

ADENDUM AL INFORME
DE LA SEPTIMA REUNION DE LA COMISION
(CCAMLR-VII)

INFORME DE LA REUNION DEL GRUPO DE TRABAJO
PARA EL DESARROLLO DE UNA ESTRATEGIA
DE CONSERVACION PARA LOS RECURSOS
MARINOS VIVOS ANTARTICOS

Hobart, Australia
23 y 28 de octubre de 1988

INFORME DE LA REUNION DEL GRUPO DE TRABAJO PARA
EL DESARROLLO DE UNA ESTRATEGIA DE CONSERVACION
PARA LOS RECURSOS VIVOS MARINOS ANTARTICOS

El Grupo de Trabajo para el "Desarrollo de una Estrategia de Conservación para los Recursos Vivos Marinos Antárticos" (GTDEC) (WGDCS), presidido por Australia, se reunió los días 23 y 28 de octubre. El informe de la Sexta Reunión anual de la Comisión establece los siguientes términos de referencia para este Grupo de Trabajo (véase párrafo 107):

- "1) Desarrollar un entendimiento común en cuanto a las implicaciones para la gestión del Artículo II de la Convención;
- 2) Desarrollar posibles enfoques de conservación para alcanzar los objetivos del Artículo II a través de los medios establecidos en el Artículo IX;
- 3) Seleccionar y aplicar criterios de desempeño para la evaluación de cada enfoque;
- 4) Identificar, para los enfoques preferidos, metas específicas a corto y largo plazo, que estén de acuerdo con los objetivos de la Convención;
- 5) Formular el marco estratégico para las actividades de gestión, con el fin de lograr la consecución de estos objetivos;
- 6) Informar a la Comisión recomendando las acciones apropiadas.

Estos son los términos de referencia provisionales que podrán ser variados a medida que el Grupo vaya avanzando".

2. El Grupo tomó en consideración el informe presentado por un subgrupo de expertos técnicos, el cual se reunió del 20 al 22 de octubre, para asesorar al Grupo sobre la determinación de los criterios de eficacia para la evaluación de estrategias de conservación y temas afines, (tercer

término de referencia). El coordinador del subgrupo técnico, Dr G. Kirkwood (Australia), presentó el informe del subgrupo, el cual fue recibido con agrado por el Grupo de Trabajo, por ser una contribución útil para su tarea.

3. En la discusión del informe del subgrupo técnico y en las consideraciones hechas el año pasado sobre este punto, se observó que la Comisión quizás quiera oficializar los párrafos 114 y 115 del informe de 1987, los cuales están sujetos a perfeccionamiento, a medida que vayan desarrollándose los enfoques de conservación. Respecto a esto, el Grupo de Trabajo tomó nota del punto de vista del subgrupo técnico, que señala que el objetivo primario del uso racional implica la extracción de una manera tal que asegure la preservación del potencial para obtener el máximo rendimiento posible en el plazo más largo, atendiendo a los principios generales de conservación aprobados.

4. El Grupo de Trabajo, respecto del párrafo 13 del informe del subgrupo técnico acordó que:

- (a) Se facilitaría la aplicación del Artículo II 3(b) si se tuviera una definición operativa de agotamiento y de metas para los niveles de recuperación de las especies mermadas. A este respecto, el Grupo de Trabajo creyó que el asesoramiento del Comité Científico sería muy útil en estos temas, ya que incluirían la consideración del rango probable del máximo incremento neto anual para varios grupos principales de especies.
- (b) Sería útil tener el asesoramiento del Comité Científico sobre la capacidad del programa de seguimiento del ecosistema para detectar cambios en las relaciones y también para reconocer los efectos de las dependencias primarias entre las especies, incluyendo la distinción entre las fluctuaciones naturales y las que producen las pesquerías.

5. El Grupo de Trabajo acordó que no era práctico evaluar enfoques de conservación opcionales mediante el empleo de pruebas de campo, debido al

riesgo de incumplir los objetivos de la Convención, y que la forma más efectiva de proceder sería mediante el modelado. Se dió por supuesto que en el proceso de evaluación de enfoques se avanzaría en el desarrollo de objetivos y de criterios de eficacia.

6. Se admitió que los enfoques de conservación deberían tener en cuenta tanto las escalas temporales cortas como las largas. Se observó que, a corto plazo, la Comisión ha comenzado a desarrollar enfoques de conservación para la ordenación de las reservas de peces, con énfasis en las especies que sufren actualmente intensa explotación; que el marco para la evaluación de la efectividad de estas estrategias para especies individuales, es relativamente sencillo; y que estos temas ya están siendo tratados por el "Grupo de Trabajo para la Evaluación de las Reservas de Peces".

7. En el contexto del ecosistema, cualquier enfoque de conservación deberá tener presente los efectos producidos por la pesca, no sólo en las especies objetivo sino también en las dependientes y en las afines; con lo cual, el desarrollo y la evaluación de su eficacia se vuelven más complejos. El Grupo acordó que, si bien es necesario el desarrollo de enfoques apropiados para la conservación de los ecosistemas, la prioridad para llevar a cabo esta tarea no es tanta como para la de las reservas de peces.

8. En este contexto, se acordó que la Antártida no debería ser considerada como un ecosistema único, sino como un conjunto de subsistemas diferentes, los cuales están sujetos a una gran variedad de niveles de explotación. Esto significa que, si bien los efectos de las pesquerías deberán ser considerados en el marco del subsistema local en donde tienen lugar, existe la necesidad de considerar los efectos potenciales de estas sobre los subsistemas relacionados.

9. El Grupo de Trabajo discutió el valor que tiene conocer los planes de pesquerías de los Países Miembros, tal como se explica en el párrafo 28 del informe del subgrupo técnico. Los representantes de Japón y la Unión Soviética manifestaron que esto era difícil en su caso, debido a algunos factores que influyen en los planes a largo plazo de las

actividades de recolección. Por ejemplo, el ritmo de expansión de las pesquerías japonesas puede estar regido por las condiciones del mercado y las actividades de las empresas pesqueras individuales. En el caso de la Unión Soviética, incluso en una misma temporada, las decisiones para escoger entre peces o krill, se hacen según las condiciones de pesca de un área concreta. A pesar de estas incertidumbres, la información suministrada al respecto es de un valor considerable para el desarrollo, entre otros, de enfoques predictivos, más que reactivos para la conservación del krill.

10. El Grupo de Trabajo reconoció que sería valioso tener cualquier información adicional sobre el desarrollo de las pesquerías, aunque fuera imprecisa. Asimismo, las descripciones de las tácticas operativas aplicadas a las actividades pesqueras serían importantes para el desarrollo y evaluación de los enfoques de conservación. Por ejemplo, la información detallada de las operaciones día a día de los arrastreros de krill, ha sido muy útil en el trabajo de modelado para evaluar el papel potencial de los datos de captura y esfuerzo en el seguimiento de los cambios en la abundancia de krill.

11. Se acordó que debería continuarse el trabajo de desarrollo de modelos para la evaluación de los enfoques de conservación, (tanto para especies individuales como para multiespecíficas). Esta tarea debe ser realizada por los Miembros y por los distintos Grupos de trabajo del Comité Científico. Al mismo tiempo, se observó que la prioridad para este tipo de tarea debería determinarse en relación a otras tareas importantes como son determinar la abundancia de las reservas y la estructura de las mismas para especies clave del ecosistema.

12. Al revisar la dirección de su tarea, el Grupo de Trabajo resaltó que deberían tomarse en consideración, con el fin de evitar duplicaciones, otras tareas que lleva a cabo el Comité Científico. Se acordó que el Grupo de Trabajo tenía un papel importante y continuado en el desarrollo de los enfoques prácticos de conservación, según lo establecido en sus términos de referencia.

13. Se incluye el informe del subgrupo técnico como anexo.

REPORT OF THE MEETING OF THE TECHNICAL SUB-GROUP
OF THE CCAMLR WORKING GROUP FOR THE DEVELOPMENT
OF A CONSERVATION STRATEGY

(Hobart, Australia, 20-22 October 1988)

The Meeting was held in the CCAMLR Secretariat on 20-22 October, 1988. A list of participants is attached at Appendix 1.

2. Dr Geoff Kirkwood was elected Convener of the Sub-group, and it was agreed that the rapporteurs duties would be assumed by members of the Australian delegation at the meeting.

3. The Convener expressed his understanding that the development of performance criteria involved developing a methodological framework for evaluation of potential conservation approaches. The Group accepted this definition of their task and adopted the agenda attached at Appendix 2.

4. Papers were submitted by technical experts from several CCAMLR Members for the Group's consideration (see list of documents at Appendix 3). It was agreed that these should be used to assist the Group through reference to them where they were relevant to the issues raised rather than considering them individually.

THE DEVELOPMENT OF A METHODOLOGICAL FRAMEWORK FOR EVALUATION
OF POTENTIAL CONSERVATION APPROACHES

5. The Group accepted, as a working definition, that a conservation strategy incorporates procedures under which conservation measures (for example, catch limits, open and closed seasons) are established, removed or varied. It involves using the information available to assess the state of the resources, from which decisions are made as to what changes in conservation measures are necessary.

6. It was pointed out that the Antarctic should not be thought of as a single ecosystem; rather it comprises a number of different sub-systems. These are subject to widely differing levels of exploitation. This means that the potential effects of fisheries have to be considered in both local and broad geographical scales.

7. It was recognised that a methodological framework had to consider both short and long time-scales. In the short term, the Commission has begun to develop conservation strategies for the management of finfish stocks, with emphasis on those already subject to heavy exploitation. The framework for assessing the effectiveness of these single species strategies is relatively straightforward. Such matters are already being addressed by the Fish Stock Assessment Working Group.

8. In an ecosystem context, a strategy has to take into account the effects of fishing on not only the target species, but also dependent and related species. This makes its assessment more complex. The Group agreed that while there is a need to begin development of appropriate strategies for conserving ecosystems, the priority for completing this task is lower than that for the finfish stocks.

Information Requirements for Specification of Conservation Strategies, Including Data Inputs and Monitoring

9. The specification of a conservation strategy involves the identification of operational objectives, data inputs and monitoring, assessment procedures and decision rules. For evaluation of a strategy, the decision rules need to be specified in terms of the information inputs and the range of decisions that are possible.

Preliminary Objectives

10. At its 1987 Meeting, the Working Group for the Development of a Conservation Strategy for Antarctic Marine Living Resources had developed a

set of principles of conservation based on Article II of the Convention, and an interpretation of the term "rational use" (CCAMLR-VI, paragraphs 114-115). These were :

"114. The Group noted that, under Article II, the term "conservation" includes rational use. Harvesting and associated activities are to be conducted in accordance with the following principles of conservation :

- (i) maintenance of ecological relationships;
- (ii) maintenance of populations at levels close to those which ensure the greatest net annual increment;
- (iii) restoration of depleted populations;
- (iv) minimisation of the risk of irreverisble change in the marine ecosystem.

115. With these principles in mind, the Working Group felt that rational use involved inter alia the following elements :

- (i) that the harvesting of resources is on a sustainable basis;
- (ii) that harvesting on a sustainable basis means that harvesting activities are so conducted as to ensure that the highest possible long-term yield can be taken from a resource, subject to the general principles of conservation above;
- (iii) that the cost effectiveness of harvesting activities and their management is given due weight."

11. The Group agreed to adopt as a set of preliminary objectives these general principles of conservation and elements of "rational use". It

agreed that they were sufficient for the purpose of evaluating potential conservation strategies.

12. The Group noted that it was not possible to simultaneously satisfy each of the preliminary objectives. Conservation strategies must inevitably involve compromises between the objectives, and an important part of any examination of differing strategies would be a comparison of the extent to which they met the different objectives.

13. The Group then addressed the interpretation of these preliminary objectives in terms which admit assessment of the degree to which they are able to be met.

(i) Maintenance of ecological relationships

The Group agreed that it was difficult to see how to evaluate the extent to which this objective could be met because of the sheer number of species and interrelationships which might be monitored. It is only practical to monitor a small number of these. This matter has been considered by the Working Group for the CCAMLR Ecosystem Monitoring Program and they have drawn up a program for monitoring selected predators which, at this stage, is as comprehensive as practicable. There are plans for the monitoring of prey species and environmental parameters. There remains a need to examine the power of this monitoring program to detect changes in relationships and to recognise the effects of even simple inter-specific dependencies.

The question was raised as to the number of species which would need to be monitored to be reasonably certain that important ecological relationships were being maintained. While it was felt that this required further investigation it was suggested that the largest and smallest species in major groups should be considered.

- (ii) Maintenance of populations at levels close to those which ensure greatest net annual increment (GNAI)

There is a paradox in this objective in that the level of GNAI for a dependent species changes with the level of exploitation of prey species. This has been resolved by interpreting the predator population levels referred to as those which would exist if there were no exploitation of prey. In practical terms these levels can be best assessed from historical levels of abundance.

It was generally accepted that if this objective is achieved then objective (i) would also probably be achieved as a consequence.

The Group agreed that, in general, it is not possible to accurately predict the population level at which GNAI would be obtained, therefore arbitrary working values will need to be chosen for various types of species.

The Group agreed that there was a problem in separating what may be natural fluctuations in dependent populations from changes induced by fishing on their prey. This needs to be addressed.

- (iii) Restoration of depleted populations

The Group identified a number of considerations to be examined in relation to this objective. These were :

- (a) the need for an operational definition of depletion and of a target level for recovery;
- (b) the likely time-scale of the recovery;
- (c) the compromise between the rate of recovery of a stock and the effects of any fishing activities permitted during the recovery period;

- (d) the possibility that reducing the abundance of competitors or predators might assist in the recovery of depleted populations.

Assessing the achievement of this objective depends upon some form of monitoring of trends in the abundance of depleted species. It was suggested that in certain instances some level of fishery could assist in monitoring the recovery of a depleted stock.

- (iv) Minimisation of risk of irreversible change in the marine ecosystem

In the Convention, this principle is stated as "the prevention of changes or minimisation of the risk of changes in the marine ecosystem which are not potentially reversible over two or three decades". This suggests that the minimum levels of abundance for various species need to be tied to their dynamics. For example, slow growing populations will take the specified time to recover from levels which are not far below the target levels, while fast growing populations may recover from levels well below target levels over that time. However, in many circumstances, it will be difficult to predict that a population could recover from a given level in the required time.

Elements of "Rational Use"

14. The primary objective involving rational use is that of harvesting to ensure that the potential for achieving the highest possible long-term yield is preserved, subject to the above principles of conservation. The Group agreed that assessing the extent to which this objective was met by a proposed conservation strategy was straightforward.

15. With respect to the issue of cost-effectiveness, it was agreed that it was not appropriate to consider the economics of individual fishing

operations. However, the costs of management and monitoring, including those related to observation and inspection, must be taken into account in any evaluation of a conservation strategy.

Evaluating Performance of Conservation
Strategies in Meeting Objectives

16. The Group considered that it was not practical to evaluate conservation strategies by applying them in the field because of the risk of failure to meet the objective should they prove inadequate. The time-scale involved could be long and the cost prohibitive. It was therefore agreed that a modelling approach to evaluation will be the most effective.

17. Models appropriate for evaluating conservation strategies for single species fisheries not involving substantial levels of ecological interactions (as currently being applied to finfish fisheries in the CCAMLR Area) are already in wide use in fisheries science.

18. The types of model required to evaluate conservation strategies for the management of fisheries involving substantial levels of interactions (e.g. krill) are more complex, because of the need to consider dependent and related species from an ecosystem perspective.

19. In any evaluation sub-models are needed to describe :

- the dynamics of the ecosystem or the species;
- the management procedure;
- the fishery; and
- the monitoring process and its results.

20. Most of the discussion focussed on the sub-model dealing with the dynamics of the ecosystem or the species. It was agreed that initial testing on simple models would define the range of potential strategies suitable for further development. These models can then be made more

complex to give more rigorous evaluation. The aim would be to use a diverse range of models to try to develop conservation strategies which are robust, in the sense that they would still meet their objectives when applied to model ecosystems that are radically different. As it will not be known which model best captures the dynamic features of real ecosystems or populations, potential strategies should be tested in as many hypothetical situations as possible.

21. The Group therefore decided that it is now appropriate to continue to develop specific models for use in the evaluation of potential conservation strategies.

22. For performance criteria, two papers presented to the meeting (WG-CSD-88/6 and 8) contained suggestions suitable for application to evaluations aimed at refining the range of potential conservation strategies. The Group recognised that performance criteria would need to evolve in step with both the conservation strategies and the complexity of the hypothetical ecosystems to be managed.

Protocols for Conducting Evaluations

23. A protocol is a uniform set of evaluation procedures which allow the performance of different potential conservation strategies to be compared. It was agreed that protocols which might be employed in this process should now be developed. Further work by individual members is required in order to develop protocols for consideration by a technical group at a further meeting.

EXAMPLES OF PERFORMANCE CRITERIA AND EVALUATIONS

24. Paper WG-CSD-88/8 included examples in which a simple predator-prey system is simulated, with exploitation occurring only on the prey. Catch limits are set according to two different conservation strategies. One strategy uses a standard Schaeffer model to obtain annual estimates of MSY

from CPUE data and harvested at 90% of the estimated MSY. The second strategy uses a simple feedback procedure to adjust catches up or down depending on whether the prey abundance is estimated to be above or below a target level (55% of unexploited). On face value, any differences in the results of applying the two strategies should be slight.

25. In WG-CSD-88/8, a number of performance criteria were defined which relate to the objectives of management identified by the Working Group. Three examples of these objectives and the corresponding performance criteria are :

(a) Maintenance of ecological relationships :

Probability of the predator population being reduced to less than 30% of its initial abundance.

(b) Maintaining highest long-term yield :

Cumulative catch over 70 years.

(c) Risk of irreversible change :

Probability of the prey population being reduced to levels from which recovery to the target level takes more than 30 years.

26. Applying the conservation strategy to the simulated predatory-prey system led to the following estimates of performance criteria under the two strategies :

Performance criterion	Strategy 1	Strategy 2
(a)	0.94	0.33
(b)	1.14	4.51
(c)	0.93	0.08

27. Despite expectations, the two strategies differ considerably in their ability to achieve the three objectives illustrated. Strategy 1 is markedly inferior in all three criteria, and would be rejected as a conservation strategy in this example.

OTHER MATTERS

28. The Group recognised the importance of obtaining an understanding of the plans of member nations for the development of krill fisheries, and similar information on squid and finfish fisheries would be useful. This information would help identify types of conservation strategy that are broadly consistent with the planned exploitation of the resource. Also, slight differences in the way in which development plans are implemented can sometimes provide substantially different opportunities to learn about the resource dynamics (e.g. the interactions between prey and dependent species and the separation of natural from fishery-induced fluctuations in abundance). Early notification of fishery development plans would allow examination of these opportunities.

CONCLUDING REMARKS

29. The Group recognised that further work is needed to develop models and protocols for the evaluation of potential conservation strategies. It noted that some related work useful for the examination of methodology and elements of conservation strategies has been and will be carried out under the auspices of the Scientific Committee.

30. The Group noted that some of the papers that it had received were pertinent to the development of conservation strategies. These might be considered by the Working Group.

LIST OF PARTICIPANTS

Technical Sub-Group of the CCAMLR Working Group
for the Development of a Conservation Strategy
(Hobart, Australia, 20-22 October, 1988)

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AGENDA

Technical Sub-Group of the CCAMLR Working Group
for the Development of a Conservation Strategy
(Hobart, Australia, 20-22 October, 1988)

1. Discussion of Methodological Framework for Evaluation of Potential Conservation Approaches
 - 1.1 Preliminary Objectives
 - 1.2 Performance Criteria
 - 1.3 Data Inputs - Harvesting
- Scientific Monitoring
2. Examples of Performance Criteria and Evaluations
3. Report to the Working Group

LIST OF DOCUMENTS

Technical Sub-Group of the CCAMLR Working Group
for the Development of a Conservation Strategy
(Hobart, Australia, 20-22 October, 1988)

Meeting Documents

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| WG-CSD-88/1 | Provisional Agenda for the Meeting of the Conservation Strategy Working Group |
| WG-CSD-88/2 | Provisional Agenda for the Meeting of the Technical Sub-Group
(Convener) |
| WG-CSD-88/3 | List of Participants
(Secretariat) |
| WG-CSD-88/4 | List of Documents
(Secretariat) |
| WG-CSD-88/5 | The Selection of Performance Criteria in the Evaluation of Conservation Strategies
(Convener) |
| WG-CSD-88/6 | Performance Criteria for the Evaluation of Conservation Strategies
(Delegation of Argentina) |
| WG-CSD-88/7 | EEC Background Paper on Conservation Strategy
(Delegation of the EEC) |
| WG-CSD-88/8 | Preliminary Consideration of Performance Criteria for the Evaluation of Conservation Strategies
(Australia) |
| WG-CSD-88/9 | Towards a Conservation Strategy for Antarctic Marine Living Resources
(Delegation of USSR) |
| WG-CSD-88/10 | Modelling and Decision Making as Part of the CCAMLR Management Regime |
| WG-CSD-88/11 | Objectives of Ecosystem Monitoring |

WG-CSD-88/12 Report of the Meeting of the Technical Sub-Group of the
CCAMLR Working Group for the Development of a
Conservation Strategy (Hobart, Australia, 20-22 October,
1988)

Other Papers Referred to at the Meeting :

CEMP Standard Methods for Monitoring Parameters of
Predatory Species, 1988