

9 Cooperation in Managing the Sea of Japan's Resources

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The extended jurisdiction movement has now transferred one-third of former high seas and most known ocean resources and activities to the control of individual states.¹ But in semi-enclosed seas like the Sea of Japan, many resources and uses are regional and transnational in nature. Indeed, the sea can become a natural link among nations providing the basis for their interactions and interdependent policies in shipping, fishing, petroleum exploration and development, marine scientific research, and environmental pollution and protection. For mutual benefit, cooperation between nations to manage marine resources is usually necessary and sometimes urgent.

For millennia, the Sea of Japan served as a conduit for the flow of culture between the Asian mainland and Japan and for the exchange of people and goods between the two. But in recent history, the economy of the coastal portions of all the countries bordering the sea has lagged behind development of their opposite coasts. Use of the Sea of Japan's resources could stimulate economic growth along its coasts and thus help to reduce the internal economic gap in each country. As the sea's coastal countries strive to improve the welfare of their people, an optimal use of sea resources could be the beginning of a new era of cooperation. Opening a new chapter in cooperative use of the Sea of Japan's resources may help fulfill for the Russian Far East, Japan, and Korea the promise of the Pacific Age and turn this sea from a zone of conflict and isolation to one of peace and prosperity.

The countries surrounding the Sea of Japan are presently striving to develop and implement policies for resource and activity management in their newly acquired areas that will enhance their national interests. But national management policies for these zones may be formulated and implemented with insufficient understanding of the transnational and interdependent character of the ocean environment and the resources and activities it harbors and supports. The overlaying of a mosaic of national regulations on transnational resources and activities creates possibilities for transnational conflicts and opportunities for cooperation. Uncertain or disputed boundaries complicate the implementation of national policies and regulations. Only the DPR Korea

(North Korea) has declared an Exclusive Economic Zone (EEZ). Although Japan and Russia have declared fisheries zones, Japan applies the zone incompletely.

With the signing of the historic Convention on the Law of the Sea by 119 nations in December 1982, the venue for addressing issues of ocean law and policy is now moving from the global to the regional and bilateral level. Indeed, the convention urges states bordering such semi-enclosed seas to cooperate with one another in exercising their rights and in performing their duties under the convention. In particular the treaty stipulates that they shall endeavor directly, or through an appropriate regional organization, to (1) coordinate the management, conservation, exploration, and exploitation of living resources of the sea; (2) coordinate the implementation of their rights and duties with respect to the protection and preservation of the marine environment; and (3) coordinate their specific research policies and undertake, where appropriate, joint programs of scientific research in the area. Unfortunately, the treaty is mute as to what sorts of regional bodies might be created for these purposes. This paper delineates the transnational issues that must be addressed and their possible cooperative solutions.

FISHERIES

There is little information on fish catch and the status of stocks in the western part of the Sea of Japan.² The DPR Korean catch may be very high—almost as high as that of Japan, which is about 2.5 million tons (Table 9.1). Total production increased from about 9 million tons in 1982 to 12 million tons in 1985. Most conventional species are fully exploited, but the total catch might be increased to about 13 million tons. The species composition of the catch has changed. This may be due in part to use of different fishing gear, but it probably also implies changes in the ecosystem for both demersal and pelagic fish. Although coastal fisheries stocks are in reasonable shape, there is concern about the stocks of flying fish, Pacific herring, sandfish, halibut, Alaska pollack, and Japanese sardine. Because of the uncertainty about the stocks, exchange of information and cooperation in fisheries research and management is necessary and urgent.

Transnational Issues Requiring Cooperation

Uncertain boundaries complicate the implementation of national regulations. Although the northern boundaries of the Japanese fisheries zone are not specified in the sea area west of Honshu, the provisional measures relating to the fishing zone mention the intention to use the median line principle in lieu of any other agreement on the method of delimitation. Boundary issues between Japan and Russia are linked to the dispute over the ownership of the southern Kurile Islands.

Table 9.1 Estimated annual production and species type taken from the defined region ('000s tons)

Species type	Japan ^a	DPRK ^b	ROK ^c	USSR ^d	Total
Fish					
Salmon	66	10		99	175
Demersal fish	678	1,890	114	31	112
Pelagic fish	1,106	240	28	1,146 ^e	2,517
Other fish	181	90	14	243	531
Subtotal	2,031	2,230	156	5,141	9,558
Other animals and seaweeds					
Shrimps/prawns	11	6	1	1	19
Crabs	75	5	1	31	112
Cephalopods	188	30	28	40	286
Shellfish	132	60	6	12	210
Other animals	13	10	5	2	30
Seaweeds	37	20 ^f	5	5	67
Subtotal	455	131	46	91	723
Total	2,486	2,361	202	5,228	10,277

Note: The FAO statistical area for reporting of fish catch covers the entire Sea of Japan and the Sea of Okhotsk plus a part of the Northwest Pacific Ocean along the Kurile Islands. Subtotals are probably incomplete.

Source: S. Chikuni, "The Fish Resources of the Northwest Pacific," FAO Fisheries Technical Paper No. 266, Rome, 1985.

- a. *Japanese Yearbook of Fisheries Statistics*, Ministry of Agriculture, Forestry and Fisheries, Government of Japan, 1983, 1984, and 1985. Average of three years, 1983-85. The statistics cover the northeastern part of Hokkaido and the southern part of the Sea of Japan.
- b. Estimates based on information collected by the four FAO/UNDP missions sent to DPR Korea, 1978-88. Average of three years, 1982-84. Estimates include production from the Yellow Sea along the west coast.
- c. *Korean Yearbook of Fisheries Statistics*, Ministry of Agriculture and Fisheries, Republic of Korea, 1983, 1984. Statistics cover the two provinces bordering the Sea of Japan (Gang weondi and Kyeong sang buk-do). Refers only to the "adjacent water fisheries," excluding the "distant fisheries." Average of two years, 1983-84.
- d. *FAO Yearbook of Fishery Statistics, Catches and Landings*, FAO, Rome, 1986. Statistics cover the entire Northwest Pacific (FAO Fishing Area 61) as the nominal catch statistics are not separable by subregions (seas). Average of four years, 1983-86.
- e. Pacific herring, 160,248 tons; Pacific saury, 21,595 tons; Japanese sardine, 736,909 tons; and Japanese chub mackerel, 227,380 tons. The catch of the last two species (totaling about 967,000 tons) has been taken mostly from Japanese waters mainly along the Sea of Japan coast, outside the region, and partly along the Sea of Japan coast.
- f. In addition to the collection of natural seaweeds, a large amount of seaweed would have been produced by aquaculture. The seaweed culture has been intense in Japan and the Republic of Korea. Aquaculture production has been excluded from this review.

For the most part, provisions of the Law of the Sea Convention relating to highly migratory species, marine mammals, anadromous and catadromous stocks, and sedentary species pertain to cooperation among coastal states and noncoastal nations fishing on certain species. Still, the management of these stocks within national jurisdiction is expected to conform to international standards. Russia claims sovereign rights over "migratory" species in its 200-nmi fishing zone and outside this zone, except when inside territorial waters, fishing zones, or EEZs of coastal states recognized by Russia (Article 2).¹ This provision would appear to apply more to anadromous species than to highly migratory species, but a clear distinction is not made. Japan adopts the opposite position, allowing fishing for highly migratory species to occur within its waters (Article 6[1], Article 9). Japan's appendix listing of highly migratory species (Cabinet Order 212, Article 3) differs substantially from that of the Law of the Sea Convention (excluding pomfrets, sauries, dolphins, sharks, and cetaceans). The DPR Korea is silent on highly migratory species, while the Republic of Korea does not require special regulation of highly migratory species in its territorial sea.

If anadromous species is what is meant in Russia's reference to "migratory" species (Article 2), then the Russian practice is consistent with the Law of the Sea Convention. Japanese domestic application, too, fits the Law of the Sea model. The DPR Korea is suspected of catching substantial quantities of salmon in the sea to its east, but catch statistics and information on production of salmon from its rivers are not available. The harvest of salmon by the DPR Korea in the absence of domestic production would be an indication of lack of adherence to the Law of the Sea anadromous species provision. The Republic of Korea reports no harvest of salmon. Catadromous species are not mentioned in any of the countries' legislation.

Marine mammals are not mentioned in the Russian legislation, although they may be encompassed in the use of the term "fish and other living resources." Japan uses the term "marine animals and plants" in lieu of the broader "living resources" term of the Law of the Sea Convention. Marine animals may encompass marine mammals, but this is not explicitly stated. Specific mention of the 1912 Law to Control Hunting of Sea Otters and Fur Seals is made in Cabinet Order 212, which provides for implementation of the Provisional Fishing Zones.

A few other issues arise with respect to domestic implementation of the policies and regulations embodied in the Law of the Sea Convention. According to Article 61, states are obligated to restore stocks of fish that are depleted. In domestic legislation in all coastal states in this marine region, there is mention of "preserving," "protecting," and otherwise managing stocks for long-term high yields. However, none of the states has expressed a commitment to restoration where it is needed. China is a noncoastal state with possible interest in the fisheries of the Sea of Japan since a few Chinese fishermen may actually gain access to the sea via passage on the Tumen River.

Existing Cooperative Agreements

Five bilateral fisheries agreements currently exist in the region. These include the two Japan-USSR agreements on fishing other than salmon in each of the counterpart's jurisdictional waters and the Japanese high-sea salmon fishing, the Japan-Republic of Korea agreement on fishing by both countries in the joint regulatory zone, the DPR Korea-Japan agreement on Japanese fishing in the jurisdictional waters of DPR Korea, and the DPR Korea-USSR agreement on fishing in each other's jurisdictional waters. Clearly, Japan is the common player and holds the key to international cooperation on the management of fishery resources in the Sea of Japan.

The first agreement is the "Fisheries Agreement" between Japan and the USSR (other than salmon). A reciprocal fishing right for each has been established between the two countries. The agreement defines the details of the fishing conditions for each party, which include the fishing grounds, number of vessels to be licensed, total allowable catch, and catch quotas for major species. A unique feature of the agreement is its "equivalency principle" employed in the quantity of the total allowable catch for each party. The amount of the catch actually taken varies greatly by country and year, however, especially in the USSR fishery. Major species to be taken by each party are:

- Japan: Alaska pollack, flatfish, rockfish, Pacific cod, saffron cod, Pacific saury, sandlances, squids, and others (for 300,000 tons total allowable catch with 1,600 vessels in 1987)
- USSR: Japanese sardine, Japanese chub mackerel, Alaska pollack, deep-sea cods, Pacific saury, and others (for 200,000 tons total allowable catch with 305 vessels in 1987)

The Japanese fishing right in USSR waters is further subdivided into two categories: fishing free of charge (for 200,000 tons total allowable and fee fishing (for 100,000 tons total allowable catch). The amount of fees for the latter was about 290 million Japanese yen or US\$9.9 million in 1987, while the amount of the total allowable catch for the latter is excluded from the "equivalency principle."

The second agreement is the "Fisheries Cooperation Agreement" between the USSR and Japan (high-sea salmon fishing). Japanese fishing on USSR-origin salmon on the high seas is subjected to the regulations defined by this agreement. Fishing has been rapidly declining, however, because of more severe restrictions imposed by the USSR since the conclusion of the Law of the Sea Conference. For instance, the Japanese catch quota decreased from 42,500 tons in 1978 to 17,700 tons in 1988, while the cooperative fees paid by the fishery increased from about 1,760 to 3,350 million Japanese yen or US\$13.5 to \$28.5 million. This implies a large increase in fishing cost from about 41,400 to 177,700 Japanese yen per ton or US\$320 to \$1,370. In terms of economic profitability, fishing is assumed to be marginal.

The third agreement is the Japan–Republic of Korea Agreement. This pact defines the fishing conditions for both parties in the joint regulatory zone established by the two countries in the offshore waters along the Korean peninsula. Apart from the agreement, Japan and the Republic of Korea have themselves established for each other a separate domestic, self-regulatory scheme for their fisheries operating in the counterpart's coastal waters beyond the joint regulatory zone. The reason for the establishment of such a scheme is that the Republic of Korea has not yet extended its jurisdiction and the Japanese extended jurisdiction has not yet been applied to the Republic of Korea fishery. The scheme covers the Japanese trawl and purse seine fisheries operating along the Republic of Korea coast and the trawl, squid jigging, and pot fishing by the Republic of Korea along the Japanese coast.

Fourth is the DPR Korea–Japan Agreement. This agreement has been established on a nongovernmental basis. The organizations responsible for the agreement in each party are the Korean Goodwill Association for Promotion of DPR Korea–Japan Friendship and the Korean Federation of Fisheries Cooperative Association for the East Sea (in the DPR Korea) and the Japanese Association of Diet Members for Promotion of Japan–DPR Korea Friendship and the Japanese Consultative Association for Japan–DPR Korea Fisheries Coordination (in Japan). Both parties have established the DPR Korea–Japan Joint Fisheries Cooperative Committee for the executive organization of the agreement. The pact defines the fishing conditions of the Japanese fisheries in the EEZ of the DPR Korea, which covers squid jigging, salmon gill net, salmon longline, and crab pot fisheries. Fishing fees have been required for these fisheries since 1988 (US\$150 per ton for squid fishing and US\$230 per ton for salmon fishing). No agreement has been reached on crab pot fishing. The catch quota system has not yet been introduced in the agreement.

The fifth agreement is the DPR Korea–USSR Agreement. A reciprocal fishing right for each has been established between the two countries. The catch quota for each in the other's waters has been decided at the regular meetings of the Joint Fisheries Committee organized by the two countries. Scientific and technical cooperation in these waters has also been discussed in detail at the committee meetings.

Except for the DPR Korea–Japan Agreement, all agreements are dealt with by the specific Fisheries Committee established in each of the countries as executive bodies. The committees then hold joint annual meetings to discuss the state of the resources and fisheries and to revise the fishing conditions for the forthcoming fishing season. Scientific meetings are usually organized as the scientific subcommittees under the parent bodies. The meetings are held regularly just prior to the annual meeting of the main committees, and occasionally when required by the parent committees. Details of the discussions held or the documents used at such scientific meetings are not released to the public.

Future Cooperation

The feasibility of future cooperation between Russia, Korea, and Japan over the management of fishery resources in the Sea of Japan will depend on the stability of the bilateral fisheries regimes that have been constructed between them and the willingness of the three countries to adjust and adapt these regimes to meet the requirements of policy coordination in this arena. Marine living resources often traverse maritime boundaries of neighboring states, rendering unilateral, national resource assessments less than complete and sometimes quite inadequate. Fishery resources in the Sea of Japan are no exception. This observation applies particularly to those anadromous species that spend part of their migratory life in the Sea of Japan, especially pink salmon (*Oncorhynchus gorbuscha*) and cherry salmon (*Oncorhynchus masou*). Since the establishment of 200-nmi zones by the former Soviet Union and Japan in 1977, Japan has been forced to harvest pink salmon only in its southernmost area of distribution in the Sea of Japan, causing a great deal of difficulty for Japanese drift-net and long-line fisheries in the area. If careful assessments of the stock indicate significant improvement, Japan would certainly like to harvest a share. Japan has recently succeeded in the artificial propagation of cherry salmon larvae and is now exploring ways to develop them to sustainable levels on a stable and efficient basis. Certainly, the technology developed by Japan will be of interest to Russia and both Koreas. International cooperation may also enhance the coastal states' ability to assess the status of other valued stocks in the Sea of Japan. Careful monitoring of these stocks is needed in view of their erratic fluctuations and, in some cases, deterioration. Several of these species overwinter, spawn in, or migrate across Chinese waters—*Scomber japonicus* (chub mackerel), *Engralis japonica* (Japanese anchovy), *Trichiurus lepturus* (hairtail), *Meraenesox cinereus* (conger pike eel), *Trachurus japonicus* (jack mackerel), *Saurida tumbil* (lizard fish), *Navodan modestus* (black scraper), *Scombero marus nipponius* (Spanish mackerel), and cods.

Japanese fisheries interests vis-à-vis the USSR have been largely uniform. In contrast, the Japanese experience vis-à-vis the Republic of Korea was marked by a clear conflict of interests between the northern and the western/southwestern fishing interests in the country. This must be kept in mind in considering the possibility of future Japanese–Republic of Korea and Japanese–Russian fisheries cooperation in the Sea of Japan. The fisheries interests of Japan, Russia, and the Republic of Korea are not always mutually exclusive. Complementary interests can be found. A good example is the Russian reliance on herring, which is not so highly valued in Japan, and the Japanese appreciation of Alaska pollack, which Russia tends to undervalue.

There are certain potentially disruptive factors in Japanese–Russian and Japanese–Republic of Korea fisheries relations. The most troublesome is the dispute between Japan and the Republic of Korea over the sovereignty of Takeshima (Tok-do). When the Republic of Korea extended its territorial limit

to 12 nmi from its coast in April 1978, the dispute surfaced, but apparently the two governments have since preferred to avoid the issue. The Japan–Republic of Korea agreement in January 1974 on the joint development of offshore oil to the west of Japan has indicated the two governments' willingness to shelve potentially thorny territorial issues in favor of anticipated benefits from the exploitation of continental shelf resources. If tangible benefits can be foreseen from cooperation in the Sea of Japan, there is no reason to doubt the ability of Japan and the Republic of Korea to continue the status quo in regard to the territorial issue in favor of cooperative ventures.

The Northern Islands also continue to be a problem between Japan and Russia. However, joint ventures may be possible. To the north, Japan and the former Soviet Union agreed in 1988 to establish a joint venture company to construct salmon hatcheries in Sakhalin and to harvest the fruit of their joint effort. The joint venture company—Pirenga Godo—was formally established with a total capital of 2,160 rubles (about 4,700 million yen), of which 49 percent would be contributed by the Japanese and 51 percent by the Soviets. The first of the hatcheries was to be built on the Pirenga River northeast of Sakhalin. To generate funding for the joint venture, Japan was allowed to catch up to 2,000 tons of salmon in the Soviet EEZ east of the Kuriles during the second half of July 1988. In return, Japan was required to pay 1,750,000 rubles (about 380 million yen) in fishing fees. In addition to the hatching of salmon, the new binational enterprise is scheduled to conduct scientific studies with a view to developing scallop culture farms in Sakhalin. Russia is interested in developing other joint venture arrangements in the production and processing of highly valued fishery resources including invertebrates (such as shrimp) and sea kelp, as well as in coastal fishery cultures.

Bilateral consultation among scientists and fisheries experts has also become an inherent feature of the Japan–USSR fisheries regime. The plan for scientific-technological cooperation in 1988, for example, includes seven topics relating to the study of salmon fisheries and six topics under the rubric of the study of marine fish and invertebrates, as well as exchange of information on all these projects. Among these are two projects that study the ecology and the changes in the quantitative condition of squids in the areas of the Sea of Japan under Japanese and Russian jurisdiction. For these projects, Japan and the USSR exchange scientists and an interpreter.

Finally, the present Japan–Russia bilateral fisheries regime also includes private-level arrangements: for Japanese crab fishing off Sakhalin, in the Sea of Okhotsk, and in the Sea of Japan in exchange for fisheries cooperation fees; for Japanese sea kelp and sea urchin fisheries around the Russia-controlled Kaigara Island, east of Hokkaido; for Japanese purchase at sea of Alaska pollock and herring; and for Japanese *madara* (*Gadus macrocephalus*) dragnet fishing in the Russian EEZ. In 1987, Japan collected 1,031 tons of sea kelp in exchange for 110,500,000 yen. Japan harvested 260 tons of sea urchin in 1987 in exchange for 57 million yen. Japan bought a total of 38,950 tons of Alaska

pollack in 1987 through this arrangement; Japan started buying herring from the Soviets at sea in 1988, purchasing 361 tons that year. Japan's 1988 quota was 25,500 tons, and 17 to 18 Japanese boats were permitted to operate within Russian waters.

Recent developments in the Japan-Russian fisheries regime with new elements of bilateral cooperation in fishery resources production and conservation indicate increasing Russian interest in cooperative ventures in fishery resource management. The Russian government is keen on firmly establishing Russian sovereign jurisdiction over the living and nonliving maritime resources within its EEZ and on rationalizing the Russian fishing industry.

The Japan-USSR and Japan-Republic of Korea agreements provide for annual fisheries committee meetings under the two regimes. These meetings allow fisheries experts from the countries involved to exchange their respective assessments of the fisheries stocks concerned and to recommend to their governments acceptable, if not optimal, levels of fishing effort and regulatory measures necessary to achieve those levels. Negotiations between government representatives, occasionally including cabinet ministers, have then managed to produce mutually acceptable agreements. The whole process has thus forced the governments to coordinate their respective policies.

The Japan-USSR and Japan-Republic of Korea fisheries regimes have shown a remarkable degree of adaptability in the face of changing needs of the countries involved. Probably the single most important development that has affected the bilateral fisheries relations between Japan and the former USSR and between Japan and the Republic of Korea has been the expansion of the fishery industry in the former USSR and the Republic of Korea since the 1970s. The two fisheries regimes have shown enough flexibility to accommodate these trends, but with painful consequences to the Japanese.

Japan occupies the pivotal position regarding possible cooperation in the management of fishery resources in the Sea of Japan. It has the longest coastline facing this semi-enclosed sea. It has also been the most extensive user and beneficiary of the marine living resources in the sea. It therefore depends more heavily than either Russia or the Republic of Korea on those resources. Furthermore, Japan has the most advanced scientific and technological know-how in the use of marine living resources.

Japan clearly understands the need to cooperate with Russia and the Republic of Korea. Technical expertise for fishery resource management is growing in Japan, although so far the most promising has been in fisheries production rather than conservation and rational use of fishery resources. Institutional arrangements should not be too difficult as Japan has a long history of dealing with its neighbors. With the establishment of diplomatic ties between Russia and the Republic of Korea, perhaps trilateral cooperative arrangements can be developed among the three. The need to coordinate their fishery policies may facilitate improvement of overall relations, just as Japanese-USSR and Japanese-Republic of Korea fisheries agreements positively influenced the two bilateral relationships in general in the 1950s and 1960s.

Fishery resource management—that is, the rational use of fishery resources through regulated and efficient exploitation and effective conservation of those resources for the attainment of a long-term stable fishery supply—requires reliable information on the status of the resources in demand. The analysis of the postwar bilateral fisheries regimes made it clear that the parties to those regimes often came up with different and competing resource assessments. This fact alone argues strongly for coordinated efforts at resource studies.

Although cooperative management of fishery resources has been proposed by many fisheries experts but remained a largely unrealistic goal in the past, circumstances today are far more favorable. If Japan, Russia, the Republic of Korea, the DPR Korea, and China are to maintain their status as fishing nations, they must learn to cooperate in the effective management and efficient use of the bountiful yet bounded living resources of the Sea of Japan. This includes limits on catch and effort, no-fishing zones, regulations on gears, mesh size, and fish length and the international coordination of these measures and management through agreement. The alternative—conflicting claims and unbridled competition—will surely bring about deterioration of those resources, and in the end harm those whose livelihood depends critically on the stable supply of marine living resources over many decades to come.

HYDROCARBONS AND MINERALS

Prospects for substantial discoveries of hydrocarbons and minerals in the Sea of Japan are uncertain.⁴ Hydrocarbon production occurs off southern Sakhalin, on the coast of Hokkaido, and in the Tsushima Basin along the southwest coast of Honshu; there is further potential in these areas. Possible strategies include more extensive and deeper drilling along Honshu, deeper-water exploration on the Yamato Rise and Korea Plateau and in Tsushima and Tartary Basins at the southern and northern extremes of the Sea of Japan, respectively, and exploration along its western margin where rifted margin structures may contain substantial sedimentary basins as suggested by SeaSat-derived gravity anomalies.

Conditions favorable for petroleum accumulations in thick clastic wedges on the Tsushima/Ullung Basin margin include: source beds with appropriate thermal-maturation conditions for petroleum generation; reservoir rocks of sufficient porosity and permeability to allow migration and accumulation of hydrocarbons; and structural or stratigraphic traps. Gas was evident in the Yamato Basin and the Japan Basin sediments drilled by the Deep Sea Drilling Program. With predictions that oil prices will remain low in the twenty-first century, production from deep waters may not be justified unless there is a major discovery.

Hydrothermal polymetallic deposits have been discovered in the Okinawa Trough and the Mariana Trough, both typical back-arc basins associated with plate subduction zones. Further, Kuroko ores containing copper, lead, zinc, cad-

mium, gold, and silver are distributed along the western coast of Honshu Island in association with volcanic rocks. These ores are thought to be the remains of submarine polymetallic deposits formed during the spreading of the Sea of Japan as a back-arc basin. Gold-bearing deposits have been found on Loihi, an active submarine volcano at the extreme southwestern end of the Hawaiian chain. These facts may indicate ore potential either in the former spreading zones in the Sea of Japan or in association with formerly active submarine volcanos.

At stake in the southern Sea of Japan is a polyhedral area encompassing the northeastern Tsushima Basin and the southwestern Yamato Rise and Trough.³ If Japan owns Takeshima (Tok-do), it will obtain a small northeastern portion of the Tsushima Basin and almost the entire Yamato Rise and Trough, including an area of possible seafloor spreading and any concomitant metallic sulfide deposits. If the Republic of Korea owns Tok-do, then it would gain the northeastern portion of the Tsushima Basin as well as the southwestern end of the Yamato Rise and Trough. The Japanese concession system overlaps the equidistant line and includes most of the disputed area while carefully skirting the Republic of Korea's "special maritime zone." Japan's concession blocks even overlap DPR Korea's potential EEZ boundary. The Kurile dispute has not prevented mutually beneficial arrangements from being made between Japan and Russia in other areas, and they are discussing the issue. Joint ventures on some of the islands and cooperative exploitation of the fish in the surrounding waters might be possible.

Joint development is one possible solution to overlapping claims in areas with petroleum potential, as in the southern and northern parts of the Sea of Japan. Joint development is a process in which the boundary dispute is set aside and the parties agree jointly to explore and develop any resources in an agreed area. A joint development agreement already exists between Japan and the Republic of Korea. Although joint development is clearly not the optimal or permanent solution to the problem of unresolved boundaries, in some situations it may be the only alternative to no action (and thus no hydrocarbon development) or, worse, to confrontation and conflict. In an energy-poor world, with many offshore areas with hydrocarbon potential claimed by more than one needy country, joint development is an idea whose time has come. Indeed, it will appear increasingly attractive as the need for oil intensifies and precedents mount. What is needed is a series of technical and policy conferences to explore its possibilities.

NAVIGATION

The shipping casualties in the channels of the Korea Strait and the area off the southern coast of the Republic of Korea are significant.⁴ From 1979 to 1983, the casualties to foreign vessels recorded by the Maritime Safety Agency of Japan as requiring rescue numbered 267 for Republic of Korea flag vessels (in-

cluding 166 fishing vessels), 25 for the People's Republic of China (including 10 fishing vessels), and 16 for the USSR (including 3 fishing vessels). During 1983, some 2,031 vessels (comprising 1,071,809 gross tons of shipping) met with marine casualties that required rescue in Japanese coastal waters; 10,101 persons were involved, 189 of them either recovered dead or missing.

Political tensions have overshadowed concerns related to the shipping sector, such as freedom of navigation, safety of shipping, marine pollution control, vessel accident contingency planning, and coordination of vessel traffic. For the benefit of all vessels operating within the Sea of Japan region, a coordinated effort to regulate maritime traffic is needed. Such effort could take the form of cooperative, nonpolitical initiatives among the respective government agencies in addition to the possible formation of an effective international regional organization. It is only through a regional approach that maximum utilization of all aspects of the shipping sector may be realized.

International Conventions

Although Japan, Russia, the DPR Korea, and the Republic of Korea are all members of the International Maritime Organization (IMO), many conventions have not been ratified by all of these nations (Table 9.2). Doing so would form the basis for cooperation in navigation regimes in the Sea of Japan. Of the 40 conventions, including the IMO convention itself, the USSR has accepted 28; Japan, 22; the Republic of Korea, only 13; and the DPR Korea, only 9. For example, it is significant that the International Convention on Maritime Search and Rescue has not been accepted by either the DPR Korea or the Republic of Korea. A 1956 agreement between Japan and the USSR provides for distress assistance in the Sea of Japan. Yet the best method of improving safety at sea and utilization of the marine highway is through cooperative regional arrangements.

In addition to IMO, several other international organizations are active in the maritime sector. The International Labor Organization (ILO), an agency established to promote basic workers' rights, has developed specific conventions relating to seafarers. Of the 36 labor conventions concerning seafarers, the USSR has ratified 9 and Japan 11. Neither the DPR Korea nor the Republic of Korea has ratified these ILO conventions.

The United Nations Conference on Trade and Development (UNCTAD) has also developed three conventions relating to maritime matters. First, the Convention on a Code of Conduct for Liner Conferences, the primary objective of which is the improvement of the liner conference system, has been signed by the Republic of Korea and the USSR but not Japan and the DPR Korea. Second, UNCTAD's UN Convention on International Multimodal Transport of Goods, designed to facilitate the continued expansion of international multimodal transport, has been signed by Japan and the USSR but not the DPR Korea and the Republic of Korea. Third, UNCTAD's UN Convention on Conditions for Registration of Ships has been formulated to combat the "open

Table 9.2 Status of IMO conventions as of 25 April 1988

Country	Convention number
China	1, 2, 3, 4, 5, 6, 7, 9, 10, 13, 14, 16, 20, 23, 24, 33, 34, 35, 36, 37, 38, 40
DPRK	1, 2, 3, 6, 9, 16, 17, 18, 19
Japan	1, 2, 3, 4, 5, 6, 7, 9, 10, 13, 14, 16, 17, 18, 19, 20, 21, 23, 26, 32, 39, 40
ROK	1, 2, 3, 4, 5, 6, 7, 9, 13, 14, 16, 23, 40
USSR	1, 2, 3, 4, 5, 6, 7, 9, 10, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 26, 30, 33, 34, 35, 37, 38, 40

List of Conventions

1. International Maritime Organization
2. International Convention for the Safety of Life at Sea
3. International Convention for the Safety of Life at Sea, 1978 Protocol
4. International Convention on Load Lines
5. International Convention on Tonnage of Ships
6. Convention on International Regulations for Preventing Collision at Sea
7. International Convention for Safe Containers
8. International Convention on Safety of Fishing Vessels
9. International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers
10. International Convention on Maritime Search and Rescue
11. Special Trade Passenger Ships Agreement
12. Protocol on Space Requirements for Special Trade Passenger Ships
13. Convention on the International Maritime Satellite Organization
14. International Maritime Satellite Organization Operating Agreement
15. Convention on the Facilitation of Maritime Traffic
16. Convention for the Prevention of Pollution from Ships, Annex 1/2
17. Convention for the Prevention of Pollution from Ships, Annex 3
18. Convention for the Prevention of Pollution from Ships, Annex 4
19. Convention for the Prevention of Pollution from Ships, Annex 5
20. Convention on the Prevention of Marine Pollution by Dumping
21. International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties
22. International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1973 Protocol
23. International Convention on Civil Liability for Oil Pollution Damage
24. International Convention on Civil Liability for Oil Pollution Damage, 1976 Protocol
25. International Convention on Civil Liability for Oil Pollution Damage, 1984 Protocol
26. Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage
27. Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1976 Protocol
28. Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1984 Protocol
29. Convention Relating to Civil Liability in the Field of Maritime Carriage of Nuclear Material

Table 9.2 (continued)

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30. Convention Relating to the Carriage of Passengers and Their Luggage by Sea
 31. Convention Relating to the Carriage of Passengers and Their Luggage by Sea, 1976 Protocol
 32. Convention on Limitation of Liability for Maritime Claims
 33. International Convention on Load Lines, 1971 Amendment
 34. International Convention on Load Lines, 1975 Amendment
 35. International Convention on Load Lines, 1979 Amendment
 36. International Convention on Load Lines, 1983 Amendment
 37. Convention on the International Maritime Satellite Organization, 1985 Amendment
 38. International Maritime Satellite Organization Operating Agreement, 1985 Amendment
 39. International Convention for the Prevention of Pollution from Ships, 1978 Protocol
 40. International Maritime Dangerous Goods Code
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registry" phenomenon by ensuring that a real link exists between a state and ships flying its flag. Although none of the states in this region operate an "open registry," the Republic of Korea and the USSR appear to support this convention while Japan, with the world's third largest fleet, has expressed opposition. Another important maritime organization is the Comité Maritime International (CMI). The principal aims of this nongovernmental international organization are the unification of maritime and commercial law and the promotion of national associations of maritime law. Japan, the Republic of Korea, and the USSR are members of this organization.

The separation of vessel traffic in maritime areas has two principal purposes: to avoid collisions and to ensure safe use-allocation in offshore waters (by ensuring that ships avoid intensive fishing areas or offshore installations, for example). The routing of ships is probably most familiar in terms of the IMO traffic separation schemes for port approaches and areas of vessel congestion such as straits, but there are other devices of routing. The traffic separation scheme is essentially passive; the vessel traffic reporting systems (VTRS) and vessel traffic management systems (VTMS) are more active under outside management, but the latter two depart from the old rule of the unchallenged autonomy of the master of the ship.

Jurisdictional Issues Requiring Cooperative Resolution

The USSR, Japan, the DPR Korea, and the Republic of Korea have all declared territorial seas of 12 nmi. However, both Japan and the Republic of Korea have modified their territorial sea to 3-nmi in the Korea Strait. This strait is an important regional navigational area connecting the Sea of Japan and the East China Sea and therefore has been designated as a strait used for international navigation. These declarations of 3-nmi territorial seas provide a high-seas corridor through which ships may transit without entering either states' territorial seas. Japan has also declared territorial seas of 3 nmi wide in the Soya Strait, Tsugami Strait, and Osumi Strait. Hopefully the Tok-do/Takeshima dispute will not affect navigation in the region.

In addition to a 12-nmi territorial sea, the DPR Korea has declared a 200-nmi Exclusive Economic Zone and within this EEZ a 50-nmi area designated as a "military zone." Within this zone, the DPR Korea has declared a prohibition on both navigation and overflight unless previous authorization has been granted. This restriction applies to foreign merchant ships and military vessels. It is questionable whether this restriction conforms with the UN Convention on the Law of the Sea since Article 17 grants ships of *all* states the right of innocent passage through the territorial sea of *any* coastal state.

The Republic of Korea has also established a "security zone" within the Sea of Japan. This zone, adjacent to the border with the DPR Korea, extends 150 nmi from east to west and up to 75 nmi from north to south. Shipping operations are prohibited within this zone, unless authorized, and then only if the vessel is equipped with adequate communication facilities. The legitimacy of this zone under the new Law of the Sea is also debatable. The maritime boundary between the DPR Korea and the Republic of Korea is probably the most sensitive area in the Sea of Japan because of the precarious relationship existing between these two states.

While well-traveled international straits are focal points of vessel traffic and often of congestion, there are no IMO-approved traffic separation schemes (TSS) in the Japan Sea straits. The only IMO-approved TSS in the Sea of Japan based on proposals of the USSR and are off Ostrovnoi Point and in the approaches to the Gulf of Nakhodka. Outside the Sea of Japan are two TSS, also IMO-approved, for Aniwa Cape and the Fourth Kurile Strait. Only one of these is concerned with a strait, and that is not a major strait. In the initial stage of adoption of these TSS, Japan expressed reservations but did not pursue the matter, and they were adopted as they were said to have been "implemented on a voluntary basis since 1972."

The Sea of Japan may eventually provide a model area for whatever forms of ship management emerge in the field of safe navigation; some of them are no doubt well in advance of TSS. It is an area where most of the elements that engender vessel management are found: narrow sea areas and island-fringed coastlines, intensive fishing activity combined with merchant shipping, and uncertain weather with poor visibility. In time there may be offshore installations to add another element and call for a fairway system or safety zone. Already in its busy ports, Japan has resorted to sophisticated and effective measures whether of overall traffic guidance or specific direction to vessels. The Maritime Safety Agency of Japan (JMSA), established in 1948, is responsible for the exercise of law enforcement at sea, prevention of maritime casualties, search and rescue activities, marine environment protection, hydrography, safety of maritime traffic, and aids to navigation. Maritime and port safety rules are administered by the JMSA, which implements the standards set out in the relevant IMO conventions and the Maritime Traffic Safety Law of Japan. Some 20 international seaports are located in Japan (some with their own safety rules), and in some of these and their approaches the vessel traffic is very heavy and

congested. JMSA ensures a maritime traffic information system for informing and controlling ships in coastal waters. Two regional Maritime Safety Headquarters of the agency are located along the western coast of Japan, and most of the stations on the Sea of Japan deploy advanced aids to navigation, surveillance equipment, search and rescue, facilities, and law enforcement craft. There are patrol vessels of various sizes, aircraft, and helicopters (with patrol vessels big enough to carry them), as well as a hydrographic service.

The Rules Concerning the Navigation and Sojourn of Foreign War Vessels in the Territorial Sea of the USSR, the Internal Waters and Ports of the USSR, which were confirmed by decree of the USSR Council of April 1983, contain the following provisions in Article 12:

2. Innocent passage of foreign warships through the territorial sea of the USSR for the purpose of passage into internal waters and ports of the USSR or departing from them for the high seas is only permitted in accordance with the provisions of Part III of the present Rules with the use of sea corridors and traffic separation schemes or by way of a previously agreed sea lane.

This interpretation of the 1982 convention to the effect that a state may require innocent passage of warships to be carried out only by determined routes and traffic separation schemes would not receive universal approval. Except for the TSS for the Fourth Kurile Strait, none of the IMO-approved TSS is specifically mentioned in paragraph one of the previously quoted article in which particular schemes of the Sea of Japan and the Sea of Okhotsk are designated for use by foreign warships.

As an example of cooperation in establishing navigation regimes, Japan and the Republic of Korea adhered to the classical limit of a 3-nmi territorial sea in the Korea Strait and to the same limit in four other Japanese straits. In the Western Channel of the Korea Strait, as in the Eastern Channel, ships could proceed with the same freedom as on the high seas, and in Soya-kaikyo (La Perouse Strait) and Tsugaru-kaikyo there were remaining corridors of the same kind of 7 and 7.5 nmi in breadth. A 12-nmi limit was adopted elsewhere.

Mechanisms to Protect the Marine Environment

In Japan, the JMSA implements the Japanese Law Relating to the Prevention of Marine Pollution and Maritime Disaster and ascertains specific types of plans for the discharge of wastes, incineration of oil and wastes whether or not containing oil, and disposal of scrap. It regularly monitors and surveys coastal areas for marine pollution. Above all, it implements the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (the "MARPOL 73/78 Convention"), which is the IMO comprehensive treaty dealing with vessel-source pollution. The JMSA takes steps to ensure that pollution from foreign vessels observed through the agency's surveillance is reported to the state of the flag. In 1986, some 18 such reports were made.

Indeed this is a model agency for both local and international standard enforcement. The international aspect of this work is derived in part from agreed action formulated by IMO: such measures as reporting incidents of oil pollution emerge from the ongoing programs of the Marine Environment Protection Committee of IMO. In this forum, standards are not only formulated and kept up to date, but active cooperation is set in motion between member states. For the states of the Sea of Japan, a variety of organizations is ready to assist in many ways and move toward collaboration. The IMO is available for multiple aspects of shipping expertise and the IHO is available for essential hydrographic assistance where charts are out of date or obstructions, navigation aids, and TSS need charting. For cooperation in scientific research and exchange of information and data, UNESCO/IOC are available to ensure that knowledge about marine pollution and effective cleanup is available and in circulation.

Possible Mechanisms of Cooperation

The first task that might be taken up in establishing entente (in the sense of listening to and comprehending others) is to complete an inventory of maritime issues in the region—singling out those that are not divisive in themselves but provide some advantage for the region and the participants. In semi-détente, the solution of some of these issues might not even require goodwill among some of the participants in the process to realize the advantages of cooperative action. The countries might set aside those issues which raise the question of the legitimacy or illegitimacy of precedent.

Common interests in rescuing persons in distress at sea and in preserving an unpolluted marine environment are strong inducements to act in concert, even if at arm's length. Traditionally, states could agree also to suppress piracy and other lawless maritime acts, since most states favor law and order. This area of noncontention seems as relevant to the present as to the past; along with piracy has been added the suppression of illicit traffic in narcotic drugs and psychotropic substances, as well as the suppression of maritime fraud and unauthorized broadcasting from ships. The states bordering the Sea of Japan might easily establish a standing mechanism of some kind between their marine law enforcement agencies (if they have not already done so) or arrive at some practical method of collaboration to detect and suppress such acts.

Nevertheless, the inventory of noncontentious areas of mutual help leaves troublesome gaps where the common interest is plain. They can be offshoots of nonrecognition in diplomatic terms—as when one state is only in communication with another through a third state or some neutral body like the Red Cross. This is not an insuperable obstacle, as we have seen in the relations of Japan with the DPR Korea dealing with common interests in offshore fishing. There may be substantial room for maneuver and practical assistance by turning to the secretariats of international organizations, particularly those of the United Nations system, but not limited to these bodies. For example, all the states bordering the Sea of Japan are members of IMO and send representa-

tives to the technical and legal bodies where the work of the organization is done. Some of these states take active roles in formulating and adopting standards. Whereas the DPR Korea is a relatively recent member, it has expressed keen interest in participating in that process.

Scholarly gatherings are of great value to the process of pragmatic cooperation in marine matters, as well as in the implementation of the new Law of the Sea. Technical and other coordinating mechanisms of an informal character, brought about by institutions of learning and professional bodies, are powerful agents of beneficial change. In the very process of lobbying, these nongovernmental groups are often influential in focusing on new solutions to old problems and in raising public consciousness of issues that are sometimes more than even governments can easily control (issues such as land-source pollution). The Sea of Japan could prove to be the positive paradigm among semi-enclosed seas and achieve this by practical and informal measures, pursued both in and out of the governments of the region and both in and out of the region itself.

POLLUTION AND ENVIRONMENTAL PROTECTION

Marine environmental protection is becoming an important issue.⁷ In relations among the four coastal states bordering the sea, negotiations on environmental questions may permit parties to avoid direct confrontation on more controversial matters such as boundary delimitation or fisheries. Thus provisional agreement on environmental issues can improve the atmosphere for further discussion of more difficult questions. The Sea of Japan is already showing signs of pollution, particularly of mercury, and there are many endangered species (Table 9.3). If tourism is to be an available option, the sea must be kept clean from both land-based and sea-based sources of pollution.

Apart from responses to occasional tanker accidents that have destroyed coastal fisheries, and severe public health risks from untreated industrial effluents, there has been only minimal overt recognition by the four coastal states in recent years of the long-term effects of land-source, vessel, and other forms of pollution on people and the marine environment. Limited regional law drafting and policy development respond chiefly to IMO and Law of the Sea initiatives. Scientific questions on factors affecting the health of marine species and ecosystems are poorly articulated, and the relevance of national laws and policies to regional environmental protection has not been seriously considered by coastal states. Prospects for improved transnational cooperation in resource development and use, however, depend upon better understanding of the potential for improved marine environmental protection in both coastal and open-sea areas.

Several perspectives are important. They include historical characteristics of sea use and protection: differences in national views on the place of en-

Table 9.3 Threatened species in the Sea of Japan

Whale

- Fin whale (*Balaenoptera physalus*)
- Blue whale (*Balaenoptera musculus*)
- Sci whale (*Balaenoptera borealis*)
- Northern right whale (*Eubalaena glacialis*)
- White (Beluga) whale (*Delphinapterus leucas*)

Seals

- Harbor seal (*Phoca largha*)
- Ribbon seal (*Phoca fasciata*)

Turtles

- Loggerhead turtle (*Caretta caretta*)
- Olive Ridley turtle (*Lepidochelys olivacea*)

Marine birds

- Oriental white stork (*Ciconia ciconia boyciana*)
- Japanese crested ibis (*Nipponia nippon*)
- Chinese egret (*Egretta eulophotas*)
- White-naped crane (*Grus vipio*)
- White-tailed sea eagle (*Haliaeetus albicilla*)
- Hooded crane (*Grus monacha*)

Nearly extinct species

- North Pacific gray whale (*Eschrichtius robustus*)
 - Japanese sea lion (*Zalophus californianus japonicus*)
 - Crested shelduck (*Tadoma cristata*)
 - Ryukyu kingfisher (*Halcyon miyakoensis*)
 - Relict gull (*Lasrus relectus*)
-

vironmental law and policy in marine resource development; distinctions between resource conservation and pollution control in national programs; relations between national and international norms and standards; the role of bilateral and multilateral formats in the definition of national rights and responsibilities toward the marine environment; institutions and organizations; and cultural factors in national approaches to marine environmental protection.

Review of national legislation shows little evidence of laws and regulations being developed with specific reference to natural features or processes that may affect pollutant transport, circulation, transformation, and dispersion. Laws and policies are couched in terms that separate legal justification and intent from the reality of people, ecosystem, and place. This tendency is not unique to this sea but is more important here because the apparent failure

to relate law more directly to nature through improved scientific understanding supports a general impression of regional lack of interest in marine environmental issues. Environmental consciousness in the region must be further raised, new institutional arrangements developed and new economic theory applied, incorporating environmental benefits and pollution costs. A UNEP Regional Seas Program should be developed and implemented for the sea. Laws must be harmonized and cooperative monitoring must be implemented, particularly regarding future industrial development. Particular focus should be concentrated on ocean dumping, red tides, and the environmental hazards of expansion of nuclear power. The first step may be to form a working group to synthesize information on the state of marine pollution and dumping in the sea.

Progress is being made. UNEP's Oceans and Coastal Activities Program convened a meeting in Vladivostok in November 1991 to discuss a possible action plan for the Northwest Pacific. Moreover, Japan's Environmental Agency called for a meeting of environmental administrators to discuss regional cooperation on marine pollution. They hope to make the meeting a regular forum on regional environmental problems and protection, particularly in the Sea of Japan. Participants will be asked to exchange information on marine pollution, their legal and technical approaches, and the extent of cooperation particularly in setting pollution standards.⁴

COOPERATION IN RESEARCH

Although there has been some cooperative marine scientific research on the sea via the Working Party for the Western Pacific (WESTPAC), much more is necessary. This section summarizes proposals for cooperative research and addresses the following questions: What do we not know? What do we need to know to resolve transnational regional issues? How might we go about obtaining the required information?

Geology/Geophysics

Measurements of surface gravity, magnetic anomalies, and heat flow in the sea are nearly complete for the southeastern portion. Seismic reflection studies are also nearly complete for the geologically interesting rises and basins. Comparative coverage of the rest of the sea is needed. Age determination of the seafloor has been carried out on Yamato Bank and small seamounts. It is important to an understanding of the origin of the basin to date seamounts in the western part of the sea. It is also important to determine the age of the basement covered with thick sedimentary layers. This can be determined by use of samples obtained from deep-sea drilling. Studies on the microstructure of the surface of the seafloor have been carried out by the submersible *Shinkai 2000*. The possibility of thermal vents has been discovered. Such vents may be associated with metallic sulfide deposits. The entire floor could be scanned by side-scan solar and interesting features checked with submersibles.

Fisheries

Because there is no systematic picture of the whole region, scientists cannot provide comprehensive advice to their governments.⁹ To improve the basis of rational utilization of fishery resources, each coastal state bordering the region should standardize its data on fishery resources and release them. Details of information covering all the major species currently utilized and its timely release are critically important to detecting any change in the ecosystem of the region's living resources. Frequent and reciprocal exchanges of scientists concerned with resource assessment between laboratories in different countries would intensify technical cooperation, primarily on a bilateral and ultimately on a regional basis. Each of the laboratories should encourage visits by scientists of other nations and make its own data and information available to them as they work together with national scientists. Working sessions in neutral locations by scientists from two or more nations dealing with specific species or species complexes should also be encouraged. The major research actions needed by the countries concerned are as follows:

- Intensify research on fish resources. This will provide scientific data for maintaining the fish stocks and fisheries.
- Jointly investigate stocks that winter and spawn in the waters of the coastal countries.
- Cooperate in management. Each state must share the benefit and responsibility of conservation by limiting fishing effort and catch. More closed fishing zones must be established to conserve the young fish and fry, and the use of gears, the size of the mesh, and the size of fish caught must be restricted.
- Work with the FAO, IOC, and regional agencies. They can coordinate and ensure the conservation and development of fish stocks in this region by organizing the exchange of oceanographic data, fishing statistics, and research on marine resources and environment and providing suggestions and information to the governments concerned.

Shipping

The following proposals are suggested responses to the need for the states bordering the Sea of Japan to promote positive cooperation to deal with increased vessel traffic and coordinate the uses of the sea in an orderly manner. A major premise of this program is that the Sea of Japan provides a good area for experimentation in pragmatic cooperation and could in time be a model area for rational management of shared uses concerned with shipping and offshore operations. A second premise is that this program should proceed on a "lead country" basis, with Japan and the Republic of Korea taking initiatives and frankly acknowledging those issues for which bilateral solutions are unrealistic, as well as agreeing to avoid actions that impinge on national claims or controversies, or establish unwanted precedents. *

Immediate steps might be taken within the Maritime Safety Agency of Japan and the Korea Maritime and Port Administration to study and realize

coordinated responses to all matters of safety of navigation on the Sea of Japan. That cooperation could include: (1) a coordinated look at flag state, port state, and coastal state rights and duties under the LOS Convention; (2) a cooperative response to needs of the fisheries community for safety of fishing vessels, as well as effective search and rescue, and measures to deal with emergencies and disasters that might occur in the Sea of Japan; (3) measures to harmonize regulatory regimes for shipping in the area, including traffic separation schemes and vessel traffic management systems and laws for offshore activities (in view of the LOS Convention); and (4) measures to coordinate publicity regarding safety zone routing of ships (separation schemes) and aids to navigation, as well as governmental requirements for entering ports and for pollution control.

On the model of a Western European agreement ("The Paris Memorandum"), a cooperative approach might be initiated for port-state control of vessels entering the ports of those states of the Sea of Japan that wish to coordinate their policies for environmental protection from vessel-source pollution. Such an initiative would cover such matters as inspection of vessels and their prompt release (with measures for bonding and other financial security) and might be widened to encompass the cooperative enforcement of fishing regulations. Moreover, a cooperative approach to shipbuilding might be explored with the study of possible joint development among Japan, the Republic of Korea, and the People's Republic of China.

An ad hoc body might be set up on the initiative of one or more states of the region to study and assess the institutional implications of regional cooperation and to examine all the global, regional, and subregional forums in which the states of the region might cooperate with the aid of third parties. Such a body would not shy away from examining issues that present a potential for conflict, but would explore the use of international organizations as focal points for data collection and cooperation as means of conflict avoidance. Publicity aspects would also be agreed—as, for example, in providing for dissemination (through the IMO, IHO, and others), of information on hydrography, the breadth of territorial seas, other navigational zones, and special areas, and the laws governing navigation in the Sea of Japan and into its ports.

General

Article 123 of the LOS Convention calls for states bordering semi-enclosed seas to cooperate in the exercise of their rights and duties under the convention. An ad hoc body of experts, perhaps assisted by the UN Secretariat on the Law of the Sea, might explore the implications of this article in the form of a medium-term study, with results made available to all states concerned with the Sea of Japan. The ad hoc body might ask:

- How can information and basic data on all issues regarding the sea best be exchanged? Could an integrated database on the sea be built? What kinds of data should most urgently be included in such a database? What are the conditions—technical, institutional, diplomatic—that should be satisfied to build such a database?

■ How can an interdisciplinary network of institutions conducting research on the different issues regarding the sea be built? What kinds of research institutions exist in and out of the region? What kinds of scientific cooperation (bilateral and multilateral) exist among the countries bordering the sea? Is it better to organize networks discipline by discipline, issue area by issue area, or in an interdisciplinary fashion?

■ How can systematic joint research be developed among the nations bordering the sea on jointly agreed priority issues? Could a regional project be conceived? Would a joint survey cruise among all coastal states be feasible, say, using a Japanese or Russian research vessel? Is it sufficient to develop projects on specific issues in the different issue areas? Or is it necessary to examine issue linkages within an integrated regional system? How can this effort be opened to extraregional scholarship while encouraging intraregional cooperation?

■ How can the scientific activities among the countries bordering the Sea of Japan best be related to the activities developed in other parts of the world? Is it possible to conceive of a broader unit of analysis of related seas from the South China Sea to the North Pacific? Is it possible to develop a comparative scheme involving different seas (South China Sea, the Mediterranean, the Caribbean, and so forth)? How can the Sea of Japan provide an example of regional scientific collaboration that can be a model to other seas?

To further the prospect of cooperation, a small ad hoc working group could be formed with members from Russia, the People's Republic of China, the Republic of Korea, the DPR Korea, and Japan. This working group on the Sea of Japan would meet consecutively in the main port cities on the sea and explore and delineate areas for cooperation. In particular, the group could focus initially on environmental protection and monitoring of pollution in the sea. The effort might eventually lead to the establishment of a Regional Marine Science and Technology Center as called for in the LOS Convention. Such a research center might combine the efforts of NGOs, universities, the United Nations University, UNEP, IOC, IMO, and industrial enterprises. This center might initially be attached to a university and nurtured into independence. In this way, the Sea of Japan could turn from a zone of tension to one of peace and cooperation.

NOTES

1. This paper is an expanded version of Mark J. Valencia, "Sea of Japan: Transnational Marine Resource Issues and Possible Cooperative Responses," *Marine Policy*, November 1990, pp. 507-525. The additional material is from Mark J. Valencia, ed., *International Conference on the Sea of Japan: Transnational Ocean Resource Management Issues and Options for Cooperation*, Occasional Paper No. 10, Environment and Policy Institute, East-West Center, Honolulu, 1989.

2. This discussion is based on Shiro Chikuni, "The Fish Resources of the Northwest Pacific," *FAO Fisheries Technical Paper* No. 266, Rome, 1985; Shiro Chikuni, "Fishery Resources and Fisheries," paper prepared for the Sea of Japan Conference, Niigata, Japan, 11-14 October 1988; Tsuneo Akaha, "The Post-War Japanese-Soviet and Japanese-Korean Fisheries Regimes and Possible International Cooperation," paper prepared for the Sea of Japan Conference, Niigata, Japan, 11-14 October 1988.
3. This analysis is based on the premise that Russia has assumed all claims and treaty rights and obligations of the former Soviet Union.
4. This discussion is based on Thomas W. C. Hilde, "Geological Framework and Petroleum Prospects in the Japan Sea," paper prepared for the Sea of Japan Conference, Niigata, Japan, 11-14 October 1988; T. W. C. Hilde and J. M. Wageman, "Structure and Origin of the Japan Sea," in P. J. Coleman, ed., *Western Pacific: Island Arcs, Marginal Seas, Geochemistry, American Geophysical Union Memoirs* (New York: Taylor and Francis, 1973), pp. 415-434.
5. This discussion is based on Mark J. Valencia, "The Sea Between Japan, Korea, and the Soviet Union: Geology, Petroleum Potential, Jurisdictional Claims, and Joint Development," paper prepared for the Sea of Japan Conference, Niigata, Japan, 11-14 October 1988.
6. This discussion is based on Edgar Gold, "Shipping in the Sea of Japan: Perspectives on Present and Future Trends," paper prepared for the Sea of Japan Conference, Niigata, Japan, 11-14 October 1988; Hal Olson and Joseph Morgan, "The Structure of Shipping in the Sea of Japan," paper prepared for the Sea of Japan Conference, Niigata, Japan, 11-14 October 1988; Teruji Sakiyama, "Direction of International Trade and Potentials of Development Across the Sea," paper prepared for the Sea of Japan Conference, Niigata, Japan, 11-14 October 1988.
7. This discussion is based on Baruch Boxer, "Marine environmental protection in the Seas of Japan and Okhotsk: Issues and Challenges," paper prepared for the International Conference on the Seas of Japan and Okhotsk, Nakhodka, USSR, 17-22 September 1989; Sequoia Shannon, "Valuable and Vulnerable Resources," paper prepared for the Sea of Japan Conference, Niigata, Japan, 11-14 October 1988.
8. *International Environment Reporter*, 4 December 1991, p. 657.
9. This discussion is based on David Fluharty, "National Fisheries Policies and Regulations: In the Sea Between Japan, Korea and the Soviet Union," paper prepared for the Sea of Japan Conference, Niigata, Japan, 11-14 October 1988.