Fish Quality in the Western Isles: The Influence of Shore Facilities

Consultancy Report No. 51

May 1992

SEA FISH INDUSTRY AUTHORITY

Seafish Technology

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SUMMARY

This contract study was undertaken on behalf of Highlands and Islands Enterprise. The aim of which was to determine whether and how the adequacy of shore facilities in the Western Isles was influencing the quality of fish and shellfish landings.

The Seafish consultants undertook extensive field visits and interviewed all sections of the industry to discover their perceived needs. The value of and trends in landings were also assessed as a means of justifying the recommendations.

Around two thirds of the registered fleet are inshore vessels of less than 9m in length. These vessels are very restricted in their area of operation and both from a safety point of view and to land their catch will need small but adequate facilities.

The peripheral nature of the fishery in the context of UK supplies as a whole and the limited demand within the Western Isles for raw material creates special disadvantages for the fishery. Transportation of the catch to the mainland is very dependent on ferry sailings and interruptions by bad weather.

Maintaining the quality of the product is therefore crucial if the economy is to be built up and maintained.

Facilities were found to be lacking in a number of respects that affected this important factor of quality. The most important of these were the tidal restrictions at many landing places and a general shortage of ice.

A series of recommendations were made to reduce these shortcomings. Wherever possible a strategic approach was taken to ensure the most effective use of resources. The close involvement of the fishing industry was also recommended wherever improvements were suggested.

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1. INTRODUCTION AND AIMS

This study was funded by Highlands & Islands Enterprise, and the main aim was to assess whether the current shore facilities and their location in the Western Isles were adversely affecting fish quality.

The work originated from three needs:

1. to maximise the returns from fish landed in the Western Isles by reducing quality loss;

2. to update an earlier Seafish Report on the brown crab fishery which recommended a range of infrastructural improvements; and

3. to prioritise improvement work for future consideration by Highlands & Islands Enterprise.

The formal contract details are contained in Appendix 1.

2. THE APPROACH

The study was undertaken by a series of site visits to nearly all the landing places in the Western Isles; interviews with fishermen, buyers and processors; and public meetings. The need was to obtain information about infrastructural problems that were perceived to be affecting quality. The difficulty of isolating these from the many other points that were raised by users is discussed at some length in the following sections. The assistance of all those who helped by providing information or otherwise giving their time is gratefully acknowledged.

The range of species landed and their distribution routes through the Islands and to the mainland were also investigated along with the product forms and their respective vulnerability to delays in transit.

The value of landings at various points was estimated as well as the disposition of the fleet and its seasonal variations. Some information was also gathered on the likely future trends of landings. Data on the value of landings was also taken from the Scottish Sea Fisheries Statistical Tables and from the Fishery Officer in Stornoway. Where data is presented in this report, its sources is identified as "estimated" or "SOAFD".

From all this a strategic view of needs was developed which enabled judgements to be made on the quality-related needs of each area.

The consultants have drawn upon their own knowledge of the Western Isles and their experience of the general development needs of inshore fisheries. The next section provides some of the background information which helps to put the study in context.

3. BACKGROUND AND DESCRIPTION OF NEEDS

3.1 Introduction and Interpretation of the Brief

This section gives an overview of the fishing industry in the Islands and then describes in detail the particular factors that should be taken into account when assessing the area's needs. First though there is a need to look more closely at the concept of 'quality' and to review how land-based infrastructure can influence it in its many forms.

The first distinction to be drawn is in the needs of the two broad product categories: live animals and dead animal products. The former is usually a sensitive organism dependent upon environmental conditions to enable it to stay alive. Its intrinsic quality as a live animal obviously becomes zero when it dies.

Fish products on the other hand, unless properly deep-frozen, are inexorably losing quality from the point of landing aboard a boat. The timescale is short, usually 10 days or so, to the point at which quality is totally compromised by spoilage. Time combined with storage conditions especially temperature are the main factors affecting the rate of spoilage, but the quality of first handling and gutting (where practised) are also important.

The ways in which fishermen's actions and the facilities available to them can influence these processes are described in Table 1 at the end of this report. It was thought important to elucidate them in some detail because they provide the justification for the Consultants' judgements as to what should be considered by this study. To some extent they define the boundaries of the work but with one important exception. The need for this work is basically that of maximising the financial returns from the available resources; where quality is compromised, returns are reduced. However, where the opportunities to exploit resources at all are also compromised by lack of infrastructure, the arguments for better provisions are greatly strengthened. Quality cannot be maintained in a product that is not available.

3.2 Historical and Geographical Considerations

Previous studies of the Western Isles fisheries have included a review of the Brown Crab fishery and its prospects for development. This work was carried out on behalf of the Islands' Council in 1989 and some of the data from it is still relevant and is used in this study. Changes in the land-based facilities were occurring during that period however and have now largely been completed and new fisheries have also developed, most notably a revival of longlining mainly for dogfish. The range of species landed and the variations in their weight and value are shown in Table 2.

The economy of the Islands relies heavily on efficient transport links with the mainland and the subject matter of this report is bound inextricably with the fishing industry's dependence on the Ro-Ro ferry system.

Around two thirds of the local registered fleet are of less than 9m in length. This characteristic introduces a series of difficulties. The fleet is severely limited in range because of weather or tidal conditions, or a combination of these, and the vessels generally have to have a base which is within about an hour's steam of their fishing grounds. This limitation is important, though often not appreciated, and gives rise to a real need for a great number of small scale landing places. Details of the local fleet are given in Table 3 which shows numbers of vessels by size, range and main fishing method.

The existence of such a scheme of things, therefore, raises its own singular problems which are now also compounded by the recently announced changes to the licensing regime. Small vessels are relatively inflexible when, for example, the requirement arises to carry boxes for the catch or ice to conserve quality, but there is no longer the freedom to graduate to a larger class of vessel. The implications of converting the fleet and its infrastructure to, say, 15m class operations are such that it is effectively inconceivable. The size profile and associated problems of the fleet are what must be worked with.

The catch from the Outer Hebrides is one of the very few in North Western Europe which can claim the natural advantage of coming from virtually pollution-free waters. One of the main challenges to this advantage is the sheer logistical problem of delivery to the centres of demand. Small scale fisheries are always at a relative disadvantage because of the dispersed nature of the supply base but when remote location is added to the vagueries of weather and the absolute need to meet scheduled ferry sailings, the size of the challenge can be appreciated.

These factors add a further dimension to the infrastructural needs of the small-scale fisheries sector. Whereas on the mainland fishermen can accept that tidal landing places may be inaccessible at certain times, on the Islands the matter becomes critical. A network of vans, light trucks and lorries is tightly scheduled to connect with ferries and mainland transport links. If the tides are at the 'wrong' time for prompt collection there are two main options: land early and watch quality suffer as the consignment awaits collection; or miss the market. In other remote areas buffer storage facilities - for the catch, ice and bait - are desirable for the success of a fishery. In the Western Isles they should be considered essential, with the availability of ice assuming particular importance. Onshore live shellfish holding facilities are in a similar category; they can remove vulnerability to tidal and other factors and have the added advantage of reducing the need for high specification landing places.

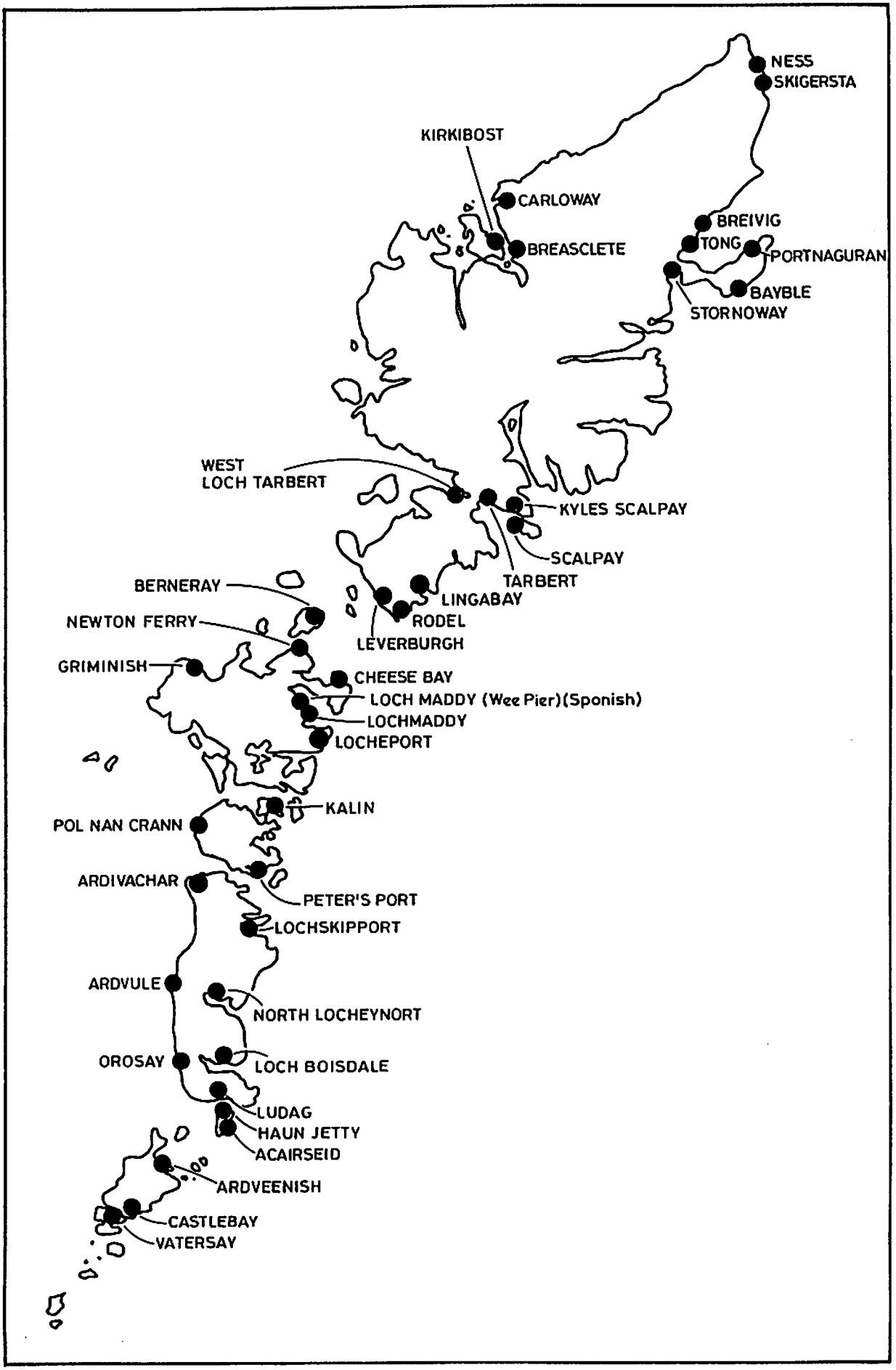
The fleet then is likely to remain more or less as it is for the foreseeable future and with it will remain the problems of scale and location that have been described. That is one of the starting points for this report and leads to the various observations and conclusions that are made. In the following section estimates are made of the value of the landings to the more important slips and harbours. It is against the background described above, and the estimated value of the catch, that decisions will have to be taken as to the cost-effectiveness of improving facilities.

4. RESULTS OF FIELD WORK

This section is presented in tabulated form for convenience.

Starting with Barra and working northwards through the Islands, the landing places are described and comments are made. Photographs of many of the landings and harbours are presented at the end of this report and follow the same order.

It is worth noting that new Guidelines produced by Seafish to help the fishing industry meet the EC Fish Hygiene Directive place emphasis on the importance of full tidal access, especially in remote areas, to avoid delays and subsequent quality loss.



Landing Places, Western Isles Fig.1

Location	Useage (Boats)		Estimated Value of Landings	Observations	Further Comments
	Summer	Winter			
BARRA Ardveenish	20>9m 3<9m	20>9m 3<9m	~£1.5m	Pier and ice plant owned by WIIC. Barratlantic almost exclusive buyers. Mr. Eddie McNeil has limited live holding capacity but throughput believed to be declining. Ice production inadequate in Summer. Water supply primitive and inadequate. Road access poor. Larger boats are mostly strangers, small boats work local grounds and need use of small slip. No resident Harbour Master on Barra, occasional visits only. Inadequate pier frontage for lay-by and can be very congested in busy periods. Sea water quality is good.	Leasing of pier to Barratlantic should be considered as an option providing that the small creel boats retain use of facilities. This could give Barratlantic responsibility for improving water supply and road access. Increased frontage could be provided by extending the existing pier over the small boat slipway, but retaining berthage for small boats. There is a risk that the main west coast harbours could become preferred landing places if conditions do not improve.
Castlebay	Occasional and variable. ~25 boats creeling from either Castlebay or Vatersay causeway.		Total minimum of £500k.	Dedicated ferry terminal but some local and stranger boats use east face of pier if needing onward ferry transport. Pier has been used to suspend codends as crab keeps. Seawater quality is good.	
Vatersay causeway			£500k ?, but see above.	Slips newly built east and west of causeway enjoying increasing use of creel fleet. Slips have sharp edges which cause some boats difficulty and minor damage. East side slip is useful and sheltered for winter use; west side slip is convenient for summer fishing. Both have good mooring areas. Industrial units are to be installed on adjacent land and three phase power is available. Fishermen are keen to set up a communal live holding facility, chill store for dogfish and coldstore for bulk bait. Sea water quality is very good.	Fendering is required. This site should be developed as the main base for creel fishing. WIE should assist local to draw up business and management plans for the facilities noted and examine funding options. 25 boats could eventually be based here and landings would total at least £1m.
ERISKAY Acarseid			See entry under Ludag	Fine natural harbour offering good depth to pier at all states of the tide. Serves local fleet of prawn/fish trawlers and creel boats but all catches have to be landed to Ludag for onward transport. No facilities available; ice has to be obtained from Barra or S. Uist.	Could make a good base for larger vessels but this would be largely dependent on whether the proposed causeway is built.

TABULATED RESULTS OF FIELD SURVEY

Location	Useage (Boats)		Estimated Value of Landings	Observations	Further Comments
	Summer	Winter			
SOUTH UIST					
Ludag	6 local 10 visitors	6 local 10 visitors	>£500k	Natural harbour but severely limited by tides. Exposed seaward landing since removal of offshore reef to convenience ferry. Important landing place for both local boats and those from Eriskay. Kilbride Shellfish [local co-op] has started construction of land-based live holding facilities and bait store.	There would be justification for expenditure on a rock pile breakwater at Ludag on the basis of present usage. However an alternative solution could be provided if a causeway wre built to Eriskay. Then the natural harbour on that Island could conveniently serve the Ludag area.
Orosay	9	0	>£500k almost exclusively live shellfish	Summer landing place, season varies with weather but can be April-October (6 months). Major problem with tidal access; jetty only available for 6 hours over high tide but during this time access to S. Uist, via causeway, is flooded. In warm months this delay between berthing and landing to onward transport results directly in high mortality of crustacea for vivier trade. Direct buyer (R. Johnstone) claims peak seasonal landings of £1m and confirms extreme difficulty of gaining access to jetty because of stone/sand deposition on causeway. Fishing grounds are ½ - 1½ hours steam, sea water quality excellent.	One of the most important summer landing points in the Southern Isles. The tidal strand causeway will always be vulnerable to inundation except at very high cost. This would be difficult to justify. Jetty extension or bouyant landing would be cheap and cost effective. Use of JCB - type digger for 4-6 days/year would keep causeway clear of deposition.
Lochboisdale	9+3 fish farm boats		>£150k and projected £200k salmon in 1992. Reduced use in Summer.	Dedicated fish quay and ferry pier. Fish quay is claimed unusable for about 3 hours each side of low water and exposed to SE. Fish boxes and keeps can be landed - though often with great difficulty. 200t salmon expected during 1992, typically in 500kg tubs. Tidal problems can result in delays of up to 4 hours in landing at times when it is not practicable to reschedule landings. Ice is still available from Monach plant but, at time of visiting, not at weekends. Prawns were inspected which were being stored in the back of a van for 2 days uniced leading to severe quality loss. Ferry pier can be used but, with no lifting gear aboard or ashore, is only feasible at high tide. This can relieve congestion at fish quay. NE side of ferry pier is usually occupied by MOD range patrol boats.	Provision of one or preferably, two small powered derricks would remove much of the difficulty, especially with salmon tubs. Availability of ice is essential. If Monach plant cannot be a reliable source of supply then consideration should be given to providing or assisting provision of a small ice plant.
Ardvule	4	0	~£150k	Concrete slip which is of inadequate length and deteriorating to the point where fishermen have reverted to using the beach. Position is relatively well sheltered from west by a reef and very close to fishing grounds. At low tide the catch has to be dragged or carried up to 70m to the MOD - owned access track over a final barrier of stones and sand. Land is all owned by MOD but they co-operate with fishermen's needs. Landing delays and conditions will cause stress to live shellfish.	Minor landing place but very close to grounds and with relatively high landed value. Either repairs and extension to jetty or access ramp to beach would significantly reduce stress to live catch.

Location	Useage (Boats)		Estimated Value of Landings	Observations	Further Comments
	Summer	Winter			
Ardivachar	3+ odd visitors	0	~£75k	Natural anchorage sheltered from south and west. Shallow bay with no facilities at all. Very close to grounds and currently used as beach landing.	Any development would require ~100m access road and long jetty to reach adequate water depth. Difficult to justify.
BENBECULA					
Petersport	8-9	8-9	>£500k	Recently built concrete slip in mainly sheltered bay. The slip is approximately 6 meteres too short to allow full tidal access. Low water commonly coincides with scheduled collection time for live crustaceans. In these circumstances it actually forms a barrier to landing about 1.5m high (see photograph no. 1). Ladder requires resiting as it does not extend to low water level because of a rock outcrop. This is an important landing place for velvet and brown crab, lobster, prawns, seaweed and salmon. No facilities available and road access is poor, limited to short rigid vehicles. Improved facilities could result in increased usage possibly relieving congestion at Kallin. Seawater quality good.	
Pol Nan Crann	9	0	~£500k	Exposed though substantial concrete jetty which is both too short and too low. This leads to problems at both low and high tide. It is awash shortly after ½ tide and therefore suffers badly from weed fouling. Fendering is poor giving rise to risk of damage to boats. Is used to maximum capacity during summer months - can become very congested. All shellfish species landed plus quite high volumes of dogfish: up to 10 tonnes/day. Rapid initial spoilage aboard boats [inadequate ice-carrying capacity] is exacerbated by having to split bulk landings because of tidal problems. Rubble in east corner constrains use by limiting mooring space. No power or other facilities. Seawater quality excellent. Access road can be badly obstructed by deposition of large amounts of kelp.	An important landing place where quality is clearly compromised by delays caused by tidal conditions. Clearing east corner of rubble would increase mooring capacity and enable slip to be built on eastern face to ease low tide problems. High water inundation would require surface to be raised by 1-2 metres. Prompt clearance of access road needs to be assured.

Location	Useage (Boats)		Estimated Value of Landings	Observations	Further Comments
	Summer	Winter			
BENBECULA (cont)					
Kallin	8	15-16	>£750k	Modern concrete box harbour with capacity for about 15 x 10m boats. Larger boats now also use the harbour and it is very badly congested. Good facilities available: water, fuel, cold storage, parking etc but limited ice supply from Monach plant. Kallin is base for North Uist Fish Marketing Limited who own a 7.5t gvw truck. They find extreme difficulty in arranging transport off the Islands because of the variable volume and needs of their products. Nearby are extensive live holding ponds which are leased out. One individual also has lobster/crawfish holding facilities at Kallin. Major problems here relate to congestion and the delays that this can cause both on sailing and on trying to land the catch. Kallin is some 3 hours' steam from the west side grounds via the Sound of Harris but smaller boats can steam under the causeway to reach the same grounds in about 2 hours.	Several options are available to reduce the chronic overcrowding at Kallin. The fishermen would like to see a new breakwater built outside the existing harbour with berthage on the outer (north) side of the existing harbour wall. As noted elsewhere there is also the potential to divert existing and prospective users by improving facilities at other nearby landing places.
NORTH UIST					
Locheport	6-10	6-10	~£200k projected for 1993	Good sheltered loch anchorage where boats currently land across beach to Sidinish. An expanding salmon farm is located across the loch which also uses this landing place. The situation is attractive, being only 45 minutes steam from fishing grounds. Seawater quality is fair to good. Shellfish keeps are operated successfully.	Development would require an access road of about 400m across a croft, and either a pier or a floating pontoon. Given the sheltered location the latter would be adequate and Locheport could take some of the overspill from Kallin.
Lochmaddy (ferry pier)	?	?		Little used by fishing boats because of the ferry usage and type of construction. Cargo vesels also use the other side of the pier. Yachting steps are available but infrequently used.	
Lochmaddy (wee pier)	9	12	~£500k	An old stone pier built for cargo schooners which dries at low water and can be awash at high water springs when fishermen land to the adjacent beach. Existing arrangements result in congestion and delays. The Wee Pier, like several others, is used by boats from Sound of Harris on a seasonal basis. Seawater quality is good.	An important landing place already, the site would lend itself well to development. A rock outcrop could easily form the base for a jetty and for ample car parking and storage. Ground mooring chains would be a most useful provision.

Location	Useage (Boats)		Estimated Value of Landings	Observations	Further Comments
	Summer	Winter			
NORTH UIST (cont) Lochmaddy (Sponish)				A modern pier built for the alginate industry some 30 years ago. The pier and adjacent factory have been leased to the Lees Group (Scotland) Limited but, at the time of writing, receivers are operating that company. The pier is in a sheltered bay area near Lochmaddy, is close to the Sound of Harris and owned by N. Uist Estates. All facilities are available including a very extensive and almost completed live holding complex with capacity for about 12 tonnes each of crab and lobster. Road access is poor being about 3 miles of rough track. Water quality is good but some dredging would be required to accommodate larger vessels at all stages of the tide.	Although not currently used by fishing vessels this is a prime site requiring only relatively minor works. It should be considered as a candidate for fisheries use in the context of the needs of northern North Uist.
Cheese Bay	5+3 visitors	5+3 visitors	>£100k	This slip is at the south eastern end of the Sound of Harris and serves a few local boats of 20-26' plus visitors from South Harris. It is similar to the slip at Petersport and is about 6m too short for low water access. It effectively becomes a barrier causing inconvenience and delays. Access is single track but good standard, gear storage, parking etc are available and water quality is good. This slip is about 1½ hours steam from the nearest west side grounds hence users are not interested in developments at Griminish.	Full upgrading would involve extension of the slip across to the breakwater and of the breakwater itself. A more modest measure would be to provide low water access to land via concrete steps.
Griminish	16	0	>£500k	Pier built in 1986 in sheltered location in NW North Uist. Well sited for west side grounds and used by the three larger vivier boats plus several others. All facilities are available except ice and large areas are available for parking, gear storage etc. There are presently problems with the structure of the pier and these are being actively addressed. When remedial work is completed it will be possible to safely dredge to an adequate depth for the larger boats to come alongside at all states of the tide. The existing depth leads to delays in landing the live shellfish catch and a consequent loss in quality.	Completion of ongoing work plus dredging would make this a most useful base for west side operations.
Berneray	5	5	~£100k ?	A good modern box harbour with capacity for up to 25 boats. Currently underutilised, partly as a result of a decline in fishing operations on the island. Previously very busy as a prawn fishing base the local fleet now concentrates on single-handed fishing for velvet crab. All facilities available except ice which is not presently needed.	If the proposed causeway were built then Berneray could become an important base for exploiting stocks inthe Sound of Harris and on the west side grounds. These factors need to be taken into account when deciding the priority to be given to other improvements to the north and west of the Uists.

Location	Useage (Boats)		Estimated Value of Landings	Observations	Further Comments
	Summer	Winter			
HARRIS					
Leverburgh	16	16	~£500K	Busy landing pier also used by N. Uist/Berneray ferry. Demand has led to priority listing for improvements. All facilities are available except for ice which is needed for the increasing catch of dogfish. Local fishermen have invested in their own 40' chilled container store and WIE have recently built new industrial units near the pier. Depth and water quality both cause problems with landing and holding live shellfish and with landing dogfish. Local depopulation is causing problems obtaining crew for some boats. Leverburgh is rather exposed to the SW which causes boats to use Rodel at certain times.	Scheduled improvements include new piling alongside E slip and platform to allow boats to land at all states of the tide. The relative importance of this area would be increased by the proposed new vehicle ferry service between Harris and N. Uist.
Rodel	2	2+		Some 2¼ miles east of Leverburgh, Rodel offers advantages of full shelter and very good water quality for keeps. The harbour is part of an old herring curing complex and is owned by Harris Estates. It offers good possibilities as a fishing harbour if dredging and infill of a gap in protective rocks were undertaken.	With modest improvement this could become a safe lay-by and keep pot location for the Leverburgh fleet.
Lingabay	3	3		A sheltered harbour which offers deep water access. The area is owned by Harris Estates and is planned to become a major freight terminal for the adjacent quarry. Fishing use will then cease. Existing road access is rudimentary.	
LEWIS					
Kirkibost	15	15	>£500k	A busy pier serving Gt. Bernera and the factory of Hebridean Shellfish Limited. Two plants employ ~ 70 people and are currently being upgraded. All facilities are available but the freshwater supply is inadequate leading to intermittent problems with processing and ice production. The power supply is also only marginally adequate.	Anticipated increased processing throughput will put great strain on mains services. This could well become critical where mussels are subject to a strict time/temperature regime. Interruption of supply would result insubstantial quality losses.
Breasclete	37	27		Substantial pier is used as a lay-by facility for large boats including strangers. Good deep water moorings. All services available except ice. Pier is too far up Loch Roag to be used by smaller boats.	
Carloway	3	3		Good modern pier with general processing plant adjacent. Pier is marginally too short to allow landing at all states of tide. Good sheltered mooring.	Limited use and expense of extension make improvements of dubious benefit. No great impact on quality would be anticipated.

Location	Useage (Boats)		Estimated Value of Landings	Observations	Further Comments
	Summer	Winter			
Port of Ness				Old cargo harbour now badly deteriorating and silted up. Very limited use because of access problems.	Would appear to offer a safe base or refuge for boats working to north and east of Lewis but the costs of improvement would need to be carefully considered.
Stornoway	>40	>40	£2.5m	Large harbour with all facilities available. Problems identified include: • old inadequate ice plant which also has contamination problem with water supply; • processing plant owned by Co-op is badly sub-standard and cannot be used (adjacent cold store is however active); • poor seawater quality and badly designed keep cages lead to mortality of live shellfish; • landing live shellfish from keeps causes delays and further stress; • high cost of developing efficient transport links to Ullapool and inadequate ferry sailings; • Stornoway Co-op is finding difficulty in devising an effective marketing strategy, and is presently reliant upon a third party.	There are unused live holding facilities on Goat Island that could be refurbished and leased to the local buyer. Fishermen would be keen to run their own land-based live holding tanks. A new ice plant is required. Processing facilities are needed that conform to new requirements. The shell of the existing plant could be retained and a number of units installed inside it. A box pool run by an external company could help resolve the problems of box supply. Transport and the links to the mainland deserve an intensive study. There may be potential for assistance to upgrade the local vehicle fleet.

5. DISCUSSION

In the previous section a range of needs was identified for the landing places described. In this section there is consideration of the broad strategic needs of the Islands and discussion of the specific needs of individual landing places and groups of these. Although somewhat outwith the scope of the study it is also worth considering how some of the existing needs have come about. In this way some guidance can be offered which will help prevent similar situations arising in the future.

5.1 The Problems Identified

List One	List Two
Tidal restrictions on landing	Road access
Live holding facilities	Lifting gear
Ice supply	Transport development
Mains services	Ferry services

List One problems are those which are currently having a direct and, in some cases, critical impact on quality. List Two problems are less severe; at best they exacerbate quality loss through minor delays and inconvenience, but at worst they too can have a substantial impact.

Throughout the Islands the local economies are largely dependent upon fishing. Looking objectively at the utility of the existing array of small jetties and slips, however, facilities are poor, especially in the southern isles. Given that most of these have been constructed in the last ten years it is disappointing that they represent little improvement over the previous beach landing arrangements.

There are several reasons for this state of affairs. The more important seem to be:

- a failure to appreciate the potential volume and value of landings at these slips;
- cash limits applied to the costs of individual projects;
- failure to appreciate the need for full tidal access that arises because of the distribution logistics; and
- poorly specified and executed work

The dramatic growth in live shellfish exports and the recent development of the dogfish fishery have also introduced new needs that could not have been anticipated when requirements were previously identified. These centre around the tight scheduling of collections to connect with ferries and the bulk and rapid spoilage of dogfish landings (see Table 5).

Similar problems are now arising with the trade in chilled prawns. Demand and price are critically dependent upon the maintenance of quality which can only be achieved by efficient transport links. The shelf life of chilled prawns even in the best of circumstances is limited to about 6 days. The product from the Western Isles finds a ready market because it is invariably from day boats and size grades are generally good. The cost penalty of the ferry links can be borne but the frequency and timing of services are a greater problem. In Summer, when ambient conditions affect quality more severely, freight availability can be a significant problem on the main routes.

Ice supply is now also becoming critical in most areas where it is needed. At Ardveenish capacity is inadequate during the Summer months, availability is now limited from the Monach plant which effectively serves all the Uists and its future is uncertain. The Stornoway ice plant is archaic and has water supply problems, and at Kirkibost both mains water supply and power limitations are likely to compromise production.

The salmon industry has its own problems too. Strength of world supply has put a premium on quality. Whilst this species does not spoil particularly quickly, any spoilage may be enough to deter customers, including those who are adding value locally. Many of these are supplying major multiple outlets which are increasingly examining quality control throughout the distribution system. Prompt landing and adequate icing are becoming more and more important to this sector.

5.2 Strategic Considerations

5.2.1. The Southern Isles

In the broadest terms, need for improved facilities is greater in the southern isles than in Lewis and Harris. A brief examination of the relative value of landings in these two areas shows that this should not now be the case but, in mitigation, the patterns and types of fishing have changed substantially over the last decade. This is shown in Tables 4 and 5. When examined in conjuction with Table 2 it is apparent that the closure of the fish meal plant in Stornoway and the decline in cod and haddock stocks have been major factors in this change.

In the southern isles, but excluding Kallin and northern North Uist the situation seems quite clear. The landing places and shore facilities are inadequate and are compromising quality. There is an inarguable case for modest upgrading to allow full tidal access and a good case to be made for more comprehensive improvements. It is estimated that at points like Orosay and Pol nan crann at least 5% of the potential value of the catch can be lost through the difficulties of landing[1]. On this basis, and bearing in mind the points made in Section 3.2 about the small scale sector, improvements should be made at:

Vatersay	Ardvule
Ludag	Pol nan crann
Lochboisdale	Petersport
Orosay	

Kallin is a special case given the inflexibility of the box harbour construction and the high costs of new work. Some solution must be found to the chronic congestion, however, and recommendations are made in Section 7 as to how this could be achieved.

Northern North Uist present particular problems from a strategic point of view. These are introduced by the proposals for a causeway to Berneray, which could bring that underused harbour into more general use, and the option of leasing the very good facilities at Sponish which include an impressive live holding establishment. It would also be possible to relocate the hardware from Sponish. Some choices need to made in order to prioritise developments at the Wee Pier, Sponish, Berneray and Griminish but at the time of writing there is not enough information available to do this. The recommendations for this area are less specific than for other parts of the Islands.

Consideration was also given to the arguments for a major facility on the west side of the Uists. In the consultants' view this would be impossible to justify on the grounds of quality and makes little sense in other respects either. The needs of this area are predominantly those of the small boat sector. One major harbour would be of little use to them because of their restricted range. The grounds are unsuitable for trawling so it would be of no advantage to the existing fleet at Stornoway. Winter weather, which causes a ground swell

[1] Based on Seafish experience of the mortality implications of handling problems and discussions with buyers

down to about 20-25 fathoms means that the creeling season could not be extended. This leaves longlining by large vessels that can work safely through the winter months. No such vessels exist in the Islands and it seems most likely that usage would be limited to French and Spanish liners. These large vessels are just as likely to use one of the upgraded West Coast mainland harbours in order to by pass the inter island ferry services or existing harbours such as Castlebay.

5.2.2. Harris and Lewis

It is assumed that the scheduled improvements at Leverburgh will go ahead. These are welcome but this location suffers from exposure to the prevailing winds and poor water quality for holding live shellfish. Both these needs would be met by modest improvements at Rodel assuming satisfactory terms could be agreed with the owners of the Harris Estate. Such developments at Rodel would solve the problems of water quality and access to keeps which occur at Leverburgh.

The situation of Scalpay is problematic. The island itself enjoys quite reasonable landing facilities but access to Harris can only be via the Kyles Scalpay ferry jetty or Tarbert. The ferry jetty is far from ideal for fish landings and fish farm tenders tend to monopolise the available space at Tarbert.

The Loch Roag area is quite well provided for in terms of landing places and shore facilities, but the adequacy of mains services is becoming a major concern. The development of sophisticated and highly quality-orientated processing at Kirkibost will be critically dependent upon these services but upgrading them would appear to have very substantial cost implications. It has been suggested that a new water main would be required for the Island of Bernera.

Stornoway is undergoing a period of great change. The traditional fleet, represented in the main by Stornoway Fishermen's Co-operative, is in decline with ageing vessels and reduced opportunities on their habitual fishing grounds. The infrastructure that has served this sector is nearing the end of its useful life.

Nevertheless, local trawlers still land some £1.3m value of prawns annually. In contrast, the creel fleet enjoys virtually no dedicated facilities and is unable to capitalise fully on the potential of its resource base.

There is obviously a requirement to redress this situation and re-equip the harbour with a range of facilities that more appropriately serve the needs of the current profile of users.

The situation is complicated by a number of factors. The Fishermen's Co-op has lost its processing capability because their building is deemed unfit for food purposes, yet to upgrade it as it stands would cost an estimated £750k. This changed product profile has also coincided with the loss of marketing expertise within the organisation to the extent that selling now appears to be very much an **ad hoc** affair. A number of stories circulate within the trade relating to value being lost because product is out of specification or has undergone unnecessary cold storage. Policy decisions by this organisation regarding its future infrastructural needs must take into account market needs and likely trends. This in turn may require access to some external source of expertise rather than relying on in-house knowledge.

Live holding in Stornoway harbour has been plagued with problems caused by inflows of fresh water, the poor design of keep cages, and the difficulty in handling and landing them. Within the immediate area consistent water quality is available only on Goat Island but the live holding ponds there are unused, of limited capacity and in poor condition. Space is at a premium on Goat Island. Given the concentration of creel boats whose catches pass through Stornoway, the crab processing there and the ferry links, this is the natural location for live holding. A relatively small survey would reveal both the position and states of tide during which it would be possible to pump good quality seawater from the harbour and also when this would not be advisable. It would be possible, therefore, to build a semi-recirculating system at Stornoway to accommodate the bulk of landings from the area.

A further factor is the proposal for a box harbour to be built at Breivig. After much thought the consultants concluded that there was no justification for this proposal on the basis of live shellfish quality. There may be virtue in the other arguments put forward but they are complex and outwith the brief of this study.

5.3 Funding and Management Considerations

Funding of improvements and the management of the improved facilities may be quite closely linked in a number of instances. This is likely to be the case where, for example, communal live holding or bait storage facilities are developed and where their success may depend upon the co-operation of the users.

The types of improvements discussed so far may be split into three categories:

- those that are clearly the responsibility of the Local Authority or some other public sector agency or utility company. These would include, for example, the structures of piers and jetties, water supply and ferry services;

- those that may attract a large proportion of public sector funding such as ice plants or live holding units; and

- those that are primarily the responsibility of individuals, groups or companies but which may qualify for some public sector grant or loan assistance.

From discussions with fishermen during the study and on many other occasions it is clear that there is a perception that if the case is made for better facilities then they should all be provided from public funds. This perception may be neither realistic nor the most effective long-term solution to the problem as there are many examples where a lack of commitment by the client group has led to facilities falling into disuse.

It is true that historically there has been an undervaluing of the contribution that creel fishing makes to many areas and that this may have been the reason for the low level of provision for this sector. It is possible however to see a number of instances where groups have been formed and have taken the initiative in providing for their own needs. In these circumstances the solutions are the fishermen's own, and their belief in the solutions is demonstrated by the commitment of their own money to them. The user groups at Ludag and Leverburgh are good examples of this approach and they seem to conform rather well to the ideas underlying the Local Enterprise Company concept.

If landed values are as high as fishermen and buyers claim then there seems no reason why some of that income should not be invested in their own infrastructural needs. Formalising the industry commitment in this way

provides a firm basis for reaching a realistic arrangement for managing facilities. In the case of communal live holding units, for example, this would focus attention on the practical problems of allocating responsibility for management and for care of the catch including its ownership and disposal.

In a number of instances during the study fishermen expressed an interest in this sort of approach and it is suggested that an early part of implementing the recommendations of the report should involve discussions between fishermen and Western Isles Enterprise. Some funding could also be sought from the Dti Enterprise Initiative.

6. CONCLUSIONS

The level and location of shore based facilities in the Western Isles were investigated in order to determine how best to minimise the quality loss in fish landed to them.

The Western Isles were found to have special problems in the landing and distribution of fresh fish and shellfish to the mainland which necessitate innovative solutions if quality of the product is to be ensured.

The needs of the islands are predominently harbours and landing places to serve the small boat section. By definition these can only be modest and not unduly sophisticated. There must however be means by which the catch can be properly handled.

The current fleet is dominated by vessels under 9m and very few vessels over 15m. The licence shceme and capacity aggregation limitations are such that no major change in fleet structure is likely.

A series of recommendations have been made which describe where improvements would be most effective in minimising quality loss. Comments are also made about the way in which these improvements could be financed and their use managed.

The cost-effectiveness of many of the proposals has been demonstrated by reference to the total value of landings at each point and the potential to maintain catch value.

7. RECOMMENDATIONS

The following list describes the improvements that would contribute to maximising the quality of seafood from the Western Isles. It would be invidious to attempt to prioritise all these tasks but, in general terms, it is felt that improving tidal access and the supply of ice are the most important to be undertaken.

Location	Recommendations
BARRA	
Ardveenish	Give major responsibility to Barratlantic by leasing council pier to them. Increase ice making capacity. Improve water supply. Protect small boat users by reserving jetty for their use and extending slightly. Consider increasing berthing space at pier.
Castlebay	Nil
Vatersay Causeway	Develop into creeling base. Form user group and agree business and management plan for live holding tanks, cold store for bait and chill store for dogfish. Provide fendering to slips.
ERISKAY	
Acarseid	Nil except in the event of a causeway being built when Acarseid could become a major fishing base.
SOUTH UIST	
Ludag	Continue support to Kilbride Shellfish for developing live holding and bait storage. Ease exposure, hence access problems, by provision of rock pile breakwater.
Orosay	Jetty extension of concrete or pontoon type. Occasional use of digger to maintain causeway access.
Lochboisdale	Provision of powered derricks (ferry pier and fishery pier). Dredging to improve tidal access. Ensure continuing availability of ice, if necessary by provision of small ice plant.

Ardvule	Repair and extend jetty or provide vehicular access to the beach.
Ardivachar	Nil
BENBECULA	
Petersport	Jetty extension of concrete or pontoon type. Ensure availability of ice for prawn and salmon landings.
Pol nan crann	Increase height of jetty. Provide slip to east face. Improve fendering. Ensure prompt clearance of access road.
Kallin	Dress north face of harbour wall to enable fuel, water etc to be available to vessels lying there and landings to be made easier.
NORTH UIST	
Locheport	Provide pontoon and access road.
Lochmaddy (ferry pier)	Nil
Lochmaddy (Wee Pier and Sponish)	One of these sites should be developed to serve the local fleet ensuring full tidal access, bait storage, lifting derricks where necessary, parking and road access. Availability of ice must be guaranteed.
Cheese Bay	Improve tidal access either by jetty extension and dredging or provision of steps.

Griminish	Completion of remedial work. Dredging to improve tidal access.
Berneray	Nil.
HARRIS	
Leverburgh	Undertake scheduled work. Provision of cold store for bait. Support to fishermen's initiatives. Arrange for provision of ice.
Rodel	Consider development as lay-by and live holding area.
Lingabay	Nil.
Kyles Scalpay	Investigate improved landing area.
LEWIS	
Kirkibost	Investigate upgrading mains services
Breasclete	Nil
Carloway	Nil
Port of Ness	Nil
Stornoway	Devise development plan in consultation with Stornoway Fishermen's Co-op and other users to include: Live holding unit Bait Storage Negotiate for box pool Increased frequency of ferry sailings during summer period Investigate local users' transport needs

APPENDIX I

TABLE 1 - FACTORS AFFECTING FISH QUALITY

Product	Factors Affecting Quality	Effects	Remedial Measures
Crustacean Shellfish For Live Export [Note: Brown crab, lobster and crawfish are all banded or nicked for live export and cannot damage eachother. Velvet crab are not nicked and, when stressed, will exhibit aggressive behaviour. Wounds result in substantial blood loss, weakening and death. Species cope differently with air exposure. Lobster are relatively tolerant, brown crab less so, velvet crab are very sensitive].	1 At catching/first handling: - poor selection	Sub standard meat yield and price, high mortality	Training and access to technical advice
	- poor grading	Mis-match to market specification	
	- rough handling	Physical damage, concussion, stress, all leading to high mortality	
	- nicking (cutting) claws	Stress - If poorly done then excessive bleeding and high mortality	
	- poor storage aboard	Stress caused by air exposure and temperature fluctuations	
	2 At first storage: - low salinity	Osmotic stress, weakening leading to death	Relocation or use of shore-based holding
	- suspended sediments	Clogging gills, asphyxiation	
	- exposure to weather	Stress, concussion, delayed access	
	- poorly designed holding units	Poor water exchange, asphyxiation	Technical advice
	3 Landing to onward transport: - quality of access to landing point (tides, beach landing, etc)	Delays leading to problems of air exposure (desiccation, asphyxiation, temp.stress all potentially causing increased mortality) Stress caused by rough handling across beaches, jetty ends etc Delays leading to lost market opportunities	Upgrading of landing facilities and/or the provison/use of shore-based live holding tanks
	4 Transfers within distribution network	Delays, as above	Removal of earlier logistical problems

TABLE 1 - FACTORS AFFECTING FISH QUALITY (cont)

Product	Factors Affecting Quality	Effects	Remedial Measures
Crustacean Shellfish for Processing **Brown Crab** [Note: un-nicked and able to damage each other]	As for live export except for effects of nicking and transport factors Poor/rough handling at any stage	Dead animals are not generally considered suitable for processing Aggressive behaviour leading to physical damage, blood loss and loss of meat yield and quality	Training, advice etc as for live export
Nephrops [Note: may go for processing or for export chilled and raw]	Lack of appropriate chilled storage Poor availability of ice	Accelerated spoilage rate leading to reduced demand and value As above	Ensure access to adequate facilities
Fin Fish [Note: small amounts of white fish are landed, mostly as by-catch]. The two main species are dogfish and salmon, both of which spoil rapidly. Customers demand top quality salmon and dogfish rapidly start producing ammonia	1 At catching/first handling -catching method -poor gutting and washing -rough handling -absence or shortage of ice 2 Landing and onward transport -landing delays, tides etc -collection delays	Long towing periods can bruise fish Netting may cause bruising and/or unslightly marking of the body Presence of enzymes and bacteria accelerate the spoilage process Bruising of flesh Inadequate cooling resulting in accelerated spoilage Increased spoilage especially when exacerbated by no or poor icing	Training and access to technical advice Availability of ice

TABLE 2
LANDINGS BY SPECIES, STORNOWAY FISHERIES DISTRICT 1980, 1985, 1990

	1980		1985		1990	
	Tonnes	£'000	Tonnes	£'000	Tonnes	£'000
Blue Ling	0.3	.055				
Brill	1.6	1.8	1.0	1.4	+	0.9
Catfish						
Cod	344.9	154.8	115	69.9	114	120.3
Conger	4.7	1.3	8	3	4	2.5
Dabs	16.5	3.6	5	1.6	1	0.6
Dogfish	132.2	22.5	494	4.8	365	260.3
Dover Sole	+	.013			+	0.4
Gurnards	2.3	.441	+	0.1	+	+
Haddock	618.5	151.5	176	81.4	73	67.1
Hake	24.3	13.1	47	47.4	56	30.2
Halibut	14.6	12.6	4	12.5	1	2.9
Lemon Sole	55.1	29.8	29	22.4	41	41.3
Ling	115.1	59.1	18	11.5	24	20.1
Lythe	4.6	1.6	7	3.4		
Megrims	68.8	17.1	80	53.7	20	23
Monks	139.3	79.4	130	126.2	168	264.9
Norway Pout	1201.7	37.0	13	0.4	+	+
Plaice	67.2	27.7	32	15.5	24	15.6

TABLE 2 (continued)
LANDINGS BY SPECIES,STORNOWAY FISHERIES DISTRICT 1980, 1985, 1990

	1980		1985		1990	
	tonnes	£'000	tonnes	£'000	tonnes	£'000
Saithe	75.6	18.8	3	0.5	34	13.3
Sandeels	212.5	6.1	18586	579.2	930	35.9
Skate	120.4	28	79	25.8	70	46.2
Tusk	87.2	34.5	-	-	-	-
Turbot	1.1	0.7	1	2.6	2	4.0
Whiting	282.4	54.4	197	58.7	112	63.4
Witches	51.3	9.4	71	23.9	71	30.7
Roes	2.6	1.4	1	0.5	-	-
Total Demersal	3645.2	768.1	20097	1146.5	2112	1045.3
Herring	1.3	.26	1854	92.8	36	29.5
Horse Mackerel	-	6	1215	52.8	18	2.4
Mackerel	8767.4	519.4	5687	312.5	73	109
Blue Whiting	4098.1	114.5	-	-	-	-
Sprats	224.4	11.9	186	9.1	-	-
Total Pelagic	13091.2	646.2	8942	467.2	127	42.8
Periwinkles	209.3	61.0	218	81.9	198	107.6
Crabs	123.4	15.6	1210	483.9	1120	957.4
Lobsters	119.0	489.3	170	1322.7	218	2032.4
Crawfish	-	-	16	108.5	14	156.9
Cockles	-	-	29	6.4	-	-
Scallops	121.3	74.5	586	724.7	519	676.4
Mussels	40.5	3.5	-	-	-	-
Norway Lobsters	827.6	821.0	1722	2206.1	1287	2597.3
Squids	0.9	1.1	1	1.9	7	5.9
Velvet Crabs	-	-	136	164.9	555	1112.2
Total Shellfish	1542.0	1466.4	4095	5102.9	3919	7646.

TABLE 3 - WESTERN ISLES FLEET DETAILS BY LENGTH CATEGORY AND MAIN FISHING METHOD

Length Group	DEM SIN TRL	DEM PR TRL	IND TRL	SN NET	LINES TRL	BM NET	GILL DEM	OTH	DEM TOT	PURSE TRL	PEL PEL	OTHER	PEL TOT	NEP TRL	SHR TRL	QS TRL	DREDGE	CREEL	SHELL BY HAND	SHELL TOTAL	GRAN D TOTAL
0-29.9	-	-	-	-	2	-	-	-	2	-	-	-	-	-	-	-	-	191	-	191	193
30-39.9	-	-	-	-	3	-	-	-	3	-	-	-	-	2	-	-	4	70	-	76	79
40-49.9	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	3	3	-	8	8
50-59.9	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	1	2	-	19	19
60-69.9	2	-	-	-	-	-	-	-	2	-	-	-	-	4	-	-	-	-	-	4	6
80-109.9	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
TOTAL	3	-	-	-	5	-	-	-	8	-	-	-	-	24	-	-	8	266	-	298	306

TABLE 4 - LANDINGS TO THE WESTERN ISLES BY CREEK AND CATEGORY (WEIGHT IN TONNES) 1980,'85,'90

	1980			1985			1990		
	Fish	S/Fish	Total	Fish	S/Fish	Total	Fish	S/Fish	Total
Lochs	1.8	0.7	2.5	2	43	45	-	27	27
Stornoway	15945	892	16837	24812	1585	26397	1462	1479	2941
Portnaguran/Ness	-	11.6	11.6	-	78	78	-	42	42
Bernera (Lewis)	441	89	530	-	433	433	14	351	366
North Harris	19.8	16.2	36	17	377	394	46	105	151
Scalpay	-	13.6	13.6	-	4	4	-	16	16
South Harris	-	25.3	25.3	1	78	79	-	86	86
Berneray (N. Uist)	-	23.1	23.1	-	29	29	-	191	191
North Uist	-	67.6	67.6	-	268	268	73	179	252
Grimsay	-	100	100	-	35	35	-	82	82
Benbeculla	-	42.2	42.2	-	47	47	-	25	25
South Uist/Eriskay	-	49.7	49.7	-	411	411	220	355	576
Barra	328	212	540	4207	707	707	424	981	1404
TOTAL	16736	1542	18278	29039	4095	33134	2239	3919	6158

TABLE 5 - LANDINGS TO THE WESTERN ISLES BY CREEK AND CATEGORY (value in £'000s) 1980,'85,'90

	1980			1985			1990		
	Fish	S/Fish	Total	Fish	S/Fish	Total	Fish	S/Fish	Total
Lochs	0.5	2.6	3.1	0.5	31.2	31.7	0.2	45.5	45.7
Stornoway	1138	725	1863	1332	1894	3226	511	2197	2708
Portnaguran/Ness	-	2.8	2.8	-	47	47	-	76.7	76.7
Bernera (Lewis)	178	140	318	-	344	344	18.5	577	596
North Harris	6.3	18.2	24.5	7	517	524	38.8	159	198
Scalpay	-	43.6	43.6	-	36	36	-	91.2	91.2
South Harris	-	81.3	81.3	-	162	162	-	213	213
Berneray (N. Uist)	-	22.2	22.2	-	109	109	-	723	723
North Uist	-	87.8	87.8	-	483	483	10.9	499	510
Grimsay	-	107	107	-	127	127	-	326	326
Benbeculla	-	13.9	13.9	-	45.1	45.1	-	92.5	92.5
South Uist/Eriskay	-	42.7	42.7	210	473	683	173	904	1077
Barra	90.9	179	270	274	836	1110	335	1742	2707
TOTAL	1414	1466	2880	1614	5103	6717	1088	7646	8734

TABLE 6
LANDINGS BY SPECIES,STORNOWAY DISTRICT 1980, 1985, 1990

	1980		1985		1990	
	tonnes	£'000	tonnes	£'000	tonnes	£'000
Saithe	75.6	18.8	3	0.5	34	13.3
Sandeels	212.5	6.1	18586	579.2	930	35.9
Skate	120.4	28	79	25.8	70	46.2
Tusk	87.2	34.5	-	-	-	-
Turbot	1.1	0.7	1	2.6	2	4.0
Whiting	282.4	54.4	197	58.7	112	63.4
Witches	51.3	9.4	71	23.9	71	30.7
Roes	2.6	1.4	1	0.5	-	-
Total Demersal	3645.2	768.1	20097	1146.5	2112	1045.3
Herring	1.3	.26	1854	92.8	36	29.5
Horse Mackerel	-	6	1215	52.8	18	2.4
Mackerel	8767.4	519.4	5687	312.5	73	109
Blue Whiting	4098.1	114.5	-	-	-	-
Sprats	224.4	11.9	186	9.1	-	-
Total Pelagic	13091.2	646.2	8942	467.2	127	42.8
Periwinkles	209.3	61.0	218	81.9	198	107.6
Crabs	123.4	15.6	1210	483.9	1120	957.4
Lobsters	119.0	489.3	170	1322.7	218	2032.4
Crawfish	-	-	16	108.5	14	156.9
Cockles	-	-	29	6.4	-	-
Scallops	121.3	74.5	586	724.7	519	676.4
Mussels	40.5	3.5	-	-	-	-
Norway Lobsters	827.6	821.0	1722	2206.1	1287	2597.3
Squids	0.9	1.1	1	1.9	7	5.9
Velvet Crabs	-	-	136	164.9	555	1112.2
Total Shellfish	1542.0	1466.4	4095	5102.9	3919	7646.

TABLE6 (cont.)
LANDINGSBY SPECIES, STORNOWAYDISTRICT1980, 1985, 1990

	1980		1985		1990	
	Tonnes	£'000	Tonnes	£'000	Tonnes	£'000
Blue Ling	0.3	.055				
Brill	1.6	1.8	1.0	1.4	+	0.9
Catfish						
Cod	344.9	154.8	115	69.9	114	120.3
Conger	4.7	1.3	8	3	4	2.5
Dabs	16.5	3.6	5	1.6	1	0.6
Dogfish	132.2	22.5	494	4.8	365	260.3
Dover Sole	+	.013			+	0.4
Gurnards	2.3	.441	+	0.1	+	+
Haddock	618.5	151.5	176	81.4	73	67.1
Hake	24.3	13.1	47	47.4	56	30.2
Halibut	14.6	12.6	4	12.5	1	2.9
Lemon Sole	55.1	29.8	29	22.4	41	41.3
Ling	115.1	59.1	18	11.5	24	20.1
Lythe	4.6	1.6	7	3.4		
Megrims	68.8	17.1	80	53.7	20	23
Monks	139.3	79.4	130	126.2	168	264.9
Norway Pout	1201.7	37.0	13	0.4	+	+
Plaice	67.2	27.7	32	15.5	24	15.6

TABLE7
LANDINGSIN THE WESTERNISLES 1990 - CREEKSAND LANDINGPLACES

Area	Weight (tonnes)				Value (£'000)			
	Demersal	Pelagic	Shellfish	All Fish	Demersal	Pelagic	Shellfish	All Fish
Lochs	+	-	27	27	0.2	-	45.5	45.7
Stornoway	1426	36	1479	2941	496.4	14.7	2197.5	2708.6
Broad Bay Point, Ness Tolsta Portnaguran Tong	-	-	42	42	-	-	76.7	76.7
Bernera (Lewis) Loch Roag, Kirkibost Carloway, Uig and Breaslete	14	-	351	366	18.5	-	577.2	595.7
North Harris Tarbert and West Loch Tarbert	28	18	105	151	21.6	17.2	159.1	197.9
Scalpay	-	-	16	16	-	-	91.2	91.2
South Harris Kyle Scalpay Rodel Leverburgh	-	-	86	86	-	-	212.7	212.7
Berneray (N. Uist)	-	-	191	191	-	-	723.5	723.5
North Uist Lochmaddy Cheese Bay Griminish Newton Ferry	-	73	179	252	-	10.9	498.8	509.7
Grimsay Kallin	-	-	82	82	-	-	326.1	326.1

TABLE7
LANDINGSIN THE WESTERNISLES 1990 - CREEKSAND LANDINGPLACES

Area	Weight (tonnes)				Value (£'000)			
	Demersal	Pelagic	Shellfish	All Fish	Demersal	Pelagic	Shellfish	All Fish
Benbecula Pol nan Crann Petersport	-	-	25	25	-	-	92.5	92.5
South Uist and Eriskay Lochboisdale Lochs, Skiport end Eynort Ardivachar, Ardvule Orosay & Ludag	220	-	355	576	173.5	-	903.7	1077.3
Barra Ardveenish Castlebay Vatersay	424	-	981	1404	335	-	1741.7	2076.7

Source: SOAFD

Highlands & Islands
ENTERPRISE

Direct Line: (0463) 244220
Contact: Kevin R Gruer
Date: 4 March 1992

Your Ref:
Our Ref: KRG/LA (MDF/3/8)

Alastair Davie Esq
Sea Fish Industry Authority
10 Young Street
EDINBURGH
EH2 4JQ

Dear Mr Davie

STUDY OF PIER FACILITIES IN THE WESTERN ISLES

Further to the submission of 29 November 1991 by the Sea Fish Industry Authority (SFIA), I am pleased to inform you that Highlands & Islands Enterprise (HIE) has agreed to commission SFIA to undertake the above study.

The commission is subject to the following terms and conditions:

1 The study shall be carried out in accordance with HIE's brief of 2 October 1991 and SFIA's tender of 29 November 1991.

2 The fee for this commission shall not exceed £5,330 (Five thousand Three hundred and Thirty pounds) plus VAT at the prevailing rate. The schedule of payment shall be as follows:

(a) £2,132.00 (Two thousand One hundred and Thirty Two pounds) plus VAT against your invoice and on receipt of your signed acceptance of offer.

(b) £3,198.00 (Three thousand One hundred and Ninety Eight pounds) plus VAT against your invoice and on acceptance of the final report by HIE.

3 In addition to the aforementioned fee, travel and subsistence expenses incurred directly as a result of carrying out this study shall be reimbursed, up to a maximum of £2,000 (Two thousand pounds). Reimbursement shall be made against a detailed breakdown of actual expenditure incurred.

4 A draft report shall be submitted by SFIA to HIE by Friday, 8 May 1992, and following our comments, the final report will be submitted by Friday, 29 May 1992.

5 In carrying out this commission, you shall liaise with Kevin Gruer of HIE's Natural Resources Division or such other person as HIE shall appoint.

6 Copyright of all information, reports, memoranda, data and other material collected or prepared by you or your sub-contractors in connection with this commission, shall vest with HIE and no reproduction or disclosure shall be authorised or permitted without the written permission of HIE.

7 In the course of this commission, you and your agents may have occasion to deal with documents and other material relating to HIE's activities. Such information must at all times be regarded as confidential as far as third parties are concerned and must not be disclosed to any unauthorised person or body.

8 HIE shall be under no liability for any claim arising out of or referable to your actions or those of your agents in carrying out this commission and SFIA shall fully indemnify HIE in respect of any such claim.

9 Should SFIA contravene any of the above terms and conditions without HIE's written permission, HIE shall have the right to terminate this Agreement forthwith.

10 Any dispute arising out of this Agreement shall be referred to a mutually agreed arbiter whose decision shall be final and binding on both parties.

11 This Agreement shall be construed, and the rights and obligations thereunder determined, according to the Law of Scotland.

If the foregoing is acceptable to you, including the terms and conditions contained therein, please sign and return this letter within 14 days. A copy is enclosed for your retention.

Yours sincerely

IAIN SUTHERLAND
HEAD OF FISHERIES AND AQUACULTURE

Agreed and Accepted

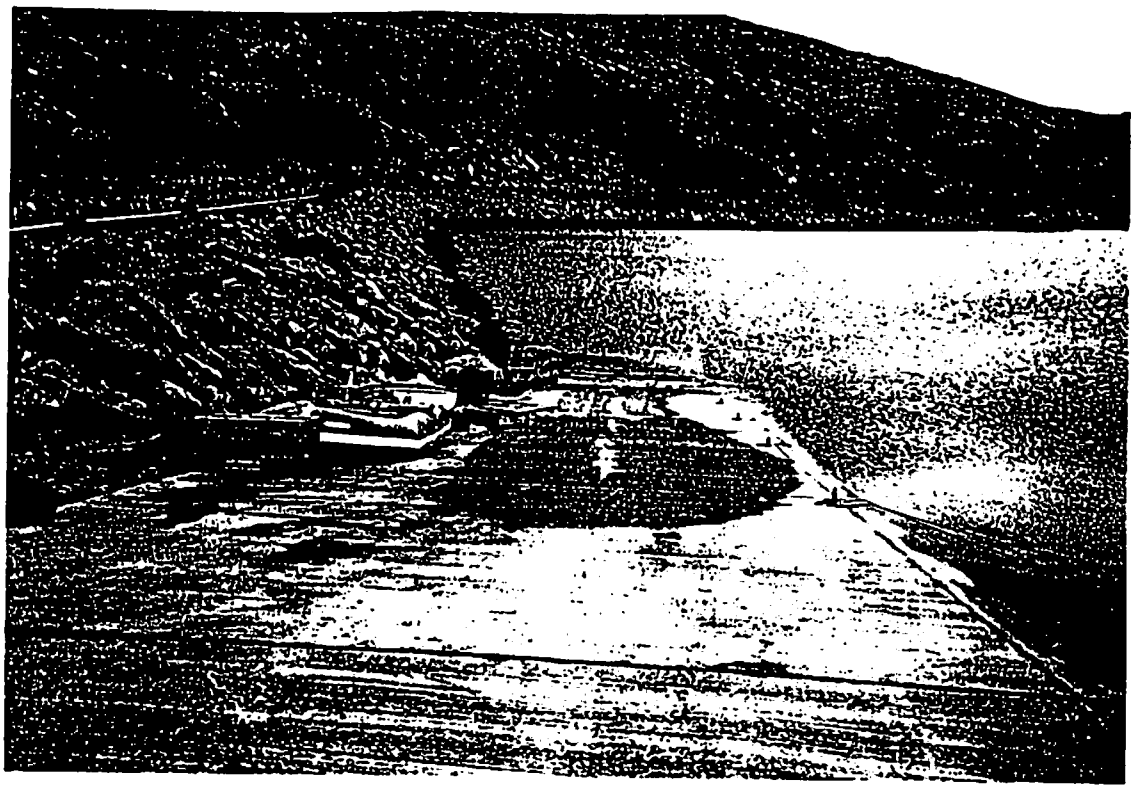
Signed: R. Annan Dane

(For and on behalf of Sea Fish Industry Authority)

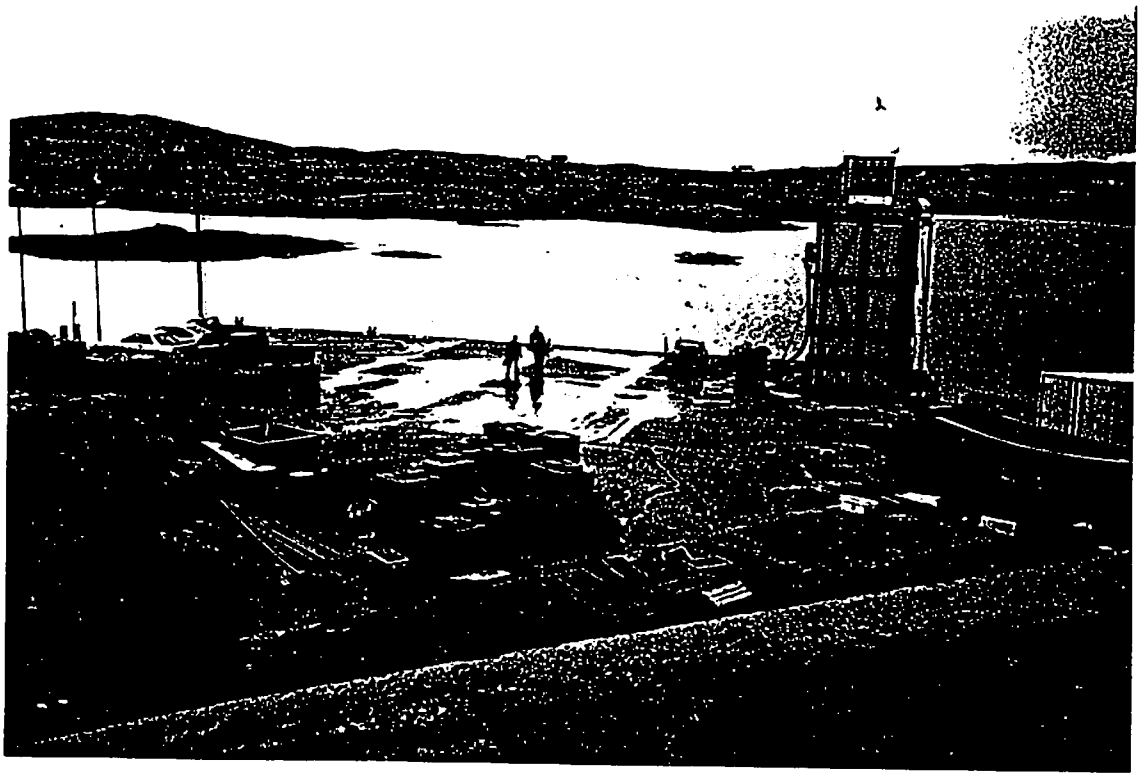
Date: 12. 3. 92.

PHOTOGRAPHS

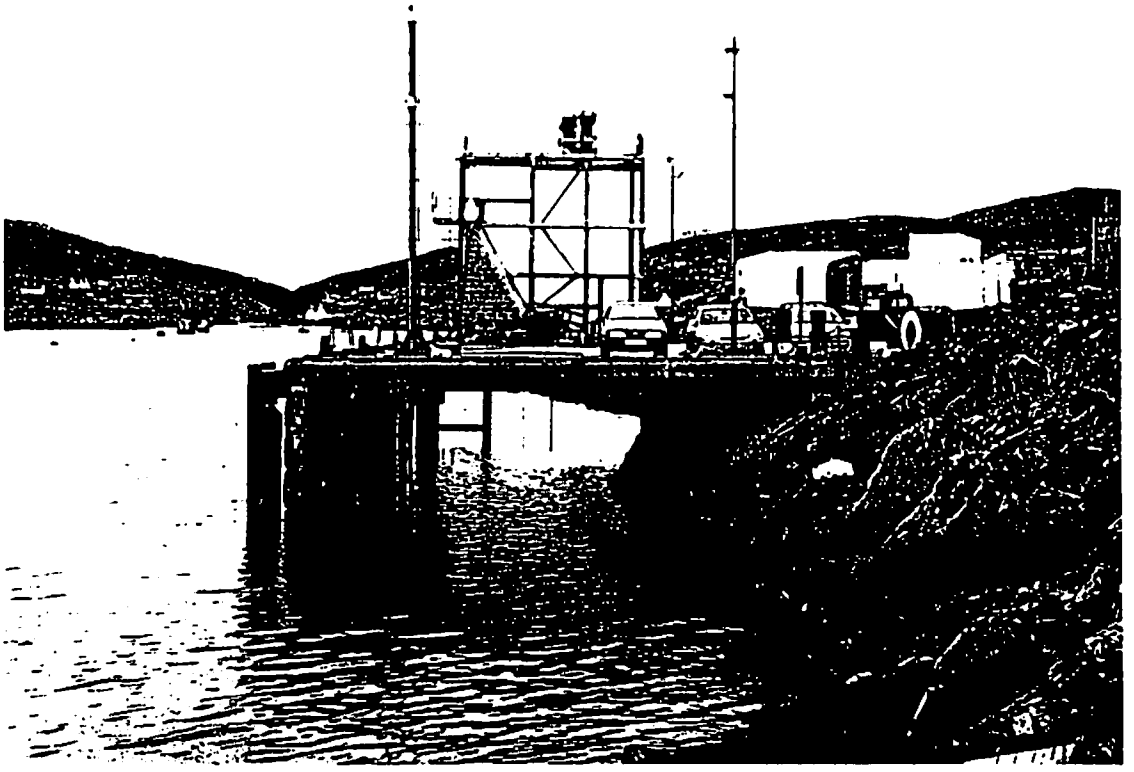
Photograph 1
Petersport Landing Keep Pot
(courtesy of R. Johnstone)



Photograph 2 - Vatersay Causeway and Slip



Photograph 3
Ardveenish Pier



Photograph 4
Ardveenish

Photograph 5
Orosay "Causeway"

Photograph 6
Orsosay Jetty

Photograph 7
Lochboisdale Fishery and Ferry Piers

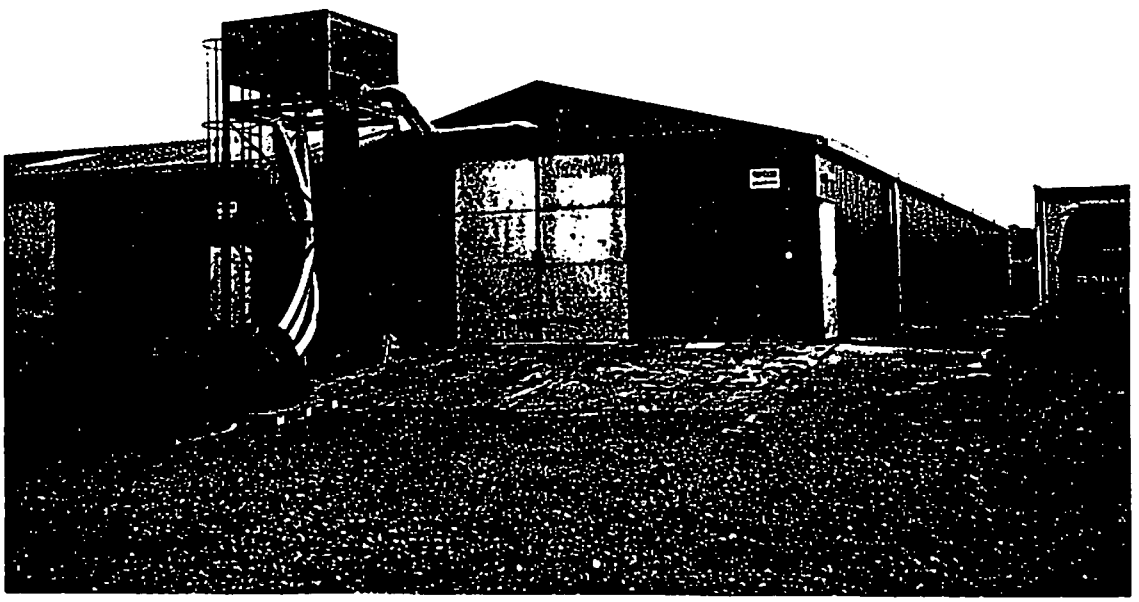
Photograph 8
Prawns Without Ice

Photograph 9
Ardvule Slip

Photograph 10
Ardivachar

Photograph 11
Lochcport

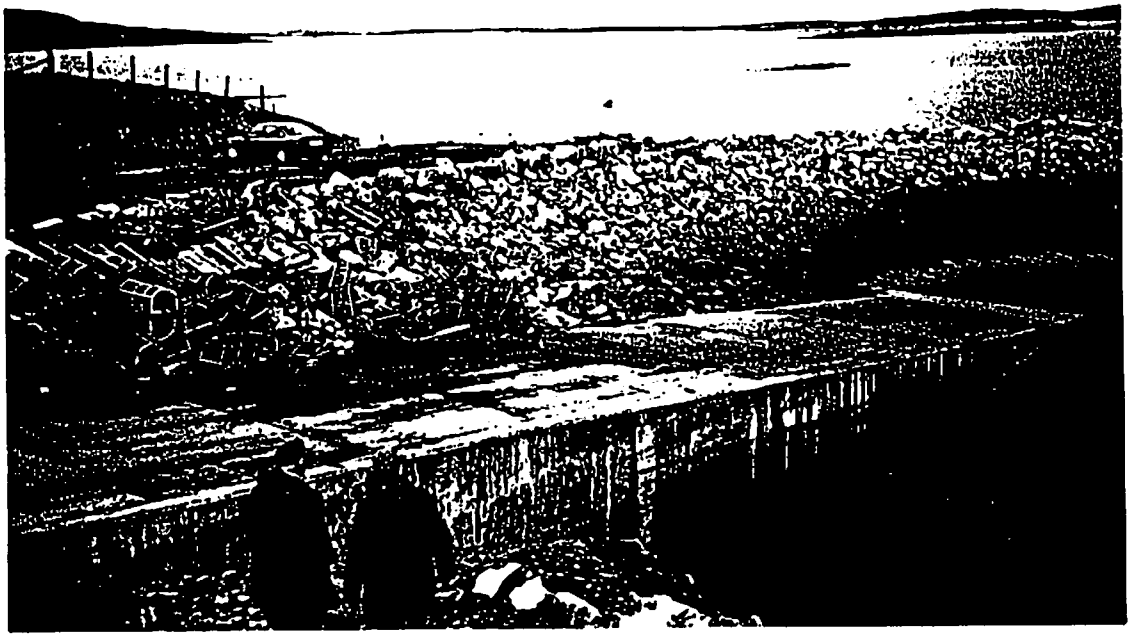
Photograph 12
Lochmaddy Wee Pier



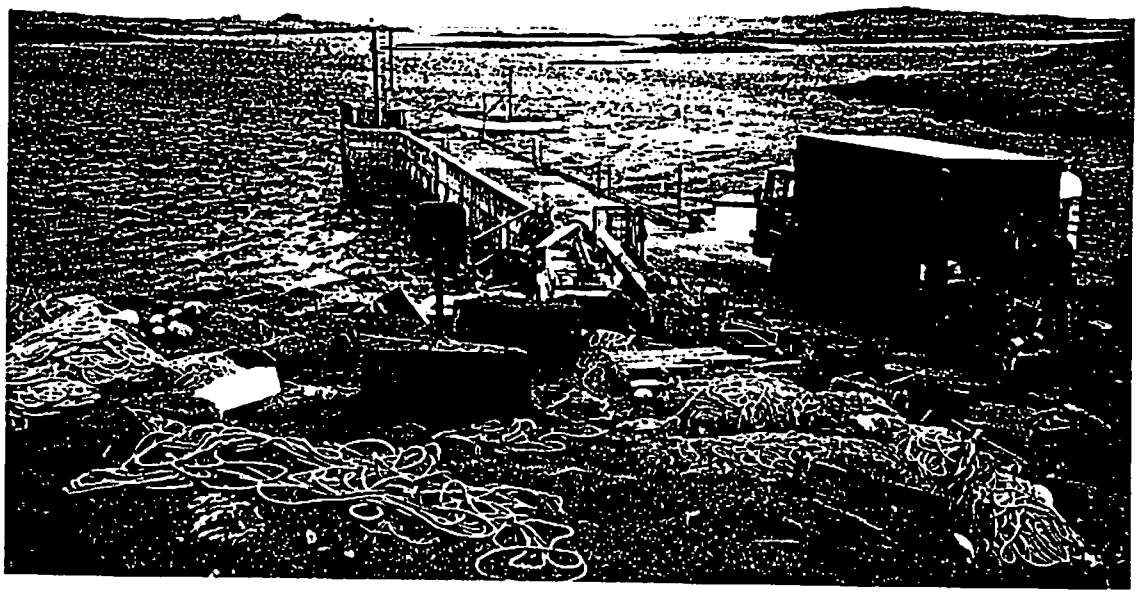
Photograph 13
Sponish Live Holding Facility

Photograph 14
Sponish Pier

Photograph 15
Petersport Slip



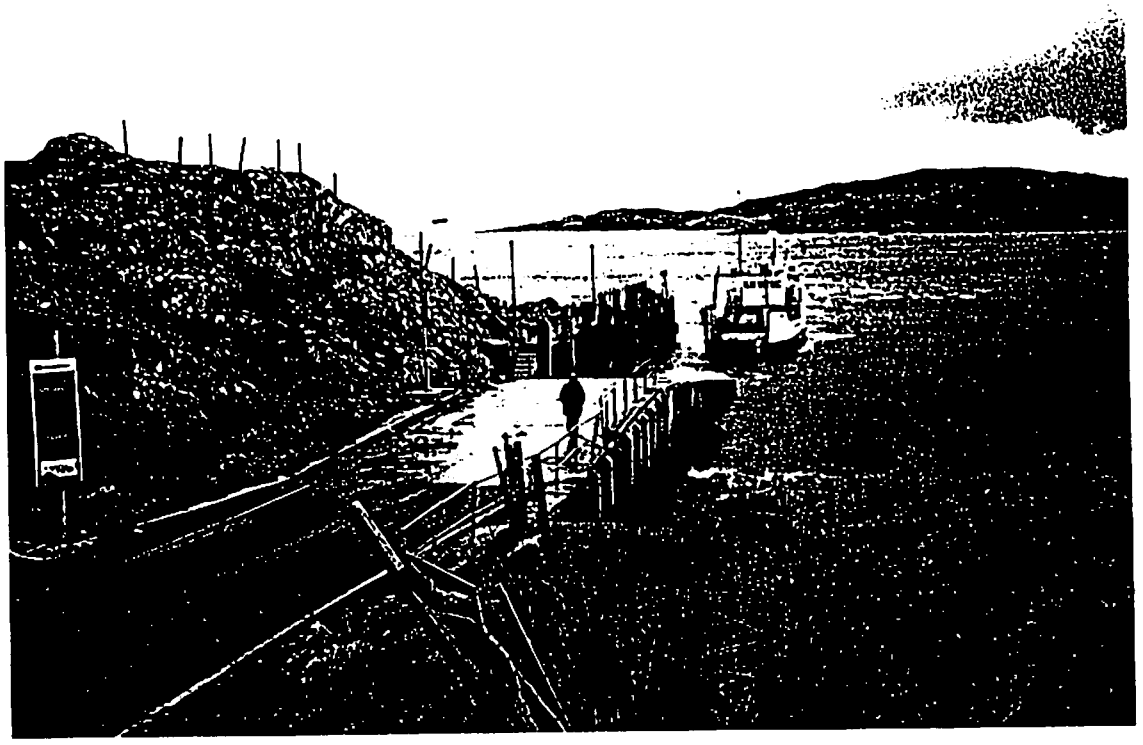
Photograph 16
Cheesebay Slip



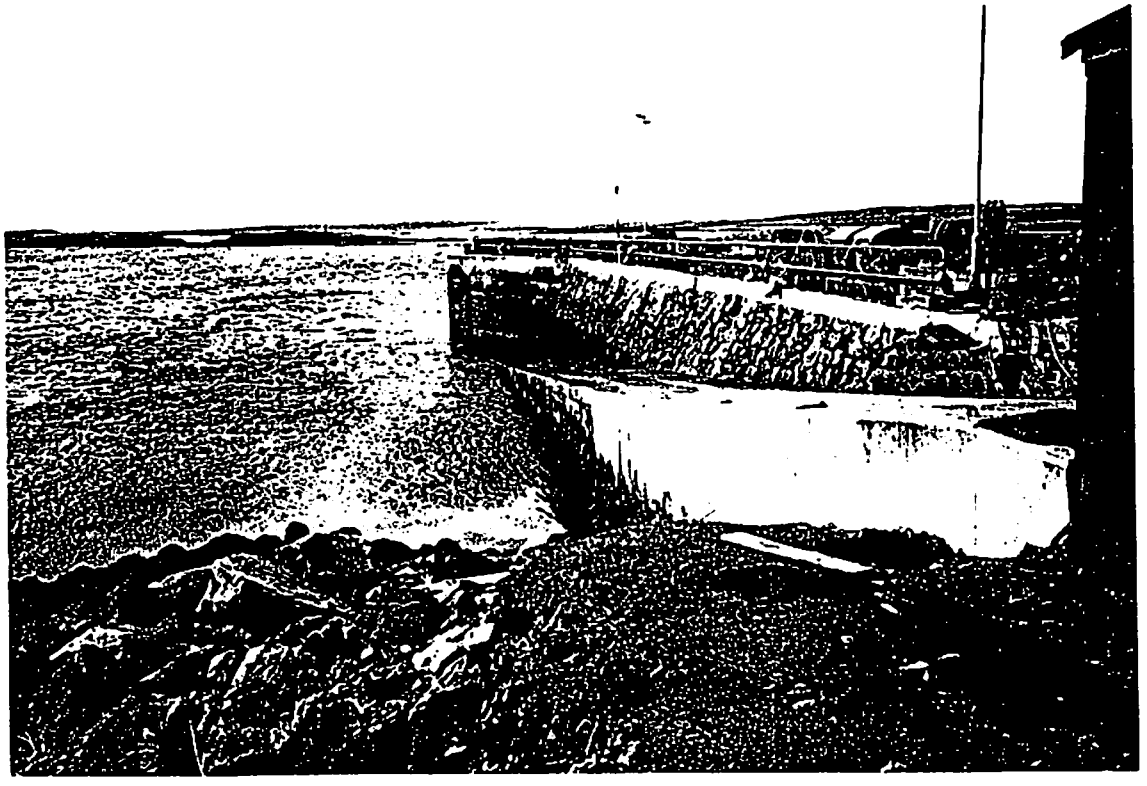
Photograph 17
Griminish Pier

Photograph 18
Newton Jetty

Photograph 19
Lingabay



Photograph 20
Kyles Scalpay Slip



Photograph 21
Leverburgh

Photograph 22
Rodel

Photograph 23
West Loch Tarbert

Photograph 24
Kirkibost