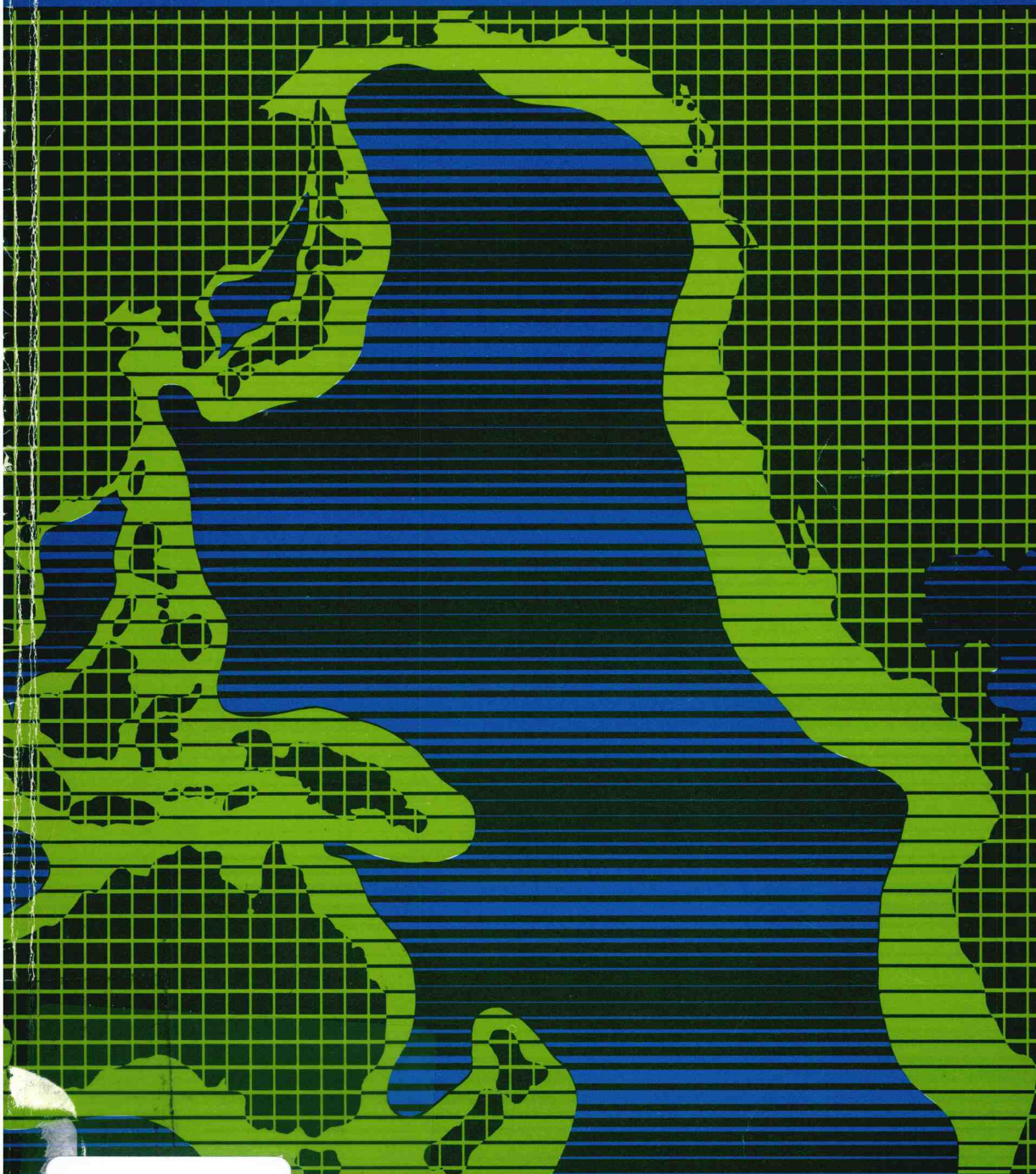


Renewable Resources in the Pacific

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Proceedings of the 12th Pacific Trade and Development
Conference, held in Vancouver, Canada, 7-11 September 1981

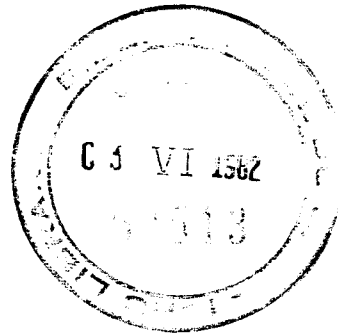


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Renewable Resources in the Pacific

**Proceedings of the 12th Pacific Trade and
Development Conference, held in Vancouver, Canada,
7-11 September 1981**

Editors: H.E. English¹ and Anthony Scott²



¹Department of Economics, Carleton University, Ottawa, Canada.

²Department of Economics, University of British Columbia, Vancouver, Canada.

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Cooperative Fisheries Arrangements between Pacific Coastal States and Distant-Water Nations

Gordon R. Munro

Department of Economics, University of British Columbia, Vancouver, Canada

The widespread implementation of extended fisheries jurisdiction (EFJ) throughout the world has meant that substantial fishery resources, which hitherto had been international common property, have become the property of coastal states. One question that this development raises is what is the future role of cooperative fisheries arrangements between coastal states and distant-water nations in the newly created zones. I address the question of whether such arrangements should be viewed as temporary, with the ultimate elimination of distant-water activity in coastal state zones, or as permanent components of the new framework of world fisheries management emerging as a consequence of EFJ. Although many coastal states at the dawn of EFJ viewed cooperative fishery arrangements largely as temporary expedients, the economics of such arrangements indicate that coastal states in the Pacific and elsewhere would benefit from maintaining many, and perhaps most, such arrangements on a permanent basis. This is true whether the coastal states are developing or developed. However, the opportunities for long-term cooperative arrangements in the Pacific and elsewhere are endangered by uncertainties and ambiguities in coastal states' rights to the fishery resources within their zones. Two major sources of uncertainty are the inadequate management capacity of some coastal states and the transboundary nature of many of the stocks in their waters.

L'extension de la juridiction des pêches (EJP), ratifiée par le monde entier s'est traduite par l'appropriation par les états riverains de ressources autrefois propriété internationale. Quel sera, dans ce nouveau contexte, le rôle des accords de coopération relatifs aux pêches dans les nouvelles zones, qui interviendront entre les états riverains et continentaux. On se demande aujourd'hui si ces conventions doivent être temporaires — et déboucher sur l'élimination de la pêche dans la zone éloignée relevant des états riverains — ou permanentes, — et constituer des éléments d'un nouveau cadre de gestion mondiale des pêches résultant de l'établissement des EJP. Même si plusieurs états riverains considèrent ces accords comme des expédients, leur intérêt au point de vue économique commanderait de maintenir certaines de ces dispositions, sinon toutes. Et cela s'applique aussi bien aux états riverains développés qu'en voie de développement. Cependant, l'établissement d'accords de coopération à long terme dans le Pacifique et ailleurs est compromis dans plusieurs régions par l'incertitude et l'ambiguïté des droits de propriété des états riverains sur les ressources halieutiques de leurs zones. L'incertitude se rapporte principalement aux capacités de gestion de certains états riverains et à la nature migratoire des populations de poissons.

As other papers in this conference have stressed, fisheries in the Pacific, as well as in other parts of the world, have been dramatically influenced by the Third Law of the Sea Conference. Extended fisheries jurisdiction (EFJ) has become fact, and important fishery resources, which had been international common property, became the property of coastal states. So extensive has this transformation been that the fishery resources remaining as international common property account for no

more than 1% of the world's fishery harvests (Gulland 1980).

One important issue that the implementation of EFJ raises is the role to be played by distant-water nations — and, thus, cooperative fishery arrangements — in the exploitation of fishery resources within the newly created coastal-state fishery zones. A cooperative fishery arrangement is one in which a distant-water nation participates in the harvesting of a fishery resource in a

coastal state zone, the processing of the harvested fish, or the marketing of the products. This definition covers all joint ventures and so-called fee fishing in which the distant-water nation undertakes all harvesting, processing, and marketing activities and compensates the coastal state in cash or kind.¹

I would argue that the common view among coastal states as they contemplated the advent of EFJ in the mid-1970s was that cooperative fishery arrangements were temporary, and rather unfortunate, expedients to be endured until local harvesting and processing capacity had been built up to utilize fully the newly acquired resources. Thus, the authors of a 1975 study on joint ventures in fisheries argued: "... the joint venture should perhaps be regarded as temporary, since coastal nations, developed and developing alike, nowadays tend to demand greater participation in the fisheries off their shores" (Crutchfield et al. 1975:2).

The question arises, therefore, whether there is a long-term future for cooperative fisheries arrangements between coastal states and distant-water nations in the Pacific or whether the distant-water fishing activity will gradually disappear. The economics of cooperative fisheries arrangements suggest that, in many instances, these arrangements will prove advantageous for the coastal state indefinitely.

However, opportunities for long-term cooperative arrangements will, in some parts of the Pacific, be undermined by uncertainty or ambiguity in coastal-state rights over fisheries in the newly formed coastal-state zones. Although the customary international law has granted coastal states property rights, it cannot ensure that such rights will become established in fact.

Basic Economics

The economics of cooperative fisheries arrangements are a blend of the standard economics of fisheries management and the economics of international trade. Thus, in evaluations of cooperative arrangements, one must begin with an analysis of fishery management in which cooperative arrangements are not an option and move to an analysis in which they are. It is assumed the fishery resource is wholly within the waters of a coastal state.

¹ Instead of thinking of separate categories of cooperative arrangements, it is more sensible to think in terms of a continuum of arrangements, running from the polar extreme of no foreign participation to that of pure fee fishing in which all harvesting, processing, and marketing activities are undertaken by foreigners.

Because the resource is renewable, it is capable of producing a sustainable harvest and, hence, a stream of net benefits to society through time. The object of management is to maximize, over time, the stream of social benefits, however they are measured. This involves ensuring that the harvest flow at any one time yields the maximum benefit to society and ensuring that the optimal stock, or biomass level, is achieved through appropriate investment (or disinvestment) in the resource. Investment (or disinvestment) in the resource is seen to occur whenever the actual harvest falls below (or exceeds) the sustainable harvest or yield, simply by virtue of the fact that, if the harvest is less (or greater) than the sustainable harvest, the resource stock or biomass will increase (or decrease).

The size of the resource stock or biomass influences not only the level of harvests but also, often, the harvesting and processing costs — for example, the greater the numbers of fish, the easier the capture and the lower the cost of harvesting. Likewise, stock density can affect processing — the size of groundfish, for instance, varies with stock density and may have an influence on consumer acceptance as well as processing.

For the sake of simplicity, I have assumed that the price of the fish products accurately reflects the marginal social benefit society enjoys from the harvested fish, that the demand for fish products is perfectly elastic, that the costs of labour and capital constituting fishing effort accurately reflect social costs, and that the supply of the inputs is perfectly elastic. Given these assumptions, the flow of net benefits to society from the harvest can be represented as:

$$\pi_s(x, h, t) = [\alpha(x)p_2(x, t) - c_2(x, t) - c_1(x, t) - m(x)]h(t)$$

where $h(t)$ denotes the harvest rate; x , the biomass; $p_2(x, t)$, the price of the fish product; $\alpha(x)$ the proportion of raw fish usable as finished product; $c_1(x, t)$ and $c_2(x, t)$, unit harvesting and processing costs respectively; and $m(x)$ unit management costs (which relate to fleet size). The object of management can be seen as maximizing the present value of this stream of net benefits, i.e.,

$$\max P.V. = \int_0^{\infty} e^{-\delta t} (\pi_s[x, h, t]) dt$$

where δ denotes the "social rate of discount."

The central problem of fisheries management has traditionally been that fishery resources are, with few exceptions, common property. If no controls are imposed upon the exploitation of a commercially valuable common-property

resource, the efforts to exploit it will expand until the sustainable net economic returns from the resource have been fully dissipated (Gordon 1954).² Moreover, the resource stock will be reduced to a level well below that which is socially optimal.

In fact, the depletion of the resource that occurs in an unregulated, common-property fishery would be socially optimal only if $\delta = \infty$ (Clark and Munro 1975). The reason is simple. The individual fisherman (or company) has no incentive to conserve the resource, to look forward to future harvests: refraining from harvesting likely does no more than increase the harvests of competitors.

It has also been learned, often painfully, that managing fishery resources through the use of global harvest restrictions alone is inadequate from an economic point of view. Thus, if the authorities establish a global harvest quota in a given fishery to maintain the size of the biomass at some desired level but make no attempt to restrict the number of fishing vessels, sustainable net economic benefits are certain to be dissipated. Although fishermen cannot increase the total harvest if the quotas are effective, they can compete with one another for shares of the available harvests. This competition invariably leads to economic waste through the emergence of excessive labour and capital in both the harvesting and processing sectors (Crutchfield 1956).

What is required is some form of control over individuals and vessels. In Canada and elsewhere, attempts have been made to impose direct restrictions on the fleet size and on the number of fishermen in the fishery. The programs have, at best, been partially successful because the incentive for fishermen to expand their fishing effort has not been removed. Economists have advocated the use of landings taxes or individual harvest quotas as alternatives, but these have yet to be used to any significant degree and must be regarded as still being experimental.

Now let it be supposed that the coastal state authorities do have the option of entering into cooperative fisheries arrangements with distant-water nations. Optimal fisheries management now demands that the coastal-state authorities consider the use of foreign harvesters and processing capabilities as alternatives to domestic harvesters and processors.

The basic argument for cooperative fisheries arrangements is no more than a variant of the argument for free trade. Certain distant-water nations may possess a comparative advantage in the provision of particular harvesting or processing (or marketing) services. Hence, it can be mutually advantageous to coastal state and distant-water nation for the coastal state to hire, i.e., import, the relevant distant-water services. The obvious advantage for the coastal state would be reduced unit costs of harvesting or processing at any one time.

Thus, consider a fishery for which coastal-state authorities have only one cooperative arrangement option — the use of a distant-water fleet as exclusive harvester of the resource — the unit cost of harvested fish to the coastal state under the cooperative arrangement would be the ex-vessel price paid to the foreign vessels, $p_1(x, t)$. The price would be determined by bargaining but would presumably reflect the harvesting costs incurred by the foreign vessels. If $p_1(x, t) < c_1(x, t)$, for all x , then the coastal state would minimize its costs for obtaining raw fish by entering a cooperative arrangement.

A less obvious advantage is reduced risk of overinvestment in the resource whenever $p_1(x, t) < c_1(x, t)$ for all x and t . If the coastal authorities do not enter a cooperative arrangement for the lower-cost foreign services, they must offset their extra costs in harvesting by reducing the effort per unit harvest. One way to do this is to increase stock density — overinvestment. When a resource has been excessively depleted, the consequences of overinvestment are an increased investment or stock rebuilding during which harvests are below the sustainable level.³ Overinvestment may also result in smaller long-run sustainable harvests.

The advantages of such arrangements to distant-water nations are much less obvious. The argument that cooperative fisheries arrangements promise them assured supplies of fish is unconvincing, given the existence of a well-developed world market for fish. A somewhat more satisfying argument is, simply, that these arrangements offer profitable exports-of-services opportunities.

Many of the factors giving rise to the cost advantages of distant-water nations are familiar from the standard literature in international economics, whereas others are peculiar to the nature of the fishery.

²If the demand for fish products or supply of fishing effort exhibited finite elasticity, not all net economic benefits from the fishery would be dissipated (Copes 1972a).

³If the stock is not to be rebuilt but rather depleted, e.g., a virgin stock, then overinvestment implies a shorter period of harvesting in excess of sustainable yield.

Factors familiar from the international trade literature include relative capital and labour costs. Thus, in the northeast Pacific relative labour costs have probably been a factor explaining the development of cooperative fisheries arrangements between East-bloc countries, South Korea and Taiwan, on the one hand, and the United States and Canada, on the other. Similarly, Japan would probably be an attractive distant-water partner among developing countries in the Pacific because of its rich physical and human capital (skilled crews).

Factors peculiar to the fishery include seasonality of fisheries combined with nonmalleability of capital, the control of fishing effort, and management costs. Many fisheries are seasonal, lasting a few weeks or a few months. Also, some of them require the use of special equipment that is nonmalleable — it has limited uses during the off-season (Baker 1980; Clark et al. 1979). The combination of seasonal fishing and nonmalleability of capital can easily give rise to attractive cooperative arrangements.

For example, a hake fishery in British Columbia waters normally runs from early July to late October, although the commencement and length of the season are often uncertain. Hake, a low-valued groundfish, has the characteristic of having soft flesh that deteriorates rapidly after capture. The fish is caught far enough from shore that it must be either processed offshore or frozen immediately. Before EFJ, Canadian companies displayed little interest in the fish for several reasons, one of which was that vessels with freezing or processing capacity had inadequate opportunities for use in the off-season. Elsewhere, I (1980) have detailed the consequences of inadequate utilization.

Distant-water nations shift their vessels to different parts of the world over the course of the year; the capital embodied in their vessels is, thus, more malleable than that embodied in vessels confined to a particular region as exemplified by the British Columbia groundfish fleet. As a consequence, when Canada acquired the resource under EFJ, Canadians found it most profitable to exploit the resource through cooperative arrangements (Munro 1981).

Indeed, the hake fisheries in both British Columbia and the American Pacific northwest (northern California, Oregon, and Washington), along with the pollack fishery in the Gulf of Alaska illustrate the complex arrangements with distant-water nations that nonmalleability can produce. In all of these fisheries, joint ventures are for the domestic (i.e., U.S. or Canadian)

trawlers to harvest the groundfish species and deliver the harvest to foreign vessels with processing capacity. The domestic trawlers that engage in these activities invariably regard them as ancillary to their other harvesting activities. For example, many of the U.S. fishermen harvesting pollack in the Gulf of Alaska regard crab fishing as their primary activity. They harvest pollack in the crab off-season when their vessels would otherwise be underutilized. Thus, the perceived marginal cost of harvesting pollack is low. At the same time, it has not proved attractive financially to construct vessels whose primary function would be that of harvesting pollack. Similarly, it has not proved attractive financially to construct vessels whose primary function would be that of harvesting hake farther south.

The result is that the domestic fleets are incapable of harvesting the total allowable catches (TACs) for these resources. This in turn has meant that the joint ventures coincide with substantial free fishing of the resources by distant-water nations. In 1979, for example, joint ventures accounted for only 9% of the total hake harvested in the Pacific.

Earlier, I argued that one of the unresolved problems of managing wholly domestic fisheries is that of preventing the emergence of redundant fishing effort. One of the advantages to the coastal state of cooperative arrangements involving foreign harvesting is that the burden of eliminating redundant fishing effort is passed to the distant-water nation. This fact could induce authorities to employ the services of distant-water nations even though immediate cost considerations suggest that the harvesting should be done by domestic fleets.

The relevance of resource management costs to cooperative fisheries arrangements arises from the need to control policing costs. If a coastal state refuses to enter into cooperative fisheries arrangements, the surveillance and enforcement costs in preventing poaching by resentful distant-water fleets could prove prohibitive, even if the coastal state were a wealthy developed state. Thus, just prior to EFJ, J. Alan Beesley, the leader of the Canadian delegation to the Law of the Sea Conference, argued that an important reason that Canada was seeking to ensure the cooperation of distant-water nations was to keep surveillance and enforcement costs to a manageable level (Munro 1977b).

Admittedly, the management-cost argument for cooperative fisheries arrangements strains the definition of comparative advantage and perhaps would be more appropriate in discussions of

bribery. Another noncomparative advantage argument for cooperative fisheries arrangements that deserves recognition concerns prices, rather than costs. Up to this point, the assumption has been that the prices of fish products are unaffected by cooperative arrangements or the lack thereof. This assumption is not always valid. There may be cases in which the cooperative arrangements will result in reduced trade barriers and thus a higher return on the fish products. Thus, for example, a distant-water nation enters into a cooperative arrangement with a coastal state and imports the resultant product: the tariff authorities within the distant-water nation, regarding the fish as being in part their own national product, may impose a lower duty on the product than they would had the products involved coastal-state harvesting and processing exclusively. Hence, even though a comparison of costs might favour exclusive domestic harvesting and processing, maximization of the coastal state's net economic benefits from the resource could well call for the establishment of cooperative fisheries arrangements.

The actual form that a cooperative fisheries arrangement takes depends upon cost factors along with what might be termed special bargaining considerations. It has been argued that fee fishing provides the coastal state with less control, and presumably less bargaining power, than do joint ventures where the coastal state plays a direct role in the harvesting or processing of the resource (Tomlinson and Brown 1979). If this is in fact the case, then the coastal state has an incentive to establish joint ventures, even though comparative advantage considerations alone point to fee fishing as optimal.

Given that the basic argument for cooperative arrangements is no more than a variant of the standard free trade argument, then, as to be expected, the arguments advanced within coastal states against such arrangements are no more than the standard arguments for protection. Indeed, if one were to turn to any major elementary textbook in economics and list the arguments, both legitimate and fallacious, for protection contained therein, one would be hard pressed to find any that have not at some time been used in opposition to cooperative fisheries arrangements.

For example, attempts in Alaska to establish cooperative arrangements in which American vessels harvest groundfish for delivery to foreign processing vessels have been vigorously opposed by domestic processors who complain about the unfair competition from foreign offshore proces-

sors that have access to cheap labour. As well, the supporters of the domestic processors warn of the adverse consequences for the U.S. balance of payments of allowing foreigners to process Alaskan fish (Munro 1981). A much more respectable argument is for the development of infant industries.

Before EFJ, many coastal-state fishing industries, without distant-water nation pretensions, viewed fisheries under international jurisdiction to be unduly risky. The attitude was particularly true for fisheries requiring special equipment. Distant-water nations were much less concerned by the uncertain future of the resources. Indeed, in many instances, distant-water fleets engaged in "pulse fishing" (Tanaka 1980:2) in which the resources were heavily exploited on a temporary basis and then abandoned until they were restored.

With the coming of EFJ, resource uncertainty was reduced and coastal-state fishing industries took a greater interest in their exploitation. However, the coastal-state fishing industries were at a disadvantage vis à vis distant-water counterparts because they lacked necessary fleet and plant capacity or necessary skills and techniques. Thus, at least some of the relevant fisheries advanced the argument that they would prove to be the more efficient exploiters of the resources if only given the necessary time to develop the requisite harvesting and processing capacity or the time to acquire the appropriate skills. The infant-fishery argument could be used to support either the proposition that cooperative fishery arrangements should be banned or the proposition that such arrangements be allowed, but on a temporary basis only.

Unquestionably in some instances, the argument will prove to be valid. Like all versions of the infant-industry argument, however, it can be easily abused by those who demand protection for infants who have negligible prospects for reaching maturity.

The Future of Cooperative Fisheries Arrangements

At the dawn of EFJ, a view prevailing in many coastal states was that voiced in 1974 by the then Canadian federal minister responsible for fisheries (Tomlinson and Vertinsky 1975:2570):

The long term is for Canadians. Canada is not only going to reach out and encompass all of the living resources of her continental slope and shelf, we are going to make sure that they are harvested by Canadians in Canadian owned vessels and processed in Canada as well.

This argument — that current cooperative fisheries arrangements are no more than temporary expedients — is simply an argument to the effect that, where cost (or price) relationships currently favour a cooperative arrangement, these relationships will be reversed over time. To illustrate, one can return to the original example of a cooperative arrangement in which foreign harvesting is combined with domestic processing (and marketing) and in which $p_f(x, t) < c_f(x, t)$. It will be recalled that $p_f(x, t)$ denotes the exvessel price to foreign vessels and $c_f(x, t)$ denotes domestic unit harvesting costs.

The cooperative arrangement can be viewed as temporary if there exists a switching time $t = T$, $0 < T < \infty$, such that $p_f(x, t) < c_f(x, t)$ for $0 \leq t < T$ and $p_f(x, t) > c_f(x, t)$ for $T \leq t \leq \infty$. On the other hand, if $T \leq \infty$, then the conditions exist for a permanent arrangement. A switch or reversal is possible if the coastal state's fishing industry actually proves to have a comparative advantage when it has acquired the necessary skills or built up its capacity.

In part, industry factors may well produce cost reversals in selected cases. However, this admission is quite different from the argument that they will be sufficiently powerful and pervasive to bring about cost (price) reversals in all cases. Whereas it is difficult to prove that cooperative fisheries arrangements will have a long-term future in the Pacific and elsewhere, the reverse argument — that *all* cooperative arrangements will eventually be undermined and eliminated — is unreasonable if not untenable. In North America at least, the view has lost ground. In Canada, despite protectionism, the policy of marine autarchy advocated by the former fisheries minister in 1974 is no longer taken seriously, and the likelihood that the cooperative arrangements for harvesting hake, for example, will give way to exclusive domestic harvesting and processing in the foreseeable future is regarded as negligible (Munro 1981).

In the United States, the shift in attitude has been even more striking and is illustrated by the decisions taken about groundfish in Alaska. As a consequence of EFJ, the United States gained control over immense groundfish resources in waters off Alaska, the bulk of which consisted of low-valued pollack. In the late 1970s, the annual harvests of Alaskan groundfish of some 1.4 Mt accounted for an estimated 9% of the world supply of groundfish and exceeded the entire U.S. consumption of groundfish (Stokes 1980b). Of these harvests, less than 1% was accounted for by American fishermen, the remainder being

accounted for by several distant-water nations of which Japan was the most prominent (Munro 1980).

Nonetheless, the American authorities expected a large expansion of the U.S. fishing industry based upon these resources. The resources were mentioned specifically in the legislation establishing the American EFJ [U.S. Congress, Fishery Conservation and Management Act of 1976, Section 2(b) (6)] and figured prominently in the National Marine Fisheries Service plan for the development of American fishing activities (U.S. Department of Commerce 1976).

The United States, in allowing distant-water nation participation, made no attempt to maximize its return from the fishery. Quotas were assigned on the basis of historical fishing rights, and the fees paid by distant-water fleets were set at low levels. Although this behaviour reflected an ambiguity in the U.S. view of its property rights over the resources, it also reflected in large measure a belief, on the part of the American authorities, that foreign exploitation of the resource would be all but eliminated by an expanded American fishing industry (Munro 1981; Stokes forthcoming).

By 1980, it was becoming evident that the expected expansion in the U.S. industry was not going to come about unless the economics of the fishery underwent a radical change (Stokes forthcoming). The infant appeared to be stillborn.

The American authorities were thus faced with the option of either tolerating the presence of distant-water fleets in their Alaskan waters on an indefinite basis or reducing their presence by legislative means. Ultimately, the authorities accepted the former option, passing the American Fisheries Promotion Act (AFPA) in December 1980 (U.S. Congress 1980a). With this legislation, the American authorities adopted a new policy of attempting to extract a positive return from foreigners harvesting within the American zone. In so doing, the American authorities tacitly conceded that the foreign presence in the Alaskan groundfish fishery would be indefinite.

Under the new policy, popularly referred to as the "fish-and-chips" policy, the Americans are now prepared to abandon their historical fishing rights approach and to use harvest allocations as bargaining counters or "chips." The legislation clearly allows the Americans freedom to use fees imposed upon foreigners as a means of extracting resource rent [AFPA Section (b) (10)].

Although I cannot speak with equal authority on shifts in attitudes in other Pacific coastal

states, it would be surprising if the experience of Canada and the United States proved to be unique.

Although the prospects for long-term cooperative fisheries arrangements are good, in several parts of the Pacific an important barrier exists to their development. The barrier takes the form of uncertainty or ambiguity in the nature of coastal-state property rights to the fishery resources acquired under EFJ.

Three observable reasons are: inadequate management capabilities in the coastal states, existence of shared stocks, and ideological or philosophical constraints. If a coastal state lacks the capacity to provide effective stock assessment and effective surveillance and enforcement, then the property rights lack substance. As a consequence, the resources revert, on a *de facto* if not *de jure* basis, to their former common-property status. Distant-water nations that enter into arrangements with the coastal state are given every incentive to discount the future of the resources heavily and every disincentive to honour their obligations. Hence, the prospects for long-term arrangements are highly unpromising.

The fact that fish are mobile has meant that many stocks encompassed by coastal-state fishery zones either are shared with other coastal states or are shared with distant-water nations because they cross the zone boundaries into the high seas. Thus, the resources constitute joint property. If the joint owners of a resource can cooperate effectively, they can introduce an optimal management program, even though their goals and interests differ (Munro 1979). However, without such cooperation, the common-property conditions emerge (Levhari and Mirman 1980) and the prospects for long-term cooperative arrangements would be seriously undermined. The greater the numbers of joint owners, the poorer are the chances for effective cooperation.

Uncertainty attributable to inadequate management capabilities and the transboundary nature of stocks is illustrated by the tuna fisheries in the southwest Pacific, the Pacific islands region. Because tuna are highly migratory, the major species in the region (yellowfin and skipjack) are widely shared among the island states and territories. Although there is not the problem of tuna crossing zone boundaries into the high seas in large numbers (Gulland 1980), tuna do cross the boundaries of 23 diverse states and territories — a fact that makes difficult the coordination of a management policy. In addition, many

of the states and territories have small populations, are underdeveloped, and, hence, are seriously lacking in surveillance and enforcement capabilities (Miles 1981).

There does exist a regional coordinating body in the form of the so-called South Pacific Forum Fisheries Agency, which includes the island states plus Australia and New Zealand. The agency has proved unwieldy, however, and, thus, of questionable value as a coordinating body. An attempt is now being made to establish a more cohesive coordinating body consisting of Papua New Guinea, the Federated States of Micronesia, the Gilberts, the Marshalls, the Solomons, Nauru, and Paulu. This group's zones account for 70% of the yellowfin and 90% of the skipjack harvests (Miles 1981). Whether it will prove to be effective is uncertain.

Many of the states and territories in the region will probably not have the capacity to harvest the tuna resource for many years. Hence, the scope for cooperative arrangements is substantial, a considerable number of arrangements having already been established. Japan, by far the most important of the distant-water nations operating in the region, has established arrangements with 16 of the 23 states and territories in the region.

At present, however, distant-water nations have an incentive to underreport their harvests and a complementary incentive to fish heavily now in fear of uncontrolled and uncontrollable entry of new distant-water nations in the future (E. Miles, personal communication). How coastal-state surveillance and enforcement capacity and coastal cooperation can be improved sufficiently to prevent the common-property syndrome from developing unchecked is not at all clear.

Another source of ambiguity of coastal-state property rights arises from ideological or philosophical constraints. In this case, a coastal state may have ample power to manage the relevant resources and may have to share them with no one but is reluctant to lay explicit claim to property rights over the newly acquired resources.

Although I would be hard pressed to point to a case in the Pacific where such reluctance has damaged the prospects for long-term arrangements, I can point to an important near miss involving the American groundfish resources off Alaska. The American position on fisheries during the preparations within the UN leading to the Third Law of the Sea Conference was that coastal states should have exclusive management, but not property, rights to fishery resources within their zones; that, as manager, or steward, of the

resources, they should be allowed preferential harvesting rights within their zone; that they should allocate any surpluses within the total allowable catch (TAC) to distant-water nations; that they should not expect a return on such surpluses; and that the fees imposed on the distant-water fleets should be for the sole purpose of defraying management costs (Munro 1981).

The Law of the Sea Conference rejected the American approach in favour of an approach in which the coastal states were to be given explicit property rights to the fishery resources in their zones. Nonetheless, the spirit of the American position became embodied in the Fishery Conservation Management Act of 1976 (Munro 1981).

Economists had long objected to the American approach on the grounds that, although apparently altruistic in nature, it could easily lead to economic mismanagement of coastal-state resources (Anderson 1974; Christy 1973; Munro 1977a). The coastal state would be faced with an irresistible temptation to acquire property rights over the resources in its zone indirectly by minimizing surplus portions of the TACs.

The implications for cooperative fisheries arrangements were twofold. First, although joint ventures would not be precluded, their future would be dubious because any foreign involvement in the fisheries would weaken the coastal state's indirect property claims to the fishery resources (Munro 1981). Second, fee-fishing arrangements would, almost by definition, be eliminated over time.

The largest fishery resources acquired by the United States under EFJ consisted of the groundfish resources in the Bering Sea and Gulf of Alaska. An overwhelmingly large percentage of the harvest of these resources has, since EFJ, been taken, not by domestic vessels for onshore

processing nor under joint-venture operations, but by foreign vessels on a fee-fishing basis (in 1979, 96% of the harvest) (Munro 1981).

In keeping with the philosophy that coastal states should not profit from foreign harvests in their fishery zones, the American authorities levied only very modest fees on foreign vessels exploiting Alaskan groundfish. Indeed, the fees were probably not adequate to compensate the United States for the management costs implied by the presence of the foreign vessels (Munro 1981). When it became clear that domestic harvesting was not going to expand and exploit the resources, the Americans were faced with the option of tolerating the presence of distant-water fleets in their zone indefinitely or of removing it by legislative force. Although they eventually adopted the former option, there was, in Congress, a serious attempt to adopt the second option.

Conclusions

Two policy questions still require serious investigation. The first concerns the requirements for long-term cooperative arrangements that will be mutually beneficial to the partners. To date, the majority of cooperative arrangements have been short term and ad hoc in nature. The second, and more difficult, question is how to upgrade coastal-state management capacity and to ensure acceptable management of trans-boundary stocks. In the regions where this question remains unresolved, it will threaten not only the future of cooperative fisheries arrangements, but the EFJ itself.

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Discussion

K. Hemmi: One should look at Gordon Munro's provocative paper carefully. It deals with prospects for cooperative arrangements over the long run. As Catherine Wallace pointed out, joint-venture arrangements have a multiple function. However, the prevailing view in many coastal states is that joint ventures are temporary expedients. Gordon Munro does not think so. In his opinion, excluding foreign fishing fleets from

some fisheries will result in economic losses because the fishery resource is renewable. Moreover, he comments that, if a coastal state refuses to enter cooperative arrangements, the surveillance and enforcement costs in preventing poaching by resentful distant-water fleets may prove prohibitive.

He is pessimistic about the possibility of developing infant industries in the coastal states,