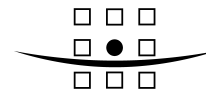


Scottish Sustainable Marine Environment Initiative
SSMEI Shetland Pilot Proposal – Final Report



Scottish Executive, Wildlife and Habitats
Unit

June 2005
Final Report
9P1698



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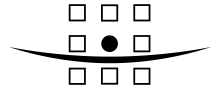
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EXECUTIVE SUMMARY

Shetland is unique in Scotland having the 1974 Zetland County Council (ZCC) Act. The Shetlands Islands Council (SIC) has authority over most marine management issues out to 12 nautical miles and issues works licences for most marine developments through the Act. The Islands Council has promoted more integrated marine management through the appointment of a coastal zone management officer, and through the work of the Council's Marine Development Sub-committee. The Council has also begun the process of developing management plans for the marine environment but this has so far focussed on aquaculture. An opportunity now exists to bring together, strengthen and build on efforts so far in order to create a more integrated and robust framework for marine planning and management in Shetland, which might serve as a model for improved marine management elsewhere in Scotland.

The experimental SSMEI project will offer added capacity and value to the work already undertaken by existing stakeholder bodies in the pilot area and in the context of the Scottish Executive's developing marine strategy

Aim

To undertake an experiment to enable and promote more sustainable management of marine natural resources in Shetland.

Objectives

- To integrate and co-ordinate sectoral planning initiatives (marine biodiversity; inshore fisheries; aquaculture; oil etc) into a marine spatial plan;
- To provide enhanced decision support to the Council and all other stakeholders on the distribution, use and value of marine resources;
- To assess the strengths and weaknesses of the ZCC Act and associated mechanisms in delivering the objectives of the Scottish Sustainable Marine Environment Initiative (SSMEI) in Shetland and its potential to inform wider approaches in Scotland;
- To collate information to develop marine management plans and underpin more informed and strategic decision making;
- To ensure that communities understand and participate more effectively in marine planning and decision making;
- To accommodate the views and knowledge of other stakeholders and the wider community at the earliest possible stage of any development proposal resulting in reduced conflict and enhanced siting, design and management.

The following are proposed as key elements of the pilot::

1. Establish the adequate level of information needed to underpin decision making.
2. Assessment of existing activities and opportunities for the future. It will encompass strategic environmental assessment of the evolving plan. This analysis should both inform and be informed by consultation, and will draw heavily on the information presented in a marine Geographic Information System (GIS) for Shetland.
3. Stakeholder and community participation to draw on marine knowledge and additional studies to fill knowledge gaps.

4. Strategy development and spatial planning will draw together the information, analysis and stakeholder perspectives in order to develop and agree an effective strategy for sustainable marine management. The strategy will include spatial planning and building on the GIS to guide future development and works licence decisions.
5. Development of a Marine Management Plan for Shetland as a whole, and local area plans identifying where marine systems are subject to current development pressures and likely future pressures.

Structure and management

The project will be managed by the existing SIC Coastal Zone Management Officer, supported by a SSMEI project officer. A steering group will be established using the existing Shetland Islands Council marine management steering group but extended to include more commercial interests, and a representative of the Scottish Executive SSMEI team. General consultancy to support analytical and presentational approaches, data analysis, etc will be provided as part of the package to support the Shetland pilot project and this is reflected in the cost of the estimates.

Funding

A partnership approach to funding is being developed with The Scottish Executive, Shetland Islands Council and Scottish Natural Heritage contributing funds. North Atlantic Fisheries College will contribute in-kind through hosting the project officer. The existing SIC Coastal Zone Management Officer will give 40% of his time towards management and implementation of the SSMEI.

The Shetland Fishermen’s Association has already offered support in kind, particularly on investigations of the distribution and value of fisheries resources. It is anticipated that if the project is to be genuinely balanced and integrated it is important that financial support is drawn from a wide spectrum of stakeholders, including commercial interests, and efforts were on-going to secure this at the time this report was produced.

The planned project costs over the 3 year lifetime of the project is summarised in the table below (August 2005 start planned). The project will work with ongoing research programmes and monitoring efforts wherever possible to achieve research objectives at minimum cost.

Year	Financial Year	Running costs	Research and Consultancy	Total
1	2005/2006 Q2,3,4	£ 29,938	£ 66,000	£95,938
2	2006/2007	£ 40,450	£ 46,000	£86,450
3	2007/2008	£ 40,250	£ 1,000	£41,250
4	2008/2009 Q1	£ 10,812	£ -	£10,812
TOTAL		£ 121,450	£ 113,000	£ 234,450

Main research and consultancy costs

Year 1 – GIS set up and collation of hydrography /topography data.

Year 2 – Socio-economic analysis, environmental management and environmental capacity study for fisheries productivity and distribution (spawning and nursing grounds etc).

Year 3 – Community/ stakeholder participation ongoing as part of marine spatial plan development

Deliverables

The main outputs from the SSMEI Shetland Pilot will be:

- a comprehensive overarching marine spatial plan for Shetland supported by a marine GIS;
- a set of three or more detailed local plans will be produced relating to marine systems where competition for resources exists;
- an improved decision support system for planners, marine stakeholders and the local community;
- strategic analysis of existing marine activities and provision of a better understanding of environmental capacity, spatial planning issues, current pressures and how the marine environment can be managed in the future.

All stages will be tied to closely monitored scheduled milestones.

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1 INTRODUCTION

1.1 Background

The Scottish Sustainable Marine Environment Initiative (SSMEI) Pilot Project commenced in November 2002 and is aimed at developing and testing the effectiveness of new approaches to deliver sustainable development of Scotland's coastal and marine environment. The experimental SSMEI Shetland Pilot Project was chosen during Phase I of the SSMEI, along with the 3 others, after undertaking a rigorous selection process. The SSMEI Shetland Pilot Project process is outlined in the SSMEI overview report which is available on the SSMEI website (www.scottish-marine-sustainability.co.uk). Further background to this Shetland pilot including an audit of natural resources, human activities and management is provided in a separate technical annex.

1.2 Shetland – Reasons for selection

The marine environment is central to the economy and people of the Shetland Isles. Fishing is of tremendous historic and cultural importance, and continues to be significant in the Shetland's economy. Oil has transformed the economy since the late 1970s and continues to be a major, if declining economic force. Fish farming and particularly salmon farming has seen tremendous growth over the last 20 years, and shellfish culture is now increasing along with other less traditional finfish species. Tourism and especially wildlife tourism is important, especially in employment terms, and is in part dependent on marine biodiversity. Aquatic leisure sports: sailing, canoeing, diving etc are all increasing. New opportunities in tidal, wave, and wind energy are arising. Shetland therefore offers a fascinating case study in marine environmental management in all its dimensions.

1.3 Pilot development process

The process for developing this proposal was as follows:

- Initial contact with SIC;
- Consultation with SIC and key stakeholders;
- Audit of marine natural resources and associated management systems;
- Development of pilot concept;
- Formal presentation at SIC Marine Management Sub-committee;
- Finalisation of proposal and report to the Scottish Executive.

Initial contact was made with Shetland Islands Council and the Coastal Zone Management Officer to establish the feasibility of a Shetland pilot, and to assess likely support for such a project. Discussions were then held with key stakeholders, including members of the marine management steering group, commercial interests and the council's planning department. An audit of Shetland's marine resources – their nature, distribution, value and management – was undertaken (see technical annex). Drawing on the consultations and specific issues to be addressed in any improved marine management system key management issues were identified along with possible ways forward. This led to the development of a "pilot concept" which was used as the basis for an open workshop involving Shetland Islands Council's Marine Management sub-Committee.

2 ACTIVITIES AND MANAGEMENT

Through consultation with marine stakeholders and a workshop session the following matrix was produced to summarize the key economic resources, associated management systems, strengths, weaknesses and opportunities that are present in Shetland. They illustrate the scope and complexity of marine management in Shetland and the range of opportunities for improved management.

The current key economic resources and the pressures they pose to the natural environment are presented in the technical annex.

Table 2.1 Issues and opportunities

Sector	Management issues	Management bodies	Management tools	Strengths and weaknesses	Opportunities for local management initiatives
Sandeel fishery	<ul style="list-style-type: none"> Historic local decline of sandeel fishery 	Sea Fisheries Protection Agency (SFPA); Scottish Executive Environment and Rural Affairs Department (SEERAD); European Community (EC); local management group (SIC – no role)	<ul style="list-style-type: none"> Total Allowable Catch (TAC) (Increased from 3,000 to 7,000 tonnes recently); Seasonal restriction – no fishing in June and July (concession to feeding seabirds); Vessels size restriction (<20m only); Catch to be landed in Shetland. 	<p>Strengths</p> <ul style="list-style-type: none"> Local buy in agreement on regime; Collaboration between fishers and Scottish Natural Heritage (SNH)/Royal Society for the Protection of Birds (RSPB) . <p>Weaknesses</p> <ul style="list-style-type: none"> Unpredictability of stocks; Poorly understood links with other sandeel stocks; Poor economic return. 	<ul style="list-style-type: none"> Possible consideration of no take zone; Proposed inshore fisheries management group; Input to EU Common Fisheries Policy Regional Advisory Councils (RAC).
Pelagic fishery Mackerel, herring, blue whiting	<ul style="list-style-type: none"> Stock health 	SFPA; SEERAD; EC	<ul style="list-style-type: none"> TAC 	<ul style="list-style-type: none"> Unpredictability of stock movements; Price fluctuations. 	<ul style="list-style-type: none"> Input to RAC
White fishery Haddock, cod,	<ul style="list-style-type: none"> Heavy quota cuts in recent years intended to facilitate stock recovery; Increasingly flexible boats with 	SFPA; SEERAD; EC	<ul style="list-style-type: none"> TAC; Effort restriction (days at sea); 	<p>Strengths:</p> <ul style="list-style-type: none"> Decommissioning will ease pressure on fish stocks 	<ul style="list-style-type: none"> Proposed inshore fishery management group; Input to RAC

Sector	Management issues	Management bodies	Management tools	Strengths and weaknesses	Opportunities for local management initiatives
anglerfish dominate; Increasingly mixed with nephrops	<ul style="list-style-type: none"> adaptable trawl and other gears and electronics leave "no place to hide" Move towards more regional management with RAC development 		<ul style="list-style-type: none"> Decommissioning. 	<p>Weaknesses:</p> <ul style="list-style-type: none"> Days at sea restrictions economically inefficient; Competition from outside vessels?; Limited local input/influence. 	
Inshore fishery Mainly scallops, crabs, lobsters, some nephrops,	<ul style="list-style-type: none"> Policing – gear restriction abuse; outside vessels?; Loss of fishing grounds to aquaculture; Availability of SFPA protection 	SFPA; Shetland Shellfish Management Organisation (SSMO); SEERAD; EC (6m +)	<ul style="list-style-type: none"> Regulating order to 6nm; Licensed (restricted entry) fishery; Gear limits 	<p>Strengths:</p> <ul style="list-style-type: none"> Local management regime; <p>Weaknesses:</p> <ul style="list-style-type: none"> Costs of policing; Negotiating weakness of inshore fisheries despite high employment; 	<ul style="list-style-type: none"> Inshore fisheries area management group; Use of more regulatory orders could be made.
Fisheries (capture) general	<ul style="list-style-type: none"> Loss in mid-sized boats – increase in <10m adaptable multi-purpose. Few remaining under-exploited fisheries in which to diversify Lack of compliance and enforcement costly 	See above	<ul style="list-style-type: none"> See above 	<p>Strengths:</p> <ul style="list-style-type: none"> Close to resources; <p>Weaknesses:</p> <ul style="list-style-type: none"> Poor stock health in many fisheries Distance from markets; 	<ul style="list-style-type: none"> Effective input to regional advisory councils; Further decentralisation of fisheries management; Mapping of fishery resources and values for decision makers.
Fish processing	<ul style="list-style-type: none"> Limited and uncertain supplies of whitefish; Poor market conditions for salmon 	SIC; SEPA	<ul style="list-style-type: none"> Environmental Impact Assessment (EIA) depending on scale. 	<p>Strengths</p> <ul style="list-style-type: none"> Broad based; Clean environment. 	<ul style="list-style-type: none"> Premium seafood products, sustainably produced within marine managed areas
Finfish farming	<ul style="list-style-type: none"> Site and environmental capacity limitation in sheltered voes; Competition with inshore fisheries; Predation by seals Marine nature conservation interests? Landscape impacts Possible loss of local ownership SE consultation paper on changes to the planning system would remove aquaculture from the 	SIC; Crown Estate; SEPA; SNH (consultee)	<ul style="list-style-type: none"> EIA (SIC); discharge consent (SEPA); Works licence (SIC); Seabed lease (Crown Estate); 	<p>Strengths</p> <ul style="list-style-type: none"> Well regulated <p>Weaknesses</p> <ul style="list-style-type: none"> Inadequacy of EIA to address cumulative issues; Perception that presumption in favour of development 	<ul style="list-style-type: none"> Local area management plans for aquatic systems (currently being prepared); Local area management plans for aquaculture (currently in development); Site rationalisation Strategic EIA for Voe systems or for Shetland as a whole; Assessments of carrying

Sector	Management issues	Management bodies	Management tools	Strengths and weaknesses	Opportunities for local management initiatives
	current Work Licensing procedure in Shetland.				capacity; <ul style="list-style-type: none"> Rationalise and integrate all the above.
Shellfish farming	<ul style="list-style-type: none"> Site and environmental capacity limitation in sheltered voes; Competition with fisheries; Local organic matter & shell litter accumulation Landscape impacts? 	SIC; Crown Estate	<ul style="list-style-type: none"> Works licence (SIC); Seabed lease (Crown Estate). 	<p>Strengths</p> <ul style="list-style-type: none"> Less bureaucracy <p>Weaknesses</p> <ul style="list-style-type: none"> No EIA or discharge consent; Lack of understanding of carrying capacity. 	<ul style="list-style-type: none"> As for finfish
Tidal power	<ul style="list-style-type: none"> Possible disruption of marine nature conservation in tidal streams/rapids Disruption of navigation; Disruption of fisheries resources 	SIC; Crown Estate;	<ul style="list-style-type: none"> EIA; Works licence 	<p>Strengths</p> <ul style="list-style-type: none"> Thorough EIA. <p>Weaknesses</p> <ul style="list-style-type: none"> Little strategic planning - ad hoc approval of individual schemes. 	<ul style="list-style-type: none"> Strategic environmental assessment; Agreed zoning.
Wave power	<ul style="list-style-type: none"> Potential interference with fisheries; Potential conflict with nature conservation interests 	SIC; Crown Estate;	<ul style="list-style-type: none"> EIA; Works licence 	<p>Strengths</p> <ul style="list-style-type: none"> Thorough EIA <p>Weaknesses</p> <ul style="list-style-type: none"> Little strategic planning – possible ad hoc approval of individual schemes 	<ul style="list-style-type: none"> Strategic environmental assessment; Agreed zoning
Oil	<ul style="list-style-type: none"> Sullom Voe utilisation capacity; Risk management (tankers, pipelines) 	SIC; SEPA; Crown Estate; Ports authority.	<ul style="list-style-type: none"> EIA; Works licence; Shetland Oil Terminal Environmental Advisory Group (SOTEAG). 	<p>Strengths</p> <ul style="list-style-type: none"> SOTEAG etc well honed; <p>Weaknesses</p> <ul style="list-style-type: none"> Regulation of tanker traffic via International Maritime Organisation (IMO). 	<ul style="list-style-type: none"> New opportunities re West of Shetland fields.
Piers; ferry terminals; port structures; aggregate	<ul style="list-style-type: none"> Locally specific 	SIC; SEPA; Crown Estate; Harbour Authority; SETLLD	<ul style="list-style-type: none"> EIA; works licence; 	<p>Strengths</p> <ul style="list-style-type: none"> Integrating role of SIC. <p>Weaknesses</p> <ul style="list-style-type: none"> Strategic planning. 	<ul style="list-style-type: none"> Strategic planning.

Sector	Management issues	Management bodies	Management tools	Strengths and weaknesses	Opportunities for local management initiatives
extraction; cabling					
Tourism and recreation	<ul style="list-style-type: none"> • Visitor site pressure and disturbance 	SIC; SEPA; SNH; RSPB Reserves; Crown Estate; Access forum	<ul style="list-style-type: none"> • EIA; • Works licence for e.g. marinas, major structures; • Access code 	<p>Strengths</p> <ul style="list-style-type: none"> • Wildlife attracts tourists; <p>Weaknesses</p> <ul style="list-style-type: none"> • Potential for disturbance of wildlife 	<ul style="list-style-type: none"> • Strategic planning; • Awareness raising (code etc)
Heritage and Biodiversity	<ul style="list-style-type: none"> • Decline of some seabirds in parallel with decline of sandeel; • Marine conservation interest vulnerable to fisheries, aquaculture and other activities; • Limited knowledge of marine nature conservation interest 	SIC; SEPA; SNH; RSPB Reserves; Crown Estate; access forum	<ul style="list-style-type: none"> • Local Biodiversity Action Plan (marine plan in preparation); • Site of Special Scientific Interest (SSSI); National Nature Reserve (NNR); Special Area of Conservation (SAC); Special Protection Area (SPA) 	<p>Strengths:</p> <ul style="list-style-type: none"> • high level of designation and protection on land; <p>Weaknesses:</p> <ul style="list-style-type: none"> • Associated by some with bureaucracy; • Limited protection of marine nature conservation interests; • Lack of control of basic ecosystem changes (e.g. climate; sandeel). 	<ul style="list-style-type: none"> • Better information on marine conservation interest and value; • Heightened awareness; strategic planning; • Integrate LBAP initiative with other marine planning initiatives.
Transport and shipping	<ul style="list-style-type: none"> • Ballast water; oil spills; • Navigation conflicts with fish farms - this may increase in future years 	Ports authority IMO	<ul style="list-style-type: none"> • Mostly via international agreements. 	<p>Strengths:</p> <ul style="list-style-type: none"> • SOTEAG advisory and monitoring work. 	<ul style="list-style-type: none"> • Strategic planning.

3 OVERVIEW OF THE SHETLAND PILOT

3.1 Issues to be addressed

Consultations with a wide range of stakeholders in Shetland have revealed many important issues and opportunities for improved marine management. Those which might be tackled through an enhanced marine planning process associated with the SSMEI include:

- Inadequate information on the location, social, economic and cultural value of Shetlands marine resources, with which to underpin strategic marine planning and the works licence approval process;
- Inadequate or late consideration of other users, or potential users/uses, in the preparation of development proposals and the works licence approval process, particularly with respect to siting and design;
- Inadequate information on environmental limits to economic activity (environmental capacity; ecosystem impacts);
- Historic *ad hoc* development of aquaculture which has had some negative economic, bio-security and environmental consequences; and the associated opportunity to rationalise the scale and location of different forms of aquaculture in order to maximise economic, social and environmental benefits.

Key elements of a marine pilot for Shetland are outlined below, and the relationships between them and the overall process for developing marine management plans is laid out in the technical annex.

3.2 Building on existing initiatives and capacity

Shetland already has a coastal management initiative. A coastal zone manager is in post, a draft local marine management plan already exists for the Swarbacks Minn area, and some more general information of relevance to strategic marine planning at the wider Shetland level has been brought together. Fish farmers have begun to develop area planning and management initiatives. Fishermen already operate under a locally developed shellfisheries regulating order.

The implementation of a comprehensive and integrating marine management plan which might address some of the outstanding issues however has proven difficult to realise, despite the efforts of Shetland Islands Council, and the support of various stakeholder organisations. Progress has been hindered by lack of resources and strategic direction.

The SSMEI pilot provides the opportunity to invigorate the marine planning process in Shetland. It will bring in additional resources and expertise to address difficult outstanding issues. It will support the collection and assimilation of critical information where this is likely to be cost effective. It will analyse this information to provide guidance to decision makers on the trade-offs (social, economic, environmental) between alternative longer term development policies and strategies, and between specific shorter term development and management options under the works licensing

system. It will promote and facilitate more effective forms of stakeholder consultation in planning and decision making to ensure a more considered and strategic approach.

3.3 Information to underpin decision making

This component will seek to establish the actual and potential location and value of marine resources and associated economic activities, and synthesise this information in an easily used and well presented GIS. Subsidiary studies will be undertaken in respect of fisheries, aquaculture, tourism, renewables and biodiversity. Spatial information on resources and value will be supplemented by socio-economic analysis.

Identification of suitable sites for different activities, identification of spawning and nursery areas for fisheries, determination of environmental capacity, and understanding of biodiversity distribution and value are all expensive and difficult. Indeed this expense has been the primary reason for taking an *ad hoc*, one-off approach to the assessment and management of developments in the marine environment.

Some form of *physical characterisation* is a common requirement for all these assessments of value or potential, and, if appropriately ground-truthed, may serve as a basis for rapid appraisal. A great deal of hydrographical information is already available, or could be modelled. Brought together with some carefully targeted new work on substrate type and other physical features and parameters, this should yield something akin to terrestrial land use potential and environmental sensitivity maps which will be invaluable in developing the plans and informing the works licence procedures.

3.4 Strategic analysis

This component will support the assessment of the overall state of existing activities, and opportunities for the future. It will examine opportunity for increased co-ordination and actual or potential conflict between different activities, their contribution to overall planning objectives, and the trade-offs between them in particular locations. It will also encompass strategic environmental assessment of the evolving plan. This analysis should both inform and be informed by consultation, and will draw heavily on the information synthesised and presented in the GIS.

The issues identified above highlight the need for strategic planning in the marine environment. In essence this means thinking ahead, and identifying and comparing alternative development and management options against a range of objectives, rather than making one off, *ad hoc* decisions based on limited information and analysis. It means allocating marine resources for the maximum long term benefit. *Sustainable* development, in so far as it requires analysis of social, economic and environmental consequences of alternative activities in the short and long term, demands a more strategic and integrated approach to planning.

It is anticipated that a Strategic Environmental Assessment (SEA) of the spatial plan will be required. SEA is designed in part to address wider *ecosystem management issues*, and thus relates closely to the objectives of the SSMEI. The Shetland pilot, along with the other three proposed pilots under SSMEI will allow for the testing of what has become known as the 'ecosystem approach' to environmental management. This approach emphasises the need to consider environmental capacity, and the complex chains of effect, interdependencies and feedback mechanisms which characterise

marine ecosystems, so that we can maintain their quality and productivity in the widest sense – for the benefit of everyone, now and in the future. This is no easy task, but an essential precondition will be to consider and understand the relationships between different economic activities and the natural environment in more detail when exploring alternative development options and strategies. The Shetland Pilot, along with the others, will serve to test the meaning of such an approach in practice and its relationship with the SEA process.

Environmental capacity is also a key theme in the Scottish Aquaculture Strategy, and fish farmers and other resource users in Shetland are keen to increase their understanding of these issues. The environmental capacity of Voe systems is poorly understood for both finfish aquaculture (assimilative capacity) and Shellfish culture (productive capacity). This has been a significant constraint on effective strategic decision making related to aquaculture siting and development. It is proposed that the pilot involves some highly targeted studies in those Voe systems under greatest development pressure to develop more accurate environmental capacity models, in parallel with initiatives to better allocate or manage this capacity, and to ensure that it is not exceeded. An assessment will also be made of the relative value of monitoring/response frameworks versus predictive modelling approaches to inform better management systems.

3.5 Consultation, participation and user knowledge

Whatever resources are available, rational planning and agreed strategy will always be constrained by inadequate understanding, uncertainty and different perspectives on social, economic and environmental values. Key elements in more integrated planning are therefore enhanced procedures and mechanisms to share knowledge and perspectives. But consultation and participation in planning can be expensive, ineffectual, unrepresentative, and exacerbate rather than reduce conflict. The pilot will therefore test alternative consultation and participation models and facilitation techniques, and identify cost effective solutions.

The project will support consultation to enhance the basic information by drawing on user knowledge (for example fishermen, fish farmers, tourist operators). It will also be used to develop and refine planning, management objectives and associated indicators, as well as to inform strategy development. This process should be enhanced through the effective use of GIS, decision analysis and workshop facilitation techniques.

3.6 Strategy development and spatial planning

This component will draw together information, analyses and stakeholder perspectives in order to develop and agree effective strategies to deliver the objectives. The strategy will include spatial planning, building on the GIS and strategic analysis to guide future development and works licence decisions.

Spatial planning is one important tool which can be used to underpin a more strategic approach. Analysis of opportunity typically has a spatial dimension: some things work better in certain places. This is particularly true of economic activities in the marine environment, which typically relate to particular features of the environment: suitable habitat for fishery; suitable water quality for finfish farming; sufficient and appropriate

plankton production for shellfish farming; suitable currents for tidal energy; structural diversity, substrates and water currents for biodiversity; sufficient food for seabirds.

Identifying locations of particular value or suitability for different activities is therefore a key part of strategic planning for the marine environment, and bringing this information together in the form of maps and identified “zones” can serve as a framework for more integrated and efficient assessment of development alternatives. Such zones can range from identified usage or suitability areas on maps (i.e. information only) through to proactive “development” or exclusion zones, supported by rigorous regulation. Between these extremes may be, for example, zones with associated guidance or codes of practice. The Shetland pilot will explore and assess these options through rigorous analysis and consultation.

3.7 Marine Spatial Plan

The various elements described above will be drawn together within a *marine spatial plan for Shetland* (an aim that was agreed by representatives of all major stakeholders and by community councils). The plan will include a summary analysis of the value and distribution of existing activities and values and potential future activities; areas of synergy and conflict; agreed objectives and associated indicators (including those relating to sustainable development), a strategy to deliver the objectives; and monitoring and response procedures.

A set of three or more detailed *local area plans* will be developed relating to aquatic systems where competition for resource use already exists or where such competition is likely in the future. They will include all the basic elements described above for the Shetland-wide plan, but would be more detailed, especially in relation to environmental capacity and spatial planning issues.

4 PILOT STRUCTURE

4.1 Purpose

The following represent the broadly agreed aims, aspirations and principles of SIC, the Shetland stakeholders and the SSMEI:

- Integration of economic, community and natural heritage aspirations within a robust decision-making framework;
- Ownership by and contribution from all major users and stakeholders;
- Streamlining and more efficient use of existing information and procedures;
- Better information available to all parties at the appropriate time.

4.2 Aim

- To undertake an experiment to enable and promote more sustainable management of marine natural resources in Shetland.

4.3 Objectives

- To integrate and co-ordinate sectoral planning initiatives (marine biodiversity; inshore fisheries; aquaculture etc) into a marine spatial plan;
- To provide enhanced decision support to the Council and all other stakeholders on the distribution, use and value of marine resources;
- To assess the strengths and weaknesses of the ZCC Act and associated mechanisms in delivering the objectives of SSMEI and its potential for wider application in Scotland;
- To collate information to develop marine management plans and underpin more informed and strategic decision making;
- To ensure that communities understand and participate more effectively in marine planning and decision making;
- To accommodate the views and knowledge of other stakeholders and the wider community at the earliest possible stage of any development proposal resulting in reduced conflict and enhanced siting, design and management.

4.4 Project management

In developing a strategic marine development and management plan for the Shetland Islands, a balance will have to be struck between many different interests. The Shetland Islands Council is the natural lead organisation to steer an initiative of this nature. The Council already has at its disposal many of the institutions and mechanisms required to develop and implement such a plan: a coastal zone management officer; a council marine development sub-committee; an informal marine management stakeholder committee; a promising GIS system; a draft local marine plan; and crucially, the works licence procedures in relation to activities out to 12 miles.

An SSMEI assistant officer will be appointed for 3 years to the current Coastal Zone Manager to synthesise existing information and develop the decision support system, with specialist research and consultancy support to address specific issues. The current SIC Coastal Zone Manager will manage the pilot project and commit a substantial proportion of his time (40%) to the project. The SIC Coastal Zone Manager and

assistant officer will report to a steering committee based on the existing marine management advisory group, but with membership extended to economic development interests on the Council, Shetland Enterprise, the Harbour Authorities and private business. The current marine management advisory group consists of :

- Seafood Shetland
- Shetland Fisherman's Association
- Shetland Salmon Farmers Association
- Shetland Shellfish Management Organisation
- SOTEAG (Sullom Voe Oil Terminal)
- Shetland Amenity Trust
- Association of Shetland Community Councils
- RSPB
- SNH

The Community council network is seen as very important in order to engage with local people at grass roots level. The Scottish Executive would also have an input into the steering committee. A possibility exists that a member of the SSMEI Steering Group could be appointed to the Shetland steering committee if appropriate.

We also suggest that the steering committee should work closely with the local management groups proposed under the strategic review of Scottish inshore fisheries in Shetland to ensure co-ordination and avoid duplication.

4.5 Project boundaries

Relevant legislation and regulatory powers apply to different marine zones. The Zetland County Council Act 1974 encompasses development out to 12 nautical miles. The Inshore Fisheries regime covers activity out to 6 nautical miles. The Water Framework Directive applies to activity and water quality out to 3 nautical miles. This pilot is concerned particularly with integration of sectoral initiatives and with planning and management at the ecosystem level. It is therefore appropriate that it should address management issues out to 12 nautical miles, and where relevant/possible ensure co-ordination with activities taking place beyond 12 nautical miles.

5 PILOT ACTIVITIES

5.1 Geographic Information System

Task: Develop an efficient, accessible and easily updated geographically based database that will provide a “one stop shop” and analytical/comparative tool for information relating to Shetland’s marine environment and associated activities and values.

The project officer will be responsible for upgrading and expanding the existing GIS, which covers mainly aquaculture activities, to enable the mapping, synthesis and comparison of data relating to fisheries, aquaculture, tourism, biodiversity, renewables, and existing spatially related management initiatives (exclusion zones etc).

The GIS should be developed to allow for the inclusion of data relating to:

- the location of existing marine resources and associated activities;
- the quantification and assessment of value – by area and/or specific location - of these resources and associated economic activities;
- the mapping of areas of high potential for different economic activities;
- the mapping of areas of particular value or sensitivity for social, cultural or environmental reasons.

The system should be set up in such a way that it can be maintained and used by non-specialists, and if possible adapted for on-line use. Options to use the GIS to generate quality specialist information maps for particular uses (e.g. wildlife and natural heritage tourism information; aquaculture, fisheries etc) should be explored.

5.2 Proposed investigations

5.2.1 Hydrography and topography

Task: Establish a sound physical basis for assessing the potential and value of different locations for different activities

Lead partner: SIC

Phase 1 of this activity will comprise a desk-based review, and synthesis in GIS format, of the hydrographic/oceanographic, topographic, water quality and substrate characteristics of Shetlands coastal waters out to 12 nautical miles. It will also review the various studies that have sought to relate physical characteristics to:

- Fisheries value;
- Aquaculture (fin-fish; shellfish) development potential;
- Renewables (tide; wave; wind) development potential;
- Habitat and biodiversity value;
- Environmental capacity

Major gaps in strategic information will be identified, and an appropriate research plan to generate critical additional information will be developed. The scope of this research is to be determined, but may include the following elements:

- Targeted hydrographic research in key locations (especially as regards potential for aquaculture and renewables; or locations where environmental capacity is, or is likely to become a management issue);
- “ground” truthing of important hypothesised correlations between physical biodiversity value and fisheries value.

5.2.2 The location and value of fisheries

Tasks:

- Synthesise, in GIS format, existing information on location and value of commercial fisheries resources and associated economic activity;
- Identify and fill critical gaps in information.

Lead partners: SIC; SFA; SSMO

Phase 1 of this activity would be a desk based review, and synthesis in GIS format, of what is known about location and value of commercial fisheries resources and associated economic activity out to the 12 mile limit. This would include information on the location and distribution of spawning areas, nursery areas, fishery areas, fishing effort, and rough estimates of economic value by area or specific location. This information will be brought together within the GIS, and major gaps in strategic information identified. A research plan to generate critical additional information will then be developed. The scope of this research would be determined following the phase 1 synthesis, but is likely to include the following elements:

- A survey of existing and retired fishers to draw on their practical knowledge;
- A study to relate hydrographical and topographic data to fisheries potential and value and to map overall fisheries potential;
- A study to establish the nature and extent of critical spawning and nursery grounds for key species (potentially undertaken by NAFC/SSMO/SFA with advice from FRS Aberdeen);
- An analysis of actual and potential economic value at key locations.

5.2.3 Location and value of aquaculture activity

Tasks

- Synthesise, in GIS format, existing information on location and value of aquaculture activities;
- Identify areas of greatest potential for future development.

Partners: SIC; SSFA

Phase 1 of this activity will be to update the existing GIS information already held on fish farming activity, and to ensure that the information is in a format compatible with that being collected in relation to other sectors.

Phase 2 will draw on existing information, together with the physical environment study, and an analysis of trends and likely future scenarios for the industry in the future, to identify areas of particular potential for both shellfish and finfish farming.

5.2.4 Location and value of coastal tourism and recreation uses

Tasks:

- Synthesise, in GIS format, existing information on location and value of tourism resources/destinations and associated economic activity;
- Identify and fill critical gaps in information.

Lead partners: SIC; Shetland tourist operators representatives/VisitScotland

Phase 1 of this activity would be a desk based review, and synthesis in GIS format, of what is known about the location and value of tourist activities and services related directly and indirectly to the marine environment. Areas for likely future development would also be identified. Major gaps in strategic information will then be identified, and a research plan to generate critical additional information will be developed. The scope of this research would be determined following the phase 1 synthesis, but is likely to include the following element:

- Postal survey of marine related tourism business.

5.2.5 Location of sites for the development of renewable energy technology.

Task: Identify areas and sites of particular suitability for different forms of renewable energy generation (wind, wave, tidal)

Partners: SIC; Shetland Enterprise, British Wind Energy Association (BWEA) and the local Renewable Energy Forum.

This would comprise a desk based review of likely suitable sites, based on the physical environment study described above, and assimilation of this information within the GIS.

5.2.6 Location and value of cultural and natural heritage in Shetland

Task: Map Shetland's marine natural heritage and cultural heritage resources and to identify areas of particular value and/or sensitivity.

Lead partners: SIC; SNH; SAMS; RSPB, Historic Scotland

Phase 1 of this activity would be a desk based review, and synthesis in GIS format, of what is known about the location and value of biodiversity and other natural heritage resources out to the 12 nautical mile limit. Particular attention will be paid to those areas where development pressures are likely to be greatest. Information will be gleaned not only from SNH, SOTEAG, SAMS, academics and environmental NGOs operating in Shetland, but also from resource users – fishermen, and fish farmers, who have substantial largely untapped knowledge about biodiversity. Major gaps in strategic information will then be identified, and a research plan to generate critical additional information will be developed. The scope of this research would be determined following the phase 1 synthesis, but is likely to include the following elements:

- A study to relate hydrographical, topographic and substrate data to biodiversity;
- Highly targeted survey to map habitat in areas likely to come under increasing development pressure in the future (as identified in the studies described above);
- A programme to engage fishermen, fish farmers and other resource users in routine reporting on biodiversity and the natural environment.

The final output of this study will be maps showing areas of particular natural heritage value, sensitivity and vulnerability to future development, which can inform strategic planning and assessment of development permits.

5.2.7 Social and economic analysis

Task: Assess the relative economic value and potential of alternative uses of marine resources.

Partners: SIC project team; consultants

This study will draw on the various studies described to assess current and potential economic value by area and/or specific location. This will be assessed quantitatively and qualitatively in terms of employment, value added, cultural/community value, and environmental value. Estimates will be incorporated in the GIS.

5.2.8 Environmental management of aquaculture and other activities

Tasks:

- Review the role of environmental capacity assessments in the environmental management of aquaculture and other activities;
- Enhance the assessment and prediction of environmental capacity and carrying capacity in key locations where this is considered to be cost effective;
- Recommend monitoring and management regimes which will ensure that aquaculture stays within environmental capacity;
- Recommend procedures and protocols for the siting and scale of aquaculture operations, along with separation and biosecurity issues, and how these should be incorporated into management plans and the current works licence decision making procedures or any future changes in relation to planning control as outlined in the recent Scottish Executive consultation paper - 'Extending Planning Controls to Marine Fish Farming'.

Partners: SIC project team; Shetland Salmon Farmers Association (SSFA); SEERAD, consultants.

Phase 1: A study will serve to pinpoint key locations for existing and future fish farm development. Existing models and assessments of environmental capacity will be reviewed and the cost effectiveness of further research to deliver significantly more accurate predictions will be assessed. The relative value of environmental capacity prediction versus monitoring and response procedures, or combinations of the two will be reviewed. Phase 1 will also support the on-going industry led work on area management of aquaculture in Shetland.

Phase 2: If appropriate, and if adequate funding can be generated (from e.g. fish farmers, the Crown Estate, and perhaps Europe) in depth studies of environmental capacity will be undertaken in carefully selected representative aquatic systems.

Phase 3: This phase will draw together all the research and information to generate recommendations for the environmental and spatial management of aquaculture which can be integrated with the broader integrated cross sectoral plan.

5.3 Strategic analysis

Tasks:

- Analyse and present/make available to stakeholder and decision makers, in a simple accessible format, the relative current value and future potential of alternative uses of marine resources in different areas/locations around the Islands;
- Analyse and assess the relationships and interactions between activities in key areas and locations, and to identify potential for synergy or conflict;
- Undertake a strategic environmental assessment in relation to these actual and potential developments, taking particular account of environmental capacity and wider ecosystem impacts.

Partners: SIC, SSMEI project team; SEPA; SNH; consultants

This represents a critical phase of the project, and should serve to provide the information and analysis which will underpin more strategic planning and decision making and the development of a spatial plan. If the studies described above have been thorough and effectively integrated, the analysis should be straightforward.

Presentation and communication will be the key to this phase and decision analysis techniques should serve to clarify the nature of the opportunities, the trade-offs between them, in terms of meeting the various objectives associated with sustainable development and the particular aspirations of the people of Shetland.

The SEA will follow the guidance currently being developed by the Scottish Executive, but should be greatly enhanced by the information and analysis described above.

5.4 Community / Stakeholder consultation and participation

Tasks:

- Draw on local knowledge more effectively in support of all phases of the project;
- Enhance the effectiveness and efficiency of stakeholder and community participation in decision making related to the marine environment;
- Gain agreement on objectives and associated indicators for marine planning and management in Shetland;
- Gain agreement on the basic elements of a strategy to achieve the objectives, including if possible a marine spatial plan for Shetland.

Partners: SIC project team; Association of Shetland Community Councils; consultants

Phase1 of this activity will review the strengths and weaknesses of existing consultation and participation procedures in respect of:

- SIC planning in general;
- Planning and management in the marine environment.

Building on this, and a review of consultation and participation techniques more generally, the project will draw up a consultation and participation strategy and plan for the whole pilot project. This will include the testing of more widespread use of decision analysis, facilitation techniques and mechanisms to solicit and assimilate local user knowledge.

A series of meetings will be set up at different levels to discuss and agree objectives and associated indicators for marine planning and management in Shetland, and to discuss and agree (as far as possible) strategy to achieve these objectives. These meetings will be informed by the strategic analysis described above. Where resource allocation issues arise, trade off analysis will be used to inform the options. As far as is possible, the outcome of these deliberations will be summarized in the form of a spatial plan.

5.5 Finalisation of the Marine Spatial Plans

Task: Write a comprehensive marine spatial plan for Shetland's marine environment, including more detailed local plans for key areas.

Partners: SIC project team; all stakeholders

The Shetland wide marine spatial plan will draw on all of the information, analysis and consultation described above. It will include, at minimum the following components:

- An analysis of the information in the comprehensive GIS and the sustainable development implications of the location, distribution and value of marine resources and associated activities;
- A set of objectives for the sustainable development of Shetland's marine environment;
- A set of targets and indicators corresponding to these objectives;
- A strategy and mechanisms to meet the targets and deliver the objectives.

Strategy and mechanisms could include any or all of the following or other mechanisms:

- Effective use of the GIS information to inform decisions relating to works licences;
- Possible extension of spatial planning and preferential or exclusive use zones beyond those already established (e.g. Sullom Voe). Specific objectives would be developed in relation to any such zones;
- Improved guidance to actual and potential works licence applicants – for example in relation to siting, location, design, and consultation;
- Procedures and mechanisms to address the spatial and biosecurity issues associated with fish farming;
- Procedures and mechanisms to address the problems of “strategic” or pre-emptive works licence applications;
- A monitoring and reporting system to measure success in achieving objectives.

A set of three or more detailed *local area plans* will be developed relating to marine systems where competition for resource use already exists or where such competition is likely in the future. The local area plans will include all the basic elements described above for the Shetland wide plan, but would be more detailed, especially in relation to environmental capacity and spatial planning issues.

6 BUDGET AND FUNDING

6.1 Budget

Table 6.1 Shetland pilot budget summary

Year	Financial Year	Basic costs	Additional Costs*	Total
1	2005/2006 Q2,3,4	£ 29,938	£ 66,000	£95,938
2	2006/2007	£ 40,450	£ 46,000	£86,450
3	2007/2008	£ 40,250	£ 1,000	£41,250
4	2008/2009 Q1	£ 10,812	£ -	£10,812
TOTAL		£ 121,450	£ 113,000	£ 234,450

Year 1 – GIS set up and hydrography.

Year 2 – Socio-economic analysis, environmental management and environmental capacity study.

Year 3 – Community/ stakeholder participation ongoing as part of marine spatial plan development

Table 6.2 Core Annual Pilot Running costs (year 3 indicative)

	total
salary & overheads (25%)	£ 31,250
travel budget	£ 4,000
project promotion	£ 3,000
annual report (design and production)	£ 2,000
Total	£ 40,250

Notes:

North Atlantic Fisheries College will cover employer costs and services e.g. office, telephones, computers, NI contributions, pensions etc. valued at £11,650.

SIC Coastal Zone Manager will contribute 40% of his time which is valued at £15,000.

Table 6.3 Proposed Additional costs for Shetland pilot

	Activity	year 1	year 2	year 3	year 4
1	Develop GIS system	£20,000			
2	Hydrography and topography	£ 20,000			
3a	Location and value of fisheries resources				
3b	Location and value of aquaculture	£25,000	£ 5,000		
3c	Location and value of tourism				
3d	Sites and potential for renewable energy	for studies 3a to 3e	for studies 3a to 3e		
3e	Location and value of natural heritage				
4	Social and economic analysis		£10,000		
5	Environmental management and environmental capacity		£25,000		
6	Strategic analysis		£ 2,500		
7	Community/stakeholder participation	£ 1,000	£ 1,000	£ 1,000	
8	Plan production		£ 2,500		
	Total	£66,000	£46,000	£ 1,000	£ -
	Total support & consultancy costs			£113,000	

Note: Support costs are indicative and may be altered according to assessments of priority which will be an on-going adaptive process throughout project life.

6.2 Funding

A partnership approach to funding is being developed with The Scottish Executive, Shetland Islands Council and Scottish Natural Heritage already contributing funds. North Atlantic Fisheries College will contribute in-kind through hosting the project officer. The existing Shetland Islands Council (SIC) Coastal Zone Manager will give 40% of his time towards management and implementation of SSMEI. Additional funding is being sought from LEADER+ and the Crown Estate.

The Shetland Fishermen's Association has already offered support in kind, particularly on investigations of the distribution and value of fisheries resources. It is anticipated that if the project is to be genuinely balanced and integrated it is important that financial support is drawn from a wide spectrum of stakeholders, including commercial interests, and efforts are on-going to secure this.

7 DELIVERABLES AND MANAGEMENT

7.1 Deliverables

The main outputs from the SSMEI Shetland Pilot will be a comprehensive overarching marine management plan for Shetland supported by a marine GIS. Furthermore a set of three or more detailed local plans will be produced relating to marine systems where competition for resources exists. These will contribute to an improved decision support system for planners, marine stakeholders and the local community. The project will involve strategic analysis of existing marine activities and provide a better understanding of environmental capacity, spatial planning issues, current pressures and how the marine environment can be managed in the future.

7.2 Milestones and schedule

Table 7.1 Shetland SSMEI Pilot milestones

	Activity	Milestone	Month
1	Set up GIS system	fully functional GIS set up for expected information and analysis	1-3
2	Hydrography and topography	report, and assimilation in GIS	2-10
3a	Location and value of fisheries resources*	report, and assimilation in GIS	4-10
3b	Location and value of aquaculture*	report, and assimilation in GIS	4-10
3c	Location and value of tourism*	report, and assimilation in GIS	4-10
3d	Sites and potential for renewable energy*	report, and assimilation in GIS	4-10
3e	Location and value of natural heritage*	report, and assimilation in GIS	4-10
4	Social and economic analysis*	report, and assimilation in GIS	4-10
5	Environmental management and environmental capacity	report, and assimilation in GIS	10-16
6	Strategic analysis and finalisation of plan	report, and assimilation in GIS	16-24
7	Community/stakeholder participation	workshops; report, and assimilation in GIS	0-36
8	Implementation and refinement of plan	plans complete	16-36 and beyond

7.3 Project monitoring

The monitoring and evaluation of the SSMEI projects including the individual pilots are discussed in more detail in the overarching SSMEI project report. Evaluating the success of the project team in the tasks outlined can be determined to an extent by the quality of the outputs themselves. There will also be opportunities to assess the efficacy of promotional campaigns through measuring levels of awareness of the project and fund-raising through additional funding contributions. These will also be dependant upon the quality and usefulness of the material emanating from the project, suggesting good management of any commissioned work will be essential.

It is proposed that the milestones presented in table 7 will contribute to monitoring the progress of the SSMEI project. The project team will report to the Steering Group meetings with regular update reports which will be disseminated through to a local community level by various media e.g. newsletters, website news etc.

7.4 Future strategy

The SSMEI project is for three years with the Scottish Executive interested in a partnership approach and a desire to see pilots continuing in a self sustaining manner after this time. The project manager and partners recognise the strategic significance of the project at a national and Shetland level and whilst no guarantees can be made at this stage there is a desire amongst partners that resources can be sourced to sustain the project after the initial three year period of the pilot as the sustainable management of the marine environment is essential to Shetland's long-term future.

7.5 Challenges for implementation

The proposal as presented in this report is more ambitious in its objectives than existing Shetland Islands Council initiatives to develop a marine management plan. Despite best efforts, a lack of resources and strategic direction has hindered the current effort. It is anticipated that the extra momentum generated by participation in SSMEI will serve to overcome these constraints and generate a high quality plan and improved management procedures.

Given the scope of integrated marine planning, a key challenge for the project will be to ensure that information collection is efficiently targeted, and that information is well used in decision making. This has been a major weakness in most previous coastal and marine management projects, where the emphasis on high quality information has not been balanced by the development of effective decision making mechanisms which can draw on and use such information to generate better and more strategic development and management decisions.

There are significant legal limitations to the changes that might be introduced in relation to expressions of interest or pre-consultations for works licence applications; and the related issue of "strategic applications" will be difficult to address.

While there is widespread demand for better information on the location and value of different resources and associated economic activity – to inform decision making relating to marine development and management issues - there is a good deal of

caution amongst most stakeholders about the use of such information to identify preferential use zones.

Cost is seen as a major constraint to generating information adequate to develop robust marine policy and strategy. Information collection must therefore be highly focused and efficient. There is also significant opportunity to draw on and synthesise the knowledge of stakeholders themselves.

As marine resource management in Scotland gathers pace through various initiatives an opportunity exists for Shetland with its unique marine resource and current marine stewardship mechanisms to make a significant contribution to policy formulation at a national level. The project will not only seek to meet short to medium term objectives, but attempt to go further where it is hoped that it will become self sustaining in the longer term. The project team will address this issue over the duration of the project.