

Fisheries Research Services is an agency of the Scottish Executive

FRS MARINE LABORATORY PO BOX 101 375 VICTORIA ROAD ABERDEEN AB11 9DB UK

tel +44 (0)1224 876544 fax +44 (0)1224 295620/295511

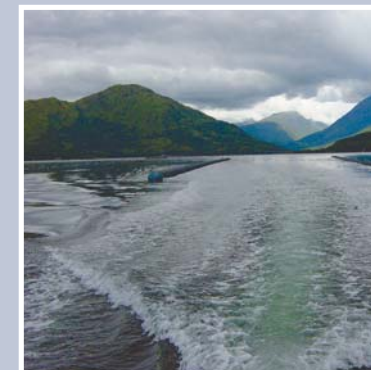
fishhealth@marlab.ac.uk <http://www.frs-scotland.gov.uk>

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FISHERIES RESEARCH SERVICES

Scottish Shellfish Farm Production Survey 2007



INTRODUCTION TO THE YEAR 2007 SURVEY

This report is based on the returns of an annual survey questionnaire sent to all active registered Scottish shellfish farming companies. The cooperation of the shellfish farming industry is gratefully acknowledged.

Movement and production forms were sent to 171 companies registered as active during 2007 (*see Appendix 1 p10*). All return forms were received. One 'wild' mussel fishery registered as a shellfish farm has been excluded from this report. During 2007, nine new companies registered and seven de-registered.

The survey showed that, of the 170 companies registered at the end of 2007 included in this report, 70 recorded no sales during that year. These 170 registered companies farmed 336 active sites, of which 157 (47%) placed shellfish on the market. Shellfish production by company and site is presented.

MD Bland

DI Fraser

April 2008

PRODUCTION

The survey indicates that the shellfish species cultivated in Scottish waters in 2007 were:

Common mussel:	<i>Mytilus edulis</i>
Pacific oyster:	<i>Crassostrea gigas</i>
Native oyster:	<i>Ostrea edulis</i>
Queen:	<i>Chlamys opercularis</i>
Scallop	<i>Pecten maximus</i>

Production was dominated by mussel and Pacific oyster. Small quantities of queen, native oyster and scallop were also produced. The 2007 production data for each species by region are given in Table 1.

TABLE 1 : Scottish shellfish production by region, 2007.

Region	Companies	Mussel (tonnes)		Pacific oyster (000s)		Native oyster (000s)		Queen (000s)		Scallop (000s)	
		Table	On-growing	Table	On-growing	Table	On-growing	Table	On-growing	Table	On-growing
Highland	51	451	0	175	410	0	0	7	0	15	45
Orkney	11	3	0	10	0	0	0	0	0	0	0
Shetland	37	2,605	7	<1	0	0	0	0	0	0	0
Strathclyde	55	1,288	36	2,417	535	273	10	377	0	<1	<1
Western Isles	16	459	1	<1	0	0	0	0	0	0	0
Scotland	170	4,806	44	2,603	945	273	10	384	0	15	45
Weight (tonnes)		4,806	44	208		22		15		2	

NB: This report lists regions with active registered shellfish farms.

Conversion to weight used the following assumptions (based on industry figures): individual oysters averaged 80g; individual scallops averaged 120g; individual queens averaged 40g.

Table = Sales directly for human consumption; On-growing = Sales to other companies for on-growing.

Table production by species is illustrated in Figure 1, while trends in production for the table market and on-growing in Scotland are presented in Table 2.

Mussel production increased by 14% from 2006 to 2007, showing a continued increasing trend. The greatest contribution in regional mussel production was from Shetland, accounting for 2,605 tonnes. 1,288 tonnes was produced in Strathclyde which, combined with that produced in Shetland, accounted for 81% of the total mussel production in Scotland. Pacific oyster production decreased by 17%, however, markets were maintained, and demand remained high. Ninety-three percent of Pacific oyster was produced in the Strathclyde region. Queen production decreased to 25% of the 2006 total. Production of farmed scallop fell to 17% of the previous years' total. Poor scallop and queen settlement and survival has reportedly led to this reduction in production. Native oyster production decreased by 9%. This accounts for a small percentage of total oyster production, and targets a niche market.

Eleven Several Orders remain in place for scallop fisheries (Figure 2, see page 5). Eight of these Orders were in Highland region, two in Strathclyde and one in Shetland. The size of the Orders ranged from 3.2 hectares (ha) to as much as 97.4 ha.

FIGURE 1 : Table production by species 1998-2007.

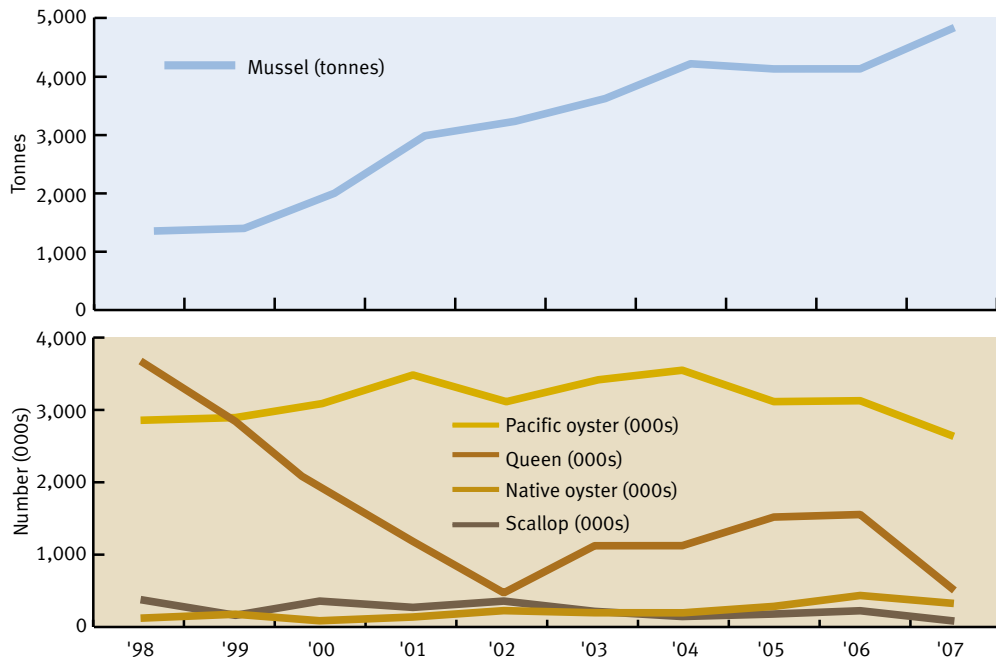


TABLE 2 : Trends in production data for the table and on-growing 1998-2007.

For the table	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	% change 06-07
Pacific oyster (000s)	2,857	2,895	3,088	3,483	3,114	3,488	3,586	3,070	3,138	2,603	-17
Native oyster (000s)	87	142	51	103	191	161	105	162	300	273	-9
Queen (000s)	3,676	2,842	2,084	1,182	472	1,124	1,118	1,441	1,510	384	-75
Scallop (000s)	343	127	323	236	323	180	85	100	87	15	-83
Mussel (tonnes)	1,355	1,400	2,003	2,988	3,236	3,632	4,223	4,135	4,219	4,806	14

For on-growing	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Pacific oyster (000s)	750	502	1,315	881	1,578	2,640	2,510	1,467	1,685	945
Native oyster (000s)	154	1	3	0	0	0	0	0	0	10
Queen (000s)	0	13	0	200	320	0	600	0	0	0
Scallop (000s)	49	86	9	485	147	86	80	382	287	45
Mussel (tonnes)	0	3	0	33	4	38	61	20	68	44

Prices of farmed shellfish fluctuated throughout the year. The value at first sale of the species cultivated was estimated based on the following figures. The price of Pacific oyster varied between £0.22-0.30 per shell; native oyster, £0.38 per shell; scallop, £1.00 per shell; queen sold for approximately £0.06 per shell; and mussel between £800-£900 per tonne. The approximate value of the table trade based on these prices and the production figures given in Table 1 is:

Mussel:	£4.3 million	Pacific oyster:	£0.7 million
Native oyster:	£0.1 million	Scallop:	£0.02 million
Queen:	£0.02 million		

The total value at first sale for all species was estimated to be in the region of £5.1 million.

SITES AND COMPANIES

The numbers of registered and active companies and sites are presented in Tables 3 and 4. Many sites held stock not yet ready for market, others were fallow, and some were positioned in remote areas where cost-effective production and marketing of shellfish proved difficult.

Historically, production data have been collected by company. However, since 2002, data have been collected for both company and site, enabling the provision of more accurate site information. One hundred and fifty-seven sites were shown to have produced shellfish for sale, an increase of less than 1% since 2006.

TABLE 3 : Registered and active companies 1998-2007.

	Number of Companies									
	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Registered	377	386	407	423	437	448	466	478	484	495
Active	171	151	176	173	183	178	175	183	173	170

TABLE 4 : Active and producing farm sites by region 2007.

Sites	Region					Total
	Highland	Orkney	Shetland	Strathclyde	Western Isles	
Active	80	13	105	97	41	336
Producing	36	2	47	54	18	157

Active = growing and placing on the market; Producing = placing on the market for the table and on-growing

FIGURE 2 : Regional distribution of shellfish production sites in 2007, and relative production proportions by area/species.

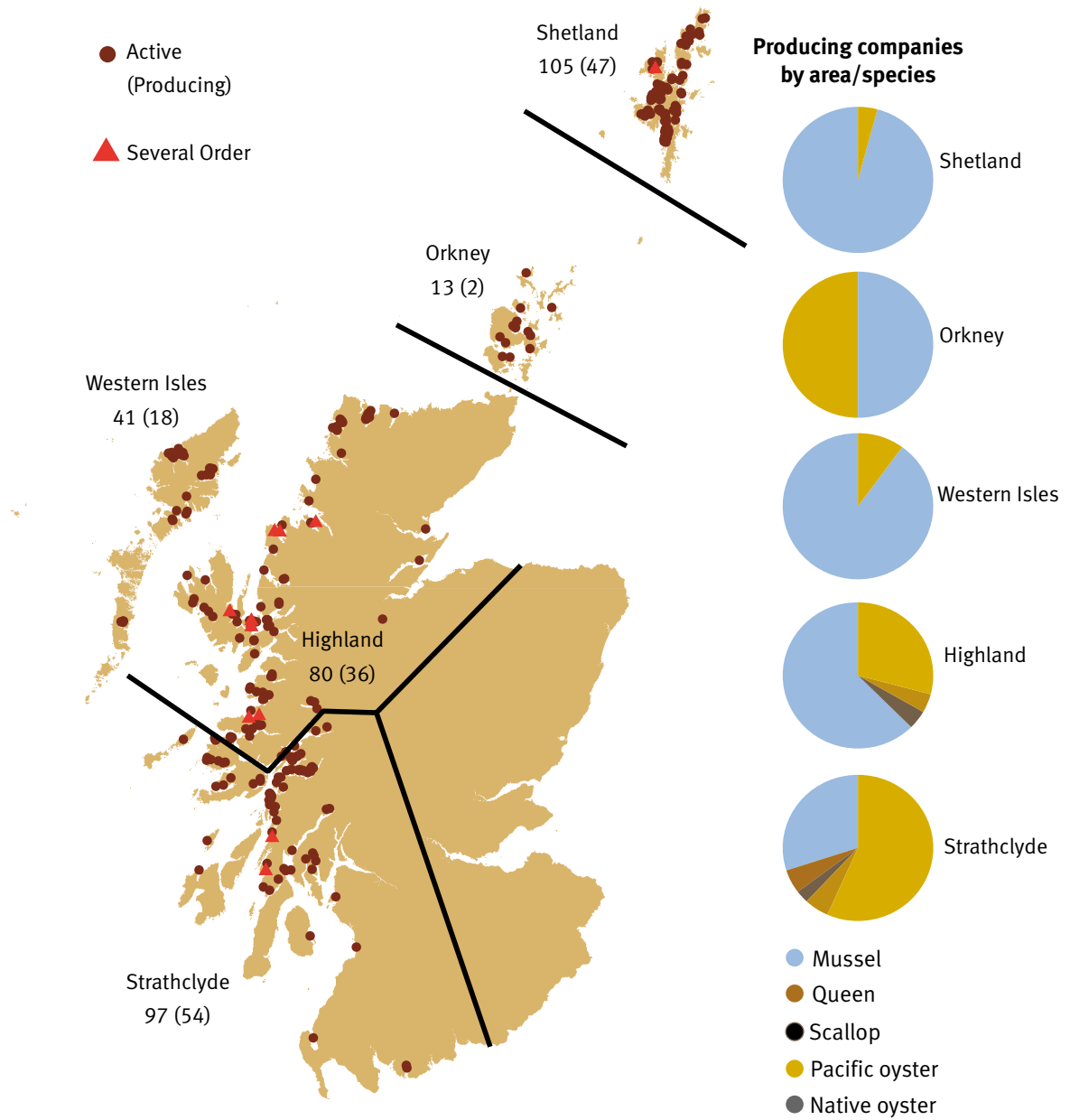


Table 5 shows the number of companies by region and by species: a) in table production, b) in on-growing production and c) showing no production. Many companies cultivate more than one species on site, a practice made possible by similar cultivation techniques. For example, scallop can be grown together with queen, Pacific oyster with native oyster, and mussel with Pacific oyster.

TABLE 5 : Number of companies by region and by species 2007.

a) Production for the table

	Region					Total
	Highland	Orkney	Shetland	Strathclyde	Western Isles	
Pacific oyster	7	1	1	21	1	31
Native oyster	0	0	0	2	0	2
Scallop	1	0	0	1	0	2
Queen	1	0	0	2	0	3
Mussel	15	1	22	11	9	58
Total	24	2	23	37	10	96

b) Production for on-growing to other producers

	Region					Total
	Highland	Orkney	Shetland	Strathclyde	Western Isles	
Pacific oyster	2	0	0	7	0	9
Native oyster	0	0	0	1	0	1
Scallop	2	0	0	0	0	2
Queen	0	0	0	0	0	0
Mussel	0	0	1	2	1	4
Total	4	0	1	10	1	16

c) No production, actively on-growing or fallow

	Region					Total
	Highland	Orkney	Shetland	Strathclyde	Western Isles	
Pacific oyster	7	3	7	14	2	33
Native oyster	5	1	2	2	0	10
Scallop	9	4	2	7	1	23
Queen	2	2	0	1	1	6
Mussel	20	5	23	13	10	71
Total	43	15	34	37	14	143

NB: A company may produce more than one species

Company production levels by species are shown in Table 6. There were 17 companies producing more than 100 tonnes of mussels, an increase of three companies since 2006. Those 17 companies produced 71% of the total mussel production in Scotland. Seven companies produced more than 100,000 Pacific oysters, a decrease of three companies since 2006. These seven companies' production accounted for 80% of the Scottish total.

TABLE 6 : Company production levels by species 2007.

Species	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90	91-100	>100	Total
Pacific oyster (000s)	15	0	3	1	0	0	2	2	1	0	7	31
Native oyster (000s)	1	0	0	0	0	0	0	0	0	0	1	2
Scallop (000s)	1	1	0	0	0	0	0	0	0	0	0	2
Queen (000s)	2	0	0	0	0	0	0	0	0	0	1	3
Mussel (tonnes)	13	4	5	5	2	2	5	1	2	2	17	58
Total	32	5	8	6	2	2	7	3	3	2	26	96

EMPLOYMENT

The industry employed 157 full-time, 241 part-time and casual workers during 2007, a reduction of three full-time staff, and an increase of one part-time employee since 2006. The regional breakdown of employment is given in Table 7.

TABLE 7 : Regional employment 2007.

Region	Companies	Full-time	Staff Part-time	Casual
Highland	51	23	42	23
Orkney	11	4	4	2
Shetland	37	47	45	24
Strathclyde	55	73	45	31
Western Isles	16	10	17	8
All Scotland	170	157	153	88

HEALTH INFLUENCES ON THE INDUSTRY

In accordance with EC Directive 91/67, native oyster were sampled from eight sites for the notifiable diseases bonamiasis (causative agent, protozoan parasite *Bonamia ostreae*) and marteiliasis (causative agent, protozoan parasite *Marteilia refringens*). Native oyster is a species known to be susceptible to these shellfish diseases. *Bonamia* infection remained confirmed in Loch Sunart and was also confirmed in West Loch Tarbet during 2007. Movement restrictions in place covering both sea lochs prevent the relaying of *Ostrea edulis* from these sea lochs (see Appendix 2 for maps of areas under movement restrictions, p15). Approved Zone status continued to protect the health of both wild and farmed native oyster stocks for the remainder of Scotland's waters.

In accordance with EC Council Directive 95/70, minimum Community measures for the control of certain diseases affecting bivalve molluscs were maintained. A third of all shellfish sites are visited annually by Fisheries Research Services (FRS) Fish Health Inspectorate. On these visits, facilities, stock health, movement records and registration details are checked. It is the responsibility of farmers to inform FRS of any abnormal, or unexplained shellfish mortality on their sites (see guidance on shellfish mortality in Appendix 1, p11)

Reported mortalities were attributed to predation by eider ducks, crabs, starfish and oyster catchers. Losses were also reported due to storm damage and warm water temperature.

As of August 2008 directives 91/67/EEC and 95/70/EC will be superceded by 2006/88/EC. The aim of this new Directive is to meet the needs of an ever evolving aquaculture industry, and raise standards of aquaculture health throughout the EU.

SUMMARY

- Mussel and Pacific oyster remain the main species produced in terms of both value and tonnage. Mussel production increased by 14% while Pacific oyster decreased by 17% during 2007;
- There has been a significant decrease in the production of queen and scallop, poor results from spat recruitment reportedly leading to this reduced production;
- Employment levels showed a slight decrease from the previous year, 398 full, part-time and casual staff being employed during 2007;
- Surveillance for the shellfish diseases bonamiasis and marteliasis was maintained in 2007. Movement restrictions are in place for the presence of *Bonamia ostreae* at Loch Sunart and West Loch Tarbet;
- For shellfish health purposes, one third of all shellfish sites was inspected by FRS Fish Health Inspectorate during 2007;
- The industry continued to be dominated by small producers, although there was a continued trend toward large companies contributing significantly to the annual production of all species.

GLOSSARY

Active sites	Farms in a production growing cycle which may contain stock or be fallow
Inactive sites	Farms not in a production cycle, without stock and not to be used by the company in the foreseeable future
Severed Order	An area of the seabed severed from the public right to fish, in order to conserve or enhance named shellfish stocks

APPENDIX 1

Covering Letter and Guidance Notes

FRS/07/0219
11 December 2007

Dear Sir/Madam

ANNUAL RETURNS OF SHELLFISH FARM PRODUCTION - 2007

For the year 2007 we seek production data from your business and site(s).

I enclose forms requesting information on your shellfish farming enterprise and a self-addressed envelope for their return. Alternatively these forms can be issued electronically upon request by contacting fishhealth@marlab.ac.uk providing business name, number and correspondent name. FORMS (a) & (b) will then be issued to you electronically for completion and return to fishhealth@marlab.ac.uk

FORM (a) requests data on production by business.

FORM (b) requests data on production and number of shellfish movements by site(s), by species.

FORM (b) can accommodate up to four site returns. If your business operates more than four sites, extra forms have been provided. Please note that production recorded by business must equal total production recorded by site. If the business has a nil return please place an X against the species registered as cultured, in FORM (a). These data will allow a more accurate reflection of site production both geographically and by species.

Recording of movements of live shellfish for on-growing (NOT for the table), on or off-site, should be recorded on FORM (b).

Please note that it is your duty to notify the Official Service of any observed abnormal mortality, under EC Council Directive 95/70. See guidance notes overleaf for reporting of mortality events where appropriate and registration changes.

Returns will be summarised in the Scottish Government Scottish Shellfish Farm Production Survey 2007, which should be available in the spring of 2008.

Thank you for your co-operation. If you have any queries regarding the survey or shellfish registration please do not hesitate to contact me at the address given below, or telephone 01224 295525 or e-mail fishhealth@marlab.ac.uk.

Please send returns to me by post, or electronically, before 7 January 2008.

GUIDANCE ON SHELLFISH MORTALITY

It is your duty to notify the Official Service of any observed abnormal mortality, under EC Council Directive 95/70. This should be interpreted as being where mortality affects 15% or greater of stocks over a short period. It is also a requirement to maintain mortality records. Where significant abnormal mortalities occur, our Duty Inspector (DI) should be informed immediately stating suspected cause, copies of movement records should be included in the correspondence. The DI can be contacted by telephone on 01224 295525, by Fax on 01224 295620 or by e-mail at fishhealth@marlab.ac.uk.

Please indicate in the box provided on FORM (b), the highest mortality as a % of the facility type, for each species registered as cultured. Mortality should be recorded over a defined period of time. Please also indicate the reason for this mortality, in the box provided on FORM (b). Examples are given below.

Example 1 – A mussel farmer has ten long lines and one line suffers total mortality through predation over one month. The highest % mortality recorded would be 10% / 1 month. Reason was eider duck predation.

Example 2 – An oyster farmer has 100 trestles and shellfish from 90 are lost through disease in spring. The highest % mortality recorded would be 90% / 3 months. Reason was suspect notifiable disease eg. Bonamia

Example 3 – A scallop farmer has 50 long lines and one line is destroyed by storm damage during the year. The highest % mortality recorded would be 2% / 12 months. Reason was storm damage.

GUIDANCE ON REGISTRATION CHANGES

If there have been any recent changes to your business and/or site registration details, held by the Fish Health Inspectorate on behalf of the Scottish Ministers, please enclose details with your returns. Such information should be included with production returns, on a separate sheet of paper headed by your business/site name and number.

Food and Fish Division
FRS Marine Laboratory
 PO Box 101
 Victoria Road
 Aberdeen AB11 9DB
 Direct Dialling 01224 295637
 Fax 01224 295620
 E-mail fishhealth@marlab.ac.uk



FORM (a) – BUSINESS PRODUCTION

IN CONFIDENCE **SCOTTISH SHELLFISH FARMS PRODUCTION SURVEY 2007**
ANNUAL PRODUCTION BY BUSINESS

Please note that the information provided on this form will remain confidential to the Scottish Government and any summary of information will be framed so that particulars concerning any one business or person cannot be ascertained from it. Please use BLOCK LETTERS and write in INK unless completing electronically:

Please indicate estimated production for 2007 of shellfish for:

A) the table (which should include any shellfish sent for depuration or cleansing, or temporarily held in other waters or tanks etc, prior to consumption or processing), AND

B) depositing in other waters (ie for restocking or growing-on, including in tanks etc).

Species	Estimated production of shellfish for 2007			
	A) for the table		B) for depositing in other waters	
	No	Weight*	No	Weight
Mussels - <i>M. edulis</i>				
Pacific oysters - <i>C. gigas</i>				
Native oysters - <i>O. edulis</i>				
Scallops - <i>P. maximus</i>				
Queens - <i>C. opercularis</i>				
Lobsters				
Other (specify)				

*Please state unit of measurement, eg tonnes, kilogrammes.

Number of persons employed by your business in 2007:

- | | |
|--------------|-----------|
| 1. Full time | Signature |
| 2. Part time | Date |
| 3. Casual | |

Thank you for your cooperation. Please return the completed form in the envelope provided, or electronically, by **7 January 2008**.

Food and Fish Division
FRS Marine Laboratory
 PO Box 101
 Victoria Road
 Aberdeen AB11 9DB
 Direct Dialling 01224 295637
 E-mail fishhealth@marlab.ac.uk



FORM (b) – SITE PRODUCTION/MOVEMENTS

IN CONFIDENCE **SCOTTISH SHELLFISH FARMS PRODUCTION SURVEY 2007**
ANNUAL PRODUCTION BY SITE AND SPECIES

*Please state unit of measurement, eg tonnes, kilogrammes.

Name of **SITE / SITE No:**

Species	Estimated production of shellfish for 2007				Highest Mortality	
	A) for the table		B) for depositing in other waters		% of facility type / Period	Reason
	No	Weight*	No	Weight		
Mussels - <i>M. edulis</i>						
Pacific oysters - <i>C. gigas</i>						
Native oysters - <i>O. edulis</i>						
Scallops - <i>P. maximus</i>						
Queens - <i>C. opercularis</i>						
Lobsters						
Other (specify)						

Name of **SITE / SITE No:**

Species	Estimated production of shellfish for 2007				Highest Mortality	
	A) for the table		B) for depositing in other waters		% of facility type / Period	Reason
	No	Weight*	No	Weight		
Mussels - <i>M. edulis</i>						
Pacific oysters - <i>C. gigas</i>						
Native oysters - <i>O. edulis</i>						
Scallops - <i>P. maximus</i>						
Queens - <i>C. opercularis</i>						
Lobsters						
Other (specify)						

Continued overleaf

Name of **SITE / SITE No:**

Species	Estimated production of shellfish for 2007				Highest Mortality	
	A) for the table		B) for depositing in other waters		% of facility type / Period	Reason
	No	Weight*	No	Weight		
Mussels - <i>M. edulis</i>						
Pacific oysters - <i>C. gigas</i>						
Native oysters - <i>O. edulis</i>						
Scallops - <i>P. maximus</i>						
Queens - <i>C. opercularis</i>						
Lobsters						
Other (specify)						

Name of **SITE / SITE No:**

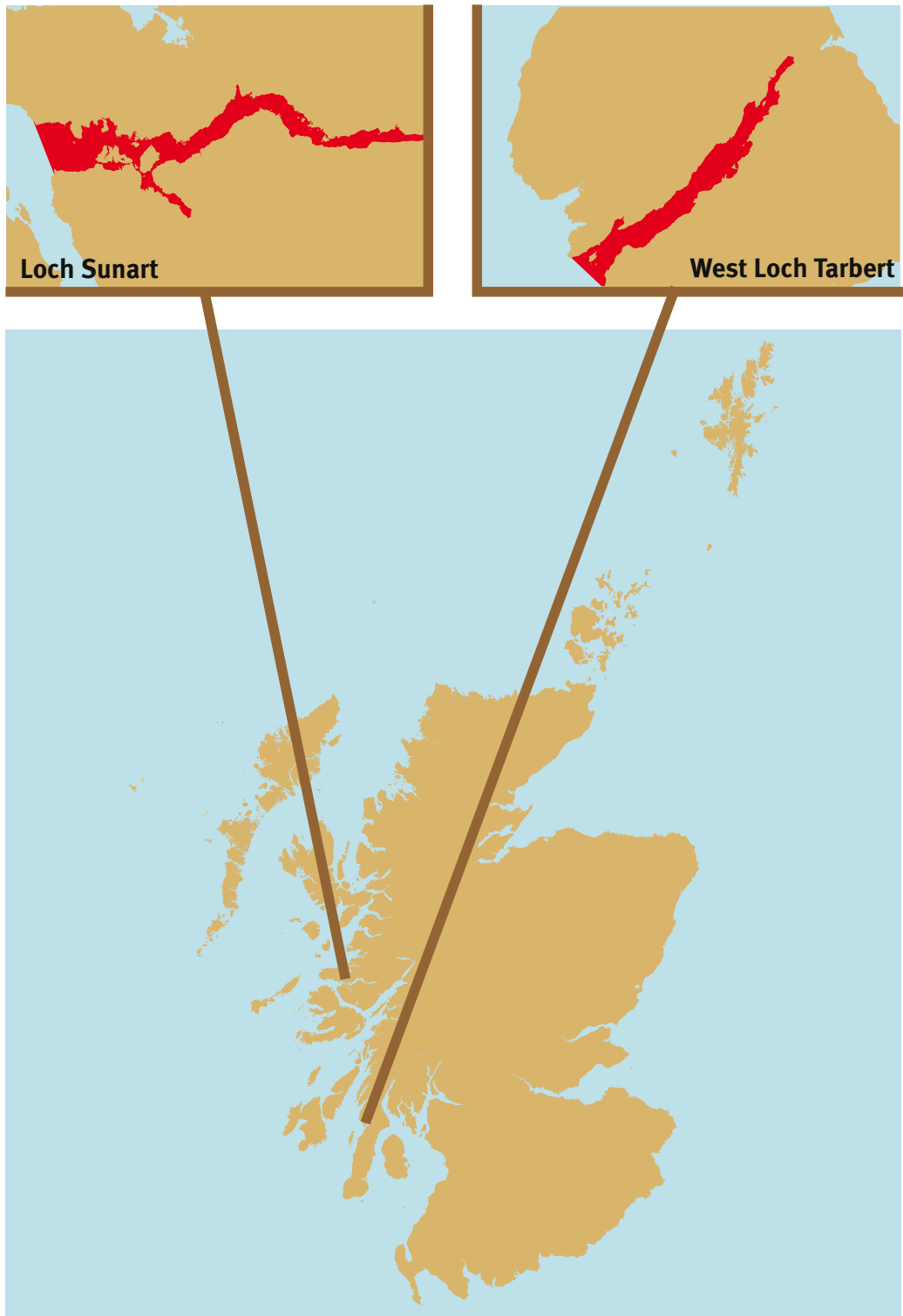
Species	Estimated production of shellfish for 2007				Highest Mortality	
	A) for the table		B) for depositing in other waters		% of facility type / Period	Reason
	No	Weight*	No	Weight		
Mussels - <i>M. edulis</i>						
Pacific oysters - <i>C. gigas</i>						
Native oysters - <i>O. edulis</i>						
Scallops - <i>P. maximus</i>						
Queens - <i>C. opercularis</i>						
Lobsters						
Other (specify)						

SHELLFISH MOVEMENTS BY SITE AND SPECIES

Name of Site/Site No			Name of Site/Site No			Name of Site/Site No			Name of Site/Site No		
.....				
No of Movements			No of Movements			No of Movements			No of Movements		
Species	On-site	Off-site	Species	On-site	Off-site	Species	On-site	Off-site	Species	On-site	Off-site

*Please record only live shellfish movements on or off-site where they are for ongrowing, **NOT for the Table.**

APPENDIX 2



Map of movement restrictions in place for the presence of *Bonamia ostreae* (designated areas in red).

Note: Other designated area orders (DAO) are in place for the presence of *Bonamia ostreae* in the Great Britain zone. Please contact the FRS Fish Health Inspectorate if you have any queries about shellfish import from England and Wales.

