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SEABED AND THE OCEAN FLOOR BEYOND THE
LIMITS OF NATIONAL JURISDICTION

Sub-Committee II

Management of the Living Resources of the Sea
Working Paper Submitted by the Delegation of Canada

I. INTRODUCTION

This working paper is submitted by the Delegation of Canada for discussion purposes, and does not necessarily reflect the final definitive views of the Canadian Government.

In the view of the Delegation of Canada the functional approach provides the soundest basis for a rational system of management of the living resources of the sea. On this basis it would be recognized that different management regimes may be required for different species groups. However, there are certain basic principles which should form the foundation of any management regime for marine living resources. The purpose of this working paper is to outline the essential elements of this functional approach to management of marine living resources, and to further amplify the principles underlying this approach in relation to their possible reflection in future treaty articles.

II. THE FUNCTIONAL APPROACH TO MANAGEMENT OF LIVING RESOURCES OF THE SEA

Relationship to Management of Marine Environment as a Whole

The functional approach to fisheries management views such management as forming part of the broader concept of management of the marine environment as a whole. The importance of that broader concept, and its relationship to fisheries management, was stressed at the second session of the Intergovernmental Working Group on Marine Pollution which was held in Ottawa in November, 1971. The statement of objectives adopted in the report of that Working Group has since been adopted by the Stockholm Conference on the Human Environment and may be regarded as the foundation for sound principles of fisheries management. It reads as follows:

"The marine environment and all the living organisms which it supports are of vital importance to humanity, and all people have an interest in assuring that this environment is so managed that its quality and resources are not impaired. This applies especially to coastal nations, which have a particular interest in the management of coastal area resources. The capacity of the sea to assimilate wastes and render them harmless, and its ability to regenerate natural resources, is not unlimited. Proper management is required and measures to prevent and control marine pollution must be regarded as an essential element in this management of the oceans and seas and their natural resources."

Differentiation of Species

In further developing the functional approach to fisheries management, it is necessary to differentiate between various groups of species with a view to identifying the types of regimes that may be most appropriate in each case. Thus, marine living resources can be conveniently classified into four broad ecological groups on the basis of their distribution and migratory behaviour, namely (a) sedentary species, (b) coastal species, (c) anadromous species, and (d) wide-ranging species.

(a) Under the terms of the 1958 Convention on the Continental Shelf, the coastal state exercises exclusive sovereign rights over living organisms which are defined as sedentary species, i.e. those organisms which, at the harvestable stage, either are immobile on or under the seabed or are unable to move except in constant physical contact with the seabed or the subsoil. In the Canadian view this approach to the management of sedentary species is appropriate and adequate in that it recognizes the interrelationship between the management of living and mineral resources and assigns to the coastal state unitary and full authority over all the resources appertaining to its continental shelf.

(b) The next broad category of marine living resources relates to the coastal species. These are the non-sedentary, free-swimming species which inhabit nutrient-rich areas adjacent to the coast. Some fish and shellfish species live in close association, but not, at the harvestable stage, in constant physical contact with the seabed. Other species inhabit the waters immediately above the seabed; others are truly pelagic in that they inhabit surface or mid-water areas; yet others are pelagic through most of their lives but return to the seabed or shallow coastal areas to reproduce. Since, in general, the productivity of these species is dependent in large part on land-related factors, the coastal state has a special responsibility as well as a special interest in the maintenance of their productivity which, in the Canadian views, should be duly reflected by assigning to the coastal state the authority to manage these species as well as a preferential position in their utilization.

(c) The anadromous species represent a special component of the coastal species. They are bred and spend their early life in the rivers of the state of origin. Even though they may travel far to sea away from their rivers of origin, they return to these rivers to reproduce. If the state of origin did not take special measures to maintain these rivers in fit condition, the most important stocks of anadromous species would soon disappear. Maintenance of the rivers is a costly undertaking for which the state of origin bears sole responsibility. In recent years, many nations have spent increasing sums to enhance the production of anadromous species by artificial means, adding to the costs of maintaining the runs. Management of the runs on a stock basis is best achieved when the fish are approaching their home rivers, when they have achieved their maximum poundage and are in prime condition in their home waters.

In the case of anadromous species, therefore, more so than any other species, the state of origin has virtually sole responsibility for the continued existence of the stocks and must make major expenditures to assure continuation of the runs. These heavy and unique responsibilities and the high cost of exercising them, in the view of the Delegation of Canada, can be justified only if management authority is vested in the state of origin and if that state, in principle, has the sole right to harvest the anadromous species bred in its own rivers. As a step in this direction, the Canadian authorities have proposed that fisheries for these species should not be conducted on the high seas.

(d) Finally, there is a group of wide-ranging species, including most of the large pelagic fish such as tunas and most of the marine mammals. It might also be envisaged that fish which inhabit waters over the deeper parts of the oceans, the "bathypelagic" species, could also be considered with the wide-ranging species for purposes of formulating a common management regime. By virtue of their distribution over wide oceanic areas, as well as their temporary presence in certain seasons in coastal waters of various states, an international authority composed of interested states would appear to be the most appropriate mechanism for management of these species. Taking into account the degree of dependence of individual species on coastal waters, consideration should be given to the provision that might be made to accommodate coastal state interests in these species during the period in which they inhabit coastal waters.

III. SPECIAL INTEREST OF THE COASTAL STATE

The coastal state has a special interest in and responsibility for the conservation of the living resources of the sea adjacent to its coast and should have the authority required to manage those resources in a manner consistent with its special interest and responsibility, as well as preferential rights in the harvest of such resources.

This principle has particular application to the management of the coastal and anadromous species (having already been given maximum application in respect of the sedentary species). The limited recognition of the special interest of the coastal state in the 1958 Convention on Fishing and Conservation of the Living Resources of the High Seas is not sufficient to enable a coastal state to implement an effective system of management of coastal fishery resources. This special interest derives from the responsibility of the coastal state with respect to productivity of living resources adjacent to its coast, as well as from the long-standing socio-economic dependence of coastal communities on nearby fish stocks.

The relationship between land and sea in coastal areas imposes certain responsibilities upon the coastal state. It must protect the coastal environment where living resources are concentrated, and which for many species is vital to reproduction, early development or feeding. The waters bordering the continents are far more productive than the open oceans. This productivity is subject to decline through the adverse effects on the marine environment caused by entry of river-borne and air-borne pollutants, dumping of refuse and industrial wastes, and shoreline alterations such as land fill projects. The responsibilities which the coastal state must assume in maintaining resource productivity and quality, and the costs it bears in meeting this responsibility, must be balanced by the authority to manage and the preferential right to utilize adjacent living marine resources, subject to internationally agreed principles (discussed below).

Coastal populations in areas remote from industrialized locations are usually dependent on some form of primary industry for their continued wellbeing. In many cases fisheries are the only form of employment available to most of the population. The population tends to be scattered over a number of small communities, each maintaining a balance, sometimes precarious, between the size of the community and the abundance of the fish species on which it depends. Each community tends to exploit fishery resources in

its immediate vicinity. Such coastal populations are often not capable of wide-ranging fishing operations. Over-exploitation of coastal living resources has serious socio-economic consequences for the coastal state, whose dependence on coastal resources must be taken into account. For some species the coastal state could have exclusive exploitation rights; for others a preferential share in the harvest could be adequate. It could also be envisaged that the coastal state could share in the benefits from coastal resources without actually fishing, for example, through a leasing arrangement with other states.

As regards the limits of the area under the management authority of the coastal state, these could be biological or geographical in nature. If biological, the functional authority of the coastal state could be exercised in accordance with the known distribution and zoogeographical limits of the stocks being managed, excepting the territorial or jurisdictional waters of another state. It may be, however, that some form of geographic delimitation of authority, related to the relevant biological limits, will be considered desirable or necessary for practical administrative purposes.

IV. BASIC PRINCIPLES FOR COASTAL STATE MANAGEMENT

The following principles would be applicable to any system for the rational management of the living resources of the sea. They are elaborated here, however, with particular reference to the management of coastal species by the coastal state, whose authority and preferential rights would be governed by these principles, as would also the participation of other states in particular fisheries under management by the coastal state.

It must be recognized that the special interest of the coastal state in the fisheries resources adjacent to its coast, is an overriding principle in the sense that particular social and economic circumstances of the coastal state may necessitate modification of these principles in particular fisheries. What is essential is that the use of coastal fisheries resources should be of maximum benefit to the people of the coastal state in terms of economic efficiency, contribution to the economy and improvement of social conditions.

(1) Yield from a fishery should be allocated among participants, on the basis of some appropriate formula, so that each participant may obtain his share on the most advantageous basis.

Stocks may be protected from overfishing, and yields maximized in the long term, by regulating fisheries to take appropriate annual catches. If such regulation does not also include a scheme of allocation to participants the resultant competition for the

available catch will inevitably result in wasteful inputs of capital and manpower. Under such circumstances, some participants will be able to compete more effectively than others and in extreme situations one or two participants may be able to appropriate most of the catch to themselves, though at costs which may be greater than the yield value. In fairness to all participants, yields should be allocated in a way that does not discriminate between their fishing capacities. To date, such allocation is rare in international fisheries, and in fact was achieved for the first time earlier this year with respect to allocation of herring and groundfish catches within the International Commission for the Northwest Atlantic fisheries. (Questions relating to the method of allocating shares are discussed in connexion with the immediately following principle).

(2) Access to a fishery should be controlled, on the basis of some appropriate formula, to ensure that no more than the maximum biological yield is taken, and that it is taken without unnecessary investments of capital and manpower.

Controlled access is, of course, an obvious consequence of any system of share allocation. The objective of rational fishery management should be to constrain the productive capacity in a fishery, by controlling access, so that the yield is taken with no greater effort than necessary, taking into account, however, relevant social factors. This concept may be extended, and it could be envisaged that economic rationalization of fisheries would include the objective of obtaining maximum economic yield from the resource. This would mean that fisheries would be exploited so that the difference between value of the yield and cost of obtaining the yield is at a maximum. This objective can usually be attained by fishing at a point slightly below the maximum sustainable yield. Indeed there are some situations where the fishing effort required to reach the maximum sustainable yield may be out of all proportion to the increase in catch so attained.

While the application of a policy of this kind is especially difficult in the case of fish stocks exploited by fleets of different nations, a reasonably satisfactory solution would be to establish an overall catch limit, with shares allocated to participants. With assurance of a pre-determined share in the catch, each country is in a position to utilize that share to the best advantage in terms of its particular social goals. In the view of the Delegation of Canada, the coastal state should have the authority to determine the allowable yield for the various stocks of coastal species falling under its management, in accordance with the principles herein outlined and in consultation with regional advisory commissions. It is because international experience

has demonstrated the difficulty of reaching consensus on particular measures needed on the basis of scientific data that it is proposed that the coastal state should have authority to impose a decision where consensus is not possible.

As to the formula which would be used to determine the shares of other states participating in a fishery subject to management by a coastal state, the essential factor would be to provide for recognition of the principle that the coastal state could reserve for itself a share proportionate to its needs and its capacity to exploit the stock in question within the limits of agreed conservation criteria. With this principle established, the question of allocation of shares among other participants would, of course, be greatly simplified and could be left for determination by regional advisory commissions (which could draw upon the developing experience of such bodies as ICNAF in this field). The same situation could also prevail with respect to the entry of new participants into a particular fishery.

(3) Management must be carried out on the basis of widely recognized and internationally acceptable scientific and socio-economic criteria.

This is essential for both effectiveness and equity. Without agreement on such criteria there would be no objective guidelines for the exercise of management authority or to help avoid or resolve disputes which might arise. Hence internationally agreed criteria are essential to any management regime, including coastal state management.

(4) Management should provide for control of the rate of expansion of fisheries.

Many of the current problems in international fisheries management are the result of rapid and uncontrolled increases in fishing; the consequences of such increases are often not apparent until the damage has been done. There are many examples where declining yields from fisheries are thought to be at least partly caused by sudden and opportunistic increases in fishing giving temporary yields which the stocks cannot maintain in the long term and which in extreme situations may seriously impair the capacity of the stocks to reproduce. Recovery of stocks under these conditions may be very slow, resulting in negligible yields over a long period of years and possible long-term imbalances in marine biological communities with consequences that are at present unforeseeable.

(5) All fish caught should be reported and utilized.

Fisheries should not be conducted so that significant amounts of the species sought, or species taken incidentally to the species sought, are discarded at sea. This practice, unfortunately, is now far too prevalent in fisheries for highly-valued species where

substantial quantities of other species are caught and discarded despite the fact that these other species are valuable to other participants and may themselves be subject to conservation regulations.

(6) Fisheries for human consumption should in principle take priority over competing fisheries for reduction to fish meal.

The oceans are gaining in importance as a source of protein. The most efficient way to use this protein is to make it available directly as food, rather than use it in animal feeds to produce less protein. Wherever the possibility exists to use species directly for human consumption, fisheries for such purposes should receive priority. Special circumstances, such as traditional fishing patterns and socio-economic needs of states conducting the fisheries will have to be taken into account. Processing of fish waste and of species not directly marketable for human consumption, to produce acceptable protein concentrates which may be used as food additives for human consumption, may eventually achieve greater importance relative to fish meal.

(7) Any management regime for an internationally-exploited fishery must be prepared to report to the international community on the exercise of its management authority; appropriate dispute-settlement procedures should be provided for.

Responsibility for resource management must carry sufficient authority to fulfil that responsibility. While the exercise of authority should be subject to review, the authority itself should not be open to challenge. The concept of coastal state management of coastal species as "custodian" for the international community would not imply some form of close supervision over the exercise of powers and the discharge of responsibilities by a coastal state, but rather that the exercise of powers in accordance with internationally agreed criteria would be subject to appropriate dispute-settlement procedures.

As to whether the coastal state would be required to submit to dispute-settlement procedures where it reserved an entire stock to meet its special needs, the view of the Canadian delegation is that dispute-settlement procedures should apply in such event only if the dispute concerned the achievement of full utilization of that stock, or of a dependent stock of another species, within the limits of agreed conservation requirements.

As to whether the coastal state would be accountable for the exercise of its authority over the whole of a stock's range including the territorial sea and the exclusive fishing zone, it might be considered inappropriate to seek any diminution of the coastal state's rights in respect of fisheries within the territorial sea and exclusive fishing zone. It must be recognized, however, that it would be anomalous for

any sound system of fisheries management to apply one set of conservation principles within the territorial sea and exclusive fishing zone and a conflicting set in areas immediately adjacent thereto.

(8) All countries participating in an internationally-exploited fishery should co-operate with the designated management authority.

Participants should contribute a fair share of the costs of managing the resource proportionate to their returns from that resource, and should provide the information needed for management purposes (catch, effort and biological statistics, etc.).

Contributions by participants might be in the form of research programmes, for instance. It should not be expected that a few participants should bear this burden on behalf of all participants, although the primary responsibility would be that of the coastal state.

(9) The quality of ocean waters must be maintained.

As discussed in Section II, it has been accepted that management of fishery resources cannot be divorced from management of the marine environment as a whole. Maintenance of environmental quality is necessary on two counts; first, to ensure that the reproductive capacity and other life processes of the species are not impaired through environmental degradation, and secondly to ensure that contaminants dangerous to human life and health are not concentrated in marine food chains to the point where species become unusable for human consumption. Here also the coastal state has a special interest and responsibility, as recognized by the Stockholm Conference.

V. SCIENTIFIC PRINCIPLES

As noted above (Section IV, Principle 3), all fisheries management systems must be founded upon certain basic scientific principles if they are to maintain the productivity of the resource and the value of its yield. Examples of such principles are mentioned below. They are not intended to be exhaustive nor comprehensive, but to illustrate the relevance of scientific factors to sound management. The dynamic state of fisheries science requires its frequent review on a world-wide basis. Such review and further elaboration of scientific principles can most appropriately be carried out through specialized technical agencies.

(1) Stocks should be managed as individual units.

Few species form homogeneous mixtures of individuals throughout the species' range. Rather these individuals tend to be grouped into separate populations or stocks, often associated with particular oceanographic features, such as current systems or distinct shelf areas, with little interchange between the separate groups. Each group will have

its own particular set of biological characteristics such as growth rate or mortality rate, dependent on its genetic makeup and the environment which it inhabits. Each will respond to fishing pressure in a different way, depending on the size of the particular stock and its unique characteristics. Management procedures should be designed to take account of the varying characteristics of each stock.

The areas inhabited by such stocks will vary in size, but for coastal species are usually well-defined. For some stocks, the distribution may extend to coastal waters of several adjacent states; for others the distribution will be confined to the adjacent waters of a single state. In any case, the stock must be managed as a whole if management is to be effective. This is not to say that stocks should be managed in isolation from other stocks of the same species, or in isolation from other species. The management system must be effective for exploited species over broad coastal areas; otherwise fishing effort is simply diverted to species or stocks not under regulation.

(2) Exploitation of unit stocks should be controlled so that production of new age groups or "recruits" is at a maximum.

Under conditions of very low exploitation the full potential productivity of the stock may not be realized, and annual yields are less than they could be. The same situation may apply under conditions of very high exploitation in that stock size may be reduced to the point where annual production of new individuals is below that which the species is capable of maintaining. Under extreme conditions of over-fishing the stock may be reduced to the point where commercial fisheries can no longer be carried out. Thus enough fish must be allowed to escape the fisherman to ensure the continued presence of an adequate spawning stock.

(3) Each age group of a species, as it becomes available to fishing, should be fished at the point when its contribution to catches can be greatest.

As an age group becomes older it gains in weight as a whole owing to the growth of the individuals, and loses weight owing to natural mortality. In early life, growth is rapid and the gains outweigh the losses. At the point where these gains and losses are in balance, the age group will have attained its maximum weight, and it is at this point that its maximum contribution to catches can be made, taking into account, however, relevant economic and social considerations. Under conditions of heavy exploitation, fish tend to be caught at too small a size and catches are lower than they could be if the individuals were allowed to grow.

Abundance of individual age groups is often variable from year to year, but can usually be predicted in advance, sometimes several years in advance, of the time when the greatest yield from the age group can be taken. This allows time to plan fishing operation to make best use of the stocks.

VI. ROLE OF INTERNATIONAL COMMISSIONS

In the view of the Canadian Delegation, only the coastal state can effectively implement the above-noted principles for the management of coastal species. The coastal state has the most to lose if adjacent stocks are not soundly managed. Only the coastal state is in a position to take prompt action in response to urgent conservation needs. By reason of geography the coastal state is in the best position to assume and exercise authority. Such authority would be the natural consequence of the responsibilities which the coastal state must already meet with respect to coastal species.

However, the system of coastal state management for coastal species envisaged by the Canadian Delegation would not preclude a role for international fishery commissions within the context of that system. In the view of the Canadian Delegation such commissions could have an important advisory role vis-a-vis the coastal state in its discharge of its management functions. Certain specific elements of that advisory role have already been discussed in connexion with some of the principles outlined above. In more general terms, international fishery commissions, established on a regional basis and comprising both coastal and distant-water fishing states, could provide a forum for cooperation and consultation and, in particular, a most useful mechanism for the collection, presentation and analysis of the statistical and biological data required for management purposes. Similarly, particular forms of consultation and cooperation might be instituted, with or without the establishment of a formal commission, in cases where particular stocks of coastal species fall under the management authority of two or more neighbouring coastal states. As regards cases where wide-ranging migratory species temporarily inhabit waters where a coastal state has management authority, that state should be a member of the appropriate commission responsible for the management of the migratory species in question.