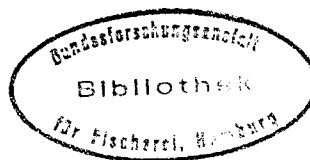


INTERNATIONAL COUNCIL FOR  
EXPLORATION OF THE SEA

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**1993 CODE OF PRACTICE**  
**TO REDUCE THE RISKS OF ADVERSE EFFECTS ARISING FROM**  
**INTRODUCTIONS AND TRANSFERS OF MARINE SPECIES,**  
**INCLUDING THE RELEASE OF GENETICALLY MODIFIED ORGANISMS**

A Report Submitted by the  
Working Group on  
Introductions and Transfers of Marine Organisms

This document is a report of a Working Group of the International Council for the Exploration of the Sea and does not necessarily represent the views of the Council. Therefore, it should not be quoted without consultation with the General Secretary.

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## SUMMARY

This document reviews changes proposed in 1991, 1992, and 1993 to the ICES "Revised 1990 Code of Practice to Reduce the Risks of Adverse Effects Arising from the Introductions and Transfers of Marine Species". These changes are:

- (1) the addition of a new section on genetically modified organisms (GMOs),
- (2) the addition of wording in Sections I and IV relative to increased sensitivity to and awareness of the possible genetic implications of the introductions and transfers of species, and,
- (3) modifications in Section IV (current commercial practice) focusing on inspection of species for pests and diseases prior to exportation rather than after importation.

*The adoption of this 1993 Revised Code by Council Resolution is recommended.*

## BACKGROUND AND PROPOSED CHANGES

The following represents deliberations of the Working Group on Introductions and Transfers of Marine Organisms (WGITMO) at its 1992 meeting in Lisbon, Portugal, and at its 1993 meeting in Aberdeen, Scotland. The full Report of the WGITMO for its 1993 meeting is presented in a separate document.

### Background: ICES Deliberations in 1991 and 1992

At the 1991 Statutory Meeting in La Rochelle, WGITMO proposed (C.M.1991/F:47) the addition of a new section concerning the release of genetically modified organisms (GMOs) to the ICES "Revised 1990 Code of Practice to Reduce the Risks of Adverse Effects Arising from the Introductions and Transfers of Marine Species". This proposal was the result of work conducted during a joint session of the WGITMO and the Working Group on Genetics at a meeting in Helsinki, held to review the Code of Practice relative to GMOs with a view to developing an extension of the Code.

This proposal was considered at the 1991 Statutory Meeting (Mariculture Committee, Item 9: ICES Annual Report for 1991 (1992), page 83), with the following comments offered:

"The question of what constituted a genetically-modified organism (GMO) was raised. A definition of GMO was required. Notwithstanding, there was a requirement for information on the genetic, ecological, and other effects on the release of genetically-modified organisms into the natural environment to serve as a basis for the development of regulatory measures."

The WGITMO responded to these comments at its 1992 meeting in Lisbon. The Working Group suggested (ICES paper, ACMP 1992/7) adopting the definition of a GMO given in Article 2(2) of EC Directive 90/220, "On the deliberate release into the environment of genetically modified organisms":

"'genetically modified organism (GMO)' means an organism in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination."

Within the terms of this definition, the EC directive lists some of the techniques used in genetic modification (EEC/90/220, Annex I A, Part 1).

This proposal was then considered again at the 1992 Statutory Meeting (ICES Annual Report for 1992 (1993), Mariculture Committee, Working/Study Group Reports, pages 86-87), with the following comments offered:

"It was noted that EIFAC had adopted the ICES Code of Practice and should, therefore, be consulted prior to the publication of the ICES Cooperative Research Report [containing a Revised Code of Practice... including the Release of Genetically Modified Organisms]."

Further, C.Res.1992/4:10 states:

"The 'Revised 1992 Code of Practice....' (as set forth in ACMP 1992/7.3), after consultation with the respective EIFAC Working Group on Introductions of Aquatic Species, will be presented to the Council for adoption."

The WGITMO responded to these comments at its 1993 meeting in Aberdeen. Prior to the meeting, Dr J. Carlton, Chairman of the Working Group, contacted the FAO/EIFAC through Dr R. Welcomme (FAO/Rome). We have been informed by correspondence from Dr Welcomme that the EIFAC Working Party on Introductions is not active at this time. At the 16th Session of EIFAC in 1990, Dr Bert Steinmetz (The Hague, The Netherlands) and Dr Fijan were appointed co-conveners. At the 17th Session, EIFAC took no further action to change the status of the Working Party.

In subsequent correspondence, Dr Steinmetz informed Dr Carlton that it would be appropriate to note now "that EIFAC plans to take up this matter at its next session in 1994", and that this could be noted in the 1993 ICES Code -- that is, the new ICES Code could be produced without waiting for further action from EIFAC. Dr Steinmetz has consulted on this matter with the EIFAC Chairman as well.

After considerable discussion, the Working Group concluded that,

- (a) No further delays in producing the new 1993 Code of Practice were necessary, and that EIFAC has been informed of and provided with copies of the new proposed sections on GMOs, and that Dr Steinmetz, in representing the EIFAC Working Party, has indicated that EIFAC has now been so informed,
- (b) That the word "Revised" should be dropped from the title of the Code, but replaced with the *year* of the Code instead,  
  
and therefore,
- (c) In accordance with C.Res.1992/4:10, the **"1993 CODE OF PRACTICE TO REDUCE THE RISKS OF ADVERSE EFFECTS ARISING FROM INTRODUCTIONS AND TRANSFERS OF MARINE SPECIES, INCLUDING THE RELEASE OF GENETICALLY MODIFIED ORGANISMS"** should be presented to the Council for adoption.

Additional discussion focused on the need to include in the Code a greater awareness of the possible genetic implications of the introduction and transfer of species.

Discussion further focused on modifications to Section IV (current commercial practice), a section which has not been revised since 1979. It was decided to change Section IV(a) to focus on the need for inspection of species for pests and diseases prior to exportation, rather than after importation. It was further decided to combine Sections IV(b) and (c) into a single Section IV(b), insert a new Section IV(c) relative to genetic impacts, and drop Section IV(d). All members of the Working Group concurred with these changes.

#### **Additional Modifications to the 1990 Code of Practice**

The Working Group reviewed the "1990 Revised Code of Practice", taking into account numerous recommendations suggested by the Working Group on Pathology and Diseases of Marine Organisms (WGPDMO) (please see a more extended discussion of these changes in the 1992 WGITMO Report, C.M.1992/POLL:3). Most of the modifications suggested by the WGPDMO will be incorporated in a proposed revised ICES Cooperative Research Report.

## THE REVISED 1993 CODE OF PRACTICE

As a result of these efforts, the WGITMO drafted at its 1992 meeting in Lisbon meeting a

### REVISED 1993 CODE OF PRACTICE TO REDUCE THE RISKS OF ADVERSE EFFECTS ARISING FROM THE INTRODUCTIONS AND TRANSFERS OF MARINE SPECIES, INCLUDING THE RELEASE OF GENETICALLY MODIFIED ORGA- NISMS

This draft includes the revisions first proposed and submitted to the Council in 1991 (C.M. 1991/F:47), with the addition of a definition of GMOs, and revisions proposed (as reviewed above) at the WG's 1992 meeting (ACMP 1992/7.3).

#### Summary of proposed changes

Changes (shown in bold face) to the Revised 1990 Code follow. *The "1993 Revised Code" as it would appear if approved is presented in Appendix I.* The present 1990 Code of Practice is presented in Appendix II.

#### Change the title to read:

### REVISED 1993 CODE OF PRACTICE TO REDUCE THE RISKS OF ADVERSE EFFECTS ARISING FROM THE INTRODUCTIONS AND TRANSFERS OF MARINE SPECIES, INCLUDING THE RELEASE OF GENETICALLY MODIFIED ORGANISMS

#### Change Section I to read:

- I. Recommended procedure for all species prior to reaching a decision regarding new introductions. (A recommended procedure for introduced or transferred species which are part of current commercial practice is given in Section IV; a recommended procedure for the consideration of the release of genetically modified organisms is given in Section V).

- (a) Member countries contemplating any new introduction should be requested to present to the Council at an early stage information on the species, stage in the life cycle, area of origin, proposed plan of introduction and objectives, with such information on its habitat, epifauna, associated organisms, potential competition with species in the new environment, genetic implications, etc., as is

available. The Council should then consider the possible outcome of the introduction, and offer advice on the acceptability of the choice.

#### Change Section IV to read:

- IV. Recommended procedures for introduced or transferred species which are part of current commercial practice.

- (a) Periodic inspection (including microscopic examination) of material prior to exportation to confirm freedom from introducible pests and diseases. If inspection reveals any undesirable development, importation must be immediately discontinued. Findings and remedial actions should be reported to the International Council for the Exploration of the Sea.

[(b) is deleted]

[old (c) becomes (b) and changed to read:]

and/or (b)

Quarantining, inspection, and control, whenever possible and where appropriate.

[new subsection 'c' is added:]

- (c) Consider and/or monitor the genetic impact that introductions or transfers have on indigenous species, in order to reduce or prevent detrimental changes to genetic diversity.

[(d) is deleted]

[The final statement will be part of Section IV and not Section V as in the Revised 1990 Code, and be changed to read:]

It is appreciated that countries will have different requirements toward the selection of the place of inspection and control of the consignment, either in the country of origin or in the country of receipt.

#### Add a new Section V:

V. Recommended procedure for the consideration of the release of genetically modified organisms (GMOs).

- (a) Recognizing that little information exists on the genetic, ecological, and other effects of the release of genetically modified organisms into the natural environment (where such releases may result in the mixing of altered and wild populations of the same species, and in changes to the environment), the Council urges member countries to establish strong legal measures (\*) to regulate such releases, including the mandatory licensing of physical or juridical persons engaged in genetically modifying, or in importing, using, or releasing any genetically modified organism.
- (b) Member countries contemplating any release of genetically modified organisms into open marine and fresh water environments are requested at an early stage to notify the Council before such releases are made. This notification should include a risk assessment of the effects of this release on the environment and on natural populations.
- (c) It is recommended that whenever feasible that initial releases of GMOs be reproductively sterile in order to minimize impacts on the genetic structure of natural populations.
- (d) Research should be undertaken to evaluate the ecological effects of the release of GMOs.

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(\*) Such as the European Economic Communities "Council Directive of 23 April 1990 on the Deliberate Release into the Environment of Genetically Modified Organisms (90/220/EEC)", Official Journal of the European Communities, No. L, 117: 15 - 27 (1990).

ADD to the DEFINITIONS section the following:

Genetic diversity

All of the genetic variation in an individual, population, or species.

This definition is from ICES Cooperative Research Report No. 159, p.42.

Genetically modified organism (GMO)

An organism in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination.

This definition is from Article 2(2) of EC Directive 90/220, "On the deliberate release into the environment of genetically modified organisms".

**CONCLUSION**

It was agreed to recommend to the Mariculture Committee (WGTIMO's parent committee) and to the Council that the "Revised 1993 Code", as presented here, be adopted by Council Resolution.

## APPENDIX 1

### REVISED 1993 CODE OF PRACTICE TO REDUCE THE RISKS OF ADVERSE EFFECTS ARISING FROM THE INTRODUCTIONS AND TRANSFERS OF MARINE SPECIES, INCLUDING THE RELEASE OF GENETICALLY MODIFIED ORGANISMS\*

- I. Recommended procedure for all species prior to reaching a decision regarding new introductions. (A recommended procedure for introduced or transferred species which are part of current commercial practice is given in Section IV; a recommended procedure for the consideration of the release of genetically modified organisms is given in Section V).
- (a) Member countries contemplating any new introduction should be requested to present to the Council at an early stage information on the species, stage in the life cycle, area of origin, proposed plan of introduction and objectives, with such information on its habitat, epifauna, associated organisms, potential competition with species in the new environment, genetic implications, etc., as is available. The Council should then consider the possible outcome of the introduction, and offer advice on the acceptability of the choice.
- (b) Appropriate authorities of the importing country (including fishery management authorities) should examine each "candidate for admission" in its natural environment, to assess the justification for the introduction, its relationship with other members of the ecosystem, and the role played by parasites and diseases.
- (c) The probable effects of an introduced species in the new area should be assessed carefully, including examination of the effects of any previous introduction of this or similar species in other areas.
- (d) Results of (b) and (c) should be communicated to the Council for evaluation and comment.
- II. If the decision is taken to proceed with the introduction, the following action is recommended:
- (a) A brood stock should be established in a quarantine situation approved by the country of receipt, in sufficient time to allow adequate evaluation of its health status.
- The first generation progeny of the introduced species can be transplanted to the natural environment if no diseases or parasites become evident in the F<sub>1</sub> progeny, but not the original import. In the case of fish, brood stock should be developed from stocks imported as eggs or juveniles, to allow sufficient time for observation in quarantine.
- (b) The F<sub>1</sub> progeny should be placed on a limited scale into open waters to assess ecological interactions with native species.
- (c) All effluents from hatcheries or establishments used for quarantine purposes in recipient countries should be sterilized in an approved manner (which should include the killing of all living organisms present in the effluents).
- (d) A continuing study should be made of the introduced species in its new environment, and progress reports submitted to the International Council for the Exploration of the Sea.
- III. Regulatory agencies of all member countries are encouraged to use the strongest possible measures to prevent unauthorized or unapproved introductions.
- IV. Recommended procedures for introduced or transferred species which are part of current commercial practice.
- \* For further details and procedures see:  
ICES Cooperative Research Report No. 130: "Guidelines for Implementing the ICES Code of Practice Concerning Introductions and Transfers of Marine Species" (1984, 20 pp.)  
ICES Cooperative Research Report No. 159: "Codes of Practice and Manual of Procedures for Consideration of Introductions and Transfers of Marine and Freshwater Organisms" (1988, 44 pp.)



- (a) Periodic inspection (including microscopic examination) of material prior to exportation to confirm freedom from introducible pests and diseases. If inspection reveals any undesirable development, importation must be immediately discontinued. Findings and remedial actions should be reported to the International Council for the Exploration of the Sea.

and/or

- (b) Quarantining, inspection, and control, whenever possible and where appropriate.
- (c) Consider and/or monitor the genetic impact that introductions or transfers have on indigenous species, in order to reduce or prevent detrimental changes to genetic diversity.

It is appreciated that countries will have different requirements toward the selection of the place of inspection and control of the consignment, either in the country of origin or in the country of receipt.

V. Recommended procedure for the consideration of the release of genetically modified organisms (GMOs).

- (a) Recognizing that little information exists on the genetic, ecological, and other effects of the release of genetically modified organisms into the natural environment (where such releases may result in the mixing of altered and wild populations of the same species, and in changes to the environment), the Council urges member countries to establish strong legal measures\*\* to regulate such releases, including the mandatory licensing of physical or juridical persons engaged in genetically modifying, or in importing, using, or releasing any genetically modified organism.

- (b) Member countries contemplating any release of genetically modified organisms into open marine and fresh water environments are requested at an early stage to notify the Council before such releases are made. This notification should include a risk assessment of the effects of this release on the environment and on natural populations.
- (c) It is recommended that whenever feasible that initial releases of GMOs be reproductively sterile in order to minimize impacts on the genetic structure of natural populations.
- (d) Research should be undertaken to evaluate the ecological effects of the release of GMOs.

\*\* Such as the European Economic Communities "Council Directive of 23 April 1990 on the Deliberate Release into the Environment of Genetically Modified Organisms (90/220/EEC)", Official Journal of European Communities, No. L, 117: 15 - 27 (1990).

## DEFINITIONS

For the application of this code, the following definitions should be used:

### Brood stock

Specimens of a species, either as eggs, juveniles, or adults, from which a first or subsequent generation may be produced for possible introduction to the environment.

### Country of origin

The country where the species is native.

### Current commercial practice

Established and ongoing cultivation, rearing, or placement of an introduced or transferred species in the environment for economic or recreational purposes, which has been ongoing for a number of years.

### Disease

For the purpose of the Code, "disease" is understood to mean all organisms, including parasites, that cause disease. (A list of prescribed disease agents, parasites, and other harmful agents is made for each introduced or transferred species in order that adequate methods for inspection are available. The discovery of other agents, etc., during such inspection should always be recorded and reported).

### Established species

Species with existing reproductive populations.

### Exporting country

The country from which a specific consignment of a species (regardless of its native region) is received.

### Genetic diversity

All of the genetic variation in an individual, population, or species.

This genetic diversity definition is from ICES CRR 159:42.

### Genetically modified organism (GMO)

An organism in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination.

This definition is from Article 2(2) of EC Directive 90/220, "On the deliberate release into the environment of genetically modified organisms".

### Introduced species ( = non-indigenous species, = exotic species)

Any species intentionally or accidentally transported and released by humans into an environment outside its present range.

### Maintained species

Species which are reproducing in aquaculture for several generations without artificial spawning.

### Marine species

Any aquatic species that does not spend its entire life cycle in fresh water.

### Quarantined species

Any species held in a confined or enclosed system that is designed to prevent any possibility of the release of the species, or any of its diseases or any other associated organisms into the environment.

### Transferred species ( = transplanted species)

Any species intentionally or accidentally transported and released within its present range.

NOTE:

- (a) It is understood that an introduced species is what is also referred to herein as an introduction; a transferred species as a transfer, and a quarantined species as a species in quarantine.
- (b) Introduced species are understood to include exotic species, while transferred species include exotic individuals or populations of a species. It is, thus, understood that the general term "exotic" can include both introduced and transferred species.
- (c) It is understood for the purpose of the Code that introduced and transferred species may have the same potential to carry and transmit disease or any other associated organisms into a new locality where the disease or associated organism does not presently occur.