

International Council for the
Exploration of the Sea

C. M. 1974/E:23
Fisheries Improvement Committee

ICES Working Group on the Introduction
of Non-indigenous Marine Organisms -
Amendments and Additions to
Cooperative Research Report No. 32

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(Secretary of the Working Group)

I AMENDMENTS

Page 4, line 18 should read: "licence specifying quantities and, for eggs, conditions for disinfection; a health certificate is also required."

Page 5, line 10 should read: "In Sweden, under the Fisheries Act 1954, paragraph 24, 'fish' may...".

line 12 should read: "...of the National Veterinary Institute. The regulation regarding the importation of fish was passed in 1968 (Svensk Författningssamling No. 551, 1968). Live fish and fish eggs for hatchery purposes may be imported only by permission of the State Veterinary Board. A certificate is required signed by a fish pathologist in the country where the fish were caught. An exception to this rule is the import of Nephrops."

Page 7, line 2, delete "brown".

line 11 should read: "caught in coastal waters. Due to the risk of introducing viral diseases, this import to Sweden has decreased considerably during the last year. Eggs of...".

line 33, delete "brown", substitute "sea".

Page 10, line 8: "O. edulis are occasionally imported into Sweden from Norway and Denmark."

line 10: "of the Bohuslän from Norway."

line 18: "at Eilerslie, Prince Edward Island. Work is now being undertaken with the third generation and it has been demonstrated that growth is twice as fast as in the native species. Reproduction has occurred in one locality and survival has been good except under winter or spring conditions of low salinity. In the United States...".

Page 11, line 16: Delete the passage from "Now, controlled..." to "America" on line 19.

line 32 should read "1914. After this introduction, the Gulf of St. Lawrence stock...". Delete "following...stock".

Page 13, line 26 should read: "Denmark, Finland, Norway and the USA of rainbow trout...".

Page 14, line 8: delete "fario", substitute "trutta".

line 9: "waters of the Baltic. Similar practices with rainbow trout and salmon have been developed in other countries."

Page 17, line 13 should read: "they were sometimes imported into Sweden, but now are deep-frozen; imports of H. gammarus...".

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Table 1: Under "Importing country - Sweden"

Delete	<u>Homarus americanus</u> from Canada, <u>Homarus gammarus</u> from the Netherlands.
Bracket	<u>O. edulis</u> from France, <u>C. angulata</u> from France, <u>O. edulis</u> from Denmark, <u>O. edulis</u> from the Netherlands, since these imports are now not important.

II ADDITIONAL INFORMATION ON INTRODUCTIONS (till January 1974)

Section 1 - Relevant laws

In France, the 1964 regulations were replaced in 1969 by new legislation which retains the ban on the immersion of molluscan shellfish (except littorinids) of foreign origin in French waters, though listing the conditions under which exceptions can be made. The public health certificates which must accompany consignments of molluscs meant for human consumption are also described. Legislation also makes it obligatory to supply certificates of origin with import consignments and, by reciprocal agreement, certificates are also supplied with exports when required.

The relaying of Crassostrea angulata in French waters has been forbidden since September 1971, except during the period from October to December in 1971 and 1972 when consumption oysters could be held before sale.

In the UK controls exercised under the Diseases of Fish Act 1937 have been strengthened; all imported freshwater fish require an import licence, and for some coldwater species certificates are required indicating freedom from named diseases. The Control of Deposit Order in England and Wales is in the process of being amended to divide the coastline into approximately 25 regions, licences being required to deposit molluscs in the tidal waters of each of these areas. A special licence will be required for the deposition of molluscan shellfish from any foreign source.

Although there are no specific regulations covering introductions into Spain, a licence is required by custom authorities before entry is allowed. In Portugal, a special licence is required from the Ministry of Trade.

Section 2 - Other procedures

No new information.

Section 3 - Deliberate introductions

3.1 For the establishment of new reproducing populations

3.1.1 Fish eggs

The Canadian transfers of pink salmon (Oncorhynchus gorbuscha) eggs are petering out, with fewer and fewer adults being found.

Kokanee (Oncorhynchus nerka kennerlyi) eggs were imported into Sweden in 1960 from British Columbia and the State of Washington. Experiments with these have been undertaken in various Swedish lakes and ponds during the 1960s, but resultant survival and reproduction has been poor.

In the last two years, Norway has imported Atlantic salmon (Salmo salar) eggs from Canada, Iceland and Sweden, rainbow trout (Salmo gairdneri) eggs from Iceland, Sweden and Denmark, and brook trout (Salvelinus fontinalis) eggs from Denmark.

Salmo gairdneri have been imported into Sweden from Seattle in the USA, and results of releases into the Baltic and Kattegat have been excellent. However, considerable drifting away from the original release sites has taken place: from the Stockholm archipelago to Zeeland in Denmark and from Kungsbacka on the west coast of Sweden to Stavanger in Norway.

Salvelinus namaycush eggs from Canada and the USA have been reared in Sweden since 1959. Releases have been made into Bothnian Bay and into many rivers and lakes, and this species may have some potential for management in the northernmost part of the Baltic.

Germany has recently imported rainbow trout eggs from Seattle and from Australia. In addition, S. salar eggs have been imported from Iceland.

Rainbow trout eggs have been imported by Portugal from Denmark.

3.1.2 Juveniles and adult fish

In June 1972, some 1 500 1-year-old O. nerka kennerlyi were released in the River Daläven in Sweden. These fish might be expected in the Baltic in the near future. Trout (Salmo trutta) have been imported into Sweden from the River Vistula in Poland since 1959. Smolts released into the Baltic have displayed excellent growth, though there have been few recoveries.

Salvelinus alpinus char have been imported to Sweden from Arctic Norway and released along the Bothnian Bay. Recaptures have been extremely rare and growth very poor. Two thousand S. salar smolts were imported into Germany from Sweden in 1973. Germany has also recently imported elvers from Italy.

3.1.3 Oysters

Large-scale development of Crassostrea gigas culture has continued in Europe.

France has imported large quantities of seed from Japan, some from Canada and a small quantity from hatcheries in the UK. Adult C. gigas have also been imported from British Columbia for the establishment of a breeding population, with good results in 1971, poor in 1972.

Germany has imported seed C. gigas from UK hatcheries and these are growing well. Spain has imported Crassostrea angulata from Portugal; no disease has been reported amongst these, though mortality has been widespread in other European countries. Spain has also imported Ostrea edulis hatchery seed from the UK.

3.2 Growth and fattening

O. edulis have been exported from France to the Netherlands and to the UK, but in 1973 the presence of disease on the north Brittany coast led to a restriction on exports to the Netherlands and a complete ban to the UK.

France has imported O. edulis from UK beds in the Solent area, from the Netherlands and from Italy.

Ireland and Holland have imported seed O. edulis from Norway.

Imports of C. angulata have continued to many European countries, but mortality has been widespread and the French authorities have banned imports from Portugal except from October to December, when consumption oysters only may be imported.

Mercenaria mercenaria and Venerupis decussata hatchery seed have been imported by France from hatcheries in the UK and the USA.

3.3 Live storage

Spain: O. edulis and Maia squinado from France;
Palinurus elephas and Homarus gammarus from the Republic of Ireland;
Venerupis decussata from Portugal.

Portugal: Maia squinado from France;
Palinurus mauritanicus and Palunaris rissoni from the Cape Verde Islands.

3.5 Research purposes

Penaeus japonicus, P. aztecus and P. kerathurus have been imported into France for experimental rearing; Crassostrea rhizophorea have been imported from Senegal and French Guyana for research on parasitism. Experimental hybridization studies have been made with Homarus americanus. French scientists have also imported spores of the giant seaweed Macrocystis pyrifera from Chile. Growth studies were carried out in the sea near Roscoff, though the plants were removed before the reproductive phase was reached. ICES Council Resolution 1973/2:18 stated that a special meeting of the Introductions Working Group should be convened to consider this proposed introduction.

3.7 Intended to alter the environment

The rice grass Spartina townsendii, which has been transplanted for shore-protection to many areas in the UK, has spread very rapidly in the Burry Inlet, South Wales. It is now threatening important cockle (Cardium edule) beds in the area, and control measures are being considered. Chemical spraying of this plant has already taken place in other areas, to protect beach amenities.

Section 4 - Species accidentally accompanying organisms
deliberately introduced

4.2.1 Establishment of predators

The flatworm Pseudostylochus ostreophagus has continued to appear amongst seed C. gigas imported to France from Japan and Canada, and control measures have been required to be implemented before the oysters can be relaid in French waters.

4.2.3 Introduction of disease

Heavy losses amongst introduced C. angulata have been reported in France, the Netherlands and the UK.

The flat-oyster disease present in France, which originally appeared in Aber Wrach and Aber Benoît, has also caused large-scale mortality in oysters in other areas in Brittany. The origin of the disease is unknown; quarantine restrictions have been applied to prevent any further spread.

4.2.4 Establishment of competitors

Undaria pinnatifida, a brown seaweed, has been found in France in the Etang de Thau region, an area which has received seed C. gigas from Japan.

A salt-dip treatment has been developed in the UK to allow the relaying of oysters from the Solent area, which are infested with Crepidula fornicata, to south-west England and to France.

Section 5 - Completely accidental introductions

Two specimens of the Chinese mitten crab (Eriocheir sinensis) were recorded in Lake Erie by Canadian biologists in 1973.

The Japanese brown seaweed Sargassum muticum was recorded in 1973 around the Isle of Wight on the south coast of England. The plant was well established at one site on the Isle of Wight and in Portsmouth Harbour. Attempts are being made to eradicate it by hand-gathering. The origin of the weed is unknown at present. Council Resolution 1973/4:5 urges eradication, by whatever means considered appropriate, in any country where it is found.

Section 6 - Species introduced for hatchery rearing

Imports to the UK:

Crustacea	<u>Penaeus indicus</u> from South Africa
	<u>Penaeus orientalis</u> from South Korea
	<u>Penaeus japonicus</u> from Japan
	<u>Penaeus setiferus</u> from the USA
	<u>Penaeus schmitti</u> from the USA
	<u>Penaeus occidentalis</u> from the USA
	<u>Penaeus semisulcatus</u> from Kuwait

Oysters

Crassostrea gigas from British Columbia

Crassostrea cucullata from the Gulf of Eilat

Import to Sweden: 20 000 larval Anguilla anguilla were imported from Italy in 1973 and reared in a closed-circuit system.