strip.
- Cliff edge is irregular in height with an uneven profile occasionally interrupted by shallow inlets on the east side of the Lynn and wooded gulleys on Lismore.
- Rugged, undeveloped shoreline, with sparse settlement set well back from the shore, except at the port of Achnacroish.
- The hinterland is of low relief, which ensures that although well defined, the Lynn is not particularly enclosed.
- Semi natural woodland is scattered over the eastern shore line, but the vegetation is generally open rough grassland.

- The coastline is relatively inaccessible by land, but not isolated due to marine activity and views to settled landscapes.
- The coast is highly visible from the sea.
- Panoramic views are drawn down the broad length of the Lynn, north to the intricate pattern of islands, along the coast and across to higher hills of Morven or Creran and Etive.
- Key coastal features, including the monument at Achnacroish, and Tirefour broch, attract visitors to elevated viewpoints.
- The area lies within the Firth of Lorn NSA.

3.5.1.2 South East Lismore key landscape and visual elements

- The sense of open-ness associated with the wide expanse of the Firth of Lorn is experienced from south east Lismore.
- The exposed, south west orientation of the Firth reinforces the maritime character, along with the intertidal range visible on the islands.
- The expanse of water and sky create a sense of light and space, reinforced by long, 360° views.
- The constant changes in weather, sweeping in from a great distance, contributes to the sense of dynamism.
- Organically shaped, diversely textured islands lie off Port Kilcheran, and contrast with the simple expanse of the Firth.
- Boats, including ferries, and yachts frequent the strait.
- Steep, blunt, high cliffs and rocky foreshore clearly define the junction of land and sea and create a narrow intertidal strip.
- Cliff edge is irregular in height with an uneven profile.
- The hinterland is low lying, which ensures that distant views from Lismore extend in all directions, even from the cliff tops.
- The shoreline is undeveloped except at the inlet of Kilcheran.
- The coastline is rugged and inaccessible except on foot, but not particularly isolated due to frequent marine activity and views to settled landscapes.
- Sense of exposure, semi natural vegetation and rugged terrain lend qualities of remoteness.
- The coast is highly visible from the sea.
- Panoramic views are drawn down the Firth, and across to the wide expanse of surrounding mountains.
- Occasional coastal features, including duns and cairns, are testament to the long settled history of Lismore.
- The juxtaposition of diverse seascape and landscape elements coupled with dramatic contrasts in scale and a context of changing light and shifting weather conditions combine to contribute to high aesthetic quality.
- The area lies within the Lynn of Lorn NSA.

Lynn of Lorn From Stronacroibh on Lismore: the wide channel of water is punctuated by the occasional island and contained by land of low relief with a relatively simple coastline



Lynn of Lorn Looking south from Fionn Ard, on east coast



Lynn of Lorn Looking south from Tirefour Castle, on west coast



South East Lismore From Rubha na Gaoith: rain sweeping across distant hills reinforces the sense of expanse within which lie small, irregularly shaped islands



3.5.2 Lismore and the Lynn of Lorn: opportunities and constraints

There is one large finfish farm near Achnacroish, and a mussel line located below Tirefour castle. Landscape opportunities and constraints which are likely to affect further development are noted below. Features identified in the opportunities and constraints presented below are shown on the following map.

3.5.2.1 Lynn of Lorn

Landscape and visual opportunities for aquaculture development:

- Relatively expansive scale of seascape can accommodate some development, even of moderate to large scale, without dominating water surface.
- Existing marine activity could absorb traffic associated with aquaculture.
- Steep coastal edge and woodland can create backdrop to structures.
- General lack of accessibility along the shore limits land based viewpoints.

Landscape and visual constraints for aquaculture development:

- Regular shaped coastline makes it difficult to site structures in relation to promontories and bays: they should be aligned parallel to the coast.
- Simplicity of the sea acts as a foil to surrounding complexity: clutter would compromise this relationship.
- Protect the settings of historic features such as Tirefour castle.
- Development should avoid the foreground of elevated panoramic views, particularly from the coastal path and key features.
- Coast highly visible from the sea, although views from this low level would be foreshortened.
- Area designated as an NSA, reflecting the high scenic quality of the surrounding landscape.
- Settlement of Achnacroish overlooks the sea, and is also the ferry port.

3.5.2.2 South East Lismore

Landscape and visual opportunities for aquaculture development:

- Relatively expansive scale of seascape can accommodate some development, even of moderate to large scale, without dominating water surface.
- Existing marine activity could absorb traffic associated with aquaculture.
- Steep coastal edge and woodland can create backdrop to structures.
- Area not populated and relatively inaccessible except by foot, therefore not seen from the land by large numbers of people.

Landscape and visual constraints for aquaculture development:

- The irregular shape and profile of islands provide a dramatic contrast to the simple expanse of the sea and are the focal point of many views.
- Qualities of remoteness, associated with inaccessible, rugged terrain and lack of development, would be compromised by development.
- Coast highly visible from the sea, although views from this low level would be foreshortened.
- Development should avoid the foreground of elevated and panoramic views.
- Area designated as an NSA, reflecting the high scenic quality of the surrounding landscape.

3.5.3 Lismore and the Lynn of Lorn: summary of the potential sensitivity of the local coastal character areas to aquaculture development

| Potential sensitivity of the seascape to aquaculture development | Lynn of Lorn | South East Lismore |
|---|---|---|
| Maritime influences | Low sensitivity Maritime character relates to sense of exposure, views to open sea and sea based activity, none of which are likely to be significantly adversely affected by aquaculture, although simplicity of sea surface could be compromised by clutter. | Low sensitivity Maritime character relates to sense of exposure and expansiveness of open sea and sea based activity, although simplicity of sea surface could be compromised by clutter. |
| Character and experience of the coast | Low sensitivity Regular, simple coastline shape offers little opportunity for development to be associated with promontories and bays, although lines and cages could be aligned to reflect the shape of the coastal edge. | High sensitivity Although fragmented character of islands lends itself to fragmented character of water based structures, it is difficult to reconcile the geometric form and static character of aquaculture structures with the irregular profile, organic form and dynamics of the tidal reach of the islands in a landscape so dominated by semi natural character. |
| Setting of landmarks and features | Some sensitivity Setting of Tirefour castle (a broch) and Achnacroish monument, both of which are also elevated viewpoints. | Some sensitivity Setting of Dun Chruban, Port Kilcheran and the lighthouse at Eilean Musdile. |
| Experience of wildness | Low sensitivity Relatively inaccessible coast, with some sense of naturalness and lack of development is always experienced within the context of the busy thoroughfare of the sea and extensive views to more settled hinterland. | Some sensitivity Rugged, inaccessible coast has some sense of remoteness and is dominated by sense of naturalness, exposure to natural processes and lack of development. This contrasts with the busy thoroughfare of the sea. |
| Aesthetic qualities | Some sensitivity Area of some aesthetic quality. Contrast between simplicity of Lynn and more complex interaction of islands and sea juxtaposed with the rugged profile of distant mountains contributes to this. Value strongly links to contrasting experience of space and set piece visual compositions. | Very high sensitivity Area of high aesthetic quality. Many qualities contribute to this, including contrast between small scale islands and large scale open sea set within context of vertical scale of distant mountains, strong semi natural character and relative quietness and perception of solitude. Many fine extensive views of expansive sea, islands and distant mountains, characterised by visual drama of vast expanse, changing light and shifting weather patterns. |
| Key viewpoints | Some sensitivity A few key panoramic views, most notably to nearby islands or from elevated historic landmarks such as Tirefour Castle. Many areas are not highly visible, or are only visible from the sea. | Some sensitivity Key views from Kilcheran, overlooking small islands from land or sea and along the coast from footpaths and archaeological features. Some areas are not highly visible. |

3.5.4 Lismore and the Lynn of Lorn: conclusions

The conclusions from the capacity assessment are noted below together with accompanying guidance.

3.5.4.1 Lynn of Lorn

Some potential to accommodate additional aquaculture development was identified in this local coastal character area, although the following guidance was identified to help steer the location of future development:

- Development should be located away from the setting of key features and should avoid the foreground and focal points of key panoramic views, or views from settlements.
- Development should be located where the sea is expansive in scale, so that structures do not visually dominate the water surface.
- Development should avoid shorelines used for informal recreation.
- Where possible, development should aim to use a wooded backdrop as an immediate setting.
- Structures should be aligned to reflect the regular, linear character of the coastal edge.
- Onshore development should be located within existing settled areas.

3.5.4.2 South East Lismore

No potential to accommodate aquaculture development in this local coastal character area was identified, largely due to the high sensitivities associated with the character and high aesthetic quality of this landscape.

3.6 Lower Loch Linnhe

3.6.1 Lower Loch Linnhe: site survey and local character analysis

This coastal character area comprises the lower part of the long sea loch of Loch Linnhe and also part of the Lynn of Lorn. It extends from Airds Bay near Port Appin to Cuil Bay at Duror. There are three local coastal character areas defined within this part of Lower Loch Linnhe as shown on the Site Survey map. Key landscape and visual elements which are likely to influence the development of aquaculture within this area are noted below.

3.6.1.1 Cuil Bay key landscape and visual elements

- Cuil Bay forms a curving bay, facing south-west down Loch Linnhe and is an unusual feature in the context of the generally linear form of the Loch. While not exposed to the open sea, the shallowness and aspect of the bay result in some tidal and wave movement.
- Eilean Balnagowan, although small, is a prominent craggy solitary island set within the confined channel of Loch Linnhe and a focus in views from Cuil Bay.
- There is no existing aquaculture evident in this part of Loch Linnhe.

- Cuil Bay arcs out into Loch Linnhe, forming a narrow shingle and sandy beach contained by a series of low rocky craggy promontories, forming distinct fingers of land separated by small inlets to the west.
- A public road provides access to the bay and the immediate hinterland comprises a fan of flat alluvial fenced pasture at the mouth of the River Duror; this lying at the foot of the rocky bluff of Ardsheal Hill. Settlement is located at the transition between pasture and rougher hill slopes.
- Long funnelled views down Loch Linnhe are a feature from the bay and from a footpath along the rocky promontories and smaller bays to the west. Eilean Balnagowan is an important foreground focus in these views while the distant mountainous profile of Mull provides a backdrop.
- While views encompass distant dramatic mountainous profiles and layered low islands, with the Loch providing a simple foreground foil to these more complex forms, Cuil Bay itself is less visually rich.
- Variations in lighting conditions can dramatically highlight the rugged Movern mountains and Eilean Balnagowan.
- This is a settled and well used area, although it is not overly developed.

3.6.1.2 East Shore of Lower Loch Linnhe key landscape and visual elements

- Loch Linnhe forms a long, strongly linear loch, even in form and edged either side by steep sided hills. There is little exposure to the open sea due to the containment of land.
- A simple, regular coastline comprising a low rocky edge with occasional narrow shingle beaches.
- The major route of the A828 is closely aligned to the loch shore, separated only by a narrow band of deciduous woodland, colonising a former railway solum. Steep hill slopes contain this narrow coastal edge and settlement is sparse.
- Views from the A828 are largely screened by vegetation, although where lay-bys or gaps occur, the focus tends to be on the rugged Movern mountains which form a contiguous edge on the other side of the loch. Further south, views focus on the narrow funnel of the Sound of Shuna to the distant fragmented pattern of islands and sea of the Lynn of Lorn.
- Variations in lighting conditions can dramatically highlight the rugged Movern mountains visible across the loch.
- This is a simple seascape with little diversity but where views focus on distant and more dramatic mountainous landscapes and seascapes.

3.6.1.3 Sound of Shuna to Airds Bay key landscape and visual elements

- The diverse pattern of sounds, lochs, bays and islands give a complex form to the maritime component of this area. The narrow channel of the Sound of Shuna, hemmed in by the high-topped island of Shuna, marks the transition from the simple form of Loch Linnhe to the complex, shallow intertidal zone at the top end of the Lynn of Lorn which is studded with a myriad of small islands of diverse shape and scale and edged by the low, craggy form of Lismore.

- Fragments of islands, banks of dark seaweed around the coastal fringe and mud flats within Loch Laich are revealed at low tide and are indicators of the dynamism of the sea.
- This is a well-frequented seascape with ferries to Lismore and recreational sailing a feature. There is a finfish development present within the Sound of Shuna. The form of the coastline is very indented with inlets, promontories, sea lochs and islands producing a complex pattern. Shorelines are generally rocky although grassy slopes and mud flats immediately back Loch Laich and around the Ardtur promontory. Low banded stepped cliffs are a characteristic feature of the Lismore coast.
- Castle Stalker is a landmark feature located on a small rocky island at the mouth of Loch Laich. Small settlements such as Port Appin, jetties and lighthouses also align the shore and Airds and Ardtur Houses and their associated policies are closely related to the sea.
- The hinterland to this local coastal type is diverse comprising; wooded craggy knolls and rock arch at Appin; pasture and policy woodlands and the elongated, low form of Lismore with its coarse texture of pasture, woodland and rocky outcrops.
- Views are diverse, but from elevated viewpoints along the A828, tend to take in the foreground of islands, along the length of the Lynn of Lorn and the mountainous backdrop.
- Although not a wild or remote seascape, the islands in particular are very naturalistic and varied in form and together with the diverse hinterland and the distinctly layered composition of land and sea, contribute to the high aesthetic quality of this coastal area.
- This area is located within the Lynn of Lorn National Scenic Area.

Cuil Bay Looking south down Loch Linnhe



Sound of Shuna to Airds Bay Looking south to Castle Stalker and Lismore



3.6.2 Lower Loch Linnhe: opportunities and constraints

There is some limited aquaculture development at present in this area within the Sound of Shuna. Opportunities and constraints which are likely to affect further development are noted below. Features identified in the opportunities and constraints presented below are shown on the following map.

3.6.2.1 Cuil Bay

Landscape and visual opportunities for aquaculture development:

- There are considered to be no opportunities for development in this local coastal character area.

Landscape and visual constraints for aquaculture development:

- Views from Cuil Bay down Loch Linnhe where development would interrupt the focus of Eilean Balnagowan and introduce an element of clutter into the presently simple, open foreground of the bay.
- The recreational focus of this readily accessible bay.
- The scale of narrow rocky inlets and promontories to the west of the bay would be dominated by development, with mussel lines in particular, likely to extend beyond the length of promontories.
- While there is scope to site finfish cages near Eilean Balnagowan in terms of utilising the backdrop and partial screen that would be provided, the focus provided by this island (due to its distinctive form and solitary presence in views from the bay) is a constraint to development.

3.6.2.2 East Shore of Lower Loch Linnhe

Landscape and visual opportunities for aquaculture development:

- Mussel lines or finfish farms aligned parallel to the shore could relate to the simplicity and linearity of the coastal edge and uniform hinterland of hill slopes where few landmark features are present.
- There is little settlement within this area and views from the A828 are presently largely screened by shoreline woodland.
- The expansive scale of the sea can accommodate some development, even of moderate to large scale, without dominating the water surface.

Landscape and visual constraints for aquaculture development:

- Open views from the A828, which although occurring infrequently, focus on Loch Linnhe, the distant Movern mountains and the Sound of Shuna and provide visual diversity along this well-used route.
- Any onshore built facility is likely to be highly visible from the A828.

3.6.2.3 Sound of Shuna to Airds Bay

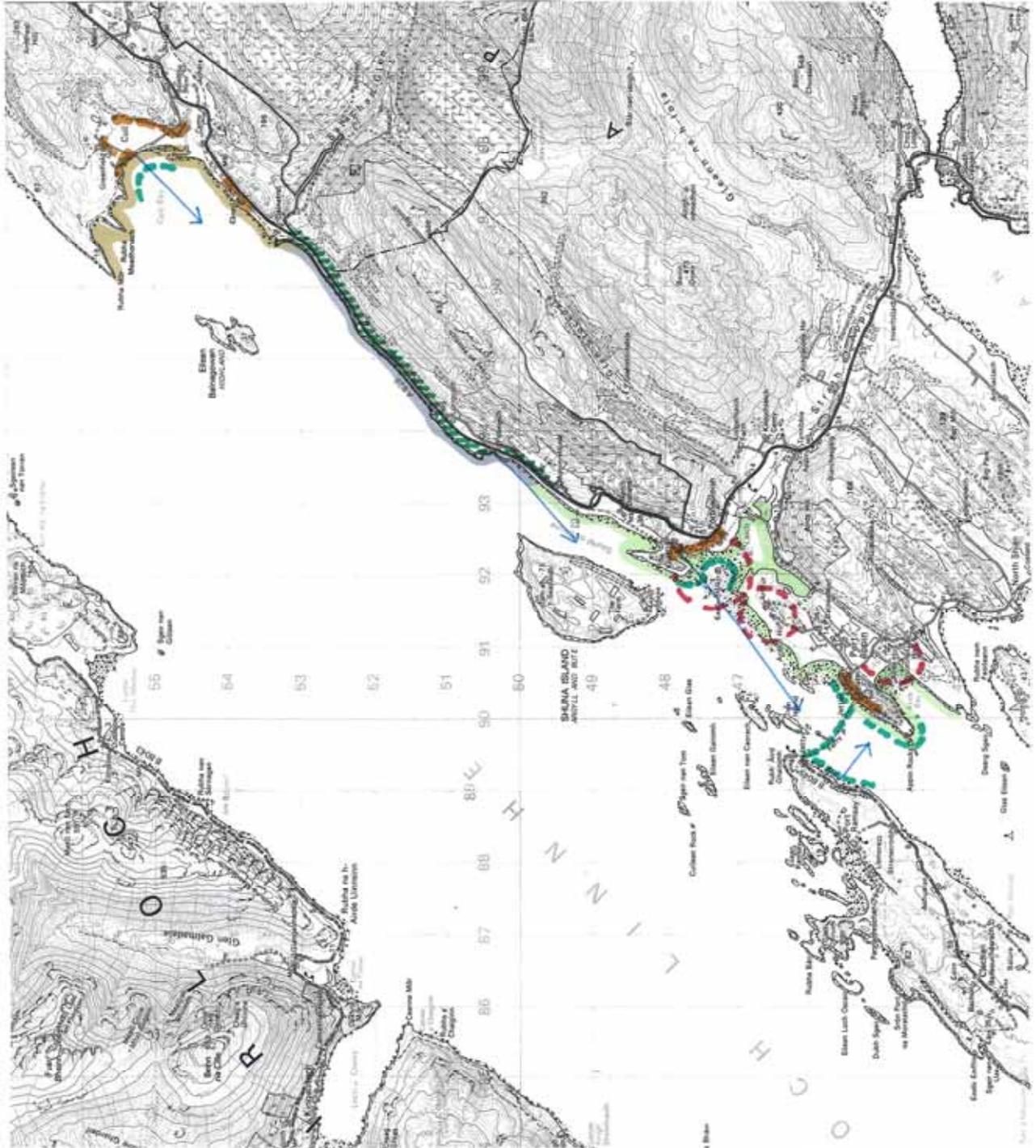
Landscape and visual opportunities for aquaculture development:

- There are no opportunities for aquaculture development in this local coastal character area.

Landscape and visual constraints for aquaculture development:

- Whereas islands could theoretically provide some partial screening and backdrop for finfish cages, the geometric forms and industrial nature of development would be overly discordant with the organic form of islands and could affect their complex spatial pattern by appearing to merge islands in some views.
- Within small sounds and sea lochs, the channel of open water would be narrowed by development encroaching from each shore, disrupting the flow of views and contrast between land and sea. Where existing aquaculture is present, this would exacerbate this narrowing effect.
- The presence of elevated views increases sensitivity as does the traffic of ferries and boats offering close views of the sea where development could interrupt the flow of views down the Lynn of Lorn.
- The seascape that provides the setting to Castle Stalker and the designed landscapes of the houses of Ardtur and Airds.
- The high aesthetic quality of the area, which is related to the scenic quality recognised by the NSA designation.

Lower Loch Linnhe Features highlighted in opportunities and constraints



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3.6.3 Lower Loch Linnhe: summary of the potential sensitivity of the local coastal character areas to aquaculture development

| Potential sensitivity of the seascape to aquaculture development | Cuil Bay | East Shore of Lower Loch Linnhe | Sound of Shuna to Airds Bay |
|---|--|---|--|
| Maritime influences | Low sensitivity Maritime influences limited to sense of exposure, open-ness of sea channel, maritime activity and moderate tidal reach on shoreline none of which are likely to be significantly adversely affected by aquaculture, although simplicity of sea surface could be compromised by clutter. | Low sensitivity Maritime influences limited to sense of exposure, open-ness of sea channel, maritime activity and moderate tidal reach onshoreline none of which are likely to be significantly adversely affected by aquaculture, although simplicity of sea surface could be compromised by clutter. | Very high sensitivity Constant flux of tides exposes diverse shapes and forms of islands, beaches and mud flats. These are a key feature of this seascape. Development would alter the complex pattern and spatial arrangement between islands and sea. |
| Character and experience of the coast | High sensitivity Cuil Bay forms an unusual feature in context of simple east Loch Linnhe coast. The simple, open curve of the bay could be easily cluttered and the small scale of the inlets/promontories to west would be compromised by development 'filling-up' the indentations and extending beyond promontories. | Low sensitivity This regular coastline offers little opportunity for development to be associated with promontories and bays however, lines and cages could relate in linear pattern to shoreline. | Very high sensitivity Intricate pattern and organic form of coastline dominates. The geometric, static form and industrial character of development would be difficult to accommodate within this naturalistic and dynamic coastline. The small scale of indentations, lochs and sounds would also be affected by large structures. |
| Setting of landmarks and features | Not sensitive There are no landmark features present in this area. | Not sensitive There are no landmark features present in this area. | High sensitivity The seascape setting of key historic features, including Castle Stalker, Ardtur and Airds houses, Port Appin, the rock arch and wooded crags at Appin would be compromised by development. |
| Experience of wildness | Not sensitive Degree of wildness limited by well-settled and accessible coastline and therefore not affected by development. | Not sensitive Degree of wildness limited by the close proximity of the A828 and accessibility of the coastline and therefore not affected by development. | Not sensitive Degree of wildness limited by accessibility, boat traffic and well settled coastline and therefore not affected by development. |

3.6.3 (continued)

| Potential sensitivity of the seascape to aquaculture development | Cuil Bay | East Shore of Lower Loch Linnhe | Sound of Shuna to Airds Bay |
|--|--|---|---|
| Aesthetic qualities | Some sensitivity While the bay itself contains no exceptional aesthetic qualities, it enables the experience of other more dramatic landscapes. The bay and sea form a simple uncluttered foil to views of dramatic distant mountains and development would impact on these. | Low sensitivity The area contains no exceptional aesthetic qualities, although allows occasional views to the distant Morvern Mountains which are more dramatic due to their rugged character. | Very high sensitivity The interaction between islands, sea, the intricate coastline, distant mountain backdrops and the accent provided by landmark features, give this area great visual drama, as recognised by the NSA designation. Development would disrupt the balance and complex pattern of open sea to land which is a key element of the high aesthetic quality of the area. |
| Key viewpoints | High sensitivity Cuil Bay is an important recreational feature from where there are dramatic views which focus down Loch Linnhe. The visual focal point of Eilean Balnagowan could be easily compromised by poor location of development. | Some sensitivity Little settlement present. Views from well used A828 are generally screened by shoreline woodland, which heightens the significance of views where gaps are present. | Very high sensitivity Elevated views from roads and viewpoints and extensive views from settlements, ferries and Lismore increase sensitivity. Development may also compete with the visual focus and composition of many coastal and sea based landmarks. |

3.6.4 Lower Loch Linnhe: conclusions

The conclusions from the capacity assessment are noted below together with accompanying guidance.

3.6.4.1 Cuil Bay

No potential for the seascape to accommodate aquaculture was identified in this local coastal character area, largely due to the high sensitivities associated with the unusual form of the bay in the context of the overall simple coastline of east Loch Linnhe, its popularity as a coastal recreational resource and its ability to provide views down the loch in which the smooth sweep of the bay and the sea forms a simple uncluttered foil to dramatic distant mountain profiles.

3.6.4.2 East Shore of Upper Loch Linnhe

There is some potential for this local coastal character type to accommodate aquaculture development provided:

- Development is sited away from open views from the A828 and is aligned parallel to, and as close to, the shore as possible.
- Development should avoid impacting on open views down the narrow Sound of Shuna. This view focuses on distant fragmented islands at the northern tip of Lismore which lie within the Lynn of Lorn NSA.

3.6.4.3 Sound of Shuna to Airds Bay

No potential for the seascape to accommodate aquaculture was identified in this local coastal character area, largely due to the high sensitivities associated with the complex pattern and organic form of islands, sea and diverse coastline, the high aesthetic quality of the area and the presence of set piece panoramic views from roads, settlements and watercraft.

3.7 Loch Creran

3.7.1 Loch Creran: site survey and local character analysis

Loch Creran forms a long, twisting sea loch extending from the Lynn of Lorn to Glen Creran. For the purposes of this study, the coastal character area has been further subdivided into three local character areas, as shown on the Site Survey map. Key landscape and visual elements which are likely to influence the development of aquaculture within these areas are noted below.

3.7.1.1 Upper Loch Creran key landscape and visual elements

- Maritime influences are limited with no visual link to open sea and the loch sheltered by enclosing hills. The upper loch is distinctly separated from the middle loch by a narrow rocky channel forming a ‘pinch point’ at Creagan.
- An open loch, rounded in form and with a narrow rocky shore. Wetlands, muddy tidal flats and extensive scrub occur at the head of the loch at the River Creran.
- Steep-sided mountains, with distinctive peaks, form a succession of long spurs down to the loch; these often reflected on the water. Extensive native woodland is a feature of the steep south-facing hill slopes while coniferous forest covers the north-facing hill slopes.
- Settlement is sparse with isolated houses located along the shore. The estate house and policies of Druimavuic are a focus at the head of the loch.
- The public road traverses the loch; its demotion as the A828 trunk road, following construction of the bridge at Creagan, has increased the tranquillity and perception of separation of the upper loch.
- Although this area is easily accessible, the distinctive high peaks of Glencoe are a distant focus and upper Loch Creran forms an important ‘gateway’ to this mountainous interior which is perceived as being wild and remote.
- The visual drama of this area results from the combination of smooth loch acting as a visual foil to wooded slopes and the irregular profile of mountain peaks; a diverse scene with many naturalistic elements.
- Views from the Creagan Bridge focus down the length of the loch and take in a dramatic panorama of steep, wooded slopes and distant landmark mountain peaks. All of the loch can be seen in views from the bridge and the public road and from elevated footpaths within the nature reserve woodlands.

3.7.1.2 Middle Loch Creran key landscape and visual elements

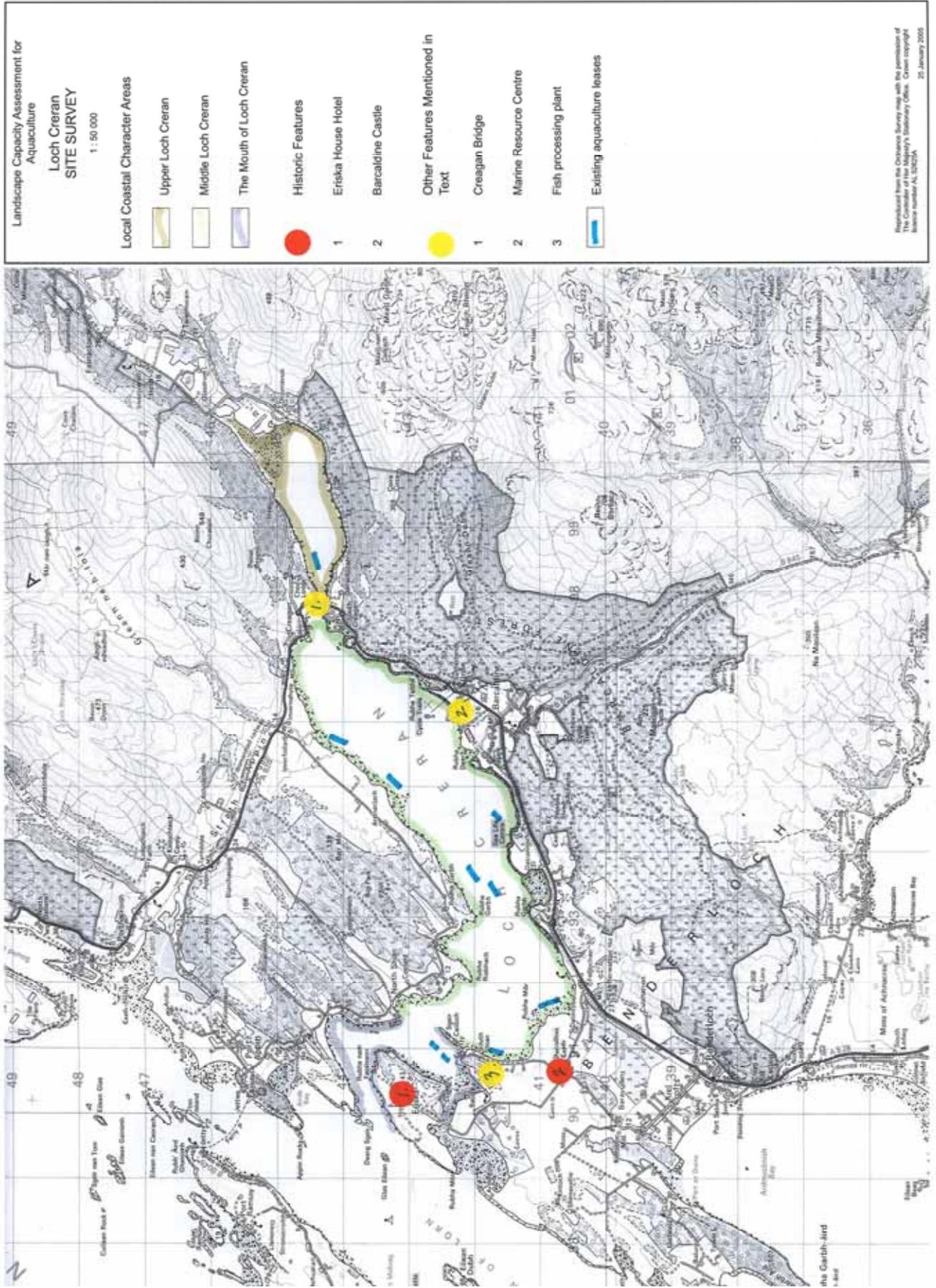
- The middle section of Loch Creran forms a relatively large scale and open body of water with an extensive tidal reach apparent in shallow bays, exposed as muddy flats at low tide. Views of open sea are limited by the constriction of spurs and islands at the mouth of the loch.

- There is much marine activity in this area with marinas, aquaculture, processing plants and industrial facilities generating frequent year-round boat traffic. Existing aquaculture development includes a finfish farm, mussel lines and large-scale oyster racks, located within the intertidal zone.
- Gently curving, shallow bays are particularly prevalent on the southern shores of the loch, interspersed with occasional rocky outcrops. Dispersed industrial development aligns the south shore of the loch and includes the prominent buildings of the Marine Resource Centre at Barcaldine and the fish processing plant at South Shian.
- The hinterland to the north of the loch forms a low relief of rolling farmland and woodland, where small fields, enclosed by neat beech hedges, and sparse settlement give an undeveloped character. To the south, the A828 and predominantly developed coastal strip are backed by rising ground forming higher hills, covered with extensive coniferous forestry.
- Barcaldine Castle occupies an open site and forms a landmark feature, distant but elevated above the south-west shore of the loch.
- This is an accessible, well-settled and developed area, with the A828 and industry, including aquaculture, visually prominent and the noise of boats and processing plant a constant feature. Although not of exceptional aesthetic quality itself, Middle Loch Creran comprises the foreground to more dramatic mountain scenery in the distance.
- Woodland tends to screen views from the A828, although where this road 'rounds' the head of the loch, views are striking and focus on the length of the loch. Elevated views are possible from the south-west, near South Shian, where the full extent of the loch and distant backdrop of mountains is revealed. An existing finfish farm, located in the middle of the loch, mars these views.

3.7.1.3 The Mouth of Loch Creran key landscape and visual elements

- Outer Loch Creran has a sinuous form and a small scale, being tightly contained by interlocking peninsulas and the island of Eriska. There is a strong south-west/north-east orientation to the grain of the landscape and the consequent form of the loch.
- Tidal dynamism is evident in small bays, although the open sea is not readily visible due to the containment of the channel and presence of small islands at the mouth of the loch.
- There is considerable marine activity in this area with boats accessing facilities in Middle Loch Creran. Mussel lines between Eriska and South Shian are partially screened by a line of rocky islets.
- The coastal edge forms a rhythmic pattern of small, scooped bays and rocky promontories. Landcover reflects the landform pattern with extensive mixed woodland occurring on higher promontories while inlets accommodate open pasture, wetland and occasional policies. Dispersed houses align the shore at North Shian.
- While not remote, this part of the loch is quiet and relatively undeveloped and the interesting form of sea and land and extensive woodland contribute to high aesthetic quality.
- Views are largely screened by woodland from the public road and tend to focus on the small bays and promontories with Eilean Dubh and Lismore being a focus in the Lynn of Lorn in some views from the north shore.

Loch Creran Site survey



Upper Loch Creran Looking north east to distant Glencoe



Upper Loch Creran With prominent fish processing plant and aquaculture a feature



The Mouth of Loch Creran Looking along the narrow sinuous channel out to Lismore



3.7.2 Loch Creran: opportunities and constraints

There is already considerable aquaculture development within middle Loch Creran, where finfish farms, mussel lines and extensive oyster racks are all present. There is also one consent for a lease site in the upper loch which has not been taken up. Opportunities and constraints which are likely to affect further development are noted below. Features identified in the opportunities and constraints presented below are shown on the following map.

3.7.2.1 Upper Loch Creran

Landscape and visual opportunities for aquaculture development:

- There are no opportunities for aquaculture development in this local coastal character area.

Landscape and visual constraints for aquaculture development:

- Development in this location would detract from the aesthetic qualities of the loch deriving from the extensive native woodland and enclosure and focus provided by distinctive high rugged mountains; the open loch being important in providing a visual contrast within the overall scene.
- The absence of containing shoreline features and the general open-ness of the loch.
- The reflective qualities of this sheltered loch with its mountainous surround, would be diminished by development.
- The perceived 'gateway' role of Inner Loch Creran to remote and wild mountainous landscapes.
- Elevated views from the Creagan Bridge and from footpaths
- The strategic need to retain the contrast between the Inner and Middle Loch and thus avoid encroaching development.

3.7.2.2 Middle Loch Creran

Landscape and visual opportunities for aquaculture development:

- Existing marine activity could absorb traffic associated with aquaculture.
- The relatively well-developed character of the southern coastal edge where industry, noise and lighting is a feature.
- Woodland and hedgerows which provide some screening from public roads on both north and south sides of the loch.

Landscape and visual constraints for aquaculture development:

- The limited capacity of the loch to accommodate further aquaculture where few parts of the coastline are presently free of development.
- Elevated views from the south-west and at the perceived 'head' of the loch at Creagan, which provide expansive long views up and down the loch, and occasional glimpsed views across the loch from the A828.
- The pastoral and less developed character of the north shore of the loch.
- The open-ness of much of the loch where no obvious containing features could provide partial screening of aquaculture.

3.7.2.3 The Mouth of Loch Creran

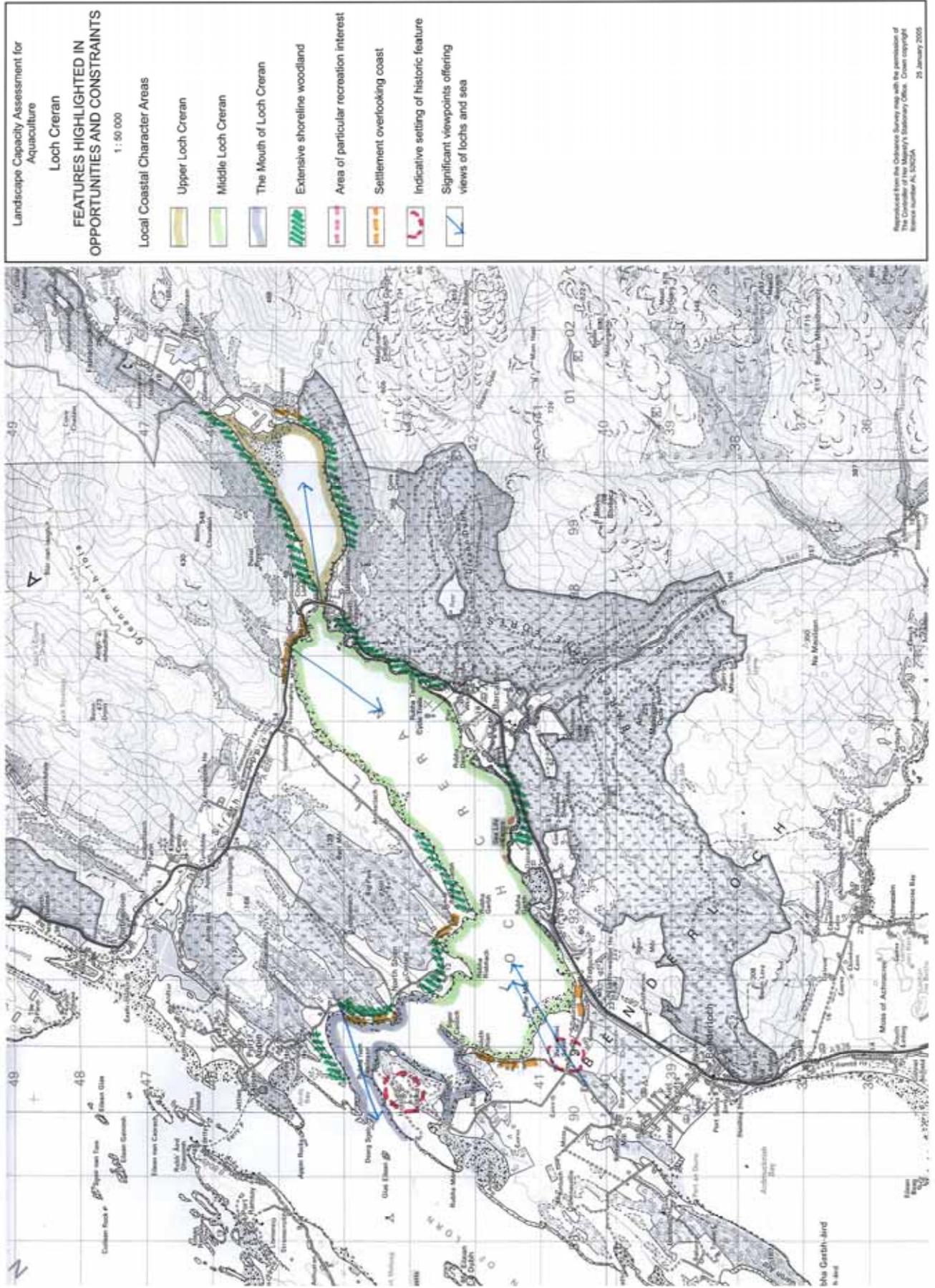
Landscape and visual opportunities for aquaculture development:

- Existing marine activity could absorb traffic associated with aquaculture.
- Woodland provides some screening from public roads.

Landscape and visual constraints for aquaculture development:

- The development scenarios considered would be too large to relate to the distinctive sinuous form and intimate scale of small bays and promontories of the Outer Loch.
- The focus of funnelled views out to the Lynn of Lorn and islands where the bays next to the public road provide the foreground to views. Development would be a dominant feature, competing with this present focus.
- Views from properties aligning the shore.

Loch Creran Features highlighted in opportunities and constraints



3.7.3 Loch Creran: summary of the potential sensitivity of the local coastal character areas to aquaculture development

| Potential sensitivity of the seascape to aquaculture development | Upper Loch Creran | Middle Loch Creran | The Mouth of Loch Creran |
|---|--|--|--|
| Maritime influences | Not sensitive Very little existing maritime influence, with only the slight tidal reach creating a relationship with the open sea. | Not sensitive Very little existing maritime influence: existing marine traffic and aquaculture could make development easier to accommodate. | Low sensitivity Channel mouth has some relationship with open sea, and this sense of expanse could become quickly cluttered by development. Existing marine traffic and aquaculture could make development easier to accommodate. |
| Character and experience of the coast | High sensitivity The naturalness and organic shape of wetlands fringing sea and land would be compromised by geometry of development and its industrial character. The absence of containing features in the loch and lack of existing shoreline development increases sensitivity. | Some sensitivity Shallow indented bays and wooded backdrop offer some opportunity for development to relate to coastal edge. Developed coast could absorb additional noise, light, activity and structures. However, few areas of coastline are free of development which could lead to cumulative effects and limit additional capacity. | High sensitivity Small-scale bays and narrow channel could easily be 'filled up' and promontories dominated by development. Aquaculture could intrude on the experience of the simplicity of the rhythmic quality of the alternating series of spurs and sea which characterise this coastline. |
| Setting of landmarks and features | Not sensitive There are no landmark features present in this area. | Low sensitivity Barcaldine Castle, although some distance from shore, occupies an open aspect the loch forms part of its wider setting. | Not sensitive There are no landmark features present in this area. |
| Experience of wildness | Some sensitivity The perceived 'gateway' role of Upper Loch Creran to remote and wild mountainous landscapes in Glencoe would be affected by development. | Not sensitive Degree of wildness limited by well developed, accessible coastline, watercraft and existing aquaculture, therefore not affected by development. | Not sensitive Degree of wildness limited by accessible coastline, marine activity and scattered settlement, therefore not affected by development. |

3.7.3 (continued)

| Potential sensitivity of the seascape to aquaculture development | Upper Loch Creran | Middle Loch Creran | The Mouth of Loch Creran |
|--|---|---|---|
| Aesthetic qualities | <p>High sensitivity</p> <p>The high aesthetic quality of the area is derived from its extensive native woodland, the enclosure and focus provided by mountains and the calm loch, creating visual drama of scale and contrasting form. Development would interrupt the contrast provided by smooth open water.</p> <p>The focus of distant mountain peaks in views and reflectivity of the sheltered water surface would be diminished by foreground clutter.</p> | <p>Some sensitivity</p> <p>While the area contains no exceptional aesthetic qualities and is characterised by development on its south shore, the open expansiveness of the centre of the loch is an attractive element, marred to some extent by existing aquaculture development.</p> | <p>Some sensitivity</p> <p>Strongly rhythmic qualities of sinuous channel, framed by interlocking landform spurs clothed with extensive native woodland contribute to aesthetic quality to this area. Development would affect the contrast between sea and land which contributes to this distinctive pattern.</p> |
| Key viewpoints | <p>High sensitivity</p> <p>Most of the upper loch visible from loch side road, plus elevated views from footpaths increase sensitivity.</p> | <p>Some sensitivity</p> <p>Long views up and down the loch from Creagan and from the south-west are important as are glimpsed views through woodland from A828. Development should avoid impacting on these views, and views in which Barcaldine Castle is a key focus.</p> | <p>Some sensitivity</p> <p>While woodland provides some screening from road, development would detract from focus of small bays/promontories and Eilean Dubh/Lismore in Lynn of Lorn in some views from road. Some overlook by houses.</p> |

3.7.4 Loch Creran: conclusions

The conclusions from the capacity assessment are noted below together with accompanying guidance.

3.7.4.1 Upper Loch Creran

No potential to accommodate aquaculture was identified in this local coastal character area, largely due to the open-ness and visibility of the loch, its contribution to the high aesthetic qualities of the area and the association of the area with perceived remote and wild mountain landscapes. When the opportunity arises, the existing lease site (which has not yet been developed) should be withdrawn.

3.7.4.2 Middle Loch Creran

No potential to accommodate further new aquaculture development in this local coastal character area was identified, largely due to the large amount of existing development already in place. However, some limited scope exists for additional mussel lines to be added to existing developments parallel to the north shore of the loch, provided these do not intrude on views of the expansive central body of the loch.

- The existing finfish farm located in the middle of the loch should be relocated closer to the southern shore, should the opportunity arise, in order to enhance elevated views over the Loch.
- On-shore facilities should avoid the north shore of the loch, utilising any existing buildings on the southern shore where possible, and thus adopting a strategy of consolidation of existing industrial uses around the Loch.

3.7.4.3 The Mouth of Loch Creran

No potential to accommodate aquaculture was identified in this local coastal character area, largely due to the intimate character of bays and inlets which would be dominated by development and where it may displace the focus of framed views out to the Lynn of Lorn and islands. Existing mussel lines occupy the most appropriate location for development, and generally avoid the key sensitivities identified in the assessment.

3.7.5 Strategic conclusions for the North Argyll pilot area

The conclusions from all five coastal character areas are shown on the following map.

This is an area where there is a considerable amount of existing aquaculture development, and much of the potential identified in the assessment has already been taken up.

One of the key findings is that there are very few areas where aquaculture is not present, and some areas where there is, in terms of the character, quality and therefore capacity of the landscape, too much already.

The findings of the assessment indicate that, should it be technically feasible there are some – admittedly very limited – locations where additional fish farming could be accommodated within the seascape. These tend to be areas which are relatively large in scale, where fish farms would appear relatively small within the wider seascape.

These areas are generally simple in character, while the guidance contained in the conclusions recommended that offshore structures should be aligned parallel to the coast, reflecting the line of the coastal edge and the pattern of vegetation, land use and even development which occurs on land in these areas, all of which seems to bear some consistent relationship with the orientation of the coast.

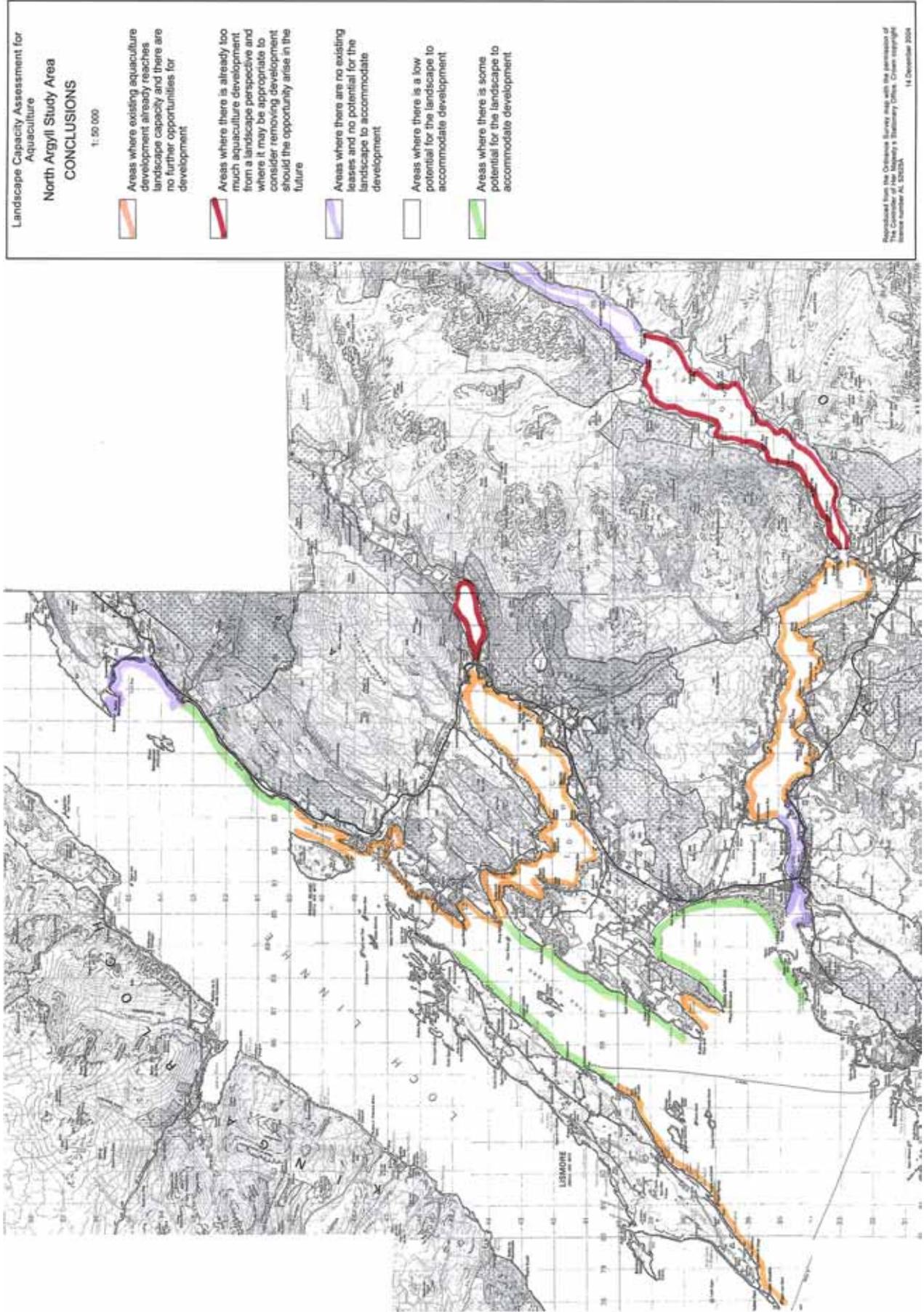
While they tend to be areas which are relatively remote and visually contained from the land, they are not the most wild stretches of coast, which were considered too sensitive for development.

While several areas were identified where the capacity of the landscape had been reached, two areas in particular were identified where already the landscape capacity is overstretched. These are upper Loch Etive and upper Loch Creran, both of which share some characteristics of enclosure, a spectacular mountain backdrop, high aesthetic quality and relative undeveloped character, although upper Loch Etive is considerably more remote than upper Loch Creran.

As a result, areas where further potential has been identified should be considered carefully: if technically feasible, an overall strategy which aims to move developments out of the more sensitive locations, such as Loch Etive and Loch Creran, to potential areas should be considered, rather than simply increasing the overall quantity of development throughout northern Argyll.

Finally, areas where there were a number of limiting factors tended to be seascapes with a concentration of high aesthetic qualities, including dramatic landscapes where mountains contrasted with the horizontal, reflective plane of the water; landscapes where solitude and naturalness could be appreciated; areas where offshore islands contrasted in scale with more expansive firths; and seascapes of rich visual diversity, expansive views encompassing fast changing weather patterns, or fine panoramas encompassing historic features.

North Argyll study area Conclusions



4 SEASCAPE/LANDSCAPE CAPACITY FOR AQUACULTURE: FROM LUCE SANDS TO FLEET BAY

4.1 Landscape context

The pilot area extends from Sandhead, at the western edge of Luce Sands, right round the long, exposed eastern coastline of Luce Bay to the rocky promontory of Burrowhead. From here the coast sweeps north to enclose the western shoreline of Wigtown Bay, the shallow waters of Wigtown Sands and finally the islands and indented coastline of Fleet Bay.

It is an extensive study area, where sea views are generally characterised by open-ness, extensive areas of intertidal sands and mudflats contrasting with exposed rocky headlands all of which emphasise the maritime influence. Part of the area is designated as a National Scenic Area (shown on the Site Survey Map for Inner Wigtown Bay and Fleet Bay), and also contains settlements, many features of archaeological interest reflecting a long settled history and areas designated because of their nature conservation interest.

There is very little existing aquaculture development, although interest has been shown in farming oysters. Much of the area is unlikely to be appropriate for finfish farming, due to the shallow waters and presence of the M.O.D., who are particularly active around Luce Bay.

The area embraces three seascape character types identified in 'An Assessment of the Sensitivity and Capacity of the Scottish seascape in Relation to Offshore Windfarms' (Scott, K.E. *et al.*, 2004). That study includes a strategic description of each of these character types, which are included in this report at Annex Six. Furthermore, the whole area also lies within the 'Outer Solway' Seascape Unit, and a copy of the description and assessment of sensitivity to this area to the siting of offshore wind turbines is included for information as Annex Seven.

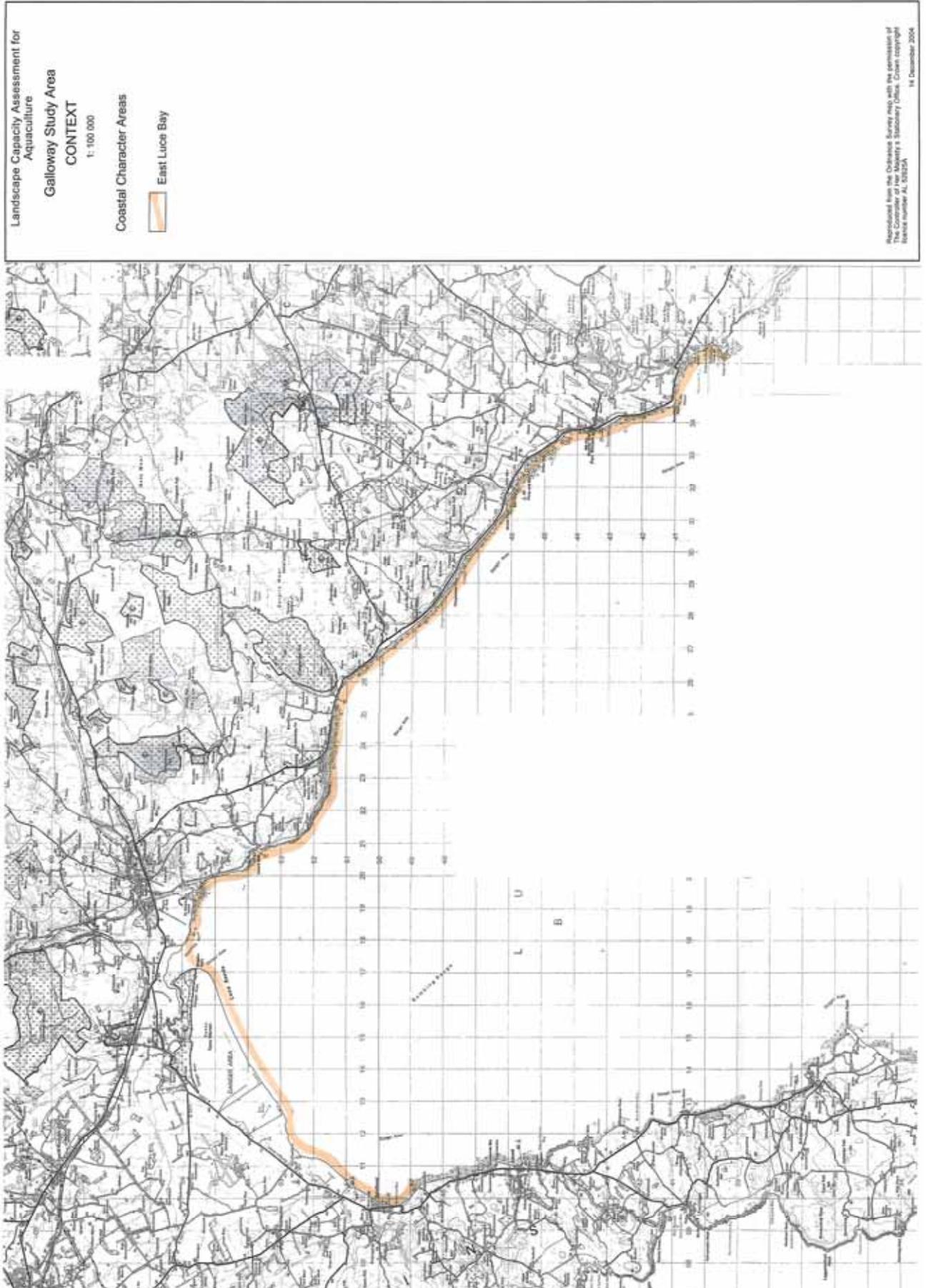
When explored in more detail, however, the study area can be divided into four clear subdivisions for the purposes of both analysis and presentation. The subdivisions take into account the seascape character types identified by Scott, K.E. *et al.*, 2004, supplemented by additional site assessment. These 'coastal character areas' are indicated on the Context Maps, which also forms the basis of the strategic landscape character and context plans for the assessment.

4.2 Luce Sands to Fleet Bay coastal character areas

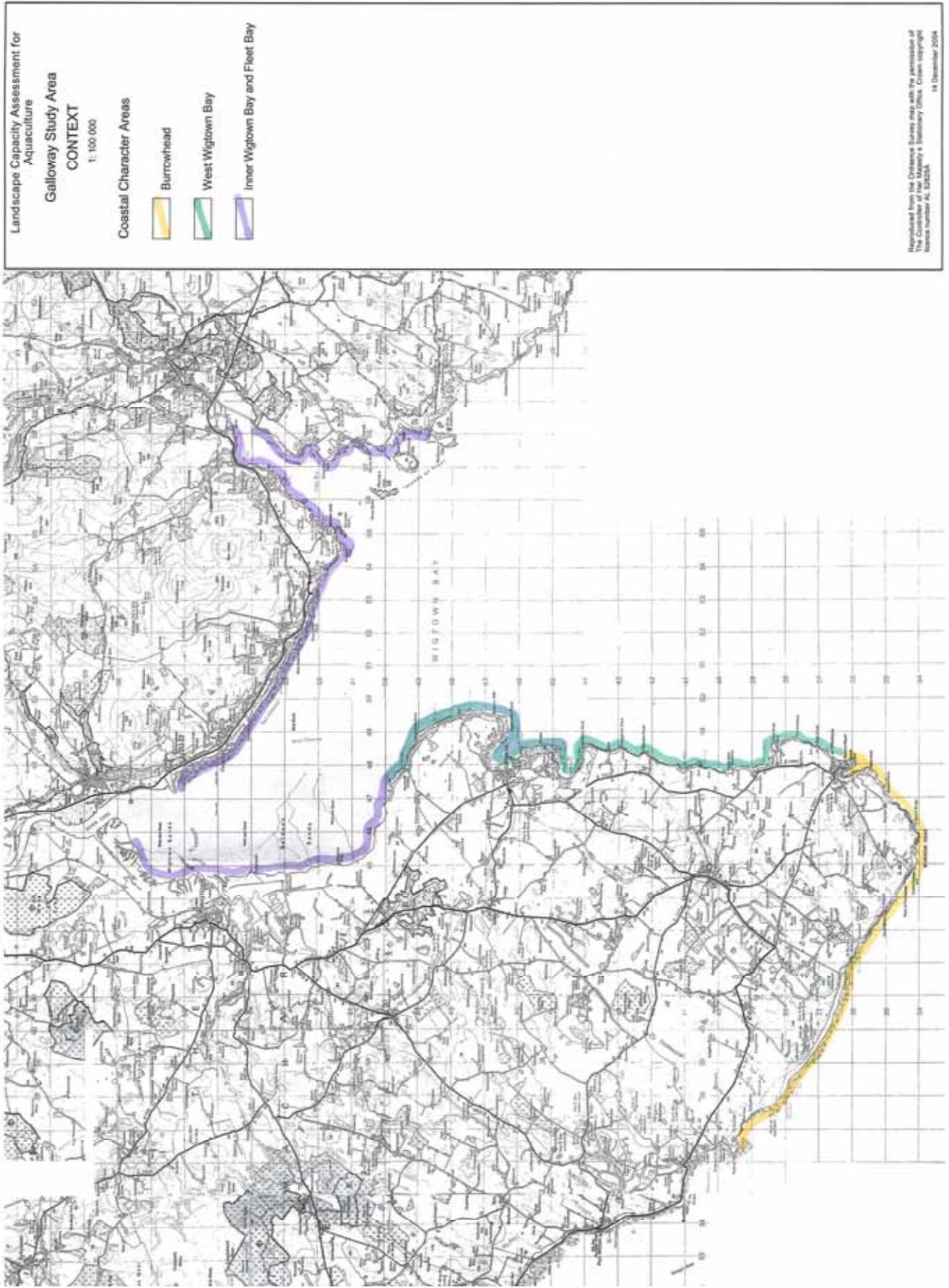
The four coastal character areas have been called:

- East Luce Bay;
- Burrowhead;
- West Wigtown Bay;
- Inner Wigtown Bay and Fleet Bay.

Galloway study area Context



Galloway study area Context



4.2.1 East Luce Bay

The long sweeping arc of Luce Sands extends west to the relatively simple but very exposed west facing coastline, dominated by rocky shingle and generally backed by a long, prominent raised beach. This stretch of coast is the focus for numerous historic sites directly overlooking the shore.

4.2.2 Burrowhead

The rugged cliffs and exposed, relatively inaccessible coastline of this wide headland is characterised by waves crashing against a shattered rocky shore, contrasting with the green, cultivated hinterland.

4.2.3 West Wigtown Bay

The low profile of shallow undulating land form forms a backdrop to an indented coastline which is sheltered from the westerly winds.

4.2.4 Inner Wigtown Bay and Fleet Bay

Extensive coastal flats, shallow sandy waters, and a simple coastline along the majority of Wigtown bay contrasts with the islands, rocky foreshore and indented coastline of Fleet Bay.

4.3 East Luce Bay

4.3.1 East Luce Bay: site survey and local character analysis

Luce Bay is contained either side by the long undulating peninsulas of the Rhinns and the Machars and backed by a band of flat alluvial farmland, extending northwards to the head of Loch Ryan. Three local coastal character areas have been defined within the East Luce Bay coastal area and these are as shown on the Site Survey maps. Key landscape and visual elements which are likely to influence the development of aquaculture within this area are noted below:

4.3.1.1 Luce Sands key landscape and visual elements are noted below

- A strong maritime influence with the sea dominating views and an extensive tidal reach over the shallow bay resulting in great dynamism and complex pattern of rivulets and pools at low tide.
- The shelter of the bay and its shallow waters over sand give characteristically pale hues and reflectivity, accentuated by the open expansiveness of the sea. There is little discernable activity on the water, although MOD structures are evident in the sea.
- A simple coastline character comprising broad, sandy beach edged by dunes, these extensive to the east, and backed by a narrow public road. The beach narrows at the transition with the rocky peninsulas containing the bay with dark shingle patches and a backdrop of rocks and some scrubby woodland.
- The small village of Sandhead borders the bay to the west and its tight-knit rim of traditional houses aligning the coast, complements the simplicity of this seascape. Isolated quarries, caravan sites and MOD structures and activity disrupt the continuity of the flat sweep of the bay further to the east.

- An alluvial plain forms the hinterland to Luce Sands and links the high containing ground of the Rhinns and Machar peninsulas either side of the Bay. A military airfield, radar systems and large-scale aircraft hangers are highly visible features in this open plain.
- The focus of views are over the broad, open sands and out to the distant horizon, with views funnelled by the low rugged arms of the Rhinns and Machars peninsulas.

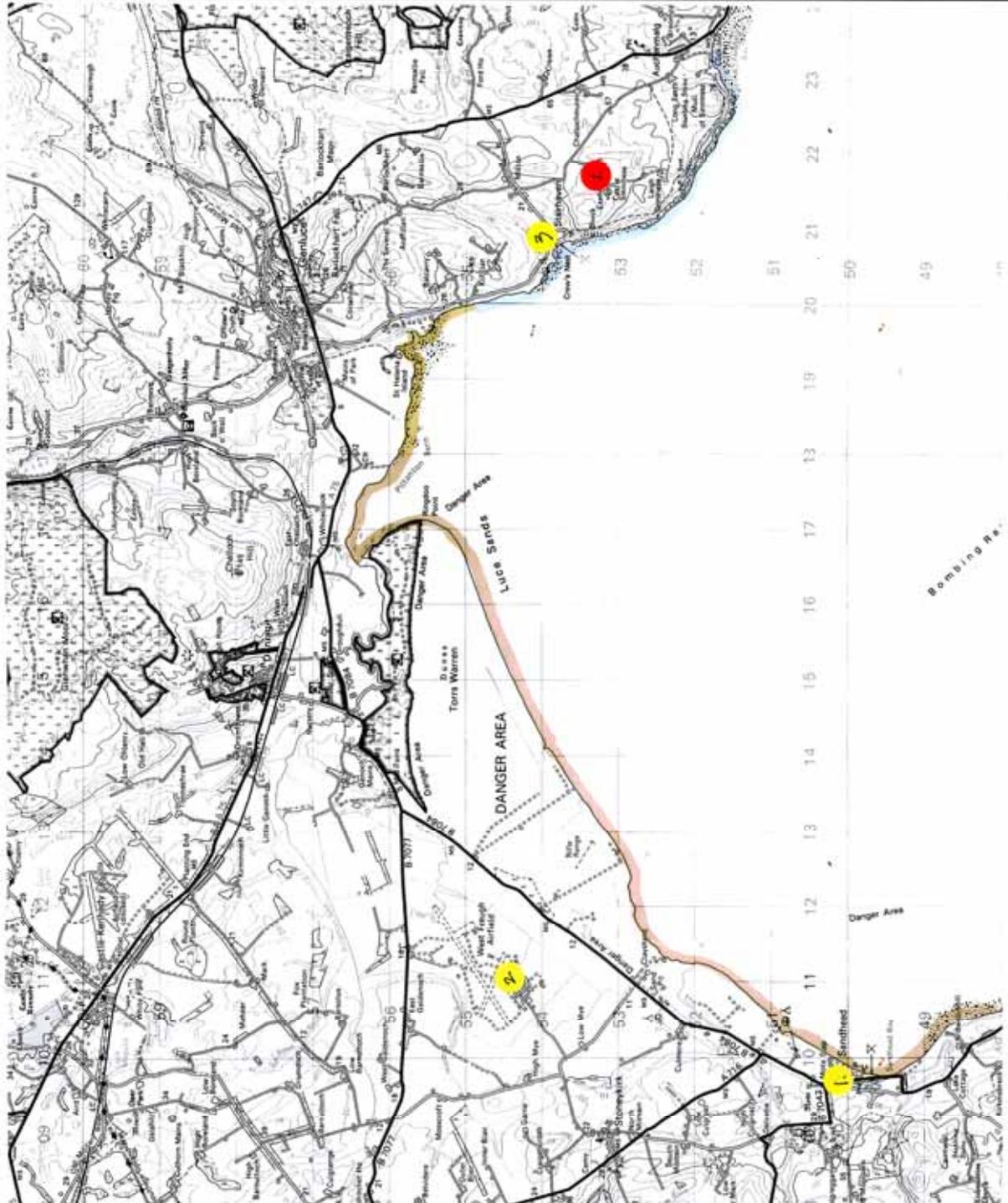
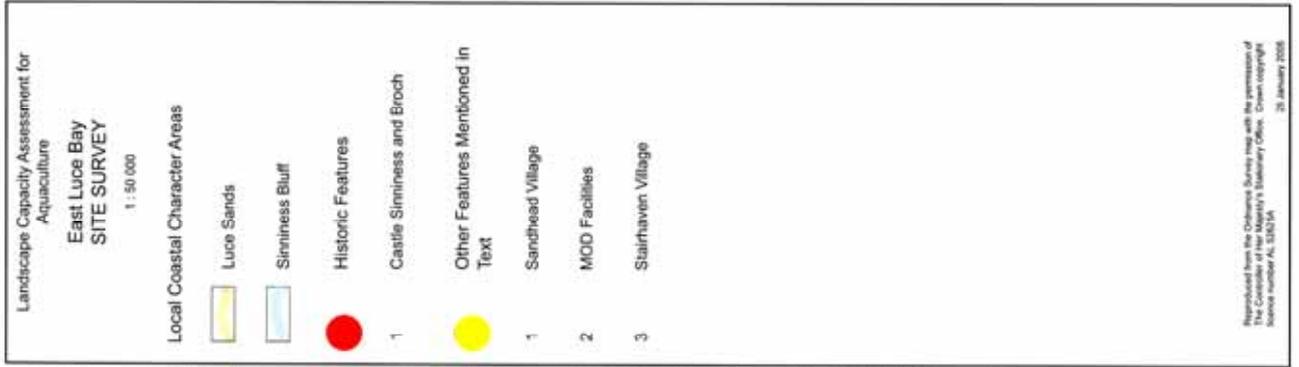
4.3.1.2 Sinniness Bluff key landscape and visual elements

- A rocky bluff gently protruding into the expansive Luce Bay. The increased exposure of the sea is evident in waves and swell caused by prevailing winds. Although the tidal reach is less significant than at Luce Sands, the shallowness of the sea is discernable by its sandy hue. Little activity on the water, although MOD structures evident in shallow water.
- The bluff interrupts the generally even east coast of Luce Bay and comprises a narrow fringe of shingle and small shallowly curved greyish-brown sand beaches at the base of rocky cliffs. Cliffs are colonised by scrubby woodland and ivy and occasionally interrupted by fragmented rocky falls. There is no development on the coastal edge and it appears semi-remote and inaccessible.
- The hinterland is rarely visible from the coastal edge but comprises a rolling plateau of enclosed pastures. Traditional farmhouses are sited on dip slopes, sheltered from the sea. The hamlet of Stairhaven clusters round a small bay at the base of the bluff.
- A number of historic features are sited on vantage points above the cliffs and include brochs and a fort and the ruinous Castle Sinniness.
- A coastal footpath is aligned on top of the cliffs and allows elevated views across the bay to the distant Rhinns and to the shore.

4.3.1.3 Auchenalg to Point of Lag key landscape and visual elements

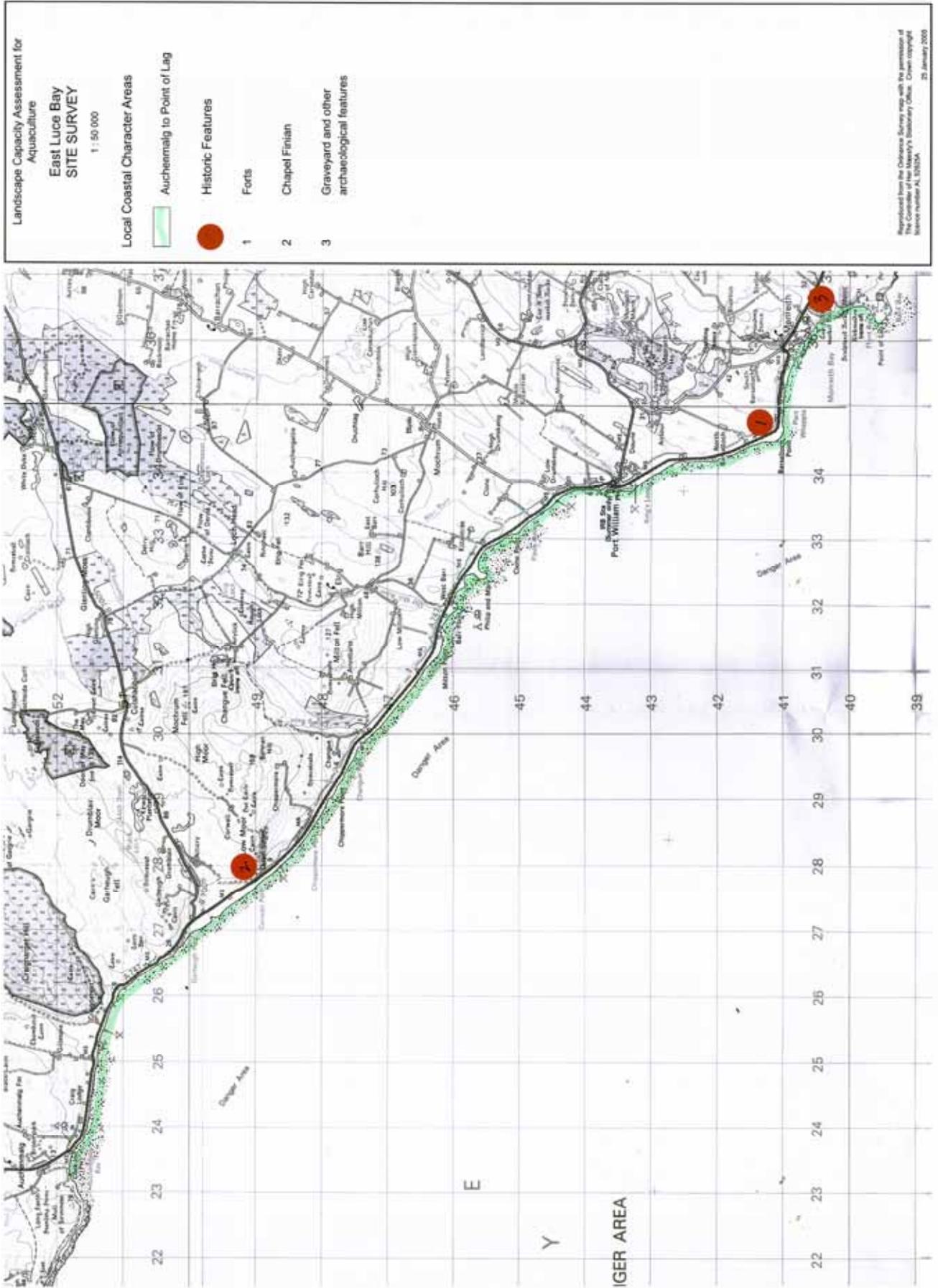
- An exposed seascape at the transition between the semi-enclosed Luce Bay and the open sea and with the prevailing wind often creating strong waves. There is little marine activity.
- Long, even coastline, cut by small inlets, particularly evident in the north-west, and forming a narrow raised beach for much of its length. A distinct parallel banding of shingle beach, sometimes edged by rough gorse thicket; flat coastal fringe accommodating main road and power lines, a strip of farmland and settlement and contained by a continuous line of vegetated cliffs. Occasional gravel extraction and agricultural storage facilities are also present on the coastal edge.
- The A747 is closely aligned to the shore and views tend to focus along the coastal edge, where subtle landform variations can appear as more distinct coalescing promontories, and out over the expansive Luce Bay to the distant Rhinns peninsula. Some elevated views are possible where the road climbs over small outcrops. The hinterland rarely features in views from the coast due to the containment provided by the cliffs backing the raised beach.
- Historic features form focal points on the tops of the cliffs. These include cairns, forts and Chapel Finian. The small arc and rocky promontory of the Point of Lag accommodates a number of historic features.

East Luce Bay Site survey



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East Luce Bay Site survey



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Luce Sands Located at the head of the expansive and strongly tidal Luce Bay



Sinnines Bluff Extends into the Bay



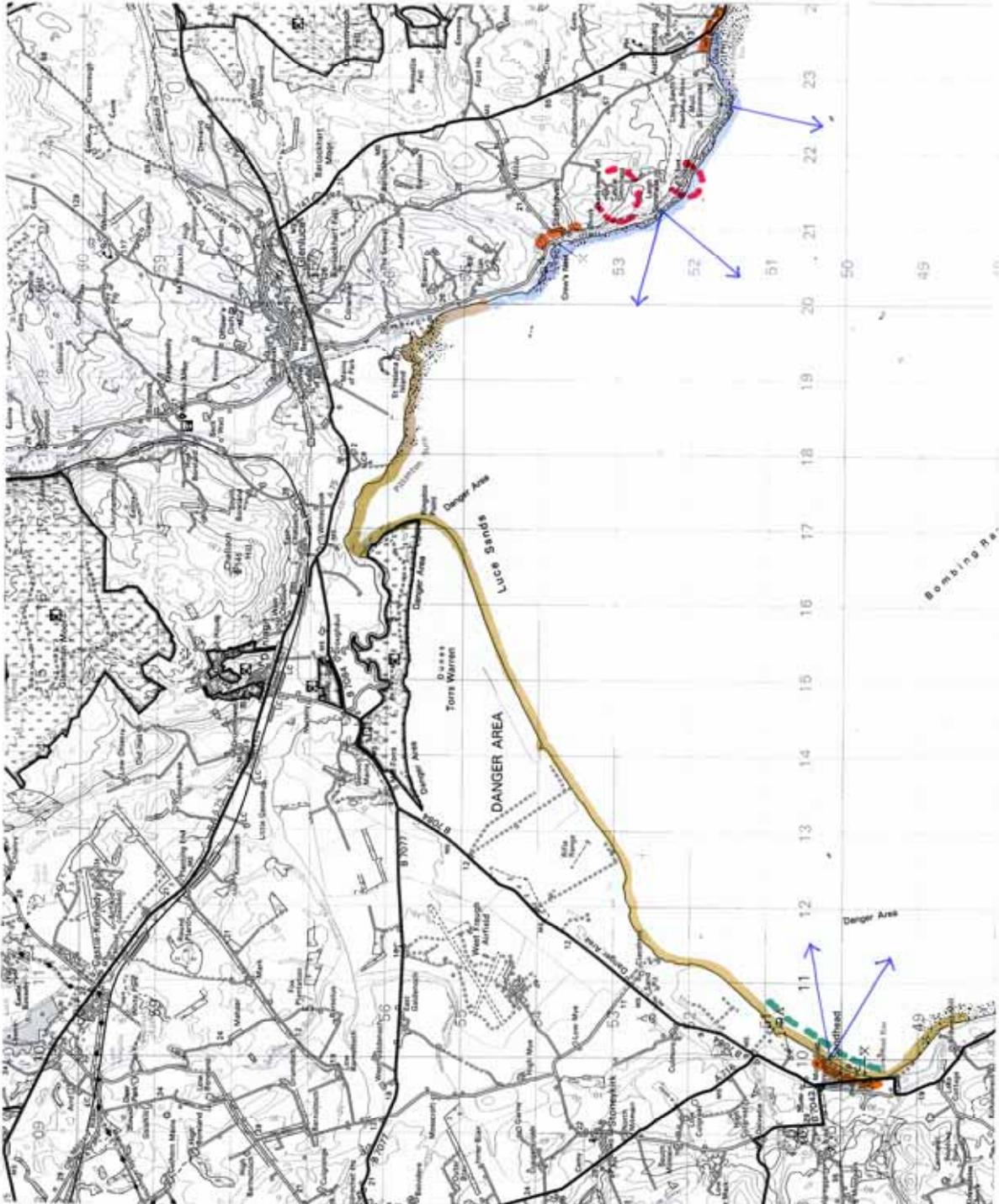
Sinnines Bluff Has a rugged character



Auchenmalg to Point of Lag Looking north along the narrow raised beach



East Luce Bay Features highlighted in opportunities and constraints



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4.3.2 East Luce Bay: opportunities and constraints

There is currently no aquaculture development present in this coastal character area. It is anticipated that the shallowness of the bay, together with the current MOD use of the area, are likely to be technical constraints to development. In terms of landscape and visual considerations, opportunities and constraints are presented on the following maps and set out below.

4.3.2.1 Luce Sands

Landscape and visual opportunities for aquaculture development:

- At the transition between the open sandy bay and the rocky coastline of the Rhinns and Machar peninsulas natural background camouflage for development could be provided by the presence of a darker shingle and rocky coastal edge, often wooded hinterland and less significant tidal reach.

Landscape and visual constraints for aquaculture development:

- The simple form and wide, open sweep of the bay would be disrupted by development.
- Development, which by its nature is static and geometric in form, would contrast with the great variability of tides and intricate organic patterns of rivulets, sand banks and pools and the pale, light reflective tones of sea and sand.
- Views from the bay which take in the dynamic foreground pattern of sand and water and are funnelled to focus on the distant horizon of open sea.

4.3.2.2 Sinniness Bluff

Landscape and visual opportunities for aquaculture development:

- Scope to site development away from settlement due to the remoteness of the bluff.

Landscape and visual constraints for aquaculture development:

- The simplicity of the open expanse of the sea where the introduction of small-scale elements into a presently open and expansive bay would be disruptive unless kept close to the shore.
- The rugged and semi natural character of the rocky shore.
- The sense of semi-remoteness and inaccessibility of the bluff could be affected by development.
- Elevated views from the coastal footpath and from the settlement of Stairhaven.

4.3.2.3 Auchenmalg to Port of Lag

Landscape and visual opportunities for aquaculture development:

- Close to settlement and communications which could provide some visual connection with development.
- The simplicity of the coastline form and its lack of exceptional aesthetic qualities; development could be aligned to reflect the linearity of the coast.

- Subtle bays more prevalent in the north-west would allow some limited screening and visual 'containment' of development.
- Rough gorse scrub present against some sections of beach has potential to provide some low level screening of small onshore facilities and offshore cages and lines in some areas.
- Landscape and visual constraints for aquaculture development.
- High visibility from the A747 aligned close to the coast. Sensitivity increases where roads rise over bluffs or turn corners to provide wide views of the sea.
- Open and distinct 'bays and beaches' overlooked by small settlements or where parking areas are provided for access for recreation, for example at Auchenmalg and Port William.
- The setting of more significant historic hill forts and Chapel Finian which occupy vantage points on cliff tops.
- Discordant visual effects associated with introducing relatively small-scale elements into an expansive open, and presently undeveloped sea.

4.3.3 East Luce Bay: summary of the potential sensitivity of the local coastal character areas to aquaculture development

| Potential sensitivity of the seascape to aquaculture development | Luce Sands | Sinniness Bluff | Auchenmalg to Point of Lag |
|--|---|---|---|
| Maritime influences | High sensitivity Tidal flux creates a dynamic, complex, organic pattern of light reflective sand and water which extends to the shore. This would be compromised by static structures and inorganic shapes. | Some sensitivity Further development would add to offshore clutter created by MOD structures contrasting with the simple expansiveness of the sea. Tidal movement less marked so not affected by development. | Some sensitivity Simplicity and scale of open expanse of the sea could be compromised by offshore development although other maritime influences would not be affected by development. |
| Character and experience of the coast | High sensitivity Clear, broad sweep of beach would be disrupted by development and would add to clutter of isolated built features such as MOD structures, quarries and caravan sites visible within dunes and onshoreline. Transition with rocky edges of bay less sensitive in terms of dark colour of shingle, less complex patterning and reduced scale. | Some sensitivity Geometry and industrial character of cages would contrast with rugged shape of rocky coastline and cliffs of bluff although mussel lines could be associated with minor indentations and less dramatic landform present either side of bluff. | Low sensitivity Onshore development could be visually associated with existing storage facilities, settlement and communications and cages and lines sited in a linear pattern could fit with the regular linearity of the coast and parallel banding pattern of the raised beach. |

4.3.3 (continued)

| Potential sensitivity of the seascape to aquaculture development | Luce Sands | Sinniness Bluff | Auchenmalg to Point of Lag |
|--|--|--|--|
| Setting of landmarks and features | Low sensitivity No designated sites or features are present in this area, although the setting of the settlement of Sandhead could be compromised by close development. | Some sensitivity Coastal setting of fort and broch could be compromised by development, and to lesser extent Sinniness Castle which is more distant from coast. | Some sensitivity Coastal vantage setting of archaeological features including Chapel Finian (signed from road and well-visited) could be compromised by development. |
| Experience of wildness | Not sensitive Degree of wildness limited by developed hinterland, where MOD and industrial activity a feature, and would therefore not be affected by development. | Some sensitivity Perception of this area being semi-remote from settlement and roads and rocky shore difficult to access, although MOD structures and settlement visible from the area. | Not sensitive Degree of wildness limited by developed coast as A747 and settlement is present, and would therefore not be affected by development. |
| Aesthetic qualities | Some sensitivity While the area contains no exceptional aesthetic qualities, the sense of space, light and open-ness of the sea and sandy beach is attractive. | Some sensitivity While the area contains no exceptional aesthetic qualities, the bluff is a relatively unusual feature and the cliffs and rocky falls along the shore have a diversity absent elsewhere in this coastal area. | Not sensitive This area has no exceptional aesthetic qualities that would be affected by development. |
| Key viewpoints | High sensitivity Luce Sands are well used for recreation and settlement is aligned on coast. Development would interrupt expansive views over the bay and the focus of distant horizon of open sea. | Some sensitivity Elevated views from coastal footpath comprise open bay and Rhinns. Development could disrupt views and finfish cages in particular would have significant impact. Views from Stairhaven, although little settlement otherwise. | Some sensitivity Close views from the A747, occasional settlements and beaches used for recreation. Vegetation could offer some limited screening between road and sea in places. |

4.3.4 East Luce Bay: conclusions

The conclusions from the capacity assessment are noted below together with accompanying guidance.

4.3.4.1 Luce Sands

There is low potential for this seascape to accommodate aquaculture development due to the present openness, light reflectivity and dynamism of sea and sand and the importance of the coast for recreation. Aquaculture development could also exacerbate the adverse effects of piecemeal industry and structures present in the hinterland.

- Small-scale shellfish aquaculture could potentially be located at the more static edges of the bay away from the broad sweep of beach, at the transition with the rockier peninsulas either side of Luce Bay. A dark backdrop of rocks and shingle and smaller intertidal zone would provide a better scale relationship with development than the wide, uncluttered beach at the head of the Bay.

4.3.4.2 Sinniness Bluff

There is low potential for development in this area principally due to the perceived remoteness of the bluff, its rugged, inaccessible coastline and elevated views provided by a coastal footpath.

- Small-scale mussel lines could be sited at the transition between the bluff and settled bays where the coast is less dramatically rugged. Finfish farms would have too great an impact on elevated views from footpaths and settlements at these transition points.

4.3.4.3 Auchenalg to Point of Lag

There is some potential for development in this local coastal area largely due to the regular form of the coastline and the presence of built development.

- Both finfish and shellfish aquaculture should be sited to relate to the linearity of the coastline and kept as close to shore as possible in order to minimise potential impacts on the presently open expansive character of the sea.
- Finfish cages should be 'tied in' with existing features, for example, located within subtle bays and/or partially screened from road by existing vegetation, because of their more substantial nature.
- Any on-shore facilities should be associated with existing buildings or on the edge of settlements or located within existed vegetation between road and beach.
- The setting of historic features needs to be respected in the detailed siting of development.
- Development should be sited to avoid intrusion on elevated views from the A747 and views from settlements and beach areas particularly popular for recreation.

4.4 Burrow Head

4.4.1 Burrow Head: site survey and local character analysis

Burrow Head forms the exposed point of The Machars peninsula to the west of the Isle of Whithorn. For the purposes of this study, the coastal character area has been further subdivided into two local character areas, as shown on the Site Survey map. Key landscape and visual elements which are likely to influence the development of aquaculture within these areas are noted below:

4.4.1.1 Point of Lag to Rock of Providence key landscape and visual elements

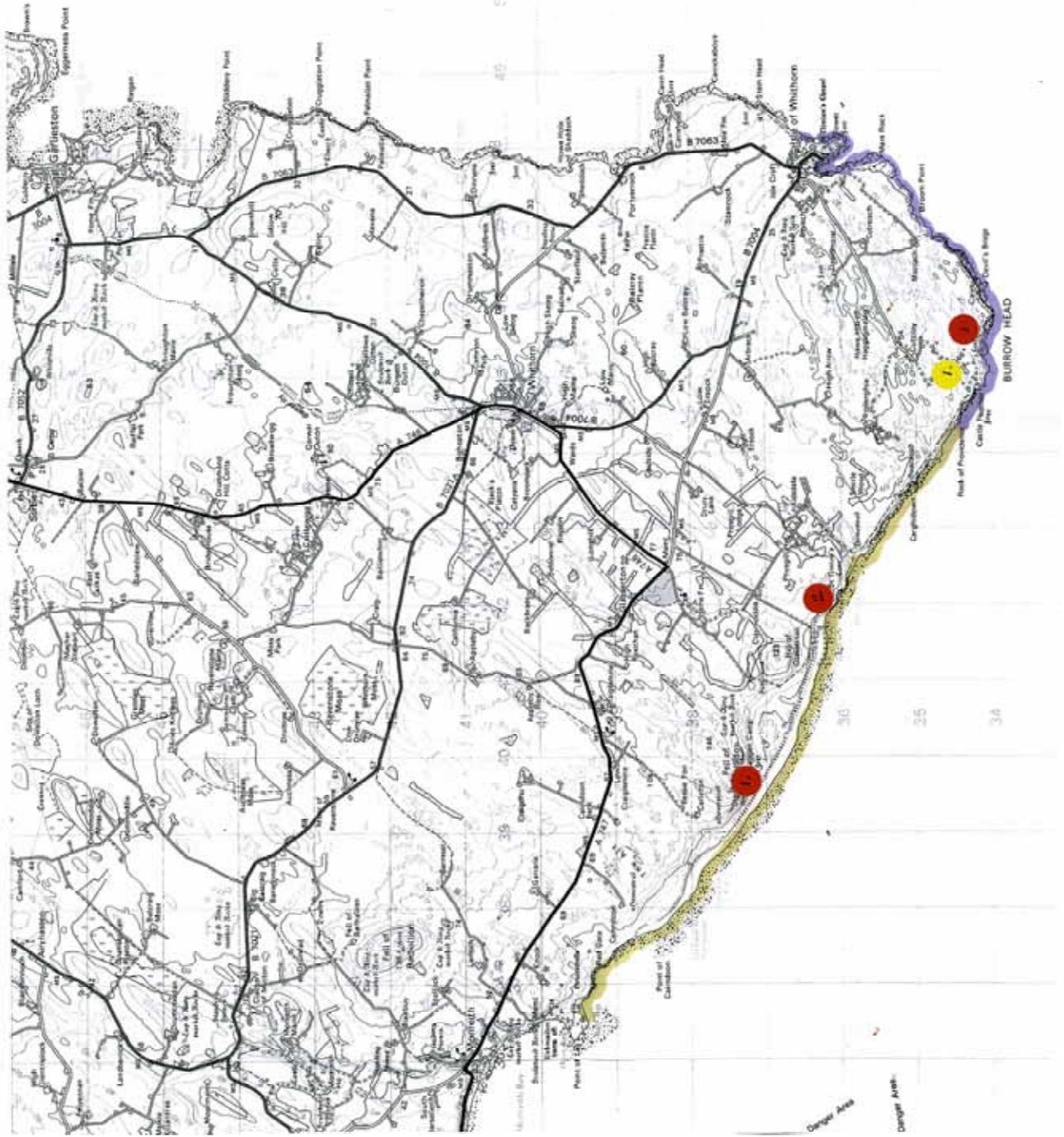
- Open sea character with Ireland, the Isle of Man and Mull of Galloway in view as distant profiles; strong wave action and exposure evident and little marine activity.

- The coastline has a dramatic rugged character and an often, stepped profile of rocky raised coastal platform, backed by a continuous line of cliffs; these occasionally cut by narrow incised inlets. Long beaches of rounded pebbles and shingle are exposed at low tide.
- Hinterland of rich, rolling farmland and distinct framework of policy woodlands; this occasionally visible from the coast where small valleys occur, for example, between the smooth rolling grassy hills of Glasserton and Carleton Fell.
- This is an undeveloped coast with farms and estate buildings set well back into the hinterland, located on dip slopes away from the sea. Access is limited to rough tracks and intermittent coastal footpaths. A narrow margin of rough gorse and scrub occurs between cliff top and farmland.
- This area has a rich archaeology with a number of historic features located at vantage points on cliffs against the coast. St Ninian's Cave, located within the cliffs against the beach, is the most visited and dramatically situated of these.
- This seascape has a high aesthetic appeal due to the exposure and drama of the sea and rugged coastline, the absence of development and strongly natural character and its diverse hinterland. It is also perceived as being remote due to the absence of roads and settlement.
- Views from coastal footpaths and hill top historic sites are elevated and focus down on the coast to the tip of the peninsula and out to sea to distant land. The well-used footpath to St Ninian's Cave tends to focus on the detail of beach and sea.

4.4.1.2 Rock of Providence to Isle of Whithorn key landscape and visual elements

- An increasingly wild and open sea character with strong wave action and exposure evident as the sea lashes against fractured rocks and cliffs at the tip of the peninsula. No marine activity evident.
- A jagged, splintered coastal edge of dark cliffs cut by small inlets and funnels. The small, traditional settlement of the Isle of Whithorn is located within a narrow rocky inlet, providing a natural harbour in this inhospitable coast.
- The hinterland forms a complex pattern of small rocky, gorse-topped knolls and wet dips with marginal farming. An extensive caravan and chalet park is located close to the coast at Burrow Head and is a dominant feature.
- There are coastal footpaths in the area and views from these are elevated, focussing out to open sea and to distant land but also on the detail of rock formations and mesmerising force of waves through gullies.
- Although the ruggedness of the coast and elemental nature of the sea are key attractors, the presence of the caravan park reduces the aesthetic quality of this seascape and the perception of remoteness.

Burrow Head Site survey



Point of Lag to Rock of Providence Looking south over rugged and remote seascape



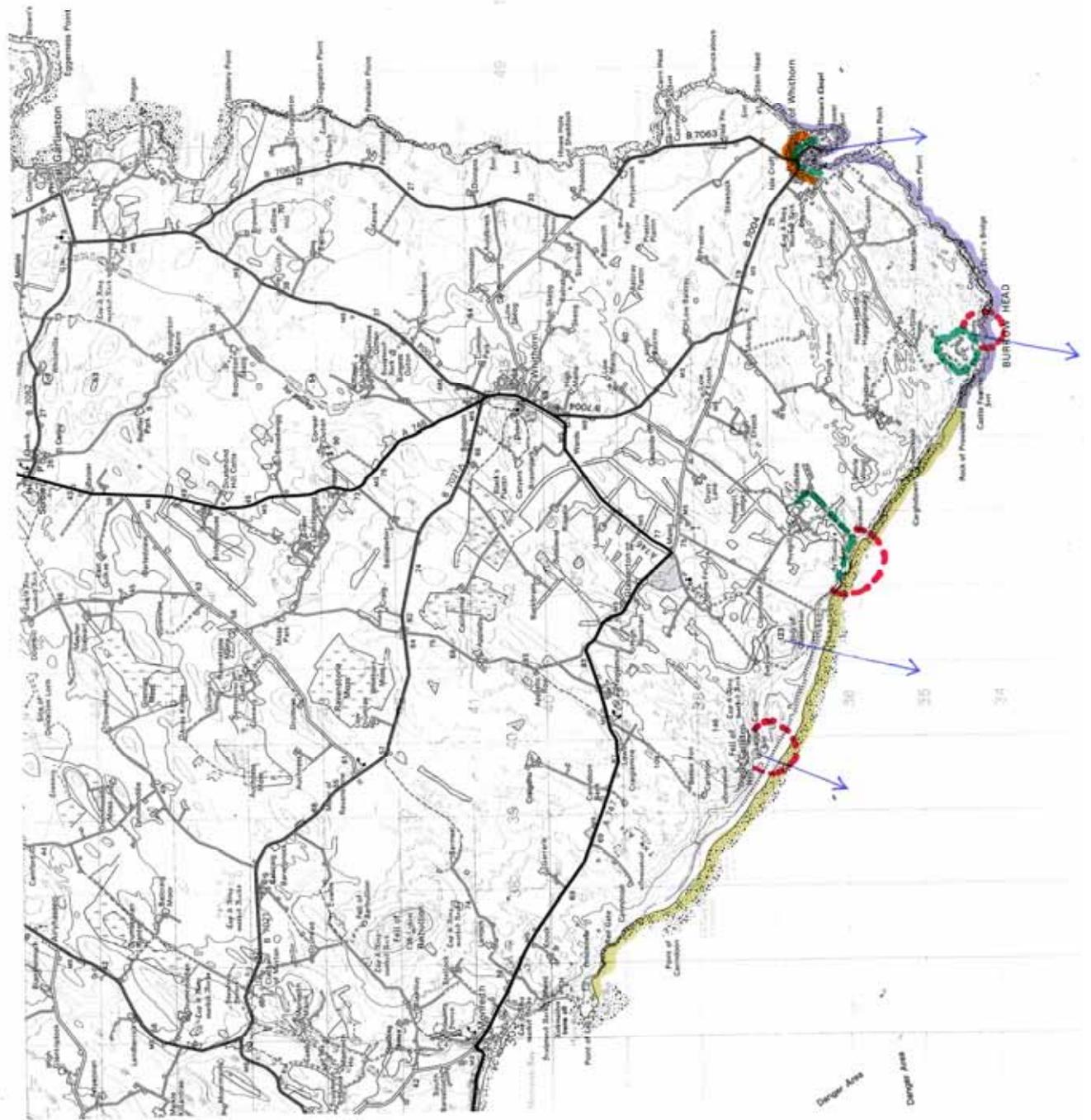
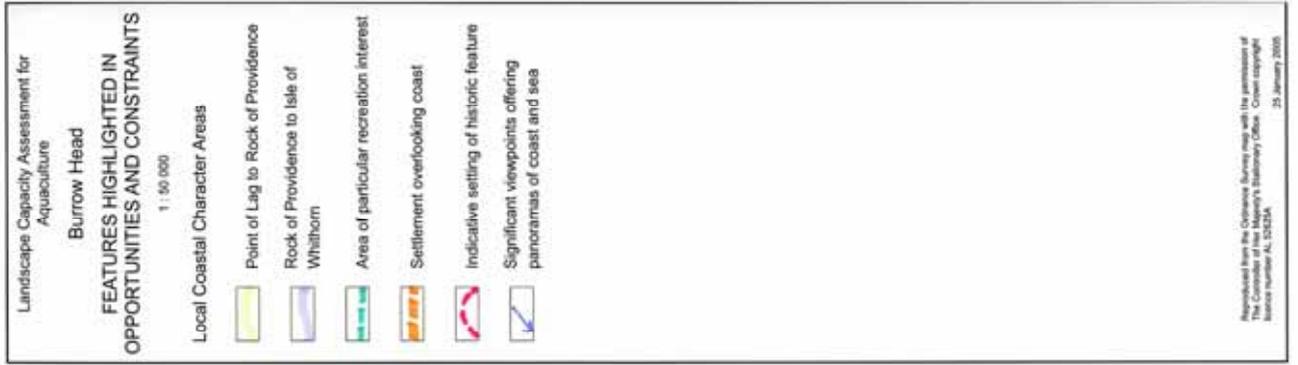
Point of Lag to Rock of Providence Looking north over rugged and remote seascape



Rock of Providence to Isle of Whithorn Looking south over the dramatic cliffs and wild sea of Burrowhead



Burrow Head Features highlighted in opportunities and constraints



4.4.2 Burrow Head: opportunities and constraints

There is no existing aquaculture in the Burrow Head coastal area. Opportunities and constraints are presented in the following map and set out below.

4.4.2.1 Point of Lag to Rock of Providence

Landscape and visual opportunities for aquaculture development:

- There are no opportunities for aquaculture in this local coastal character area.

Landscape and visual constraints for aquaculture development:

- Rugged and dramatic character of the continuous stretch of cliffs, rocky foreshore and beach and the open expansiveness and dramatic elemental qualities of the sea where the geometry and industrial character of aquaculture development would be discordant.
- Elevated views from coastal footpath and from the well visited St Ninian's Cave on the coast.
- The absence of development and perceived remoteness and wild character of the coast and sea.

4.4.2.2 Rock of Providence to Isle of Whithorn

Landscape and visual opportunities for aquaculture development:

- Sensitivity is reduced by extensive development on the hinterland.

Landscape and visual constraints for aquaculture development:

- The elemental and wild character of the rugged coastline and the open expansive sea; accentuated by the perception associated with being at the exposed 'end of the peninsula' at Burrow Head.
- Views from the coastal footpath and, to a lesser extent, from caravans and chalets where the foreground is uncluttered by existing development.

4.4.3 Burrow Head: summary of the potential sensitivity of the local coastal character areas to aquaculture development

| Potential sensitivity of the seascape to aquaculture development | Point of Lag to Rock of Providence | Rock of Providence to Isle of Whithorn | |
|--|--|--|--|
| Maritime influences | High sensitivity Exposed sea towards extremity of peninsula is characterised by crashing waves and dynamic forces. Static development would impact on these elemental qualities of the sea. | High sensitivity Exposed sea towards extremity of peninsula is characterised by crashing waves and dynamic forces. Static development would impact on these elemental qualities of the sea. | |
| Character and experience of the coast | High sensitivity Extensive cliffs, rock platforms and pebble beaches dominated by rugged, organic shapes and natural features The geometry and industrial character of development would compromise the rugged character of this coast. | High sensitivity Jagged cliffs cut by inlets create a highly natural coastal edge. The geometry and industrial character of development would compromise the rugged character of this coast. | |
| Setting of landmarks and features | High sensitivity The coast provides the setting of designated historic features, including the well-visited St Ninian's Cave. | Some sensitivity Setting of historic features already compromised to some extent by hinterland development. | |
| Experience of wildness | High sensitivity The dominance of natural forces and elemental qualities associated with the sea, lack of development, relative inaccessibility and perceived remoteness of the coast give a degree of wildness which would be affected by development. | Some sensitivity Although the coast and sea are greatly exposed and have 'wild' qualities, close development on the coastal edge and hinterland limits the degree of wildness overall. Aquaculture would extend the influence of built development on the hinterland into the presently undeveloped and open sea. | |
| Aesthetic qualities | High sensitivity The rugged character of cliffs, beaches and open exposed seas backed by well-managed farmed hinterland and policies give this area high aesthetic appeal which would be compromised by development. | Some sensitivity The coastal edge of cliffs and the sea are significant attractors although aesthetic quality is reduced by nearby, highly visible caravan and chalet park development. | |
| Key views | Some sensitivity Not overlooked by settlements and inaccessible by road, but development would impact on open views along coast and over sea to distant land from coastal footpaths and the access to St Ninian's Cave, a popular visitor attraction and pilgrimage site. | Some sensitivity Overlooked by caravans and chalets and from coastal footpaths where presently panoramic views of open sea to distant land could be interrupted by development, although some views are already marred to some extent by existing hinterland development. | |

4.4.4 Burrow Head: conclusions

The conclusions from the capacity assessment are noted below together with accompanying guidance.

4.4.4.1 Point of Lag to Rock of Providence

There is no potential for development in this area principally due to the wild exposed character of the sea, the perceived remoteness of the coast, the high aesthetic quality of the seascape and presence of a well-visited designated historic site and views from coastal footpaths.

4.4.4.2 Rock of Providence to Isle of Whithorn

There is no potential for development in this area principally due to the perceived wild and exposed character of the sea and the especially rugged qualities of cliffs. While an existing caravan site is highly visible, and a detractive feature on the coastal edge, the introduction of aquaculture to open seas would extend development out from the coast. This would affect the present contrast of elemental exposure and wildness with the extremity of the Burrow Head peninsula and the developed hinterland.

4.5 West Wigtown Bay

4.5.1 West Wigtown Bay: site survey and local character analysis

West Wigtown Bay forms the indented coastline of the outer arm of Wigtown Bay. For the purposes of this study, the coastal character area has been further subdivided into three local coastal character areas, as shown on the Site Survey map. Key landscape and visual elements which are likely to influence the development of aquaculture within these areas are noted below.

4.5.1.1 Isle of Whithorn to Cruggleton key landscape and visual elements

- East facing, less exposed coast, sheltered from westerly winds.
- Expansive coastal views, extending across to Kirkcudbright.
- Little sign of marine based activities, although there is a harbour at near by Garlieston.
- Alternating rocky foreshore and domed cliffs characterise the indented coastal edge, which is emphasised by small bays and promontories.
- Vegetation is sparse, with an exposed rocky coast contrasting with a hinterland of well defined fields of improved grassland.
- Farms set at regular intervals back from the coastal edge.
- Shoreline not readily accessible, although coast could be traversed on foot.
- Views along the coast are dominated by the indented coastal form, but visibility of the shoreline is limited from the road by distance and topography except at Portyerrock.
- Limited accessibility and lack of obvious development on the shoreline creates a low key sense of remoteness.

- Archaeological sites frequently punctuate the coastline, most visibly the accessible castle at Cruggleton Point.
- Landscape of distinctive, consistent pattern and strong unity.

4.5.1.2 Cruggleton to Eggerness Point key landscape and visual elements

- Distinctive, well defined, sheltered and calm bays with sandy seabed and views focussed out to the sea between promontories.
- Foreshore of sand and dark coloured shingle, extensive patterning of water and sand at low tide.
- Some maritime activity, and a harbour at Garlieston.
- Curved form of bays strongly contained by low but pronounced peninsulas.
- Settlement of Garlieston extends down to the shore.
- Well established and extensive policy woodland encloses Cruggleton bay and emphasises enclosure of peninsulas.
- Coastal walks encourage accessibility and offer coastal views.
- Galloway House gardens are open to the public.
- Small caravan park located at Garlieston.
- Diverse hinterland of cultivated fields and woodland, with clear elements of designed landscape.
- Key historic features include Galloway House and buildings within the designed landscape.
- Settlement pattern and the design of the well managed woodland relates well to landform, creating a comfortable and harmonious landscape.

4.5.1.3 Eggerness Point to Innerwell key landscape and visual elements

- Slightly more exposed character, due to outward orientation of headland.
- Seascape character further emphasised by panoramic views.
- Rocky shoreline with dark coloured, shingle beach is uniformly exposed at low tide and backs onto a steeply rising, wooded slope.
- Immediate coastline sheltered by woodland, in contrast to the exposed character of the shoreline.
- The coast is accessible by a footpath which travels through the woodland, limiting views of the coast and sea except from Innerwell fishery.
- The coastline is very visually contained from the hinterland by steep slopes and woodland.
- Sense of exposure, limited accessibility, visual containment of woodland and lack of obvious development on the shoreline creates a sense of remoteness.

Isle of Whithorn to Cruggleton Looking north from Portyerrock: rocky foreshore and domed cliffs alternate along this indented coast



Cruggleton to Eggerness Point View of Garlieston Bay



Garlieston Harbour



Garlieston Village



4.5.2 West Wigtown Bay: opportunities and constraints

There is no obvious existing aquaculture development within this coastal character area which is likely to have technical limitations for some types of aquaculture. Landscape opportunities and constraints which are likely to affect future development are noted below. Features identified in the opportunities and constraints presented below are shown on the following map.

4.5.2.1 Isle of Whithorn to Cruggleton

Landscape and visual opportunities for aquaculture development:

- Rising coastal edge could offer a backdrop to development.
- Indented coastline offers opportunities for fish farms to be sited in relation to promontories and at the edge of bays.
- Some stretches of coast not highly visible from road or existing footpath.
- Onshore development could be located in Garlieston.

Landscape and visual constraints for aquaculture development:

- Protect the setting of the castle at Cruggleton Point.
- Coastline offers potential sense of remoteness, although it is not particularly wild due to well managed hinterland.
- Short stretches of coast are overlooked by elevated coastal footpaths.
- Key viewpoints from the footpath at Cruggleton and Stein Head and at the coastal panorama revealed at Portyerrock.
- Coastline overlooked at Portyerrock.

4.5.3 Cruggleton to Eggerness Point

Landscape and visual opportunities for aquaculture development:

- Development could be associated with promontories.
- Rising ground could offer a backdrop to development.
- Dark coloured shingle could provide setting for trestle type structures.
- Lighting, noise and activity onshore, as well as some marine activity, could provide developed context for offshore development.
- Onshore development could relate to the existing harbour.

Landscape and visual constraints for aquaculture development:

- Small scale of bays, and their simple curved form could quickly become dominated by more complex offshore development.
- Protect the setting of Galloway House and gardens.
- Coastline directly overlooked by housing at Garlieston.
- Elevated coastal footpaths extend the length of the coast, offering fine views of the bays and their immediate setting.
- Views out of the bays to the open sea should not be obstructed by structures.

4.5.3.1 Eggerness Point to Innerwell

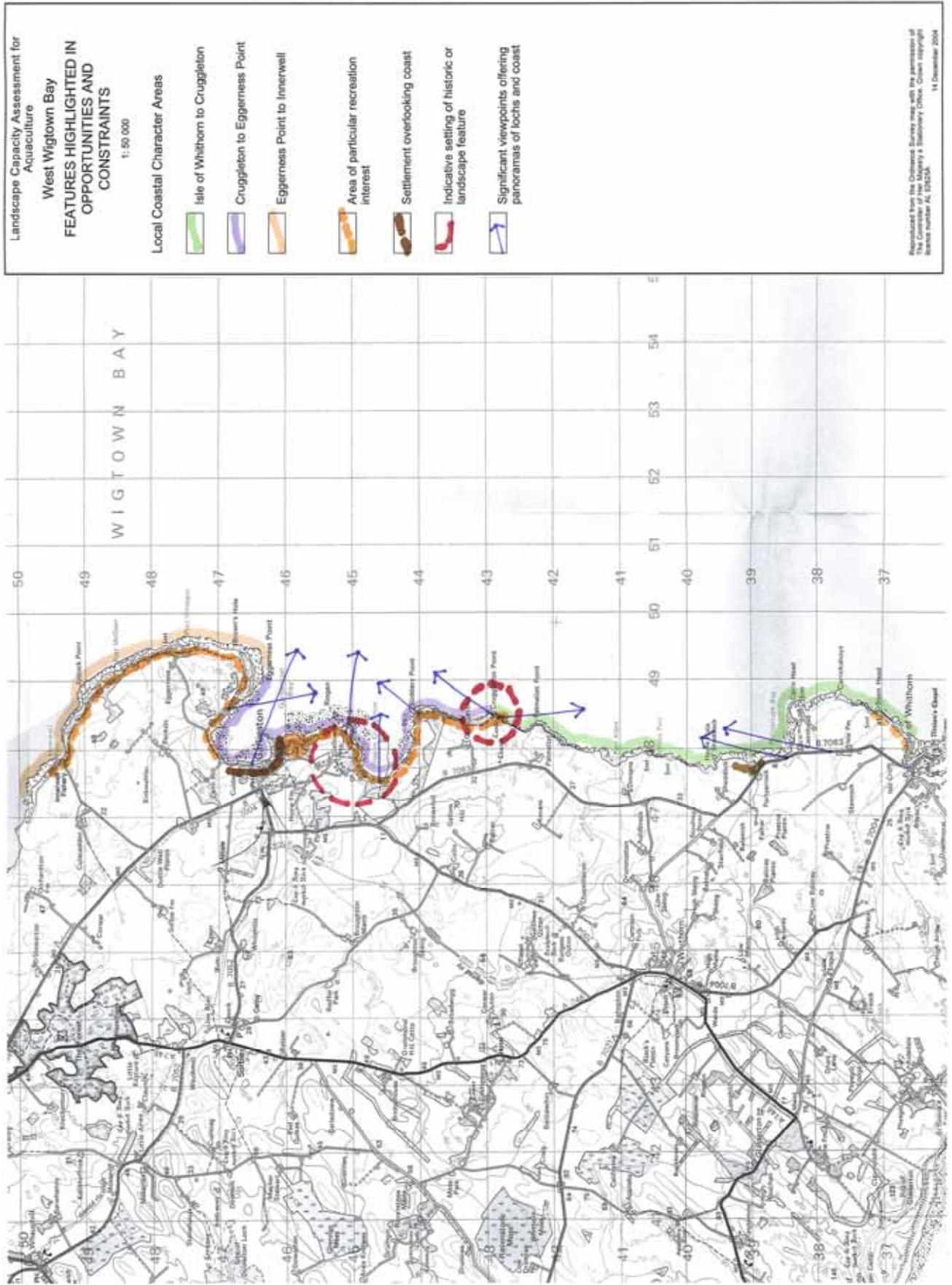
Landscape and visual opportunities for aquaculture development:

- Visibility of coastline is limited by woodland, relative inaccessibility of shoreline and constant convex curve of coastal edge.
- Woodland also obscures views from coastal footpath.
- Onshore development could be sited at Garlieston.

Landscape and visual constraints for aquaculture development:

- Relatively simple coastline offers little potential for associating development with coastal form.
- Sense of remoteness would be compromised by offshore development.
- Key viewpoints at Innerwell Port, where shoreline is also accessible at low tide.
- Some coastline directly overlooked by housing at Innerwell Port.

West Wigtown Bay Features highlighted in opportunities and constraints



4.5.4 West Wigtown Bay: summary of the potential sensitivity of the local coastal character areas to aquaculture development

| Potential sensitivity of the seascape to aquaculture development | Isle of Whithorn to Cruggleton | Cruggleton to Eggerness Point | Eggerness Point to Innerwell |
|---|---|--|--|
| Maritime influences | Low sensitivity Maritime influences limited with little relationship to 'open sea' and relatively sheltered orientation. | Low sensitivity Maritime influences limited to modest intertidal reach with little relationship to 'open sea' and relatively sheltered orientation. | Low sensitivity Maritime influences limited to narrow band of intertidal reach across the dark coloured shingle and some sense of exposure due to outward orientation of headland, but not affected by aquaculture. |
| Character and experience of the coastal edge | Low sensitivity Indented shape of promontories and small bays offer potential to absorb some coastal development. | Some sensitivity Curved form of bays, existing development and marine activity offers some scope for locating aquaculture associated with the enclosing promontories, but small scale of bays limits the scale of development. | Some sensitivity Regular coastline offers little opportunity for development to be associated with promontories and bays, but varied shoreline of shingle and wooded backdrop may offer opportunities for trestle type or offshore linear structures. |
| Landmarks and features | Low sensitivity Setting of Cruggleton Castle should be avoided, but this leaves plenty of scope for alternative sites. | Some sensitivity Setting of Galloway House, gardens and Cruggleton Castle should be avoided, which limits scope in Cruggleton Bay. | Not sensitive No particular land marks identified. |
| Experience of wildness | Some sensitivity The coastline is relatively inaccessible, with access limited to foot traffic only. Managed hinterland and nearby farms limit the degree of wildness, but exposed rocky foreshore enhances it. | Low sensitivity Degree of wildness limited by well developed, accessible coastline, therefore not affected by development. | Some sensitivity The coastline is relatively inaccessible, with access on foot limited to a track set in woodland away from the coastal edge. Visual separation from built development and sense of exposure enhance this quality. |
| Aesthetic qualities | Some sensitivity Landscape of strong unity, with consistent arrangement of elements parallel to coastline. Attractive rocky foreshore and alternating sequence of small, sheltered bays contrasting with higher more exposed cliffs contribute to aesthetic quality. | High sensitivity Designed landscape associated with Galloway House provides a relatively high quality, harmonious setting balancing policy woodland with small scale open spaces. Village, clusters snugly around the curve of the bay, reinforcing the unity of the landscape. | Low sensitivity This is a landscape of strong unity, with each element well related to changing topography and aligned parallel to the coast. Nevertheless, the area contains no exceptional aesthetic qualities. |
| Key views | Some sensitivity Elevated, panoramic views south from Cruggleton castle, and from the road on the arrival to Portyerrock Bay. Some overlooking at Portyerrock. | High sensitivity Bays are extensively overlooked by the settlement, with views out to sea framed by promontories. Extensive views from walks associated with Galloway House gardens and Eggerness Point and from elevated Cruggleton castle. | Low sensitivity Apart from key views from Innerwell pier and the nearby houses, much of this coastline is hidden from public viewpoints by woodland and steep slopes. Even the footpath is located in woodland. |

4.5.5 West Wigtown Bay: conclusions

The conclusions from the capacity assessment are noted below together with accompanying guidance.

4.5.5.1 Isle of Whithorn to Cruggleton

Some potential for the landscape to accommodate modest scaled aquaculture development was identified in this area, provided:

- Structures stay close to shore, where they can be associated with the coastal edge.
- Structures are sited and designed in a way which they can emphasise the shape and form of the coastal edge.
- Key views, particularly from Cruggleton and Portyerryrock, as well as the setting of prominent features, notably Cruggleton Castle, are avoided.

4.5.5.2 Cruggleton to Eggerness Point

No potential for the landscape to accommodate aquaculture was identified in this local coastal area, largely due to the high sensitivities associated with the quality of the setting of the settlement and Galloway House, the small scale of the bays and the potential negative effect of development on visual amenity.

4.5.5.3 Eggerness Point to Innerwell

Some potential for the landscape to accommodate modest scaled aquaculture development was identified in this area, provided:

- Structures stay close to shore, where they can be associated with the coastal edge.
- Linear structures, aligned parallel to the coast would be most appropriate.
- There is capacity for trestles and structures within the intertidal, where the shingle can provide a context for their setting.
- Key views and the setting of Innerwell beach are avoided.

4.6 Inner Wigtown Bay and Fleet Bay

4.6.1 Inner Wigtown Bay and Fleet Bay: site survey and local character analysis

Inner Wigtown Bay is an expansive shallow estuary with an extensive intertidal. This shallow water extends into Fleet Bay, where the coastline becomes more indented and fragmented with low islands. For the purposes of this study, the coastal character area has been further subdivided into three local character areas, as shown on the Site Survey map. Key landscape and visual elements which are likely to influence the development of aquaculture within these areas are noted below.

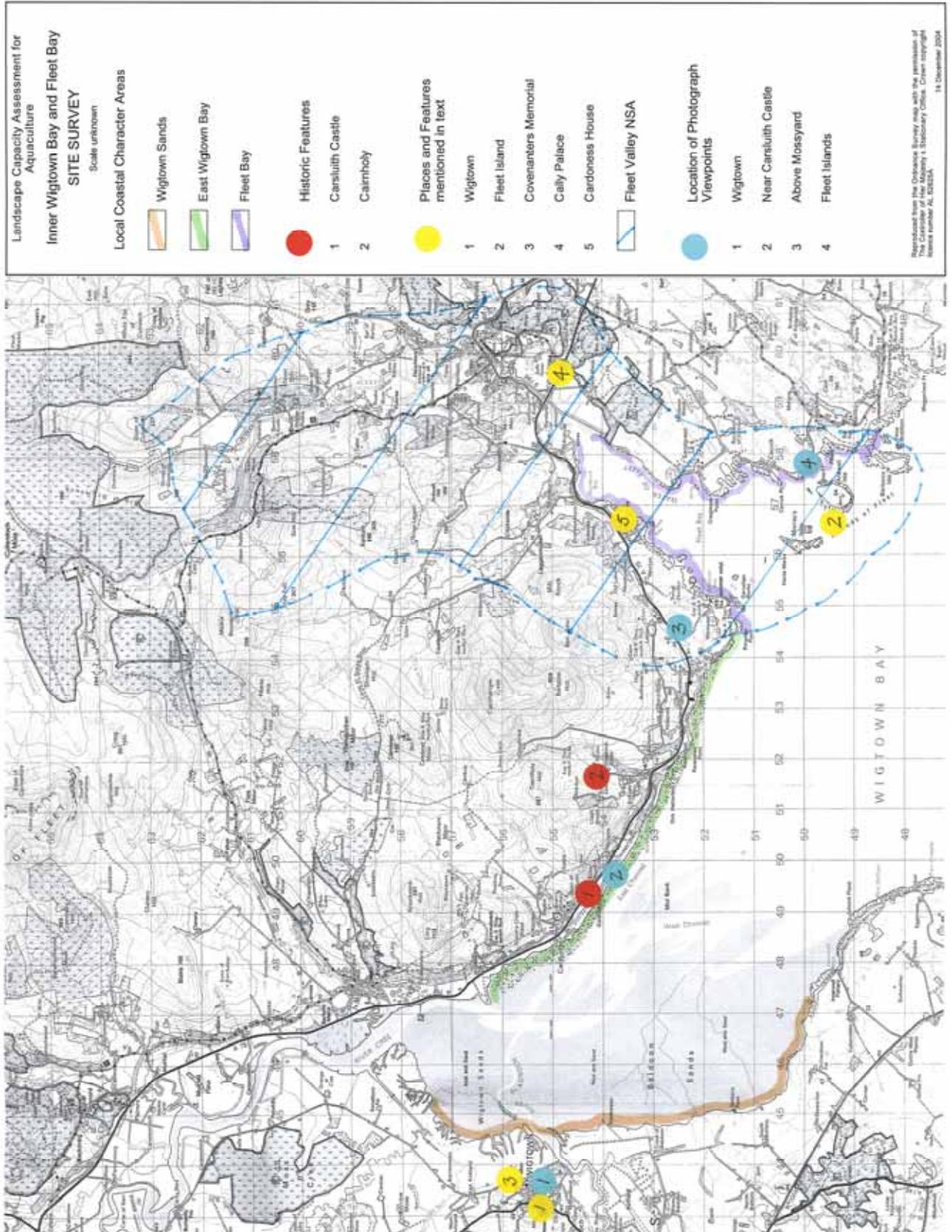
4.6.1.1 Wigtown Sands key landscape and visual elements

- Extensive, shimmering, light reflective sand and mud flats revealed at low tide, contribute to a very dynamic seascape.
- East facing coast, open but sheltered from westerly winds.
- Expansive views, extending around the Bay.
- No evidence of marine based activities.
- Level, open coastal flats extend inland, creating an intricate network of creeks and inlets fragmenting the marshland.
- Vegetation is limited to low lying bog associated with the coastal flats and some improved grassland on higher land.
- Gently undulating land form, punctuated by the occasional prominent knoll characterises the farmed hinterland.
- Low level views across the coast emphasise the level expanse and elements are foreshortened.
- Views from higher viewpoints, such as Wigtown which is set on a prominent knoll, are panoramic.
- Visitors can access the flats to visit the Covenanters' Monument, but generally the shoreline relatively inaccessible, as waterlogged coastal flats are relatively difficult to traverse.
- Inhospitable terrain, open-ness, perception of naturalness and sense of timelessness contributes to remote character, despite nearby development.
- Perceived ambiguity of whether the intertidal is land or sea.
- Intriguing seascape with strong unifying elements, which is striking in the contrasts between both overall simplicity and complexity of detail, and between a sense of timelessness and the ever changing intertidal dynamics.

4.6.1.2 East Wigtown Bay key landscape and visual elements

- Relatively sheltered estuarial character.
- Expansive sands and mudflats of the vast intertidal area are revealed at low tide, emphasising dynamic character.
- Foreshore of dark coloured shingle and boulders backed by woodland which is sometimes under water at high tide.
- Marine activity limited, but evidence of salmon netting.
- Simple coastline, with few significant indentations.
- Woodland extends directly from the foreshore up steep, even slopes to a narrow, level strip of small grazed fields all of which align parallel to the coast.
- The hinterland is similarly consistent, with a road and then further wooded slopes aligned parallel to the line of the coast.
- Occasional house located close to the shore, in woodland.
- Carluith Castle, which is open to visitors, is a significant historic feature prominently sited overlooking the coast.

Inner Wigtown Bay and Fleet Bay Site survey



Wigtown Sands From Wigtown: broad, light reflective sands extend across this bay at low tide, adjacent to the open coastal flats with their intricate network of inlets



East Wigtown Bay From near Carluith Castle



Fleet Bay From above Mossyard



Fleet Bay From near Carrick: Ardwall Island is linked to the mainland at low tide by shimmering sands



- Access to the shore is limited, but sense of remoteness is limited due to the persistent noise of traffic.
- The shoreline is very visually contained from the hinterland by steep slopes and woodland.

4.6.1.3 Fleet Bay key landscape and visual elements

- A south west facing, estuarine inlet, peppered with islands and islets which fragment the outer bay.
- The shallow waters reveal light reflective, shimmering sandy flats at low tide, when the Isles of Fleet are dramatically connected to the shore.
- The shoreline is rocky and indented with sandy beaches alternating with dark coloured shingle.
- The coast is well developed, particularly for recreation, with frequent caravan sites and an accessible, popular shore.
- The hinterland of gently undulating landform, managed pasture and policy woodland is an integral part of any view.
- Perceived ambiguity of whether the intertidal is land or sea.
- The area lies within an NSA, which has a management strategy.

4.6.2 Inner Wigtown Bay and Fleet Bay: opportunities and constraints

There is no obvious existing aquaculture development within this coastal character area which is likely to have technical and ecological limitations for some types of aquaculture. Landscape opportunities and constraints which are likely to affect future development are noted below. Features identified in the opportunities and constraints presented below are shown on the following map.

4.6.2.1 Wigtown Sands

Landscape and visual opportunities for aquaculture development:

- Low level viewpoints emphasise the horizontal dimension and foreshortened views may visually absorb low lying structures.
- Some stretches of coast not highly visible at close range from elevated viewpoints.

Landscape and visual constraints for aquaculture development:

- Overall simplicity of landscape makes it very difficult to accommodate a complex structure on the water surface.
- Static, manmade structures would contrast with the dynamics of the intertidal area, which is dominated by natural process.
- Geometric shapes would be prominent against organic interlocking patterns created by sand and water.
- High visibility from elevated viewpoints, such as Wigtown and well visited locations, such as the Covenanters Memorial and bird hides.
- Coastline offers a sense of remoteness and naturalness.
- Landscape has a quality of timelessness and feels set apart from the managed context of the surrounding land.
- Onshore development would be isolated and prominent and could not relate to existing harbours or development.

4.6.2.2 East Wigtown Bay

Landscape and visual opportunities for aquaculture development:

- Shoreline and coast not highly visible from the public road.
- Rising ground and wooded foreshore could offer a backdrop to development when viewed from distant shore.
- Dark coloured shingle could provide setting for trestles.
- Simple coastal form most appropriate for linear shaped developments aligned to reflect the shoreline.
- Onshore development could be located in Carluith.

Landscape and visual constraints for aquaculture development:

- Seascape overlooked by small settlements and the chambered cairn sites at Cairnholy.
- The setting of Carluith Castle should be protected from development.
- Development towards the centre of the loch may appear 'detached' and unrelated to other elements in the seascape.

4.6.2.3 Fleet Bay

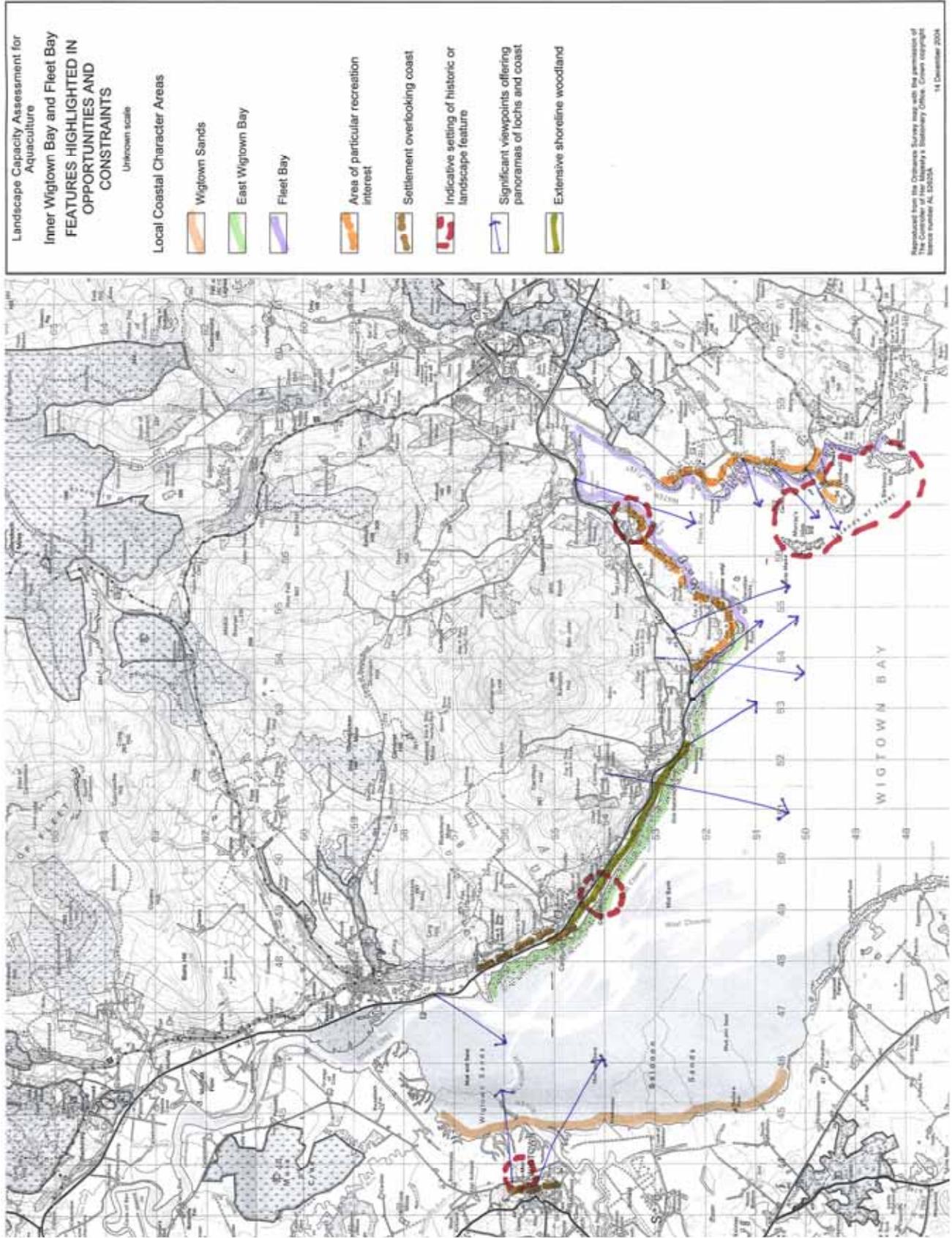
Landscape and visual opportunities for aquaculture development:

- Indented coastline and offshore islands offer opportunities to associate modest scaled structures with coastal form and fragmented pattern.
- The coast is well developed, with structures, activity, noise and lighting associated with well developed recreation sites.
- Key views frequently low level, and low lying structures would be less visible and seen against a backdrop of diverse landscape elements.
- Dark coloured shingle could provide setting for trestles.
- Onshore development could be located at coastal settlements.

Landscape and visual constraints for aquaculture development:

- Dynamic qualities of the intertidal, including the drama of the revealed access to islands at low tide, would be compromised by extensive static structures.
- High recreation use of the shoreline and the sea limits development in places where unobstructed access contributes to the experience of the seascape.
- Frequent panoramic views often encompass the scenic qualities of the NSA.
- The setting of Cardoness House and associated policies should be protected from development.
- Some coastline directly overlooked by caravan sites and chalet development.

Inner Wigtown Bay and Fleet Bay Features highlighted in opportunities and constraints



4.6.3 Inner Wigtown Bay and Fleet Bay: summary of the potential sensitivity of the local coastal character areas to aquaculture development

| Potential sensitivity of the seascape to aquaculture development | Wigtown Sands | East Wigtown Bay | Fleet Bay |
|--|--|--|--|
| Maritime influences | Very high sensitivity Dynamics of intertidal create a dramatic and ever changing, organic pattern of light reflective sand and water which extends to the shore. This would be compromised by static structures and inorganic shapes. | Some sensitivity Dynamics of intertidal are present but have a less obvious effect on the seascape of the eastern side of Wigtown Bay, largely due to the extensive shingle foreshore. Some marine activity provides context for aquaculture. | High sensitivity In some places, the dynamics of the intertidal create a dramatic and ever changing, organic pattern of light reflective sand and water which extends to the shore. This would be compromised by static structures and inorganic shapes. |
| Character and experience of the coastal edge | Very high sensitivity Limited palette of elements – low salt marsh and the intertidal area – create a simple landscape character which would be compromised by introducing complex structures. | Some sensitivity Relatively even coastline offers little opportunity for development to be associated with promontories and bays, but varied shoreline of shingle and wooded backdrop may offer opportunities for trestle type or offshore linear structures. | Some sensitivity Indented shape, diverse shoreline, islands fragmenting the water surface and a high degree of existing coastal development all offer potential to absorb coastal development, but development of the shore and intertidal difficult to combine with free ranging recreational access. |
| Setting of landmarks and features | Some sensitivity The setting of the Covenanters' Monument, and its board walk access should be avoided. | Low sensitivity Setting of Carsluith castle should be avoided, but this leaves plenty of scope for alternative sites. | Some sensitivity Setting of Cardoness House and Cally Palace should be avoided, along with the setting of the main Fleet islands, particularly those which are accessible at low tide. |
| Experience of wildness | High sensitivity Sense of remoteness and dominance of natural processes on sense of place would be lost if development was encountered. | Low sensitivity Existing sense of remoteness and isolation is limited, although there is some visual separation between the shore and the nearby busy road. | Low sensitivity The most remote locations are the islands of Fleet, while the rest of the coastline is well developed and readily accessible. |
| Aesthetic qualities | Some sensitivity An intriguing rather than classically scenic landscape, but with a strong, uncluttered unity which would be compromised by development. Sense of timelessness and the atmospheric experience of the ever changing interplay of land, sea and light also contribute to aesthetic quality. | Low sensitivity This is a landscape of strong unity, with each vegetation element well related to changing topography and aligned parallel to the coast. Nevertheless the area contains no exceptional aesthetic qualities. | High sensitivity The drama of the dynamic intertidal zone, ambiguity of whether it is land or sea and ever changing light on wet sand and water combined with the scale and complexity of the islands, all contribute to aesthetic quality. Several well composed set piece panoramas contribute to the visual experience of aesthetic quality. |

4.6.3 (continued)

| Potential sensitivity of the seascape to aquaculture development | Wigtown Sands | East Wigtown Bay | Fleet Bay |
|--|---|---|---|
| Key viewpoints | Some sensitivity Low lying development likely to be difficult to see within low level, foreshortened views. Large scale development would be highly visible from panoramic and elevated views from Wigtown. | Low sensitivity Apart from key views from Carsluith Castle, the occasional settlement and the Cairnholy chambered cairn sites, much of this coastline is hidden from public viewpoints by woodland and steep slopes. | High sensitivity Much of this area is overlooked, either by settlements or caravan and chalet parks. There are frequent viewpoints revealing set piece panoramas from roads or well used beaches and coastal facilities. |

4.6.4 Inner Wigtown Bay and Fleet Bay: conclusions

The conclusions from the capacity assessment are noted below together with accompanying guidance.

4.6.4.1 Wigtown Sands

No potential for the landscape to accommodate aquaculture development was identified largely due to the high sensitivities associated with the distinctive, simple seascape and maritime character, intriguing landscape quality of the potential negative effect of development on the experience of wildness.

4.6.4.2 East Wigtown Bay

Some potential for the landscape to accommodate modest scaled aquaculture development was identified in this area.

- Structures should stay close to shore, where they can be associated with the coastal edge.
- Linear structures, aligned parallel to the coast would be most appropriate.
- There is capacity for trestles and structures within the intertidal, where the shingle can provide a dark setting.
- Key views and the setting of prominent features should be avoided.

4.6.4.3 Fleet Bay

A very small potential for the landscape to accommodate small scale aquaculture development was identified in this coastal character area.

- Structures stay close to shore, and preferably be associated with the less remote islets adjacent to the north side of the bay, which create a fragmented context for siting development.
- Structures respect the small scale of the landscape and fragmented character of the coastline.

- There is a very small potential capacity for small scale trestles and structures within the intertidal, where the shingle can provide a context for their setting, but only in areas not valued for recreation where unobstructed access is a key element of the seascape experience.
- Key views and the setting of prominent features should be avoided.

4.6.5 Strategic conclusions for Galloway pilot area

The conclusions from all five coastal character areas are shown on the following Conclusions maps.

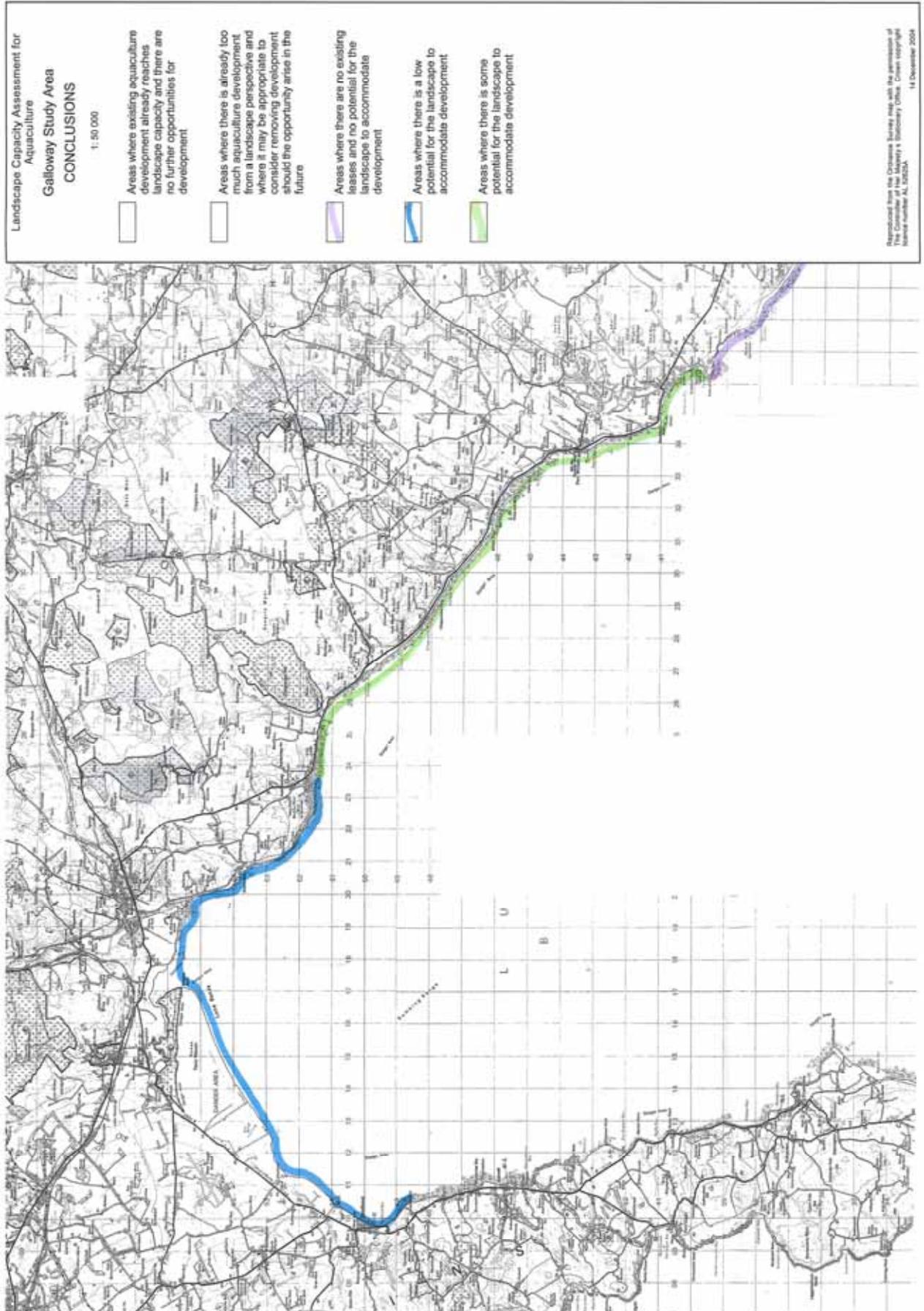
There are currently no leases granted for fish farming in this area, and there are likely to be technical difficulties for aquaculture development.

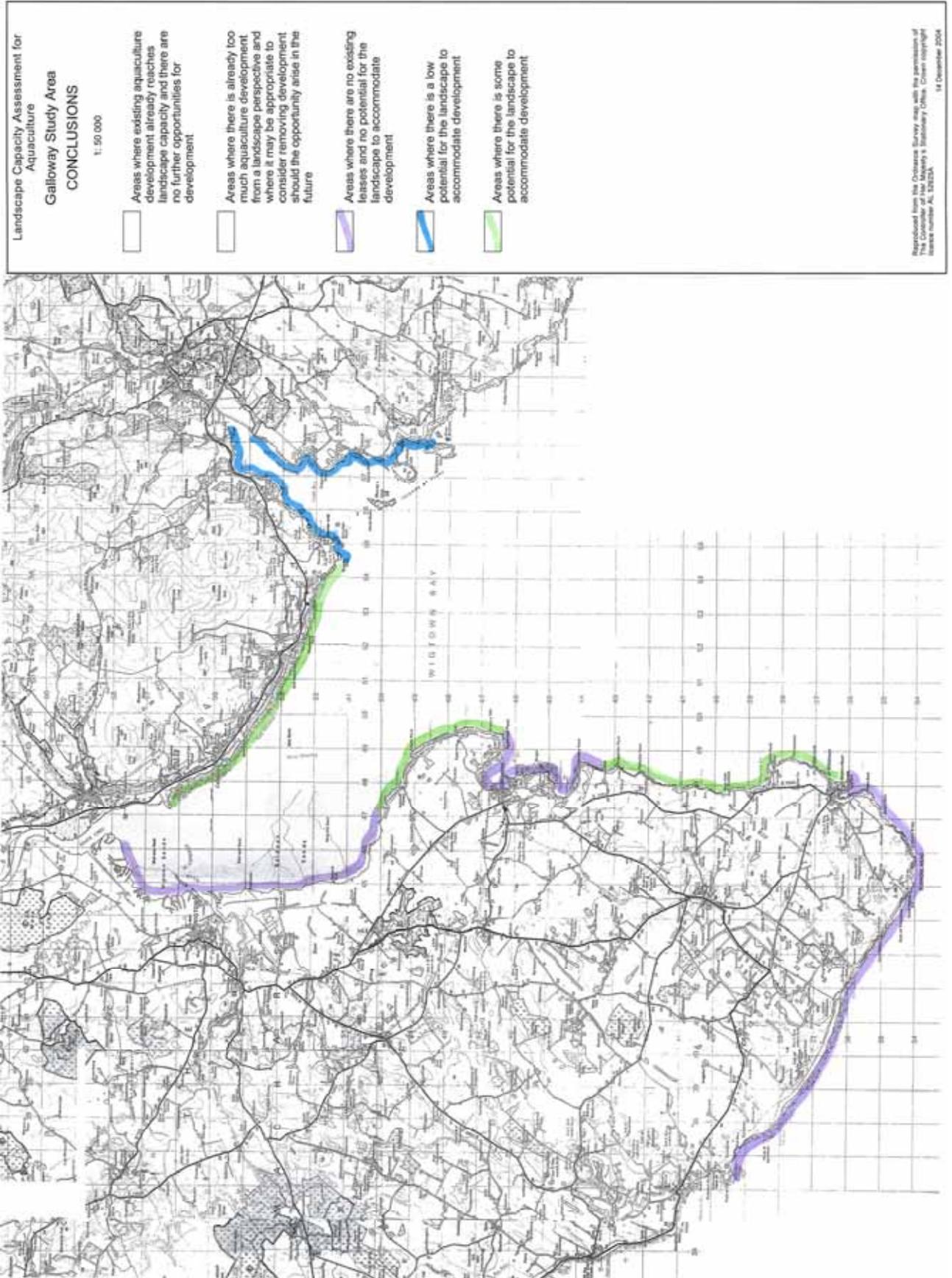
The findings of the assessment indicate that, should it be technically feasible there are some – but relatively limited – locations where fish farming could be accommodated within the seascape. These tend to be areas which are of relatively strong landscape unity, where the presence and alignment of land based character reinforces the orientation of the coastal edge.

These areas tend to be relatively simple in character, while the guidance contained in the conclusions recommended that offshore structures should be aligned parallel to the coast, reflecting in some way the pattern of vegetation, land use and even development which occurs on land in these areas, all of which seems to bear some consistent relationship with the orientation of the coast.

While they tend to be areas which are relatively remote and visually contained from the land, they are not the most wild stretches of coast, which were considered too sensitive for development.

Finally, other areas where there were a number of limiting factors tended to be seascapes with a concentration of aesthetic qualities, including remarkable seascapes of vast, shifting intertidal zones, areas where offshore islands contrasted in scale with more expansive estuaries, and coastlines where finely designed policies, a plethora of historic interest or intense recreation use limit capacity.





5 REPORT CONCLUSIONS

This report sets out a methodology for assessing the potential landscape capacity for seascapes to accommodate aquaculture development. The brief required the methodology to be transparent, clear and replicable. It expected it to be fully tested in pilot areas which would stretch its application, and to produce full capacity studies for these areas. The brief also expected the methodology to consider carefully the appropriate scale of assessment application and to take into account recent trends in aquaculture development and practice. In terms of the sensitivity analysis, the brief specifically asked the consultants to consider how best to assess wildness as an attribute of the coast, and to identify a comprehensive list of criteria relevant to this sensitivity assessment. In preliminary discussions it also became clear that some guidance on the relationship between capacity assessment and cumulative effects was also required. This report has attempted to tackle all these issues, and these conclusions summarise the consultants findings in relation to the key requests identified in the brief, and in meetings with the steering group.

5.1 Is the methodology transparent?

While not everyone may agree with the capacity conclusions within each coastal character area, the methodology aims to ensure that the reasoning and assessment which led to these conclusions is clear. This, in the consultants' view, is the main purpose of a transparent methodology, as it allows informed debate. The resulting assessments are as a result very detailed, but the structured format should help to avoid a laborious presentation. Feedback so far has welcomed the amount of explanation included in the assessments, which is of particular assistance to non landscape architects and those who often have to weigh up a number of different issues when assessing lease applications.

5.2 Can the methodology be replicated?

The consultants have tested the methodology in two very different seascapes. Galloway has no existing leases, and was exceptionally useful for testing the methodology, largely due to the lack of existing farms which provided a 'clean canvas' scenario against which the criteria could be tested. In contrast, Argyll gave the opportunity to consider existing capacity, and even consider whether the methodology could provide a process which helped identify where there is an overcapacity (in landscape terms) of aquaculture development. It was felt that these areas combined to rigorously test the methodology, which proved applicable to all the situations encountered by the consultants. The methodology is therefore considered to be replicable.

5.3 Is the approach to sensitivity analysis robust and replicable?

The sensitivity assessment for each local coastal character area is presented within one matrix for the whole of the coastal character area. This allows the consultants to make relevant sensitivity comparisons where appropriate across all the local coastal character areas which are present within one coastal character area. In addition, once all the sensitivity assessments were completed as first drafts, the consultants worked together to ensure that assessment of sensitivity was consistently applied both within each pilot study area, and for this exercise, between each pilot area. This 'checking' process demonstrated to the consultants that the methodology was robust and consistent, as in all the tables across both pilot areas, only three changes in sensitivity rating were made as a result of this review.

5.4 What was the preferred scale of assessment?

In terms of the minimum area within which it makes sense to carry out a capacity assessment, it is preferable to assess at least a whole loch system such as the Loch Etive system, or a whole bay, such as the whole of Wigtown Bay. This allows the sensitivity assessments to be relative within one understandable geographical area, and for cumulative implications of the analysis to be assessed across one geographical area.

However, it makes sense, in terms of people's understanding and experience of an area, to incorporate a larger area in any assessment, although the consultants did not determine an upper limit. It was simply recognised in carrying out the work, that the assessment of relative sensitivity became more robust as more landscapes were included within the study area. It also makes assessment of overall cumulative effects easier if a wider study area is incorporated in the assessment.

5.5 What is the relationship between capacity assessment and cumulative effects?

A capacity assessment incorporates some analysis of cumulative effects already at a local level. However, to identify potential cumulative effects at a more strategic level would require additional research into the criteria which should be used to identify the size of area appropriate for such a strategic assessment. The consultants did identify some issues which might be useful in considering how best to assess potential cumulative effects.

5.6 Was there one landscape type which consistently seemed to have more capacity than others?

One type of landscape did seem to have the consistent potential to accommodate aquaculture development, although this conclusion should be treated with caution, as the geographic scope of the study was limited. This type of landscape tended to be where the seascape was of moderate to large scale, and often quite simple in character, although it was frequently recognised that in these locations, development might create visual 'clutter'. Aquaculture development seemed to be acceptable in seascapes where experience of wildness was not highly sensitive, and where high aesthetic quality was limited.

The selection of these areas reflects in part the growing size of aquaculture infrastructure – newer developments are no longer able to be discreetly tucked between islands, reflecting and emphasising the fragmentation of the coastline. Instead, their size means that they are difficult to visually contain, and the chosen locations rely on the vast expanse of the sea to be a dominant characteristic which provides a unifying visual context. These locations also help to diminish the perceived size of the structures, by locating them where other potential scale reference points do not exist.

5.7 How was wildness assessed?

It was recognised from the outset that the coast offers particular opportunities to experience wildness, not least because of the ubiquitous presence of natural forces, such as the tide, wind and waves, which are not controlled by human intervention. Some areas are perceived as being more wild than others, however, and the assessment took this into account by considering a sequence of terms which reflect an increase in wildness. In this case, sense of naturalness progressed to perceived remoteness to sense of isolation and finally sense of wildness. Judgements relating to the intensity of wildness were analysed as part of the assessment.

In addition, because wildness is relatively fragile and may be vulnerable to even quite discreet development, it was assessed independently within the sensitivity matrix. This allowed the assessors to identify where it was a relevant issue, and to come to a judgement on the intensity of wildness experienced in each individual local character area, and to assess sensitivity accordingly.

5.8 How long did the assessments take?

To undertake such detailed assessments, and present the explanations and justifications clearly, takes time. This study allocated time to the development of the methodology as well as undertaking the pilot studies, therefore it is difficult to be exact about the amount of time actually spent on the assessments. However, we concluded that ten man days were spent on site in Argyll actually undertaking site survey work for the pilot study, while eight man days were spent undertaking site work in Galloway. An additional twenty four man days were spent writing up the reports for both areas, working through the justifications and agreeing the sensitivity assessments: the wording of the sensitivity matrixes was particularly time consuming.

5.9 How could this methodology be used in the future?

It is hoped that this replicable methodology could be used on a wider scale. In particular, it would be useful to explore an upper limit of study area which would assist in considering how best to determine an area appropriate for assessing cumulative effects over a wider area.

5.10 Were there design implications of recent trends in aquaculture?

The trend towards larger developments also raised the issue of design criteria early on in the study. The consultants were depending on the guidance provided in the publication 'Marine Aquaculture and the Landscape: The siting and design of marine aquaculture developments in the landscape' (Grant, 2000), to set the industry standard for aquaculture development. However, the large scale of these more recent developments is not considered to be adequately covered by this guidance.

6 ANNEX ONE: EXTRACT FROM PROJECT BRIEF

LANDSCAPE/SEASCAPE CAPACITY FOR AQUACULTURE

6.1 Background

- 1 There continues to be considerable interest in the development of aquaculture, both finfish and shellfish farming, around parts of the coastline of Scotland. As with any type of development, aquaculture has impacts upon the natural heritage, including landscape and visual effects. In addition, with ongoing development, the issue of cumulative impacts becomes increasingly relevant.
- 2 The landscape and visual impacts of aquaculture can be significant in coastal areas. Shore bases, storage areas, piers and other elements are often part of the development in addition to the sea-based cages or long-lines.
- 3 Scotland's coastline is distinctive, much of it is a focus for recreational activities and it is also where a lot of settlement is located. In addition it has a strong cultural component, and the issues of wild land and wildness are becoming more prominent. Scottish Natural Heritage (SNH) has produced a policy document on wildness¹ and it is emerging as a consideration in some casework. The question of how wildness at the coast might be identified will be one aspect of the current study.
- 4 Given that the impacts of aquaculture can be significant, and its location is often sensitive, establishing best practice and the likely acceptable limits of coastal aquaculture development is desirable. Some guidance exists: SNH, together with The Crown Estate Commission and Scottish Quality Salmon, produced guidance on the design and siting of aquaculture developments². Two capacity studies for aquaculture for parts of both Orkney and Shetland^{3 4} have been produced under SNH commissions. There is also ongoing work into seascapes that may be relevant to aquaculture. However, a 'standard' methodology for assessing the landscape/seascape capacity of different areas for aquaculture has not been established.
- 5 To fulfil a requirement within the Strategic Framework for Scottish Aquaculture (Scottish Executive 2003), SNH is to lead on developing a methodology for assessing landscape/seascape capacities for aquaculture. This research project is intended to meet this need. It will build on the existing studies and research in order to refine a methodology and test it in two pilot areas. It will also result in capacity studies for these study areas.

¹ Scottish Natural Heritage (2002). *Wildness in Scotland's Countryside: A Policy Statement*. Perth, SNH.

² Scottish Natural Heritage (2000). *Marine Aquaculture and the Landscape: the siting and design of marine aquaculture developments in the landscape*. Perth, SNH.

³ David Tyldesley and Associates (2001). *Landscape Capacity Study for Marine Aquaculture Developments in the Orkney Islands* *Scottish Natural Heritage Commissioned Report, No. FOOLA01B*.

⁴ Landscape Design Associates (2002). *Landscape Capacity Study for Marine Aquaculture Developments in Shetland*. *Scottish Natural Heritage Commissioned Report, No. FOOLA09*.

6.2 Aims

- 6 The aims of the project are:
 - To develop a recommended methodology for assessing the capacity of landscapes/seascapes for aquaculture development. (This should include a list of the criteria that are regarded as being relevant, and how to identify wildness as an attribute of coasts. It should also establish the appropriate scale for carrying out capacity studies of this type.)
 - To test the likely methodology in two pilot areas, as agreed by the steering group, and to include one area in which the effects of wildness on the suitability of a location for aquaculture development can be assessed.
 - To describe clearly the recommended methodology.
 - To assess the landscape/seascape capacity for aquaculture of both study areas.
 - To give a presentation on the study, if required, to an invited audience.
- 7 Note that for the purposes of this brief, aquaculture development shall include both finfish and shellfish farms. It shall also include shore bases as well as marine cages and long-lines or other structures.
- 8 The results from this work will be used to help inform SNH staff, and others, in developing policy and responding to casework. It will also contribute to SNH's input to the Scottish Executive's aquaculture policy, therefore, it needs to be clearly and concisely written for a wide but informed audience.

6.3 Methodology

6.3.1 Background information

- 9 There is national coverage of landscape character assessments. A recent study of seascapes in Scotland is in final draft and the latest version will be made available to the successful consultants on award of the contract.
- 10 The two aquaculture capacity studies of parts of Orkney and Shetland shall also be made available to the successful consultant on award of the contract.
- 11 The study methodology should be broadly compatible with that outlined in Landscape Character Assessment (LCA) guidelines⁵ and the "*Guidelines for Landscape and Visual Impact Assessment*"⁶. Any departure from this would require justification and explanation, as they are the basis of SNH's approach to landscape casework and research. LCA Topic Paper 6⁷ on capacity and sensitivity will also be relevant.

⁵ Swanick, Carys *et al.* (2002). *Landscape Character Assessment: Guidance for England and Scotland*. Cheltenham The Countryside Agency and Perth, Scottish Natural Heritage.

⁶ Landscape Institute and Institute of Environmental Management and Assessment (2002). *Guidelines for Landscape and Visual Impact Assessment* 2nd edition London, Spon Press.

⁷ Swanick, Carys (2004). *Techniques and Criteria for judging capacity and sensitivity LCA Topic Paper 6* Countryside Character Network, Countryside Agency & Scottish Natural Heritage.

6.3.2 Pilot studies

12 The capacities of two study areas shall be assessed as a means of checking the methodology. These areas will be agreed and confirmed at the initial contract meeting. They will both be on mainland Scotland, on the west coast, probably one in Argyll and one in either Dumfries and Galloway or the Highlands. Consultants should state where they intend to carry out the pilot studies, and why. A range of different landscape/seascape types should be included in order to provide a reasonable test of the methodology. It is envisaged that at least a sea-loch scale of study area (eg Loch Torridon and Upper Loch Torridon, or a sizeable portion of the Firth of Lorne) will be involved.

6.3.3 Method

13 It is envisaged that a desk study and review of the above and other relevant literature shall form part of the research project. Contractors may also be useful, and a list of these could be drawn up in discussion with the steering group and the successful consultant if this is proposed as part of the study.

14 The methodology shall be agreed with the successful consultant and the steering group at the initial contract meeting and may include innovations or improvements suggested by the successful consultant. It is foreseen as including the following outlined stages:

- Desk study: review relevant texts and maps; identify the nature and extent of development including recent innovations. This is likely to be in consultation with the steering group and others.
- Draft refined methodology.
- Pilot field study to test likely methodology.
- Assessment of the capacity of pilot study areas.
- Production of guidelines, recommended methodology, and report of capacities of the two study areas. Deciding on the most appropriate scale at which to work will be an important part of the recommended methodology, as will considerations of how best, if at all, the whole coastline or parts of it could be assessed.

7 ANNEX TWO: TRENDS IN AQUACULTURE

As background to considering the implications of further aquaculture development on the seascape, the consultants have tried to identify current trends in the industry. The following information was provided in personal communications with staff in SNH. In particular, the consultants would like to thank Matt Davies, David Donnan and Jane Dodd for their assistance and advice. The consultants, however, take full responsibility for any errors in the interpretation of the following information.

7.1 International context

Salmon farming, which dominates the Scottish finfish farm industry is largely in the hands of a few key international operators, who also have fish farming interests in other countries, most notably in Norway, Chile and Canada. In many of these other countries, the trend has been towards large scale units, which have advantages in terms of economies of scale. As a result, recent press coverage and anecdotal discussions have indicated that finfish farming in Scotland is under pressure to become more automated, amalgamate farms and produce more biomass per site. There would appear to be more restrictive physical limits to individual finfish farms in coastal Scotland, however, and there may be pressure for some of the large operators to consider withdrawing from Scotland altogether.

7.2 Finfish farm developments

Tentative exploration into new types of fish farming, such as cod and halibut, are underway. Currently they occupy similar sites to salmon farming and the cages and equipment appear similar to salmon farms. It is possible that these fish may be particularly successful in Scottish waters, although it is too early to be confident about economic viability.

Within salmon farming, there is a trend towards increasing biomass at existing farms, resulting in fewer applications for new sites, but more interest in expanding existing farms.

There has also been development of large circular, semi submerged cages, which can be used in more exposed locations. These developments may allow bigger farms to be located well offshore, where flushing of debris by currents is easier and more effective, and a larger biomass per farm/operator is achievable.

7.3 Fallowing of sites

SEPA encourage operators to fallow sites to let the sea bed recuperate and reduce the effects of pollution, although this is not yet a statutory requirement.

Where operators are fallowing sites, it generally results in two lease sites being used alternately. Fish are grown to maturity in one, then nets cleaned and site left while the other site is used. This generally results in more aquaculture sites and they all appear operational at the same time as cages and associated infrastructure.

7.4 Shellfish farm developments

Anecdotal evidence from SNH staff indicate that there is a rise in interest in developing shellfish farms – particularly mussel lines. This evidence was particular to Argyll, but reflects a growing demand in shellfish more generally.

The consultants certainly noticed an increase in size and number of mussel lines and rafts in Loch Etive since a previous visit in 2002. The use of standard large buoys for mussel lines, and the increase in offshore infrastructure required around mussel farms was also noted. The process seems to be becoming more industrial in terms of size and operation, with a recent application for a ten mussel line farm noted.

8 ANNEX THREE: LITERATURE REVIEW

The consultants undertook a desk assessment of related reports, the key findings of which are presented in this annex.

8.1 Background

In addition to the Guidelines for Landscape and Visual Impact Assessment (The Landscape Institute/Institute of Environmental Management, 2002) and settlement capacity studies previously undertaken by the consultants, four reports addressing issues of capacity in coastal areas were considered to be particularly relevant to this study. Two previous capacity studies for aquaculture development, undertaken in Orkney and Shetland respectively, were consulted (Tyldesley, 2001 and Landscape Design Associates, 2002). Two other seascape based studies are also of particular significance. These are the 'Guide to Best Practice in Seascape Assessment', published by the Marine Institute in Ireland (Hill *et al.*, 2001) and the more recent 'An Assessment of the Sensitivity and Capacity of the Scottish Seascape in Relation to Offshore Windfarms' (Scott, K.E., *et al.*, 2004), which was commissioned by SNH. Key issues identified in each of these four studies are highlighted below.

8.1.1 Landscape Capacity Study for Marine Aquaculture Developments in the Orkney Islands (David Tyldesley and Associates, 2001)

This study, carried out by David Tyldesley and Associates, aimed to provide guidance on 'if, how and where specified types of aquaculture development can best be accommodated in defined areas of Orkney, assessing both landscape and visual aspects' (para 2.2, page 3).

The brief for the study identified in advance selected areas around the Orkney coast where the assessment was expected to focus. These areas were considered to be both representative of the Orkney landscapes and seascapes and subject to pressure for aquaculture development.

8.1.1.1 Role of the Orkney Landscape Character Assessment

The Orkney study (David Tyldesley and Associates, 2001) draws upon the landscape character types identified in the Orkney Landscape Character Assessment and it was considered that 'it forms an adequate basis for capacity assessment' (para 3.6, page 4). Subsequent studies (see sections 2.3.2 and 2.3.4 below) have indicated that the SNH LCAs do not consistently provide adequate assessments of seascape or even coastal landscape. As a result, for this current study, it has been assumed that the land based LCA will not necessarily provide adequate coverage of seascape issues – where it does so, this is a bonus and may be used as background information for the analysis.

The key outputs from the Orkney study (David Tyldesley and Associates, 2001) which have therefore informed this current study include:

- The different sizes and types of aquaculture development which were used to define the 'development scenarios' for assessment. In the Orkney study, three scenarios were assessed: firstly, small to medium scale finfish farms of 1–8 cages of 70m in circumference, secondly, large scale finfish farms of either nine to twenty cages of 70m in circumference, or more than five cages of 70–100m in circumference, and thirdly shellfish farms using lines suspended from buoys.

- The assumptions used in the Orkney study, which included that all proposals are expected to comply with good practice guidelines, an assumption with which we have concurred in this report.
- The criteria used in the capacity assessment, which is extensive and detailed, and which contributed to the criteria developed for the methodology undertaken in this study.
- The consistency of the methodology and presentation which was developed for the Orkney study, which has informed the development of the methodology developed in this study.

8.1.2 Coastal Capacity Study Marine Aquaculture Developments in Shetland (Landscape Design Associates, 2002)

This later study was carried out by Landscape Design Associates in 2002 and aimed to provide guidance on 'if, how and where new aquaculture development can best be accommodated in defined areas of Shetland' (para 1.2, page 1). To assist in this, the study identified and described the landscape character and setting of the study areas, undertook an assessment of sensitivity to change in each landscape character unit and identified appropriate general areas for future development.

The brief for the study identified in advance a selected section of the Shetland coast where the assessment was expected to focus.

8.1.2.1 Role of the Shetland Isles Landscape Character Assessment

The Shetland study (Landscape Design Associates, 2002), concluded that the LCA for the Shetland Isles did not 'specifically consider coastal character variations, so it is of limited value' (para 3.2, page 6). The consultants were also informed by the 'Guide to Best Practice in Seascape Assessment' (Hill *et al.*, 2001) which influenced the approach.

This study therefore undertook a strategic landscape character assessment which provided the basis for identifying 'large tracts of coastal landscapes with a strong unity of character'. These formed the basis of 'coastal character areas' which were assessed at a strategic level for their capacity to accommodate aquaculture development.

The key outputs from the Shetland study (Landscape Design Associates, 2002) which have informed this study include:

- The conclusion that the Shetland LCA was of limited value, due to the lack of information on coastal and seascape character. Any methodology for assessing capacity in relation to aquaculture development therefore needs to assume that LCAs will not contain a comprehensive assessment of seascape and coastal character. The methodology presented in this report therefore includes a strategic assessment of seascape and coastal character which forms the basis for analysis and presentation.
- The division between considering the implications of development on the landscape and seascape character of a 'coastal character area' and of the potential impact of development on the visual amenity of a 'visual unit' was well separated in this report. In the Shetland report, 'coastal character areas' were identified and assessed at a strategic scale, then further subdivided into 'visual units' for more detailed examination. There is inevitably some overlap between impacts on character and visual amenity, therefore the division between the two is more one of emphasis than a categorical division. Nevertheless

the role of an overriding coastal character area which is then subdivided into more manageable landscape units with a clear identity was one which was adopted in the development of the methodology in this current study.

- The descriptive approach to the report's findings which helped explain clearly the thinking behind the report findings, which has informed the development of the methodology undertaken in this study.

8.1.3 Guide to Best Practice in Seascape Assessment (Hill *et al.*, 2001)

This seminal report explores the main elements of seascape character and how to incorporate these into decision making processes. It includes advice on how to judge value and assess capacity. It informed the Shetland study (Landscape Design Associates, 2002) described in 2.1.2 above. The key outputs from this good practice guide which have informed this current study include:

- The descriptions of the definition and scope of 'seascape', which embodies maritime, coastal and hinterland elements. The report helped to establish the breadth of the characteristics which come together to create seascape, which in turn informed the criteria used in this report for assessing character and subsequently determining sensitivity to change.
- The definition of different scales of seascape unit, from national to local scale which informed the different scales of character areas used in this study.

8.1.4 An Assessment of the Sensitivity and Capacity of the Scottish Seascape in Relation to Offshore Windfarms (Scott, K.E., *et al.*, 2004)

This study was completed in July 2004, and aimed to inform SNH of the seascape issues which are likely to guide the strategic location of offshore windfarms. The key outputs which have informed this study include:

- A brief review of SNH commissioned landscape character assessments, which concluded that coastal landscapes and seascapes were not consistently assessed within the reports, notably in relation to the character of the marine element. As a result the team undertook their own strategic assessment of seascape character.
- A description of seascape character types, drawn from the combined experience of the team and the consultees, which identified 13 types of seascape and mapped their location at a very strategic level around Scotland's coast.
- A map and accompanying description of 33 Seascape Units, which combined knowledge of seascape character, coastal sedimentation cells, coastal geometry, aspect and visibility to define units of seascape which could be assessed and for which recommendations could be made.

8.1.4.1 Relationship between Seascape Character Types, Seascape Units and the areas identified for this assessment

For this study into aquaculture development, it is recognised that consistency between the studies would be helpful, particularly in relation to the extent of the Seascape Units and identification of seascape character types. However, it should be noted that the studies were carried out to accommodate developments which are very different in terms of scale, location, design and potential impact. As a result, this study explored how it may be possible to 'nest' more the detailed character and site assessment required for aquaculture within the more strategic character assessment carried out for the Offshore Windfarm Study. It does not

however, draw on the evaluation and conclusions of the Offshore Windfarm Study, as assessing the potential sensitivity of seascape to wind turbines requires a very different set of criteria to assessing sensitivity of the seascape to aquaculture development.

In Argyll, it was easy to 'nest' this assessment within the strategic character assessment of the study carried out by Scott, K.E., *et al.*, 2004. The Argyll based sample area lies entirely within the 'Sound of Mull/Firth of Lorn/sound of Jura' seascape unit, and as a whole is characterised as 'Sounds, Narrows and Islands' seascape character type. In the current study, this character type was simply subdivided further, as a more detailed assessment of coastal character was required to undertake this study. Aspects of the description of the overall character type described in Scott, K.E., *et al.* 2004, were considered in this process and the descriptions of the coastal character areas.

The Galloway pilot area, although larger than the Argyll area, lies within one Seascape Unit – 'Outer Solway' – but includes three seascape character types – 'Remote High Cliffs', 'Deposition Coastline, Open Views' and 'Outer Firths'.

Placing the study area into one Seascape Unit therefore was straightforward, and it may be that future capacity assessments could address coastal stretches based on the units, although further work may need to be undertaken to consider this in more detail.

The three seascape character types represented in this case, a more detailed assessment of character than the 'Sounds, Narrows and Islands' character type identified in Argyll. As a result, 'Deposition Coastline' correlated exactly with the 'Luce Bay local coastal character' type identified in this current study. The remaining two seascape character types were further subdivided in the site assessment into slightly shorter lengths of coast with a consistent character, reflecting again, as in Argyll, the need for a slightly more detailed level of character assessment for this study.

The consultants concluded that while the Seascape Units might form a useful strategic framework for further study areas, the Seascape character types are generally not detailed enough to use as the basis for coastal character types in this case, although it is possible to ensure that boundaries indicating changes in character can be made to correlate between the studies.

9 ANNEX FOUR: DESCRIPTION OF THE SOUNDS, NARROWS AND ISLANDS SEASCAPE CHARACTER TYPE

(extract from 'An Assessment of the Sensitivity and Capacity of the Scottish Seascape in Relation to Offshore windfarms', Scott, K.E., *et al.*, 2004)

Sounds, Narrows and Islands

Locations

- Applecross peninsula to Mid Kintyre and encompassing eastern seaboard of Islay, Jura, Mull, Small Isles and Skye
- Loch Fyne, Argyll
- Eriskay/Barra, Harris/North Uist, Loch Seaforth, Lewis
- Loch Ryan, Galloway

9.1 Physical characteristics

A deeply indented and fragmented coastline, with narrows and sounds strongly enclosed by islands and mainland. The coastline line is generally low and rocky and is often an 'incidental' feature, the focus being the narrow elongated stretches of open water which act as a visual foil to often diverse landform of mountains and craggy islands. Sandy beaches occur occasionally at inlets, although are more extensive between Arisaig and Morar. The coast is strongly fragmented in places, breaking up to form a myriad of small islands such as the 'Slate Islands' off Argyll coast. Settlement occurs along the narrow coastal edge of sheltered sea lochs. This type is backed occasionally by crofting land but mainly comprises moorland hills. Forestry occurs in places against coast with ancient woodlands found in more inaccessible narrows such as fjords. High mountain massif occurs close to coast and dramatically features in views. Views of islands tend to be the focus from the Mainland and vice versa, with mountain ridges eg Cuillin on Skye/Paps of Jura/Rum and Harris being particularly arresting. The profiles of sea, islands and mountain ranges build up different contrasting layers which create an overall high scenic quality. The open sea is not generally obvious with views characteristically very contained in narrows and sounds and further broken by islands. A broader bay containing the Small Isles between Mallaig and North Ardnamurchan allows more open views in contrast. Fish farming occurs in sheltered bays and the Sounds are important ferry routes between islands and the mainland.

9.2 Experiential qualities

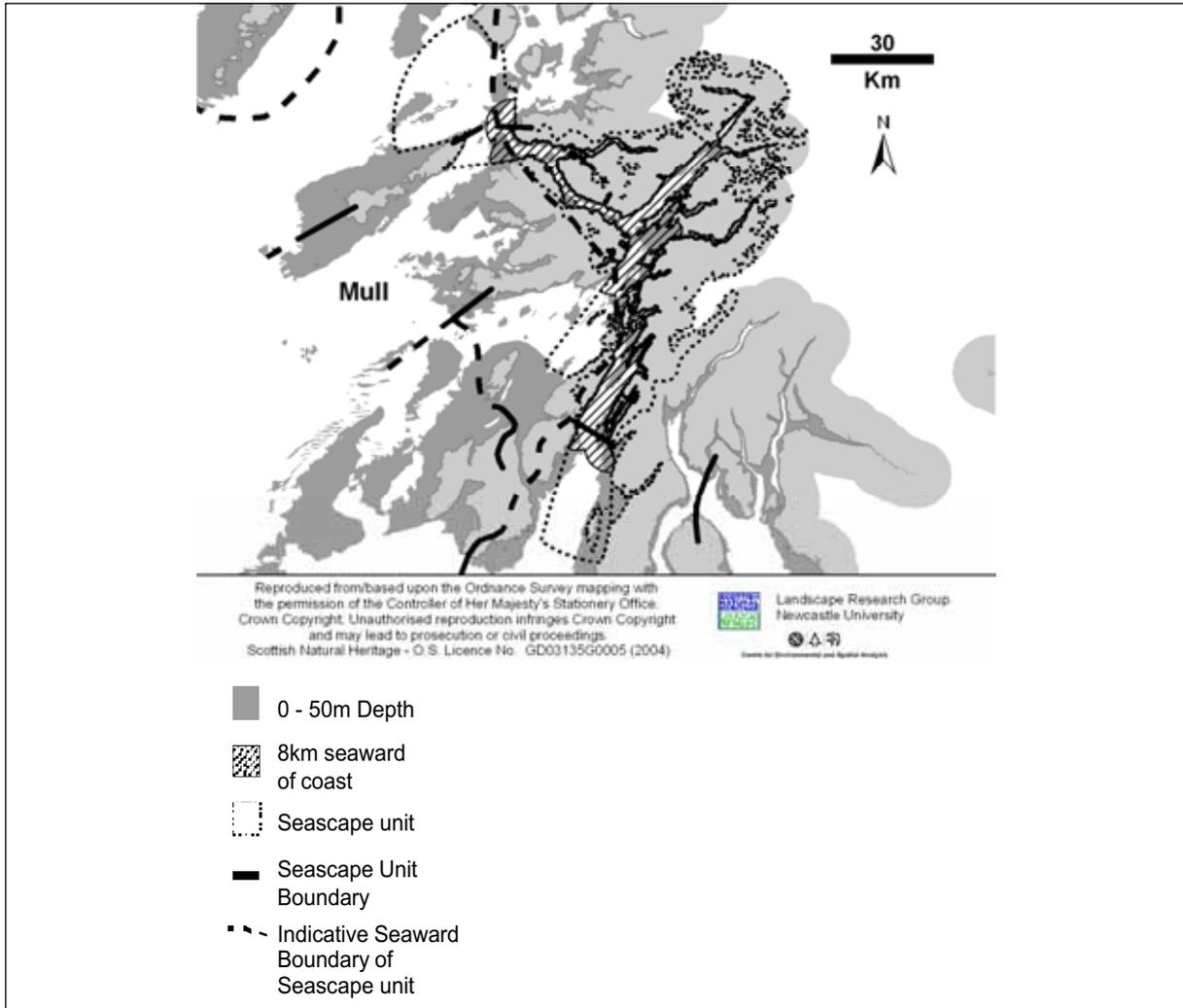
This type forms a highly scenic seascape due to the variety of landscapes seen in views against the sea. Key ferry routes cross the sounds and give changing views of islands, mainland and sea. Sandy beaches although rare, are magnets for recreation and climbing and walking are all popular pursuits within this type due to the presence of mountains close to the shore. The sheltered waters of the sounds also attract sailors and scenic coastal road and rail routes eg Fort William to Mallaig are present.

This type is not exposed to the open Atlantic being relatively calm and sheltered due to its inherent enclosure, however, views of mountains can often give it a dramatic character and it can feel remote in some of the more inaccessible narrows eg parts of Knoydart, Movern and Loch Nevis.

10 ANNEX FIVE: DESCRIPTION OF THE SOUND OF MULL/FIRTH OF LORN/SOUND OF JURA SEASCAPE UNIT

(extract from 'An Assessment of the Sensitivity and Capacity of the Scottish Seascape in Relation to Offshore windfarms', Scott, K.E., *et al.*, 2004)

Area 20 Sound of Mull/Firth of Lorn/Sound of Jura



Seascape character types

Type 9 – Sounds, Narrows and Islands

Key characteristics

Narrow sounds, high containment

Main settlement at Oban, with important ferry routes to the islands

Main transport routes A85, A816

Fragmented coastline and small islands including Slate Islands to south

Slotted views out to open sea

Scale and openness

Small scale, contained seascapes. Narrow stretches of sea with small islands and fragmented coastline particularly in the Firth of Lorn. There is no point more than around 5km from shore due to the high level of containment by land form. The scale of development would totally dominate seascape.

Form

Sound of Mull is a narrow stretch of sea which creates a foil to rolling hills and plateaux with cliffs on both sides. There is a more mountainous hinterland on Mull and to the north on the mainland. The land around the Firth of Lorn is flatter especially to the south and fragmented with many small flattish islands such as Lismore, Kerrera and the Slate Islands further south. The straight rigid forms of turbines would conflict with the natural fragmentation of coastline but would not conflict heavily with the more gently undulating hinterland. They would also interrupt the smooth plane of the sound and lessen its contrast with the detail of the containing landform.

Settlement

Oban is one of the major towns on the west coast and has a busy harbour with important ferry routes to the islands. It has a very urban feel with some fine large buildings on the seafront. Other settlements are smaller scale and more traditional including the picturesque Tobermory on Mull. Development would conflict strongly with the nature and form of these settlements. Historic houses and designed landscapes may take advantage of the views and access via the sea.

Pattern and foci

Settlements, forestry, islands, larger clusters of yacht moorings, and distant peaks form focal points in this landscape. The interlocking sea and land form varied patterns with changing forms.

Lighting

Although there is some lighting at night due to the main settlement at Oban, ferries etc a large windfarm would be heavily lit at night causing a change to the seascape in this area.

Movement

This area is fairly busy with the major settlement of Oban and much ferry traffic. Sailing and many marinas. Busy harbours and transport routes including rail.

Aspect

Varied – turbines would be so close to the land here that aspect is less of an issue. They would be seen from land all around with no one aspect dominating.

How experienced

From ferries sailing from Oban and accessing the islands of the west and from other watercraft. This is a popular tourist area and views from coastal roads, settlements and visitor facilities will be important. Landform and forestry obscures views seawards on the A816.

Modification/Sense of Remoteness/Sense of Naturalness

Although this area has many natural characteristics it is generally accessible and relatively well settled.

Exposure

This area is fairly sheltered, more exposed toward the south in more open waters of the Firth of Lorn. A windfarm would not readily relate to this sense of shelter.

Sensitivity

High – it would be physically unfeasible to accommodate the development scenario within the narrow Sounds. Irrespective of the geographical limitations to development, the strong containment and scale of the small islands would be diminished by turbines.

Forces for change

Pressure for ferry link between Jura and Keills in Knapdale may diminish wild coastline and associated road links. Aquaculture and construction of new water and shore based infrastructure such as marinas. New housing. Onshore wind farms.

11 ANNEX SIX: DESCRIPTION OF THE 'REMOTE HIGH CLIFFS', 'DEPOSITION COASTLINE' AND 'OUTER FIRTHS' SEASCAPE CHARACTER TYPES

(extract from 'An Assessment of the Sensitivity and Capacity of the Scottish Seascape in Relation to Offshore windfarms', Scott, K.E., *et al.*, 2004)

Type 1 Remote high cliffs

Locations

- St Abbs, Borders
- Mull of Galloway and some headlands on Solway Firth
- North west Sutherland Coast
- Atlantic coasts of Orkney
- Parts of Shetland Coast
- North Caithness

Physical characteristics

High cliffs, often over 200m tall, with occasional small sandy or stony bays at their base, contained by rocky headlands. Stacks, caves and collapsed cliffs are often features of this coastline. There is a strong contrast of line and form arising between the sheer verticality of cliffs and wide horizontal expanse of the sea.

This type usually has a high moorland, or occasionally, mountainous, hinterland where semi-natural heathland is the dominant landcover. Settlement is generally absent although occasional small villages can be found tucked in bays and inlets or extensive crofting on tops within Highland areas. Light houses can be prominent features on headlands. This type has a remote, wild character due to the absence of roads and settlement. Where roads exist they are aligned parallel to the coast, for example, the North Sutherland coast.

Access and views to the coast from the hinterland are restricted due to the cliffs. Wide elevated views are directed along the coast and out to open sea, although views of other islands are possible from parts of Orkney. Views of rigs or boats can be a focus within the maritime component of this type. The Northern quality of light often gives intense clarity in views.

Experiential qualities

Atlantic coasts of Orkney and Sutherland and parts of Shetland coast have a particularly exposed character and are physically remote from settlement. The coast is difficult to access and the water's edge is often blocked by impassable steep cliffs. These are exhilarating and awe-inspiring coastlines due to the great height of cliffs giving elevated and distant views and being particularly dramatic when the sea is turbulent. The noise of sea birds nesting on cliffs and waves add to the attraction and excitement of this seascape type.

Type 3 Mainland deposition coastline with open views

Locations

- East coast of Angus and Aberdeenshire
- Parts of the East Caithness and Sutherland Coast
- Parts of the Outer Solway Firth

Physical characteristics

Low sections of coast comprising long, sweeping curved sandy beaches, often backed by dunes and forming a soft linear edge to the sea. This type tends to have a simple horizontal visual composition of sky, sea and land. Grassland and gorse occurs behind dunes and this is backed in turn by flat, mixed or arable farmland. Some areas of dunes (eg Barry Links) are reserved for military live firing. Golf courses occur within this type and settlements are located within farmland. Larger settlements such as Carnoustie, are popular holiday and golf resorts. St Fergus Gas Terminal is noted as being visually prominent in Aberdeenshire.

Views are long and expansive along beaches and uninterrupted, although low level, views occur over the North Sea. Ships are commonly seen at sea.

Experiential qualities

This type is located within a relatively well-populated area and beaches are an important recreational resource. The straightness of the coast and open views of the sea give a degree of exposure. The northern coastal light can often accentuate particular textures, shapes and colours. This type has a dynamic character – both physically and experientially – visible in the migration of sand and the constantly changing character of the sea and passing weather systems.

Type 4 Outer Firths

Locations

- Outer Firth of Forth
- Outer Moray Firth
- Outer Firth of Tay
- Outer Dornoch Firth/Loch Fleet
- Outer Solway Firth

Physical characteristics

Sandy beaches interspersed with low rocky headlands. Backed by farmed plain of varying width with viewshed contained by the Lammermuir hills in the Lothians and coastal hills in Fife and the Black Isle which can often considerably restrict the coastal edge. Broader agricultural plains are present against the coast in East Lothian and Morayshire, although views in the latter are often restricted by coastal forestry located on dune systems. Relatively well populated with small towns and villages along coast, some of these comprising small holiday resorts. Internationally renowned golf courses on links and dunes backing coast. Occasional industry and roads and railways are aligned parallel to the coast.

Views focus on distinctive islands (Bass Rock/Isle of May) within Firth of Forth. Islands are less significant in views over Moray and Tay Firths. Land on either side of the Firths is a focus common to all these types, with settlements, and often masts and other infrastructure located on ridges, forming significant features in views. The profile of land on the opposite side of the Firth tends to flatten due to both the distance and often subtle topography. The Outer Firths, and particularly the Firth of Forth, are major shipping routes.

Sub type 4A: Smaller and less developed Outer Firths

This sub type applies to the outer Dornoch Firth and Loch Fleet which are less developed and relatively sparsely settled. These firths are generally narrower than the larger east coast firths and backed by high hills. Forestry is commonly planted on coastal dunes, some of this ecologically important in Loch Fleet, and this limits views of the coast from inland. Extensive intertidal zones and wetlands occur in this sub type.

Sub type 4B: Outer Firth with distinct headlands and inlets

This sub type comprises the outer Solway Firth lying west of Southernness Point. It has a more diverse coastline than the general type with a distinctive pattern of narrow inlets interspersed and contained by rocky headlands on the Scottish coast. These inlets often have an intimate scale and contain broad estuarine flats and marsh. Forestry and policy landscapes are a feature of the hinterland with small settlements generally located within these sheltered inlets. Long views over estuarine sand, mud, salt marsh of the Firth are a feature of this sub type with the mountains of the Lake District and isolated hills, such as Criffal on the Scottish coast, forming foci in views.

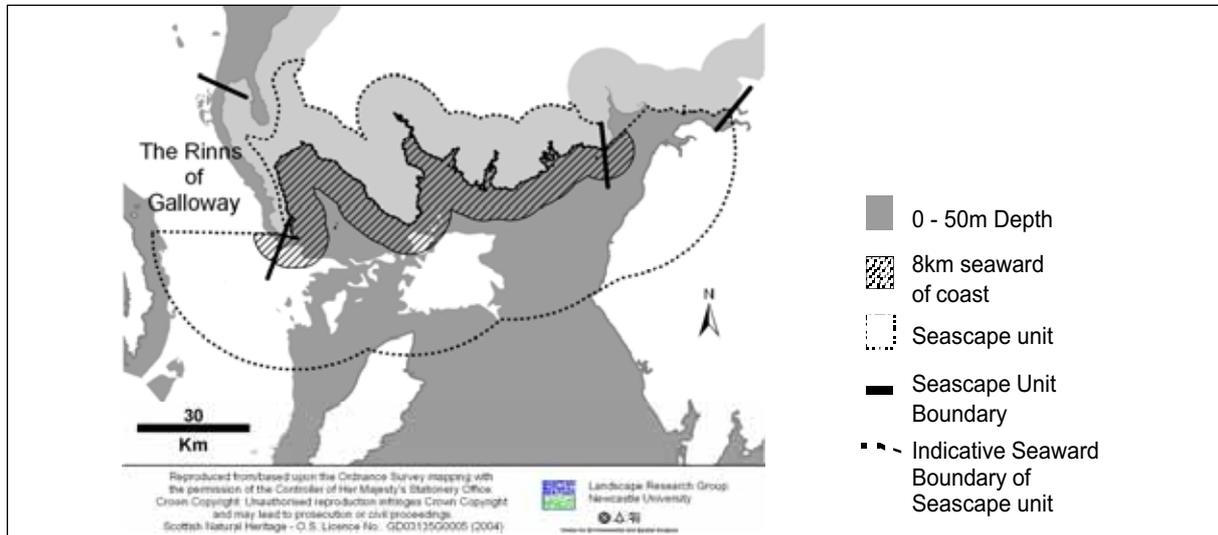
Experiential qualities

The containment of the Firths where land is visible and provides shelter, generally gives a less exposed and dramatic seascape. However, this sense of enclosure is weakened further to the east of the Moray Firth and Firth of Forth where the firths suddenly broaden and land flattens creating a more open seascape. The presence of ships, rigs (in the Moray Firth and Firth of Forth) settlements (particularly visible at night) and other built features and well farmed hinterland gives this type a developed character away from the open sea.

12 ANNEX SEVEN: DESCRIPTION OF THE 'OUTER SOLWAY' SEASCAPE UNIT

(extract from 'An Assessment of the Sensitivity and Capacity of the Scottish Seascape in Relation to Offshore windfarms', Scott, K.E., *et al.*, 2004)

Area 29 Outer Solway (Mull of Galloway – Southernness Point)



Seascape character types

Type 1 – Remote High Cliffs, Type 3 – Mainland Deposition Coastline/Open Views, Type 4 – Outer Firths.

Description of key characteristics

Varied coastline, cliffs, sandy bays, salt marsh, mud flats with channels changing at each tide, rocky inlets

Improved grassland or moorland or forestry forms hinterland

Settlements generally small with forestry and policy landscapes a feature

Traditional, settled rural feel

Remote character in places

Wealthy in archaeological and historical features and designed landscapes

'Big sky' attracts artists and craftspeople.

Scale and openness

Although there is some containment provided by Luce Bay and Wigtown Bay these bays are large and views are generally wide. At headlands, scale will be increased. Depending on orientation the backdrop of the Lake District can be distinctive in the inner reaches and development may diminish the scale of distant mountains.

Form

Diverse form of inlets, cliffs and bays. Simpler form inland with gently undulating moorland and more distinct hills near Newton Stewart and at Criffel near Dumfries.

Settlement

Small scale locally distinctive settlements. Traditional in character. No large development. Main town Newton Stewart.

Pattern and foci

Extensive road network. Foci include settlements and headlands and military infrastructure at Torrs Warren. Pattern not distinctive but varied. Stronger integral pattern within bays with focal point of headlands. Turbines should avoid areas of sea which are framed by headlands.

Movement

There are main transport routes such as the A75 which is very busy and exploits the former Carlisle to Stranraer railway route, train line from Ayr to Stranraer.

Lighting

Lights on Cumbrian coast do not detract at outer firth. This area is visited by English astrological societies because of its readily accessible dark night sky.

Aspect

This is generally southerly looking towards the Lake District and Isle of Man where views can be important, and looking across the bays and inner firths.

How experienced

The sandy shores and the Southern Upland way are the foci of recreational activity. Many people also visit the designed landscapes, castles and ancient monuments. The relatively unspoilt and uncrowded hinterland attracts walkers while the coast is busier with campsites and chalet parks. There is some yachting but away from the shifting sands of the coastal flats.

Modification/naturalness/remoteness

There is a lack of heavy industry and the area has a traditional, settled feel rather than a heavily developed one. The A75, other main roads and associated development which skirt the coast in places can dominate. There are some military bases along the coast which discourage access.

Exposure

Apart from on headlands this area is fairly sheltered.

Sensitivity

Medium to High Sensitivity – turbines could relate to the medium to large scale but compromise open sweeping views across mud flats or shallow tidal waters where reflective effects are more likely. Settlements are small and traditional and this is predominantly a rural area with many historical and archaeological interests, the scale and form of a windfarm would conflict with these. Views out from small inlets are significant and development may detract from the focus of open sea views.

Forces for change

Variety of subtle though cumulatively profound changes, onshore wind, masts, tourist developments etc. Large offshore windfarm at Robin Rigg is a major force for change. Area shows effects of foot and mouth disease when many farmers chose to leave agriculture. Land management practices have altered, resulting in subtle changes to landcover. Shellfish farming, expansive areas of mussel trestles.

13 ANNEX EIGHT: REFERENCES

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14 ANNEX NINE: GLOSSARY

Aesthetic quality A value placed on the landscape, as part of the assessment process, which relates to its aesthetic appeal.

Aesthetic qualities Those aspects of the landscape which, in the judgement of the assessors, contribute to the positive aesthetic appreciation of the landscape.

Experiential characteristics Those aspects of landscape character which may be perceived visually, but are also most likely to be perceived by other senses. They inform our perceptions of a place, often in response to physical conditions.

Landscape capacity 'The degree to which a particular landscape character type or area is able to accommodate change without significant effects on its character, or overall change of landscape character type' (Swanwick, C. and Land Use Consultants, 2002, page 53).

Landscape character 'A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another' (Swanwick, C. and Land Use Consultants, 2002, page 8).

Landscape unity A landscape where elements create a pattern which is strongly related to the underlying physical capability of the landscape. This often results in a visually logical landscape.

Scenic quality In this report the term 'scenic quality' has been used when referring to the value of 'unsurpassed attractiveness' (Countryside Commission for Scotland, 1978. *Scotland's Scenic Heritage*, page 7, paragraph 3.1) for which some landscapes have been designated as National Scenic Areas.

Seascape The visual and physical conjunction of land and sea which combines maritime, coast and hinterland character.