



**SALMON GEAR LIMITATION IN
NORTHERN WASHINGTON WATERS**

ROYCE, BEVAN, CRUTCHFIELD, PAULIK, AND FLETCHER

**MANAGEMENT OF THE HIGH
SEAS FISHERIES OF THE
NORTHEASTERN PACIFIC**

VAN CLEVE AND JOHNSON

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Salmon Gear Limitation In Northern Washington Waters

An Economic, Biological, and Legal Survey of the
Salmon Resource of Northern Puget Sound
and Strait of Juan de Fuca



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Salmon Gear Limitation in Northern Washington Waters

*An Economic, Biological, and Legal Survey of the Salmon Resource
of Northern Puget Sound and the Strait of Juan de Fuca*

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ABSTRACT

The excess fishing gear used to harvest the salmon resource of northern Puget Sound and the Strait of Juan de Fuca has endangered the conservation of the salmon runs and greatly reduced the earnings of the men and vessels engaged. The International Pacific Salmon Fisheries Commission has officially requested that the gear be reduced, but it lacks the power to require its reduction.

This study is the result of a request by the Governor's Fishery Advisory Committee and the Legislative Interim Committee on Fisheries to the University of Washington. The study has been organized in three main parts: (A) Biostatistical analyses of the catches to determine the amount by which the gear can be reduced and the runs still harvested; (B) Economic studies to determine the recent earnings of men and vessels and to estimate the effect on earnings of a reduction in gear; and (C) Legal studies to determine whether a legislatively-prescribed scheme for restricting the number of units of gear fishing would be valid.

The findings are:

1. The number of units of fishing gear can be reduced to two-thirds the recent amount, and all runs can be fully harvested. The number might be reduced to as little as one-half the recent amount with no effect on the full harvest of any except very large runs.
2. The recent earnings of all three major types of gear are severely depressed despite record or near-record runs of the most valuable species, the sockeye.

3. If the number of units of fishing gear were reduced to two-thirds the recent number, the additional income to boat owners and fishermen would range from \$700,000 to \$2,500,000 annually, depending on the size and composition of the run.
4. Any further increase in the numbers of units fishing or decrease in the size of the runs will cause more severe economic loss.
5. Conservation regulations can be more precise with fewer units of fishing gear and the runs will be subject to less risk of overfishing.
6. Broadly speaking, if legislation to limit the number of fishermen is enacted, it would seem likely to withstand challenge based on the constitutional concepts of due process and equal protection, for the following basic requirements would be met: The legislature has proceeded upon some basis in fact; it has made a rational determination that some benefit to the general welfare of the people would be served by the legislation; and, further, it has made a rational choice of means to accomplish that benefit. Such legislation should not, nor is it contemplated that it would, discriminate against nonresidents of the state. As to specific provisions of such legislation, the conclusion is drawn that a grandfather clause would be valid, but other details have been examined cursorily or not at all, since the detail of proposed legislation has not been determined.

Recommendations are made for specific steps to reduce the number of units of fishing gear.

I. INTRODUCTION

Many people around the world who have studied trends in fish populations and who have been concerned with fisheries conservation have become alarmed at man's tendency to destroy the fish stocks. Every stock can produce a maximum sustained yield, but when this is temporarily exceeded, the future generations of fish and men must suffer. As the men fish harder and harder, the fish stock can produce less and less because we have no way of augmenting the stock, but must harvest merely what God has provided.

Michael Graham, who was long the director of the principal fisheries laboratory in Great Britain, stated his "Great Law of Fishing."* He stated this simply as "fisheries that are unlimited become unprofitable" and he stated further that as the fishing effort increases the fisheries stay unprofitable and the fish stocks tend to die out. A series of studies by professional economists in recent years reinforces this conclusion. Fisheries with free entry invariably produce low incomes and poor efficiency, and there is no automatic tendency to correct these undesirable results.

This problem of excess fishing effort has plagued fishermen and those concerned with the conservation of fish in Washington for many years. It has recently become a much more urgent problem as people realized that they had had years of near-record salmon production that were yielding little if any profit to the salmon fishermen. The runs of sockeye salmon have been increased to near-record sizes, yet there has been no increase in benefits to the fishermen, the processors, or the public.

The International Pacific Salmon Fisheries Commission has long been concerned with the problem of excess fishing effort, and on December 18, 1957, its chairman sent the following letter:

*Graham, Michael, 1949. *The Fish Gate*, Taber and Faber, Limited. London. 199 pp. Chapter 13.

December 18, 1957

Mr. W. C. Herrington
Special Assistant to the Under Secretary
Department of State
Washington 25, D. C.

Dear Mr. Herrington:

The International Pacific Salmon Fisheries Commission has reported to the United States Government on several occasions that the recent rapid increase in the gear efficiency and units of fishing gear in United States Convention waters has created a situation which makes the fulfillment of our terms of reference extremely difficult.

Since 1951 the development of nylon gill nets has increased the efficiency of this gear by an estimated 50 per cent resulting in a rapid growth of the gill net fleet. In 1957, 637 gill nets fished sockeye as compared with 322 gill nets the preceding brood year cycle and only 46 in 1945 the third preceding cycle. The 1956 gill net fleet comprised 491 boats compared with 192 the previous brood year cycle and 55 boats in the third preceding brood year cycle in 1944. The other two year cycles of sockeye runs in 1955 and 1954 show similar growth in gill net fishing activity.

The number of purse seine boats have not shown such a phenomenal increase but there has been a gradual increase of roughly 50 per cent in fleet size over the last twelve years. In addition to the increase in fleet size the drum seiner and the power block have been developed and perfected since 1950. The drum seiner is able to make twice the number of sets per day as made by the original conventional seiner. The power block has increased the number of sets made by making fishing easier and in general has increased the efficiency of this type of operation by an estimated 18 per cent or more.

Under the Sockeye Fisheries Convention the only action the Commission can take to offset the effects of the rapid increase in fishing efficiency and fleet size is to reduce fishing time. Our action in this regard has now become so stringent and the weekly closed period so long that we are unable to analyze the runs of sockeye in such a manner that proper racial escapement and equal division of the catch as required between the fishermen of the United States and Canada can be guaranteed. The fishing industry is likewise faced with uneconomic operations arising out of the allowable short fishing weeks.

Article V of the Sockeye Fisheries Convention prescribes in part as follows: "Whenever, . . . the taking of sockeye salmon in waters of the United States of America . . . is not prohibited under an order adopted by the Commission, any fishing gear or appliance authorized by the State of Washington may be used in the United States of America by any person thereunto authorized by the State of Washington" The Commission is in complete accord with this provision but in view of our serious difficulties brought about by the rapid increase in fishing fleet size and gear efficiency we ask that United States Government transmit a statement of our current problem to the State of Washington; further that we believe it desirable in the interest of good management that a regulatory formula be designed by and satisfactory to the State of Washington which will reduce fishing efficiency in United States Convention waters by a minimum of 25 per cent effective if possible prior to the 1959 fishing season.

In making this recommendation the Commission recognizes that a similar problem exists in other major fishing areas of the Pacific Coast of North America and that attempts to control fleet size and gear efficiency have not been entirely successful to date. We do, however, believe that the State of Washington will, upon receipt of our recommendations, take such action as it deems most desirable in an attempt to correct a very serious and difficult situation.

Yours very truly,

INTERNATIONAL PACIFIC SALMON
FISHERIES COMMISSION

/s/T. Reid
Senator Thomas Reid
Chairman

The problem was also stated forcefully by Mr. DeWitt Gilbert, a more recent chairman of the Salmon Commission, at the Commission's meeting in Bellingham on December 19, 1961, and I quote:

Now let's consider some of our problems. One of them is high-lighted by that fact that the industry generally considers 1961 a disastrous season, despite the fact that it yielded the third largest pack made on this cycle since 1917.

What is wrong when third-best in 11 cycle years is a "disaster"?

Why do many purse seiners of both fleets report they failed to make expenses? Why do all types of gear fishing around Point Roberts report consistently declining returns? Why do Fraser River gillnetters say they are catching fewer fish than formerly?

The answer, plainly, lies in over-development of the fishery.

For years the Commission has reported to the two Governments, and to the industry, that increasing gear efficiency, increasing fishing effort and expanded fishing areas are making it most difficult for the Commission to fulfill its management responsibilities.

This over-development is not alone a matter of *numbers* of boats and nets, although that is important.

Other factors concern area of operations and efficiency of gear. Within the past 10 years the Canadian side of Juan de Fuca Strait has become a major fishing area. . . . The Power Block has doubled or tripled the number of sets a seiner can make in a day. . . . Drum seine gear permits a boat to make as many as 15 sets a day. . . . Synthetic fiber gill nets are universally used, and they have about twice the fish-catching ability of linen nets. . . . Mobility of the fleet, increasing with speed and power, permits high-speed craft to shift between areas, defeating efforts at effective administration.

Further, the fishermen get smarter, about the ways of the fish, and the methods of fishing.

To secure an escapement in the face of the increased intensity and efficiency of fishing effort, the Commission has been forced to reduce fishing time. Even with the drastic measures applied on the Early Stuart run in 1961, when the Strait was closed completely and the other major areas averaged less than three days per week, the actual escapement was less than 20 per cent of the run.

If the fishery had operated in the Strait, and the other areas had been on a two-day-a-week basis, it is doubtful if we could have secured the minimum 20 per cent escapement.

Essentially, the Commission is not concerned with the type of gear which may be operated in Convention waters. That primarily is a governmental responsibility.

However, we do have the responsibility of regulating the operation of that gear in order that (1) the sockeye and pink salmon resource of the Fraser River may be conserved and increased; and (2) that the allowable surplus above the needs of such conservation and growth be divided equally between the fishermen of the two nations.

So we are seriously concerned with the problem of increased development of the fishery when:

1. Fishing time must be reduced to the point where it is almost impossible for the staff to measure the timing and abundance of the runs.
2. Gear is so abundant and efficient that each fishery in several different areas spread over 200 marine miles is taking virtually *all* of the fish in any area while the gear is being operated.
3. Large sections of the fleet become resentful of necessary increase in restrictions because of declining individual boat earnings, in spite of favorable total catches.
4. Gear competition and reduced earnings per boat threaten eliminations of certain forms of gear to the point where division of allowable catch between the national fleets might not be possible.

5. The Commission is accused of regulatory favoritism because of any imbalance in the catch between individual fishing areas in the same country, and in spite of the fact of equitable division of the catch between the two national fleets.
6. Economics of the industry are so unstable in spite of favorable total catches that local economic pressures in the industry make proper escapement safeguards difficult.
7. The number of fishing days is so low that a further temporary reduction of even a single day makes the operation of any fishing gear impracticable.

Authorization of Study

At a meeting on February 24, 1962, the Governor's Fisheries Advisory Committee adopted the following recommendations:

The Governor's Fisheries Advisory Committee to recommend to the Governor that he order, through the Department of Fisheries, an economic and management survey of the salmon resources (especially those of Convention Waters—pink—sockeye) by a third party—the University of Washington.

The purpose of the survey would be to establish the number of units of fishing gear required to harvest a run of salmon (predetermined by the IPSFC—Sockeye Commission) with not less than 4 days fishing per week.

Based on the findings of the survey, the Department of Fisheries to be instructed to propose legislation to establish the maximum amount of gear to be licensed for any given fishing season.

This recommendation was discussed at length on April 6 and 7 of 1962 at a meeting of the Legislative Interim Committee on Fisheries. It was approved, and subsequently arrangements were made between the Department of Fisheries of the State of Washington and the University of Washington for the study.

The Salmon Resource of Northern Puget Sound and the Strait of Juan de Fuca

The salmon resource of northern Puget Sound and the Strait of Juan de Fuca consists predominantly of sockeye and pink salmon runs to the Fraser River. Pink, silver and chum salmon runs to streams in both British Columbia and Washington comprise a smaller fraction of the resource and a very few chinook salmon are included incidentally.

This resource is harvested by the salmon net fisheries using purse seine, gill net, and reef net gear. These net fisheries take almost all of the sockeye, pink and chum salmon caught from these

runs, but only part of the silvers and chinooks which also are caught in major quantities by the commercial troll, the recreational, and Indian subsistence fisheries.

These runs are shared by British Columbia and Washington fishermen. The sockeye and pink salmon runs to the Fraser River are under regulation by the International Pacific Salmon Commission, which provides for equal catches by the fishermen from the two countries. These two species provide the majority of the income to the fishermen.

The regulation of sockeye salmon by the Salmon Commission has been strikingly successful from the standpoint of conservation. Runs during recent years have been among the three largest for each cycle since the disastrous slide in 1913 and the very large run in 1958 produced the all-time record catch for that cycle.

The regulation of pink salmon has only recently become the responsibility of the Salmon Commission, and the relative success of their regulation is not yet apparent. However, their approach to the regulation is based on extensive research, and it may be expected that the Commission will be permitting the maximum catches of pink salmon that the stocks can produce.

Summary of the Treaty

The Sockeye Salmon Fisheries Convention was ratified in 1937. It applies to the territorial waters and high seas westward of Canada and the United States from a line between Bonilla Point, Vancouver Island, and Tatoosh Island, Washington. It includes all such waters between 48 and 49 degrees north latitude, excepting Barkley Sound and Nitinat Lake. Eastward of this line, it includes the Strait of Juan de Fuca, the Strait of Georgia as far as Lasqueti Island—excepting Howe Sound and the waters east of Whidbey Island—and the Fraser River and its tributaries. (Fig. 1.)

Regulations enacted by the International Pacific Salmon Fisheries Commission are enforced within the territories of each nation solely by the government of that nation. The Commission has no power to authorize any type of fishing gear contrary to laws of the State of Washington or the Dominion of Canada.

The Convention required research for eight years before power to regulate the catch was given to the Commission. During this time studies were made of the salmon runs and of the river, and

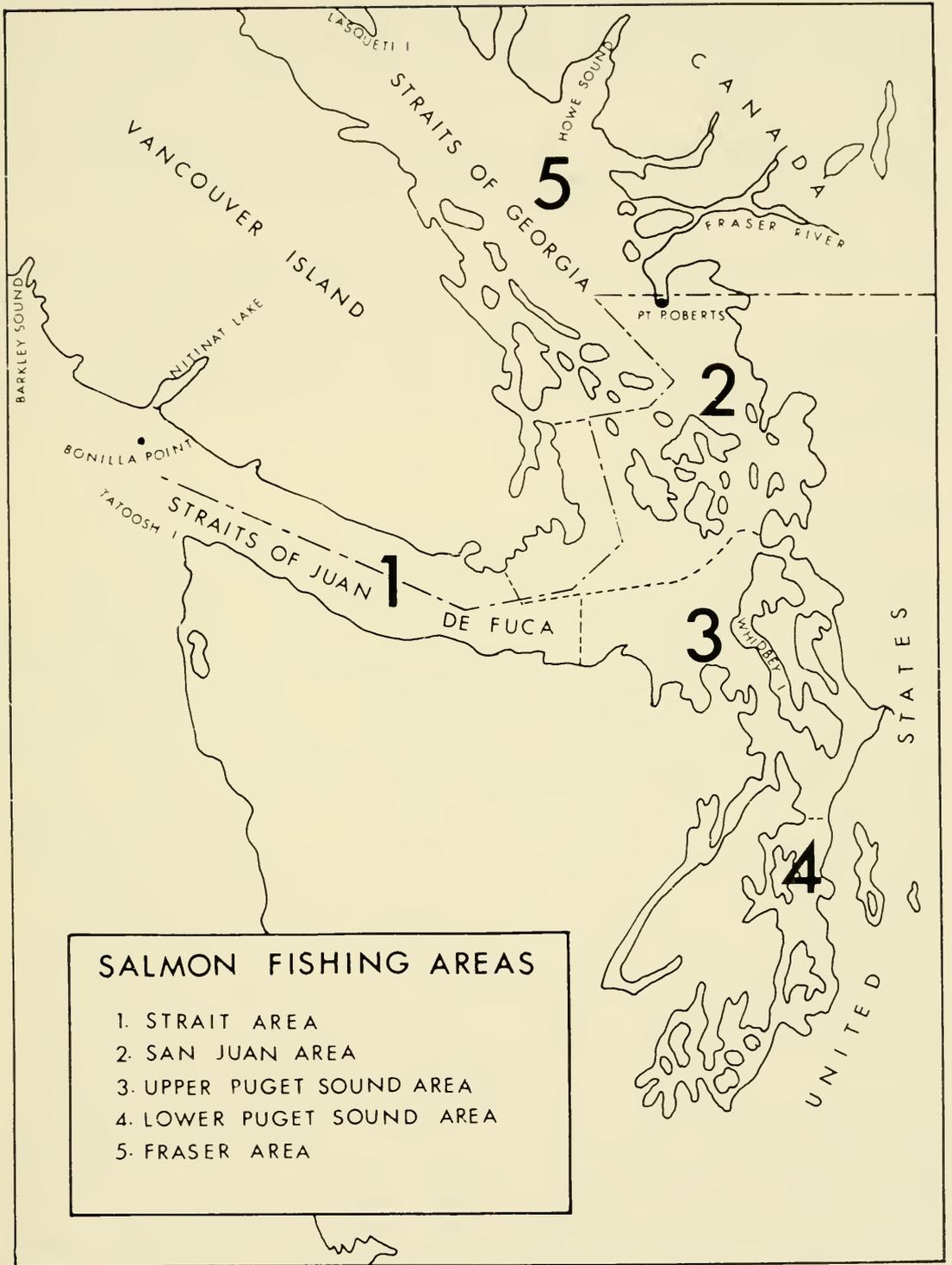


FIG. 1. Salmon fishing areas.

obstructions to the migration of salmon were removed. In addition, the Commission collected detailed and excellent statistics of the total sockeye runs. Regulation of the Fraser River and Puget Sound sockeye fisheries was undertaken for the first time by the Commission in 1946.

The responsibilities of the Commission were enlarged to include pink salmon stocks of the Fraser River by an amendment which was signed on 28 December, 1956.

Essentially the Commission has the responsibility to decide on the required escapement and the permissible catch from each run of pink and sockeye salmon and to recommend regulations to the Government of Canada and to the State of Washington which will allow an even division of the catch between the fishermen of Canada and United States.

Organization of the Study

The Commission and the Department of Fisheries have responsibility for conservation and thus the problem which was given to the University essentially was to determine how much fishing gear was needed to harvest the quantity of salmon that can reasonably be expected to be available to Washington fishermen during the next decade, to estimate what earnings fishermen and vessels might expect, and to suggest legal action which should be taken to limit the size of the fleet. Such a study by the University was possible only through close collaboration with the College of Fisheries, Department of Economics, and the School of Law. The general coordination of the contract was handled by the Fisheries Research Institute. Donald E. Bevan and Gerald J. Paulik of the Institute were responsible for the analysis of the data on the runs of salmon.

The University and the authors of this report have been asked to study the question of gear limitation to provide factual information that can be used as a basis for decision. We believe that fishing gear limitation as outlined in this report is desirable and will benefit all segments of the fishing industry. Ultimately, of course, the decision for its implementation rests with the people of the state, particularly those most interested in the utilization of the resource, and their elected representatives.

Fortunately, the Washington Department of Fisheries and the International Pacific Salmon Commission had detailed statistical data on the catch and fishing effort, as well as extensive analyses of

the dynamics of the fishery. In addition, numerous studies by tagging had been made of the migrating behavior of the fish. Without such a background, the analysis would have been impossible and full use of all these pertinent data were made. The principal steps in the biostatistical analyses were:

1. Determine recent catches from this resource by species, races, time, location, and gear, and the fishing effort by time, location, and gear.
2. Estimate from best available data the timing, speed, and route of migration by species and race.
3. Using factors determined from recent fishery data, simulate the runs of salmon, the fishing activity, and the catch under various conditions on the IBM 709 computer in order to estimate the catches that may be expected by different numbers and kinds of fishing gear.
4. Hindcast recent runs to test the computer simulation.

The economic analyses were under the direction of James Crutchfield. They started from a much smaller background of information than was available for the biostatistical analyses. Two things especially were needed — first the estimates of catch by vessel under all anticipated conditions which could be developed under Part 3 of the biostatistical analyses, and second, adequate income tax data from a representative sample of men and vessels. The principal steps were:

1. Determine recent net and gross earnings of men and vessels using each type of gear.
2. Estimate net and gross earnings and changes in economic yield with varying numbers of vessels and varying catches.
3. Estimate economic effects on other fisheries and transitory economic effects of proposed remedies.

The legal studies proceeded under the direction of Robert L. Fletcher. This work was greatly assisted by the State Department of Fisheries, which obtained statutory and regulatory material from many other states as a basis for comparative study and also furnished a detailed history of regulation in the State of Washington and other miscellaneous information.

Based on this material and other material furnished by the Fisheries Research Institute or available in the library of the School of Law, an extensive study was made of the following general topics:

1. Measures adopted by other states for the regulation of fisheries, including the interpretive decisions where there were features of interest to this project.
2. All regulatory measures and applicable decisions of the State of Washington pertaining to the regulation of fisheries.
3. Applicable provisions of the Canada-United States treaty, operation of the treaty Commission, and recommendations of the Commission.
4. Constitutional limitations upon legislative licensing of other occupations, as the features of that regulation might bear upon the regulation of fishermen.
5. Decisions of the Washington court with reference to equal protection and due process limitations upon legislative regulation of economic activity.
6. "Buy-back" as within the concept of public use or public purpose under the terms of the Washington constitution.

From this study and from other material, the legal analysis section of this report has been drafted.

II. TRENDS IN PRODUCTIVITY OF PUGET SOUND SALMON

Complete fisheries statistical reports are prepared annually by the Department of Fisheries of the State of Washington. We will include here only sufficient information to point out the importance of the fisheries in the State of Washington and the relative magnitude of the Puget Sound salmon catches compared to other species. Reference should be made to Robison, Ward, and Palmen, 1962.

In most years, salmon provide about one-quarter of the total poundage of fish and shellfish landed in the State of Washington, and their value comprises almost one-half of the total value to the fisherman. A record landing in 1958 brought 26 million dollars in payments to the fishermen. Of this total, almost 15 million dollars was paid to fishermen for salmon. In this same year, the value to the fishermen of salmon from the Puget Sound and Strait of Juan de Fuca area was 12 million dollars (see Figs. 2, 3, and 4 for recent trends in catch value to the fishermen and processed value of Washington State landings of salmon, halibut, and bottom fish).

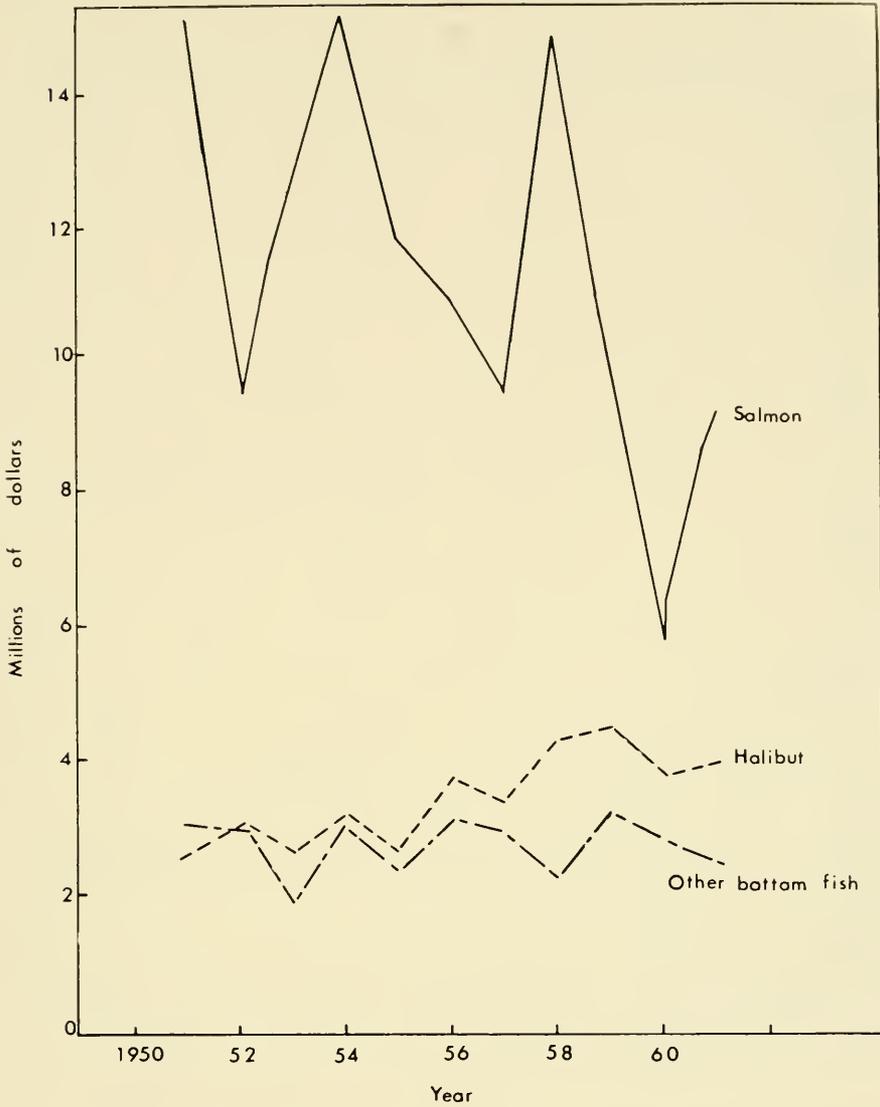


FIG. 2. Washington State fish landings, catch value to fishermen. Source: Robison, Ward, and Palmen, 1962 Fisheries Statistical Report.

Sockeye salmon provide the greatest money returns to fishermen, and in recent years the runs of sockeye have been increasing (Fig. 5). Pink salmon are second in value and first in quantity of fish landed. Although smaller numbers of chum and silver salmon are taken they are important to the commercial fishery. Chinook salmon are taken incidental to the Puget Sound and Strait net commercial fishery. With the exception of pink and chum salmon the runs of salmon in Puget Sound have been maintained or increased in recent years. Although the decline in pink and chum salmon presents an obvious problem to the fishermen, the situation has been intensified by an even greater drop in the average catch per boat (Fig. 6), brought

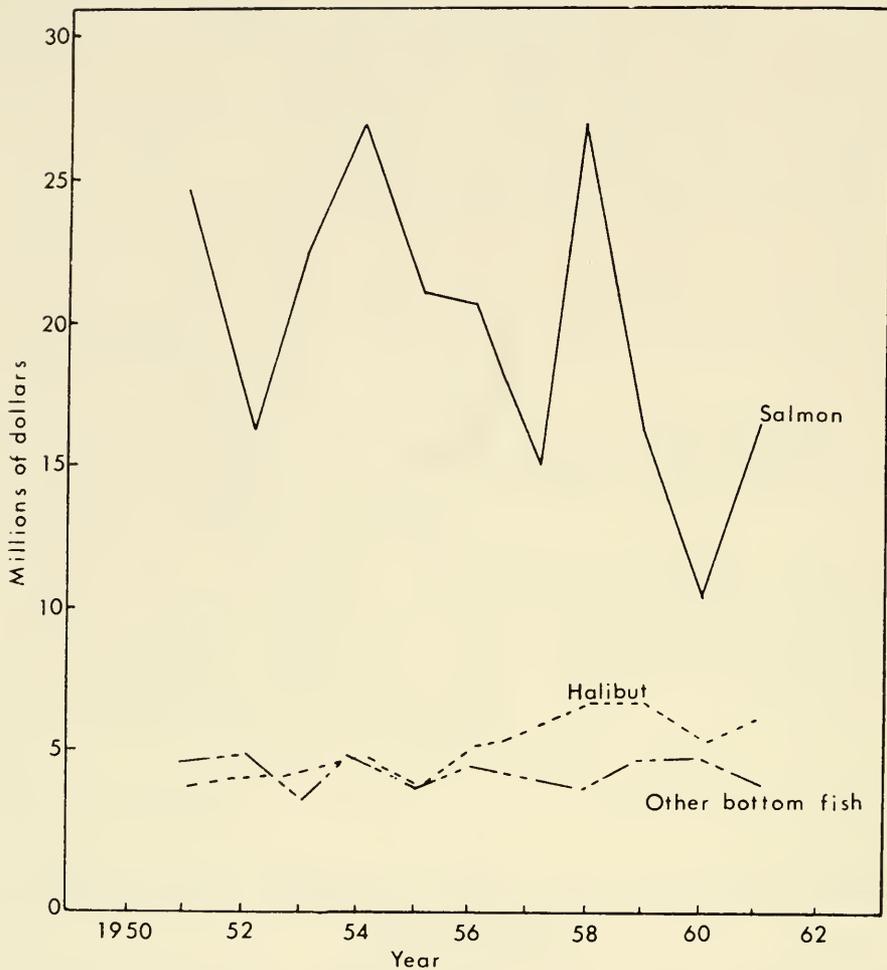


FIG. 3. Washington State fish landings, processed value.
 Source: Robison, Ward, and Palmen, 1962 Fisheries Statistical Report.

about by the introduction of more gear into the fishery (Fig. 7).

Chinook and silver salmon are taken in significant numbers by sport fishery (Fig. 8). An increase in the size limit in chinooks and a decrease in the bag limit beginning in 1958 have caused sharp reductions in total numbers of chinooks and silvers taken in the sport catch in recent years. The reduction has been primarily in small fish. In the Puget Sound fishery the commercial catch of chinook is far below the sport catch (excluding the offshore troll fishery which takes significant numbers of chinooks and exceeds in number the sport catch). The sport catch of silver salmon exceeded the commercial catch only in 1957.

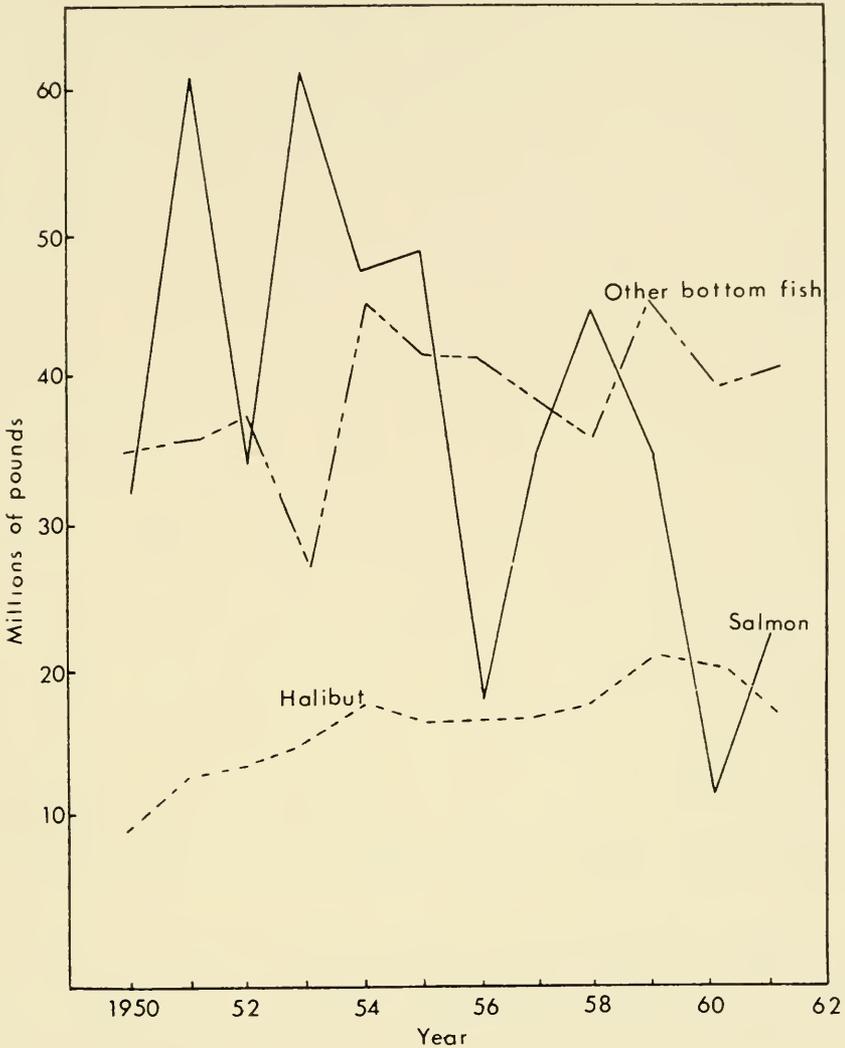


FIG. 4. Fish landings in the Puget Sound District.

Source: Robison, Ward, and Palmen, 1962 Fisheries Statistical Report.

The value of salmon landings in Washington has held up much better than the physical catches. This reflects the combined impact on prices of generally declining North American salmon catches on the supply side and a rising demand coming from increases in both population and per capita income. The rise in salmon prices has been particularly sharp since 1957.

The importance of the salmon fishery to the state economy is even greater in view of its status as an "export" industry. Most of the salmon landed and processed in Washington is shipped to other parts of the country. Even when account is taken of the

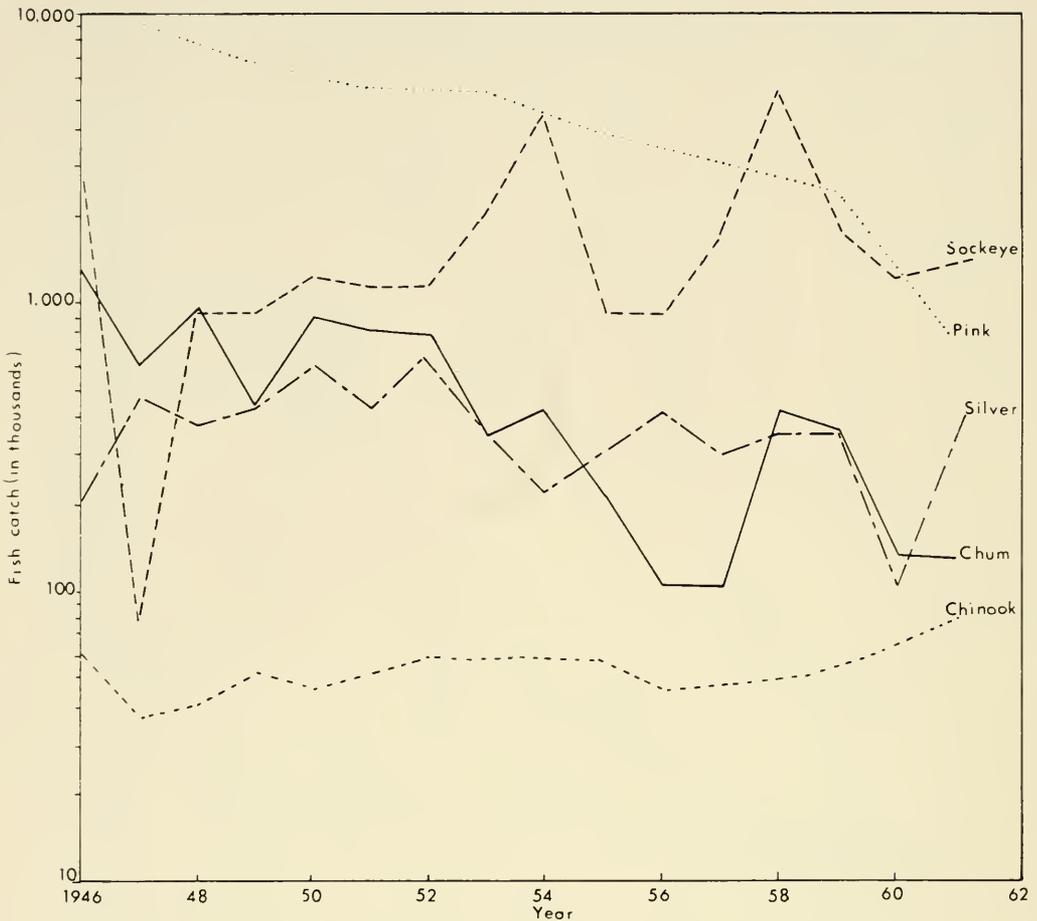


FIG. 5. Puget Sound salmon catches.

Source: Robison, Ward, and Palmén, 1962 Fisheries Statistical Report.

“imports” of materials and equipment required by fishermen and packers, the industry provides a substantial money inflow to the state. On the basis of a 1955 study it is estimated that no less than 80 per cent of the processed value of salmon represents a net addition to state income payments.

Since salmon fishing in Washington is inevitably a seasonal occupation, it is difficult to give precise figures on full-time employment. In 1961 there were approximately 5,800 licensed fishermen on salmon vessels, and perhaps five times that number of shore workers were required to process and market the catch. In addition, nearly 3,000 Indians fish commercially for salmon. The capital investment in nearly 2,000 salmon fishing vessels and 400 specialized wholesaling processing firms is obviously substantial, though the precise amount is not known.

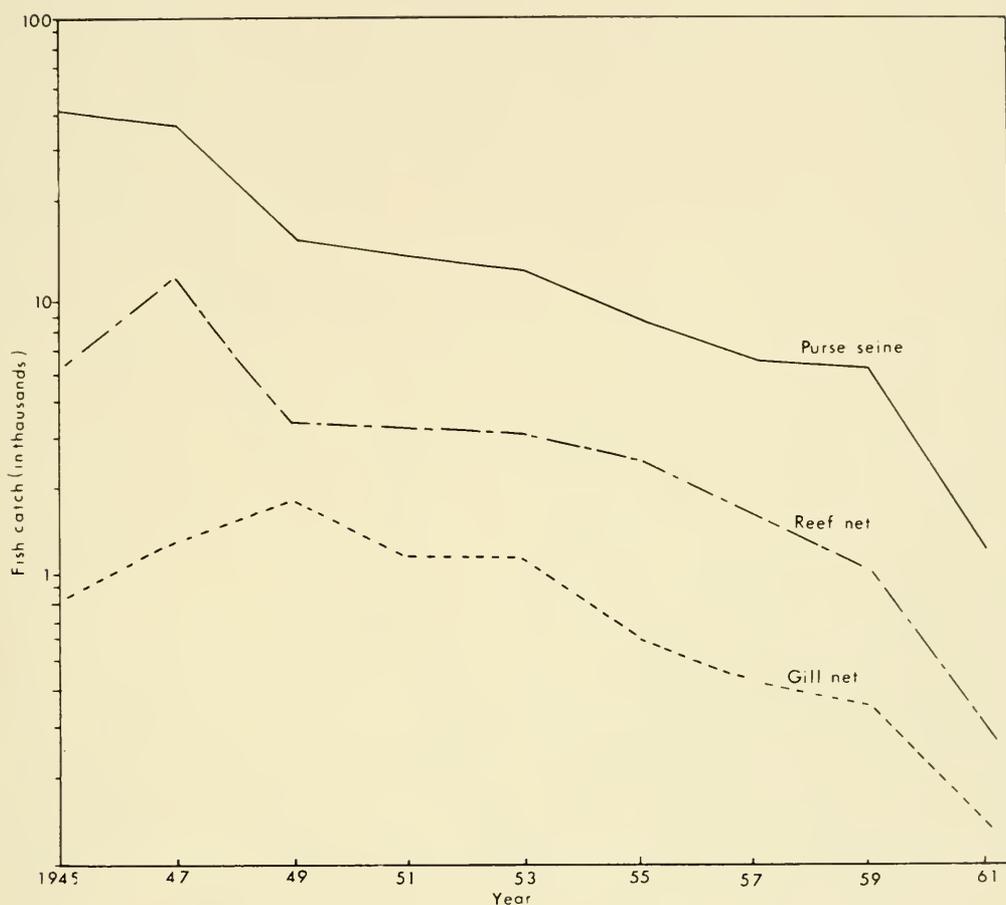


FIG. 6. Puget Sound and Strait of Juan de Fuca, average catch per license issued—pink salmon only.

Source: Robison, Ward, and Palmen, 1962 Fisheries Statistical Report.

NOTE: Pink salmon only are shown in order to eliminate fluctuations due to different cycle runs in other species.

Purse seine landing adjusted after 1955 to reflect changes in percentage actually fishing.

The salmon industry is a substantial contributor to income and employment in Washington State. Any threat to its survival, because of depletion of the basic resources or economic inefficiency, is a threat to the economic welfare of all residents of the state.

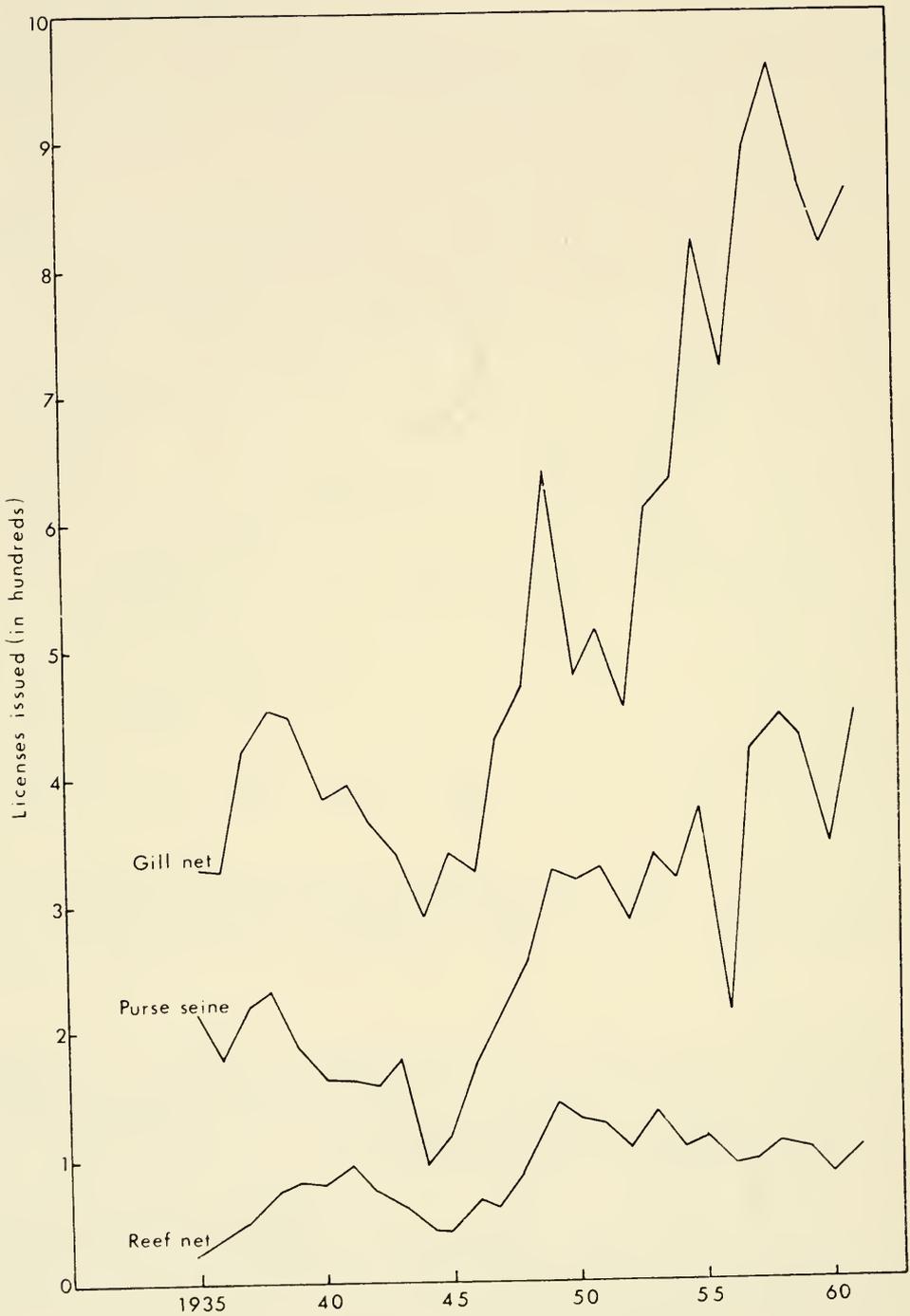


FIG. 7. Puget Sound net fishery licenses issued.

Source: Robison, Ward, and Palmen, 1962 Fisheries Statistical Report.

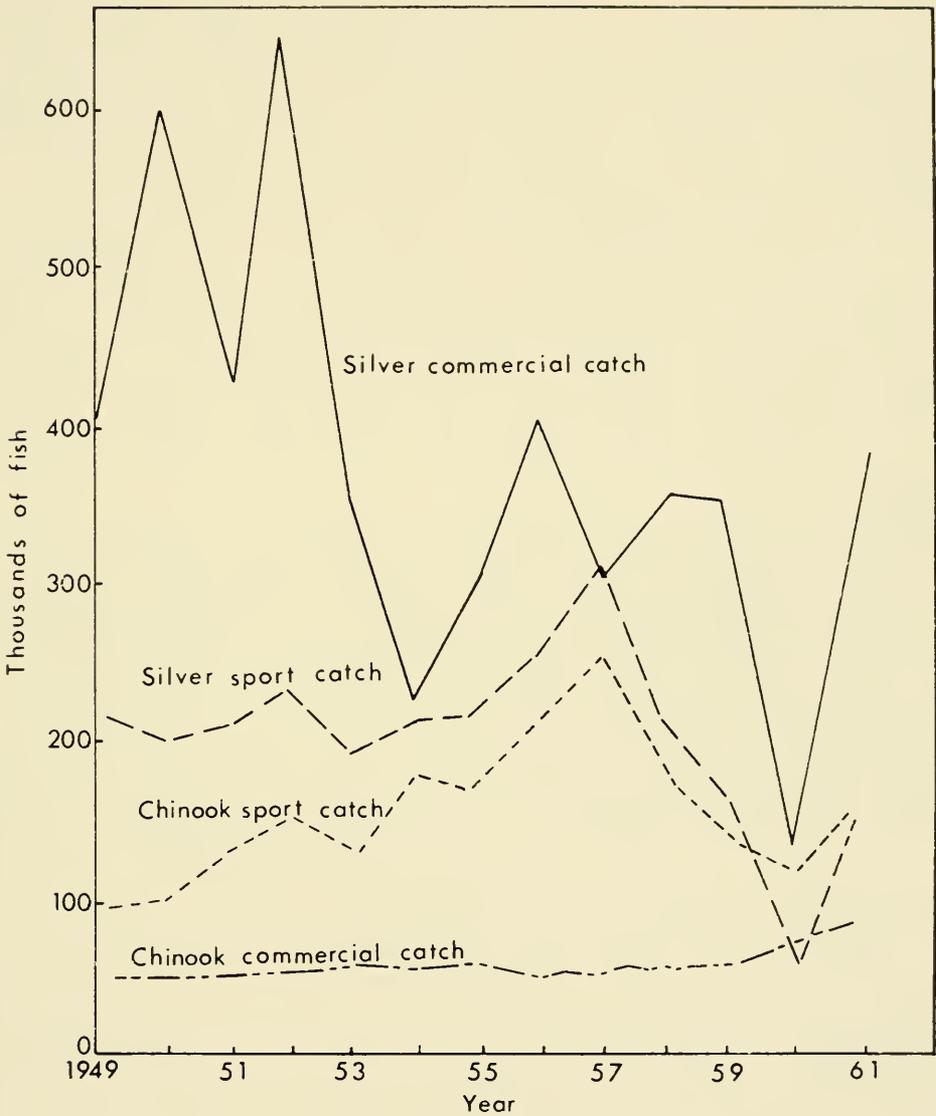


FIG. 8. Puget Sound and Strait of Juan de Fuca. comparison of sport and commercial net fishery catches.

Source: Robison, Ward, and Palmen, 1962 Fisheries Statistical Report.

III. BIOSTATISTICAL ANALYSIS

The salmon net fishery resource of the State of Washington consists of the annual runs of mature salmon that pass through the Strait of Juan de Fuca and Puget Sound on their way from the open ocean feeding grounds to spawning areas along the coasts of Washington and British Columbia. The catches are taken all along the migration routes in Canadian and United States waters.

The net fishery depends upon four species of salmon. In the order of their importance to the value of the catch these are the sockeye, pink, silver, and chum salmon, respectively. Chinook salmon are not the primary object of the net fishery except in a few very restricted localities. The catch of chinook is properly described as being incidental to the catch of the other four species.

Timing

During any given year these four species enter the fishery in a definite chronological order. The sockeye run arrives first in the late spring or early summer and is followed by the pink, silver, and chum runs, in that order. The actual timing of the peaks of the runs may vary as much as several weeks from year to year. A variety of factors may cause these fluctuations of timing. It is clearly recognized that oceanographic conditions and the racial composition of the run are of major importance. For example, the sockeye fishery depends entirely upon fish returning to the Fraser River to spawn. However, the Fraser River spawning run is far from homogeneous. The run may be composed of a number of distinct stocks or races which are destined for five major lake systems (Shuswap, Quesnel, Stuart, Chilko, and Francois) and a multitude of minor systems within the Fraser system. The individual races have fairly independent migratory schedules. The changing relative abundance of the individual races is considerable and is reflected in the timing of the total run through the fishery. The other three species are affected in a similar manner. Fluctuations in the timing of the other species are even greater than those in the sockeye since they are returning to a greater number of spawning streams distributed over a large geographic area.

Although the exact timing of the runs cannot be forecasted precisely each year, the general timing, chronological order of races,

and pattern of movement can be forecast. The situation is analogous to the familiar one of weather prediction. Although it is not possible to forecast the exact day-to-day variations in the weather in a particular region, we can forecast the general climate in an area. Throughout this report we will be more concerned with the "climate" than with the "daily" fluctuations.

Typical time-of-entry curves for each of the four species were constructed from two main sources of data. The first of these is the troll catches off the west coast of Vancouver Island and the second the seasonal distribution of net catches in the San Juan Island area. The catch per unit of effort in the offshore troll fishery on a given day is a measure of the population abundance in the area. The relative index of population abundance can be converted into numbers at the end of the season when the total catch and escapement have been tallied. The San Juan catches were lagged from three-and-one-half days to several weeks, depending on the species and the time of year, to give a similar index of relative abundance.

The "standardized" entry patterns shown are those that were used in the simulation program. The entry patterns represent the daily entry of fish into Area 1 or Strait area (see Fig. 9). The timing of the fish's appearance in the inner fishing areas (Areas 2, 3, 4, and 5) is determined by the rate of movement along the various parts of their migratory route. As fish travel through the fishery, there is also a tendency for the temporal abundance pattern to become more spread out (less peaked).

The rate of travel is usually sharply reduced in the estuarine areas just off the natal spawning streams. The exact length of the delay time may vary considerably from species to species and between the early and late races or parts of a run for one species. Delay time is also affected by the stream flow conditions. The migratory times used in the simulation model are shown in Figs. 10, 11, 12, and 13 for sockeye, pink, silver, and chum salmon, respectively. The data were obtained, in part, from published results of tagging experiments conducted by the International Pacific Salmon Fisheries Commission, the Washington State Department of Fisheries, and Fisheries Research Board of Canada.

The tagging data were supplemented with an analysis of the timing of the catch curves in the various areas. From each catch curve it is possible to estimate the time of peak abundance of the fish in an area. The time lag between the peaks of abundance in

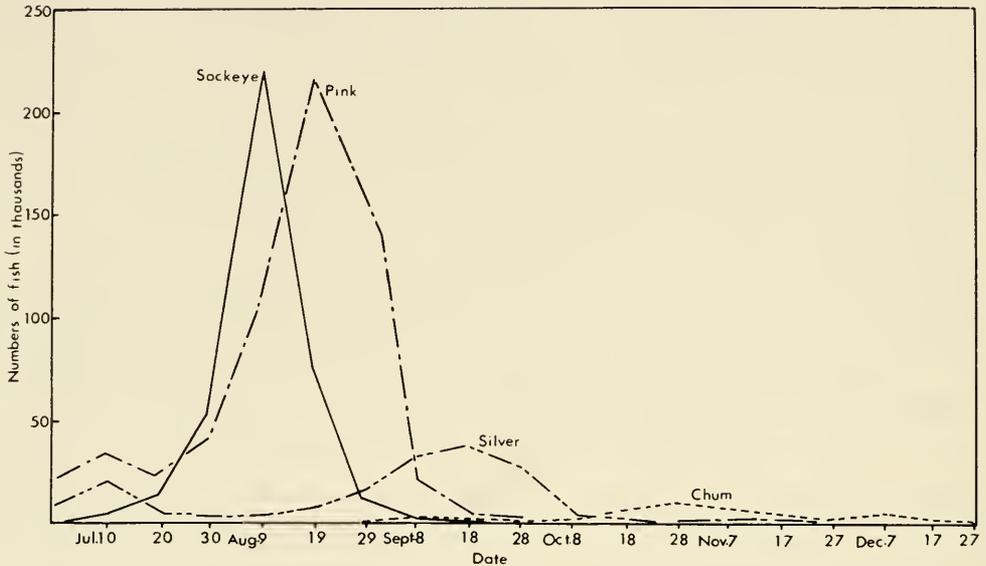


FIG. 9. Entry patterns showing the numbers of fish entering Area 1 each day during the season for sockeye, pink, silver, and chum salmon.

two areas provides an estimate of the travel time between the areas.

Staff biologists of the Washington State Department of Fisheries rendered valuable assistance in determining the timing patterns. Fortunately, we were able to draw upon their experience and knowledge to help estimate the values of movement parameters in areas where tagging data were deficient or catch data difficult to interpret.

Route of Migration

The general migratory routes used in the computer simulation of the net fisheries are shown in Figs. 10, 11, 12 and 13. Fishing Areas 1 and 2 include both Canadian and United States waters. The per cent of the run available to each of the national fleets was estimated from available catch and tagging data. For example, in area 1, 94 per cent of the sockeye population is available to the Canadian fleet and 6 per cent available to the United States fleet. Regardless of the amount of intensity exerted by the United States fleet in this area, 94 per cent of the sockeye would not be affected.

The exploitation of the runs in each area is determined by the proportion of the runs that enter the area, the length of time fish spend in the area, and the amount of gear that fishes in the area. For example, the sockeye runs are totally unaffected by the amount

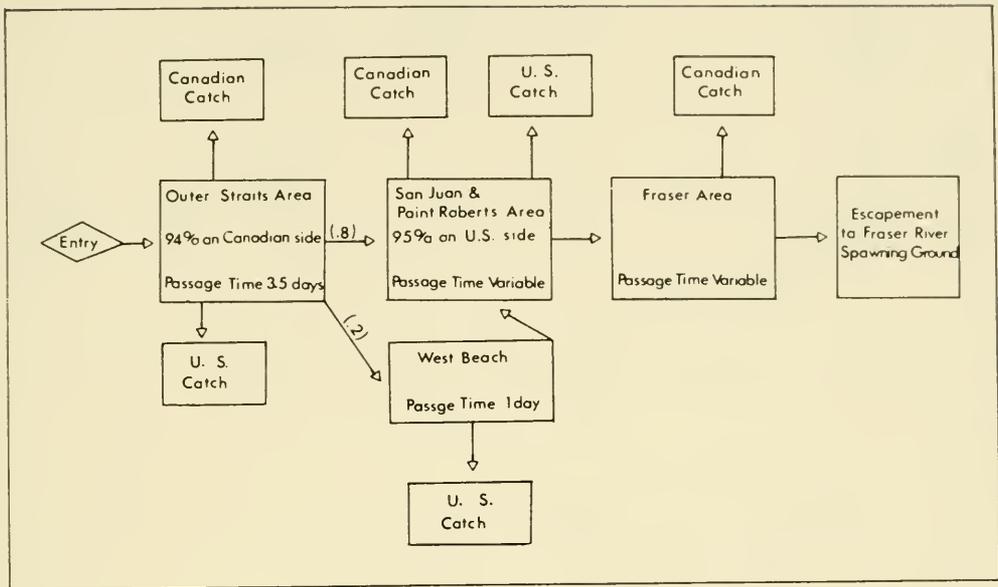


FIG. 10. Schematic outline of biological and gear sectors of simulation program for sockeye salmon.

of gear fishing in the inner Puget Sound area, and are only slightly affected by the gear intensities in upper Puget Sound. Twenty per cent of the sockeye leave the Strait of Juan de Fuca and spend one day in the West Beach area before returning to a migratory path through the San Juan Islands, to the Fraser River.

The three major fishing areas for sockeye salmon are: (1) the Strait of Juan de Fuca, where the sockeye run is fished extensively by the Canadian seine and gill net fleet; (2) the San Juan Island-Point Roberts area, where the United States purse seines, gill nets, and reef nets harvest the majority of the United States catch; (3) the Fraser River area, which include the Strait of Georgia off the mouth of the Fraser and the lower part of the Fraser River, where the Canadian gill net fleet takes the remainder of the Canadian catch (Fig. 1).

The major fishing areas for pink salmon are similar to those for sockeye.

Silver salmon catches are taken to a greater extent in upper Puget Sound. The United States catch of chum salmon is made in both upper and inner Puget Sound areas.

The numbers of fish that enter convention waters from the north

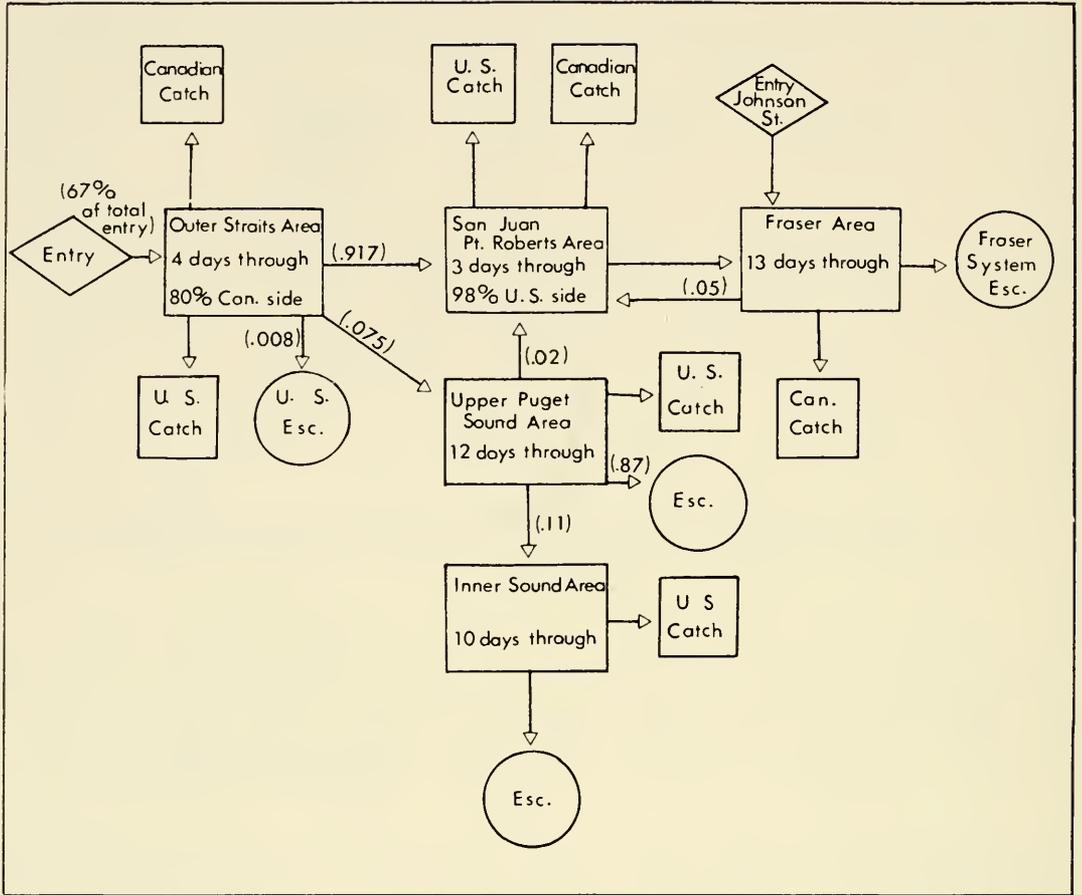


FIG. 11. Schematic outline of biological and gear sectors of simulation program for pink salmon.

through Johnstone Strait is vitally important to the management of the United States sockeye and pink salmon fisheries. Under the international treaty arrangement, the Canadian and United States catch of pink and sockeye salmon in convention waters must be balanced. Therefore, a large northern entry into the Fraser necessitates that a high proportion of the runs moving through the Strait of Juan de Fuca must be harvested by the United States fleet because the northern fish are only available to Canadian gear. The fish entering from the north are also subjected to an intensive Canadian fishery in the Canadian nonconvention waters in the Johnstone Strait, but this catch is not considered in balancing the United States-Canadian catches. Usually, less than 5 per cent of the sockeye run (the percentage value used in our model) use the northern entry. However, it is known that in at least one recent year about 20 per cent used the northern entry.

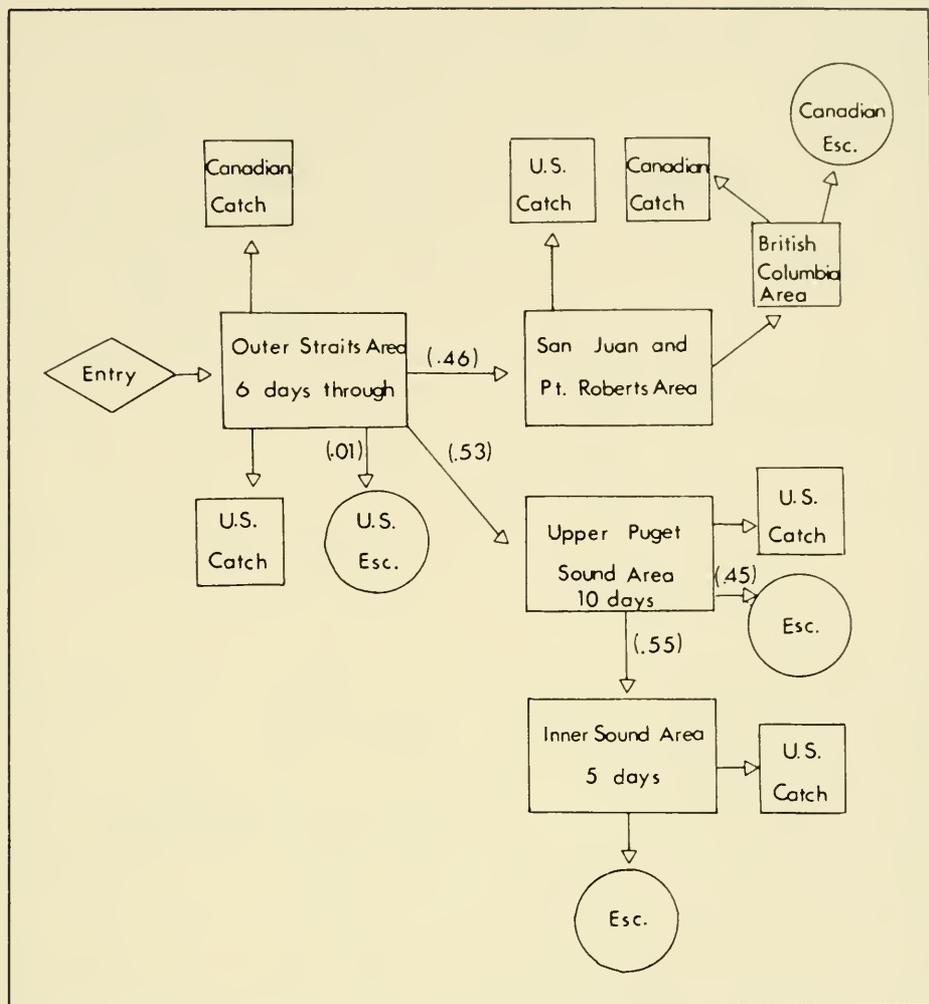


FIG. 12. Schematic outline of biological and gear sectors of simulation program for silver salmon.

For pink salmon the entry into the convention waters from Johnstone Strait route is considerably larger. The figure of 33 per cent of the run used in the simulation model was obtained from the 1959 tagging experiments (unpublished data of the International Pacific Salmon Fisheries Commission).

The migratory patterns shown in Figs. 10, 11, 12, and 13 are fairly well documented for the sockeye salmon and for the pink salmon, at least in recent years, in the reports of the Department of Fisheries and the Salmon Commission. For the other species — silver, chum, and chinook — the exact migration patterns are less well known. The migratory patterns used in the program were con-

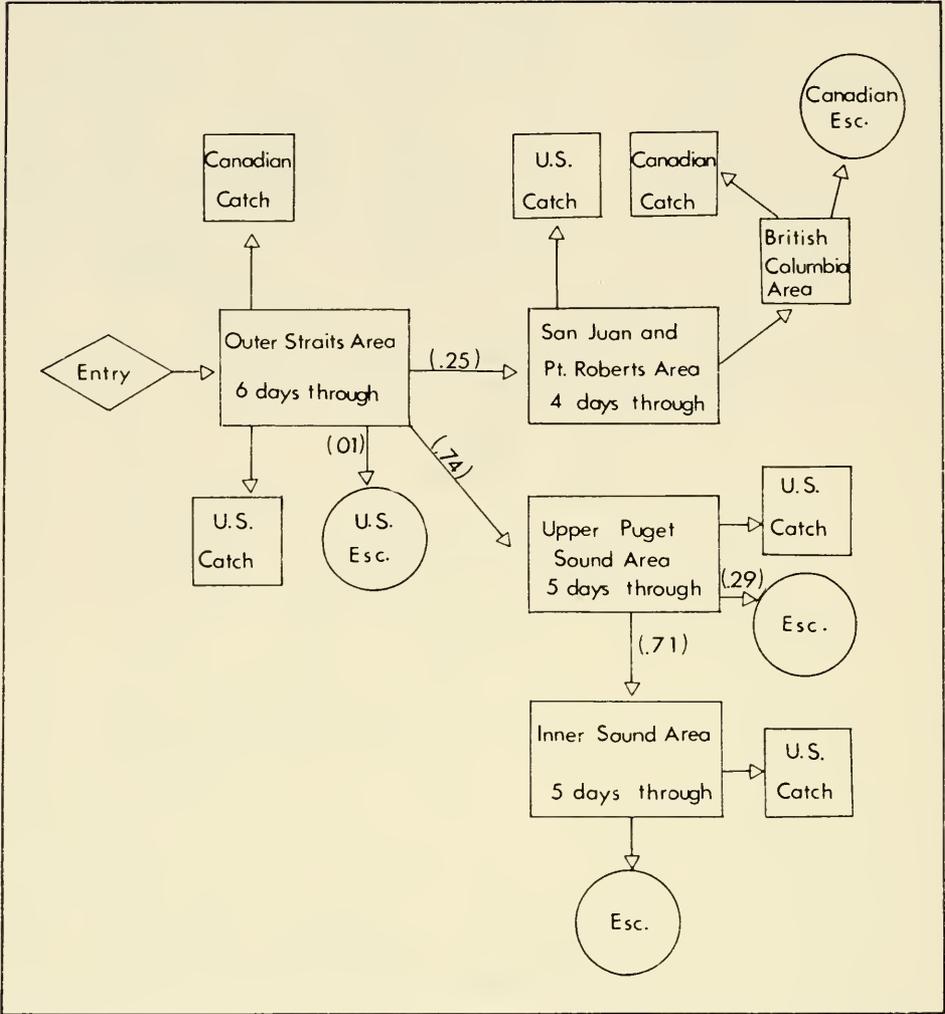


FIG. 13. Schematic outline of biological and gear sectors of simulation program for chum salmon.

structured primarily from the distributions of commercial catches, and will probably be modified considerably as additional tagging data become available.

Size of the Runs

The areas under the time-of-entry curves shown in Fig. 8 give the total numbers of fish in each of the "standard" runs. The standard runs were 4.33 million for sockeye, 9.12 million for pink salmon, 1.67 million for silver salmon, and 0.37 million for chum salmon. The Johnstone Strait entry into convention waters is also included

in the totals given above. In recent years, the sockeye run into convention waters has varied from about one-half to about four times the standard run. The pink run in the last three cycles has been less than the standard run, however, for the period of 1947 to 1955, the catch alone has been near, or exceeded nine million. Although the total silver and chum run sizes are not accurately known, the run sizes and migration pattern used in this program produced catches which agree well with those observed in recent years. The chum catches indicated by the computer are certainly lower than the average during the past decade. However, the chum catches have shown a consistent downward trend, and the figures used are based on an expected continuation of the present low levels of chum salmon populations.

Gear

The three principal types of net gear which participate in the United States Strait-Puget Sound fishery are purse seines, gill nets, and reef nets. For some of the species, other types of gear are also extremely important. Large numbers of silver salmon are taken by trolling and in the sport fishery, and with other miscellaneous types of gear. In the simulation model used to represent the fishery, detailed economic and catch data were summarized for the three major types of net gear. Other types of gear were combined in a category called "miscellaneous gear." No economic data were accumulated for these other types of gear. However, their effect on the net fishery was represented by including them in the model and allowing the miscellaneous gear to remove fish that would be otherwise available to the net fishery.

The detailed catch and effort statistics for all of the United States fishing areas in the Strait of Juan de Fuca, adjacent coastal areas, and in Puget Sound were obtained from the Washington Department of Fisheries and summarized for the years 1956, 1957, 1958, 1959, 1960, and 1961. These summary tables give the numbers, total weight, and average weight of each species taken each day by each type of gear in each of 58 statistical subareas. The numbers of landings were also summarized and tabulated for each type of gear. In addition to the daily summaries, monthly landings and catch data were prepared for each of the subareas and for the larger districts.

These data provide the basic statistics for two important parts of the biostatistical analyses. One part is the number of units fishing in the United States fishery on any given date during the season. As has been mentioned in the previous section, the number of licenses gives only an upper bound for the maximum number of units that could have fished in the fishery on a single day. The second part is the detailed catch and effort statistics needed to provide basic data for estimating relative gear efficiency. A mathematical model was developed which gives a simultaneous estimate of the relative efficiency of the several types of gear fishing in a given small statistical area on a given date. The method uses all daily records of two or more types of gear operating at the same time in a particular area. It was found that the relative efficiencies of the different types of gear varied considerably from area to area and from season to season. The size of the fish in the run and their schooling behavior are among a number of factors that appear to affect the relative efficiencies of the various types of gear. Standardized relative efficiency factors were computed from the several years' analyses and were computed for the large statistical Areas 1, 2, 3, and 4 (Fig. 1) by combining the individual estimates of relative efficiency from the smaller statistical subareas. The relative efficiencies for each species in each of the statistical areas is shown in Table 1. It should be noted the relative efficiencies are expressed in terms of gill net units which give a convenient measure of the relative fishing powers of the purse seines, reef nets, and gill nets.

The maximum number of units of gear available during the season does not provide a measure of the number of units that would be available to fish on different days during the season. Analysis of the catch and landing data revealed very definite seasonal patterns in number of landings recorded per day. Daily patterns observed for the years from 1956 through 1961 were combined to obtain the average seasonal patterns shown in Fig. 14 for each of the dates and areas. This figure is standardized in much the same way that the entry patterns of the various species into the fisheries were standardized. If the time scale is shifted so that the run is either later or earlier than normal then the gear patterns are shifted in a similar manner. The number of units available to produce the seasonal availability patterns shown in Fig. 14 were computed from the number of units that made landings on the peak day during the

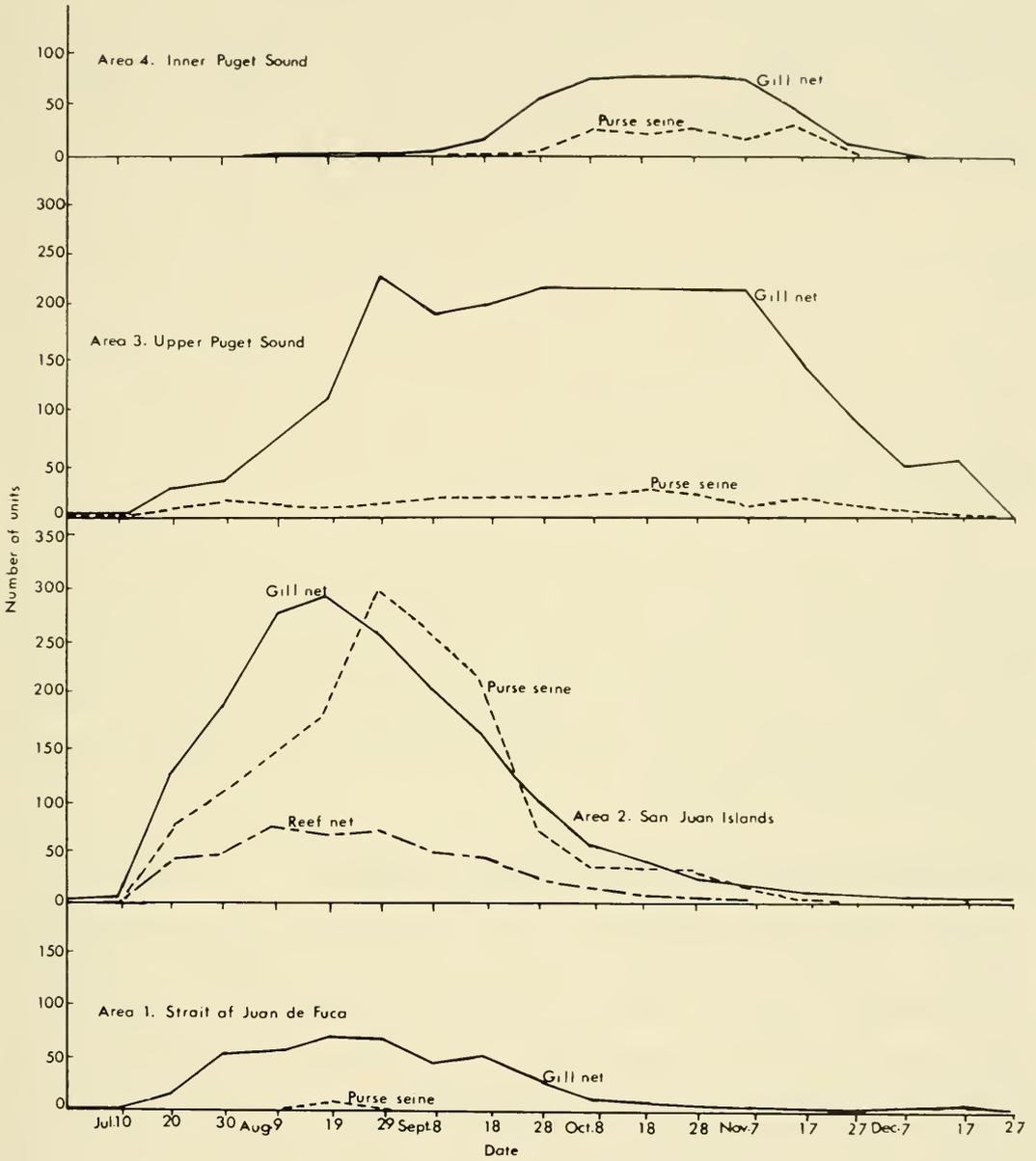


FIG. 14. Gear availability tables for the United States Fishery.

season. These were 555 gill net units, 318 purse seine units, and 73 reef net units, respectively. These figures are for the entire United States fishery, and were obtained from the combined sockeye, pink, silver, and chum landings.

Any realistic study of the effects of gear reduction must consider

TABLE 1. RELATIVE GEAR EFFICIENCY TABLE
(IN NUMBERS OF GILL NET UNITS)

<i>Area</i>	<i>Gear</i>	<i>Sockeye</i>	<i>Pink</i>	<i>Silver</i>	<i>Chum</i>
1	Purse seines	8.0	13.0	4.0	4.0
2	Purse seines	8.0	9.5	2.0	3.8
	Reef nets	2.5	2.0	1.0	1.2
3	Purse seines	5.0	11.0	3.5	3.8
4	Purse seines	12.8	2.0	2.5

Gill net efficiency equals 1.0 in all cases.

Data have been rounded for uniformity in the table. Most efficiencies rounded exactly to units do not have accuracy to tenths.

the seasonal availability of gear. Two types of gear reduction patterns were investigated in this study. First, the number of units fishing near the peak of the season was reduced while the numbers fishing in the beginning and the ends of the run were not reduced. Second, a straight proportionate reduction of numbers of units was made during the entire season.

The Mathematical Description of the Fishery

It is impossible to describe a complex system such as the salmon fisheries in the state either verbally or by the usual methods of mathematical analysis. The simulation approach was employed to study the effect of changes in gear intensity on the economic and biological sectors of the fishery. Simulation consists of tracing, step by step, the actual movement of fish through each of the fishing areas into the respective spawning grounds. In a similar way the accumulation of earnings and expenses for the fishery was followed through the entire season. An explicit mathematical description of the fishery requires around 1,000 equations which must be evaluated at any given time during the season. These equations were translated into computer instructions. These instructions enable the computer to simulate the movement of the fish through the fishery and into the spawning grounds and the catches in the various areas by types of gear and by time. The computer also tabulates and plots these results in easy-to-understand tables and graphs. An entire season may be simulated on the computer in 1.1 minutes. All the

basic input data can be varied over any range of values that may be of interest. For example, fish prices, gear expenses, depreciation rates, operating costs, etc., can be entered as constants and may be changed from run to run. All of the biological factors, such as the entry patterns of the fish, their migration routes and rates of movement can also be varied from run to run as can the gear availability and absolute and relative gear efficiency.

The present program allows the computer to start with any desired set of descriptive information about the salmon runs and the fishery for one season. From this information the computer will compute daily catches, the escapement to various spawning grounds, the total cost of harvesting the run, and the catch and cost per individual unit of gear for each type of gear. Some idea of the scope of the output of the computer program may be obtained by looking at the dictionary in the Appendix of definitions for the code names of the variables.

One of the most important features of the computer program used for the simulation model is the management decision making processes which are built into the program. The rate of exploitation of the salmon runs in international, Canadian, and United States waters is regulated by the International Pacific Salmon Fisheries Commission. The regulations are designed to provide an adequate escapement of sockeye and pink salmon to each of the major spawning systems and also to divide the total catch equally between the United States and Canadian fisheries. As might be imagined, this complex regulatory objective necessitates a highly flexible regulatory scheme. On the basis of the past performance of the Salmon Commission and from talks with personnel of the Commission, a scheme was devised and built into the computer program. In fact, three basic regulatory schemes are available with the present program. The one that was used for the majority of the runs reported upon here was designed to close the fishery any time that the actual fishing mortality exceeded a given specified level. The particular level used in the program was 20 per cent escapement for a normal-sized run. If the run size dropped to half, the desired escapement was raised to 30 per cent. On the other hand, if the run size increased to four times the normal level, the desired escapement was reduced to 15 per cent. If at any time during the season the fishing mortality exceeded the desired level, both the American and Canadian fisheries were closed. From June 20 through August 29 (see Fig. 9), this regulation was formulated on

the basis of the sockeye run and catch. On August 30, the regulation was switched to pink salmon and continued until October 18. After October 18, it was assumed that the fishery would operate on a four-day week for the remainder of the season. In addition to this rule which permitted the desired escapement, a second decision was made which could close either the American or Canadian fisheries independently. If the Canadian catch exceeded the American catch, the Canadian fisheries were closed. However, if the American catch exceeded the Canadian catch by over 5 per cent of the total catch, the American fishery was closed until the Canadian fishery caught up. The extra 5 per cent for the American fishery was allowed because the fish are available to the Canadians in the Fraser River after the bulk of the run has passed through the American fishery. The Canadian fishery has an opportunity to catch up if it is slightly behind. These regulations were imposed for both sockeye and pink salmon. The number of days actually fished during the season was recorded by the computer for each week. The actual fishing patterns produced by this regulatory scheme were fairly close to those observed in the past.

Validation of the Model

One way of testing the validity of a complex and detailed simulation model is to put into the model an actual entry pattern and gear distribution and compare the output generated by the model with the actual catch data. The sockeye salmon are an especially good species for use in such hindcasts because of the wealth of good statistical data available for the fishery. One such validation of the simulation model was carried out using a more detailed description of migratory routes than shown in Fig. 10. A schematic outline of the biological and gear sectors in this simulation model (which will be referred to as simulation model No. 1 to avoid confusion) is shown in Fig. 15. Results using model No. 1 were tabulated by month for each of the subareas. A comparison between the output generated by the computer and the actual catch data is shown in Fig. 16. The greatest discrepancy between the computer results and the actual observed results is in the September catches by the Canadian fleet off the mouth of the Fraser River and in the South Vancouver Island area. (This area included statistical area 17 which contains the high September catches of the Canadian gill net fleet.) In later runs and in simulation model No. 2 this deficiency in the model was corrected by decreasing

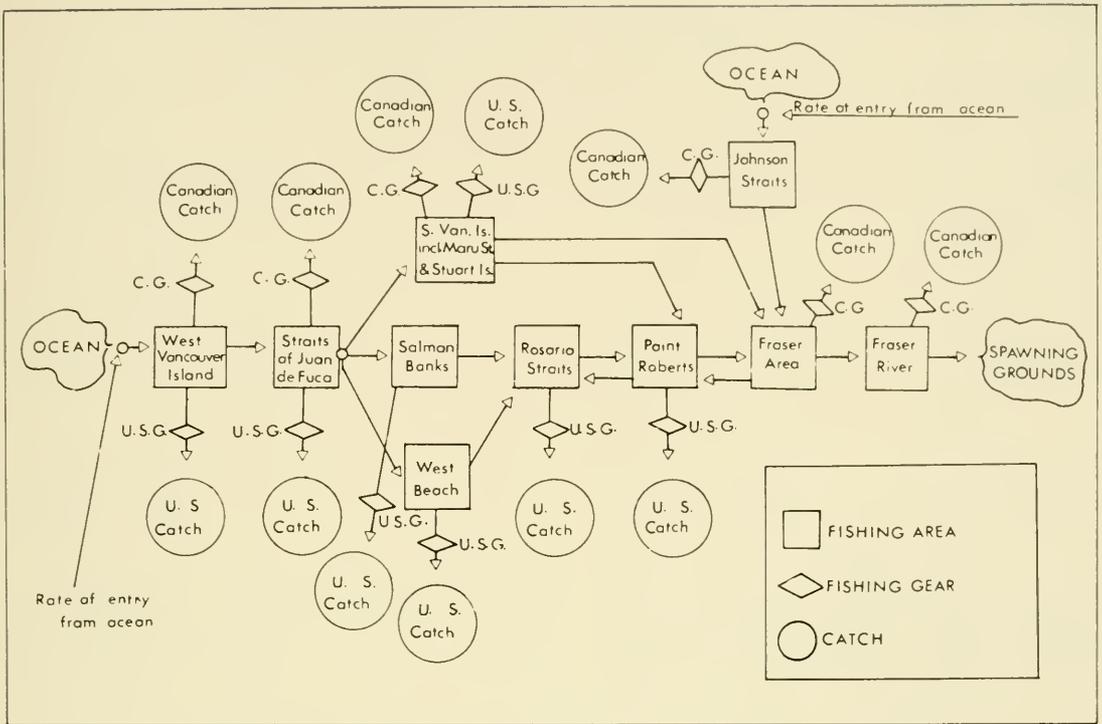


FIG. 15. Schematic outline of biological and gear sectors of simulation program for sockeye salmon (simulation model No. 1).

the rate of travel of the salmon in the vicinity of the mouth of the Fraser in the latter part of the season.

Other years were not simulated in the detailed model described in the preceding paragraph. The program (simulation model No. 1) is available and any further simulation that may be of interest can be carried out with ease.

The same constants and general structure were built into the second simulation model (simulation model No. 2) that was already described in an earlier section. Simulation model No. 2 contains the migratory routes shown in Figs. 10, 11, 12, and 13. Simulation of the 1959 run using simulation model No. 2 gave the results shown in Table 2. It might be well to note that the computer catch is almost perfectly adjusted between the two nations, whereas the actual catch has a slight discrepancy. This was caused by the decision rule

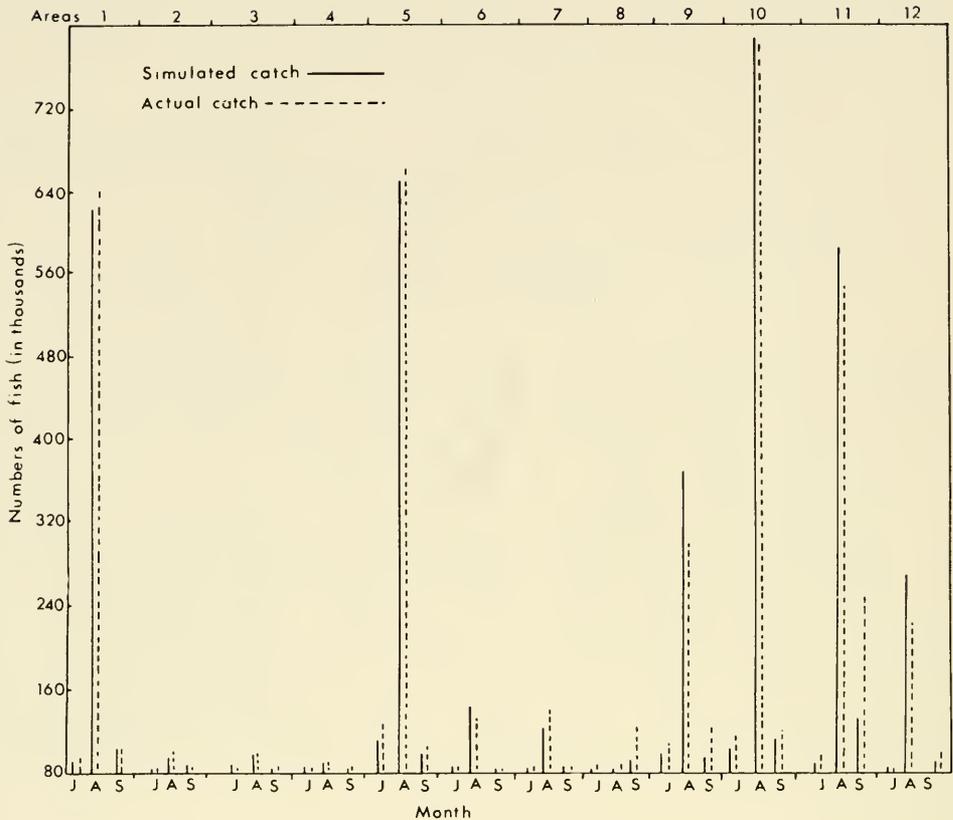


FIG. 16. Comparison of actual and simulated data for the 1959 sockeye run using simulation model No. 1 (see text).

(See p. 120 for further explanation.)

described earlier which assumes perfect knowledge of the run at all times. Such variations from actual results were considered to be unimportant to the over-all objectives of the study. The model is specifically designed to give accurate estimates of the dynamic behavior of the catch and the economic sectors of the fishery when the amount of gear available is changed.

The Economic Sector of the Simulation Model

In addition to the biological and gear sectors of the simulation model which have already been described, an economic sector for the purse seines, gill nets, and reef nets was included. The economic sector of the model determines the number of days each gear fishes in each area during the season. The total number of days fished during the season for each type of gear is tabulated and multiplied by the average operating cost per day to calculate the total operating ex-

TABLE. 2. ACTUAL AND SIMULATED CATCHES OF SOCKEYE SALMON IN 1959 IN CONVENTION WATERS USING SIMULATION MODEL No. 2 (See text)

	<i>Actual</i>	<i>Simulated</i>
U. S. Purse seines	1,401,819	1,251,200*
U. S. Gill nets	241,163	293,090
U. S. Reef nets	163,093	154,770
Total U. S. Catch	1,810,738	1,699,100
Total Canadian Catch	1,581,883	1,634,300
Total Catch	3,392,621	3,333,400

*Note the discrepancy between the actual and simulated purse seine and gill net catch was caused by the use of "normal" relative efficiency factors rather than the actual relative efficiency factors which were unusually high for purse seines in 1959.

penses during the season. The total fixed expenses to equip and ready the fleet to fish are calculated from the total number of units of each type of gear that is available to fish on the maximum or peak day during the season. The catch and numbers of each species are calculated for each type of gear and multiplied by an average weight and a price per pound to give the dollar value of the catch of each species. A list of the values for the pertinent constants for the economic sector that was used in the calculations which follow is given in Table 3. Some idea of the actual extent of the computer calculations for the economic sector can be had by scanning the dictionary of definitions for code names given in the Appendix.

The economic yield obtained by varying the amount of gear was computed for different gear levels and run sizes. The relative changes give a good picture of the behavior of the economy of the fishery under changes in the amount of gear operating. In Fig. 17, the net economic yield in dollars is given for each of the three major gear types for a "standard" size run. The levels of gear intensity investigated in this figure are the present level, one-and-a-half times the present level, two-thirds of the present level, and one-half of the present level. It is apparent that the total economic yield climbs steadily as gear is reduced. It should be kept in mind that the in-

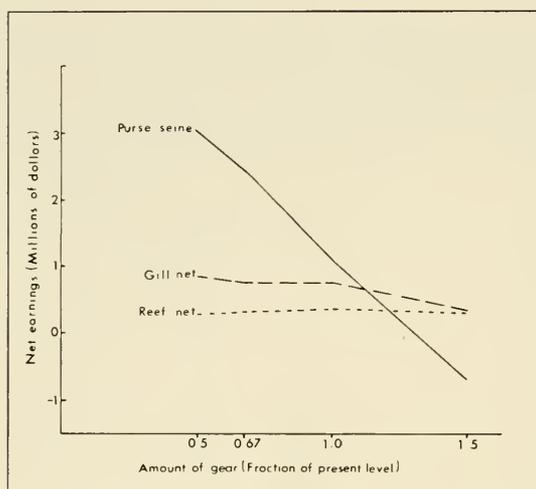


FIG. 17. Net earnings* of (U. S.) Puget Sound net fisheries for “standard” run sizes as a function of the amount of gear fished.

*Net earnings is defined as the gross value of the catch minus all fixed costs and operating costs. Labor costs have not been subtracted from the net earnings figure. Net earnings is the profit that is available for division between labor and capital.

creasing yield will be divided among fewer units of gear. Reductions below one-half were not considered, since calculations at this gear intensity with large size runs indicate that there may be some difficulty in harvesting an extremely large run with half the present gear fishing at present gear efficiency. For example, when the sockeye run was increased to four times the standardized level to give a total run of approximately 17,000,000 fish in convention waters and the gear intensity (the amount of gear) was reduced to one-half of the present level the fishery managed to harvest 77.9 per cent of the run. However, the season was open virtually seven days a week during the entire season and the machine had been instructed, but was unable to harvest 85 per cent of the run. On the other hand, gear restrictions of one-third of the fleet size have caused no difficulty. Reductions of one-third have been investigated for large runs (a total of 35 different conditions have been simulated to date) and have indicated that such runs can be harvested without approaching the exploitation limits of the present gear. The earnings picture for runs at twice the “standard” level is shown in Fig. 18. The effect on earnings of “poor” runs of sockeye and pink salmon is illustrated in Fig. 19. The high fixed costs of purse seines make them particularly susceptible to any reduction from present levels of production.

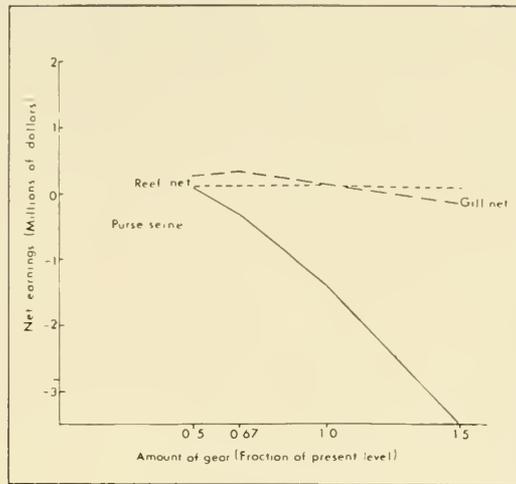


FIG. 18. Net earnings* of (U. S.) Puget Sound net fisheries when the sockeye and pink runs are one-half their "standard" sizes as a function of the amount of gear fished.

*Net earnings is defined as the gross value of the catch minus all fixed costs. Labor costs have not been subtracted from the net earnings figure. Net earnings is the amount of profit that is available for division between labor and capital.

It should be mentioned that no correction factors have been included in this model for gear interference effects. It can be assumed under any restriction scheme that the less efficient units would be eliminated and that the efficiency of the units left fishing on the grounds would increase simply because there were not so many other units of gear to interfere with the standard fishing operations. Neither of these factors has been included in this model. Therefore, if there is any error in the computations it would be on the conservative side; i.e., we would tend to underestimate the economic benefit of gear reduction and underestimate the harvesting ability of a reduced fleet.

Conservation and Management of the Runs

Totally aside from any economic gains, gear limitation can provide definite benefits to the conservation of the resource and at the same time provide more fish to the fishermen.

During moderate-sized runs with the present level of gear, fishing must be curtailed to as little as two days per week in order to allow the necessary escapement. Short fishing periods with very high fishing

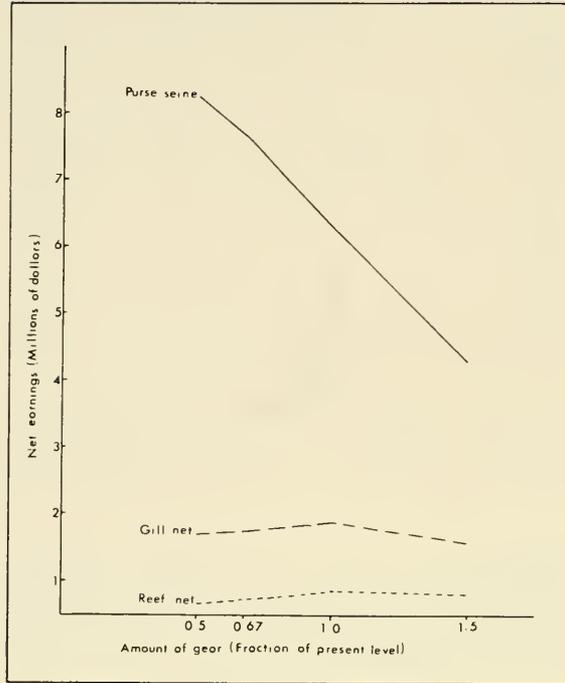


FIG. 19. Net earnings* of (U. S.) Puget Sound net fisheries when the sockeye and pink runs are twice their "standard" sizes as a function of the amount of gear fished.

*Net earnings is defined as the gross value of the catch minus all fixed costs and operating costs. Labor costs have not been subtracted from the net earnings figure. Net earnings is the amount of profit that is available for division between labor and capital.

intensities can result in alternate over-fishing and under-fishing of a series of races that pass rapidly through the fishery. The return from this kind of regulation can result in numbers of progeny below the reproductive capability of the parent stocks.

Short fishing periods hinder the management agencies in their task of getting information on the status of the runs. The result of regulation with insufficient information can result in management decisions more conservative than needed or, on the other hand, decisions that reduce needed escapement. In either case, the price paid is reduced returns from races that have been over- or under-fished.

TABLE 3. CONSTANTS USED IN THE ECONOMIC SECTOR OF THE SIMULATION MODEL

<i>Species</i>	<i>Average Weight (lbs.)</i>	<i>Price (dollars per lb.)</i>
Sockeye	6.0	\$0.331
Pink	5.5	\$0.169
Silver	8.2	\$0.297
Chum	10.8	\$0.204

<i>Gear</i>	<i>Operating Costs* (daily)</i>	<i>Fixed Costs (annual)</i>
Gill nets	\$22.50	\$ 1,000.00
Purse seines	\$67.50	\$15,209.00†
Reef nets	\$ 5.00	\$ 1,110.00

*The division of the various depreciation costs between the operating and fixed costs is discussed in part IV.

†Includes an "incentive allowance" of \$4,631. The average "incentive allowances" have been applied only to purse seine gear, since no figures were available for the "allowances" paid to other types of gear.

IV. ECONOMIC ANALYSIS

Standards of Economic Performance

Before reviewing the results of our study of the economic condition of the salmon fishery, it would be useful to indicate the performance we would expect under ideal conditions. From the standpoint of protection of the salmon stocks, the major concern is to regulate fishing so that maximum physical productivity is maintained. From the purely physical point of view it makes little difference what kind of regulation is employed to achieve that goal as long as it prevents overfishing and is administratively workable. From the economic standpoint, however, it is equally important that we take the right number of fish in the most efficient possible way. Thus the objectives in management of the salmon resource should be not only to assure a continued high level of production, but also to insure:

(1) that the individual fishing units are as efficient as we know how to make them; (2) that the minimum number of units are employed for any given average and maximum catch level; and (3) that regulations operate to encourage innovation and improve efficiency rather than the opposite. In brief, it would be desirable to get the largest possible margin of dollar receipts over dollar costs for the fishery as a whole.

From the standpoint of the individual fisherman, vessel owner, and processing-marketing firm, proper functioning of the industry and of management are defined in terms of incomes. Given the nature of the salmon runs, nothing can prevent a considerable amount of instability in the incomes of both fishermen and processors. Nevertheless, it would be desirable to have incomes as stable as possible, with a minimum of job shifting, and to develop a skilled, professional group of fishermen as the mainstay of the operation. This implies that earnings to both labor and capital in the industry should average out to those obtainable in other occupations with comparable degrees of risk.

In the long run we are also concerned with the safety and health of fishermen. When large segments of the industry struggle under the handicap of very low and variable incomes, there will always be a tendency to skimp on expenditures which relate directly to physical risks in salmon fishing. Only if incomes are sufficient to permit modernization of the fleets and installation of minimum safety equipment can the welfare of the individual fishermen and the efficiency of the industry as a whole be maintained at the highest possible level.

Finally, it would be desirable to achieve these objectives (or the best possible compromise among them) with a minimum amount of intervention by government, particularly in the internal business decisions of fishermen and processors.

Present Economic Condition of the Salmon Fishery

In terms of over-all efficiency, the trend in the salmon fishery is clearly illustrated by a comparison of catches and the number of fishing units. Of the major types of net gear used in Puget Sound waters, only the reefnet has declined in numbers in step with the decline in total salmon landings. The number of purse seiners stands at about the same level it did ten years ago, while the number of gill netters has increased tremendously. All three types of gear are

far above their immediate post-war levels, and only vigorous regulation has prevented a sharp rise in the fishing efficiency of the individual unit.

In Fig. 19 an indexed total fishing capacity in the Puget Sound net fishery is compared to total landings of salmon. The conclusion is plain: over the past fifteen years we have been using more and more fishing effort to catch fewer and fewer fish. By any standard — physical or economic — this must be termed inefficient.

How could this trend continue when it obviously makes no sense to incur greater and greater costs for a smaller and smaller catch? In part the situation simply reflects increases in the prices of salmon in the post-war years, a trend accentuated by the serious decline in salmon production from the major fishery in Alaska. As long as prices continue to climb it is possible to waste large amounts of capital and labor through excessive numbers of fishing units without forcing more than a few fishermen out of the operation. Finally, the situation reflects the competitive situation in the Puget Sound industry. It is extremely expensive to run a salmon cannery below capacity. As fish became increasingly scarce the struggle to obtain a larger part of a decreasing total catch led to concealed and open subsidizing of salmon fishing gear. It is obvious that all firms could not simultaneously increase their shares of the salmon catch. The end result has been to increase the amount of idle capacity in the fishing fleet and to increase costs for operators in every segment of the industry.

The effects of overcapacity on earnings are apparent in the following summaries of the direct surveys of fishermen's incomes conducted as part of this study.

1. *Purse seiners*

The owners of twenty-one purse seine vessels, comprising a fairly representative segment of the Puget Sound fleet, provided detailed information on sales and costs of operation from income tax returns for the years 1959-1961. The principal findings from this survey are summarized below.

The average seiner surveyed showed annual gross receipts of \$36,613 of which \$31,982 represented sales of fish and \$4,631 "incentive" payments from buyers. The gross receipts include the shares of the crew and represent returns from Alaska as well as Puget Sound fishing. The total net return to the owners of the vessels, including their own fishing shares,

averaged \$8,210. If owners' shares are deducted as part of actual labor costs — the proper treatment — profits averaged \$5,013.

These figures, however, overstate the actual net return to vessel owners from purse seine operations. Much of the equipment employed has been fully depreciated for tax purposes, and many of the hulls are being depreciated on a cost basis which bears no relationship to present construction costs. Thus the average depreciation reported for tax purposes (\$3,100) is not representative of current costs. Analysis of these boats indicated an average replacement value for hull, motor, and equipment of about \$72,000, while the value of the skiff was estimated at \$5,000. This would represent the cost of a new vessel, comparable in size, equipment, and construction to those actually surveyed. Annual depreciation on this basis would amount to approximately \$5,000 (assuming a life of 15 years and scrap value of \$12,000 for the vessel, and a 5-year life for the skiff) rather than the survey figure of \$3,100. On an investment of approximately \$77,000, a net return of only 3.9 per cent could be expected.

It is also important to note that the costs reported for income tax purposes do not include payment for various types of repair and maintenance work performed on the boats by owners. Yet it is an established fact that owners do much of this work. Even if no account is taken of the value of these services, the expected rate of return on the investment required for a replacement purse seiner would be somewhat lower than the rate of return that could be earned from a savings and loan account.

Earnings are also highly unstable. We were able to obtain some operating statements from owners of seiners covering ten years of operation. Net incomes ranged from a high of \$17,000 to actual net losses, with an average income of less than \$4,000.

These figures also indicate that without so-called "incentive payments," the purse seiners in our sample would have yielded virtually no profits even on the basis of depreciation based on book value. On a replacement cost basis the entire fleet would

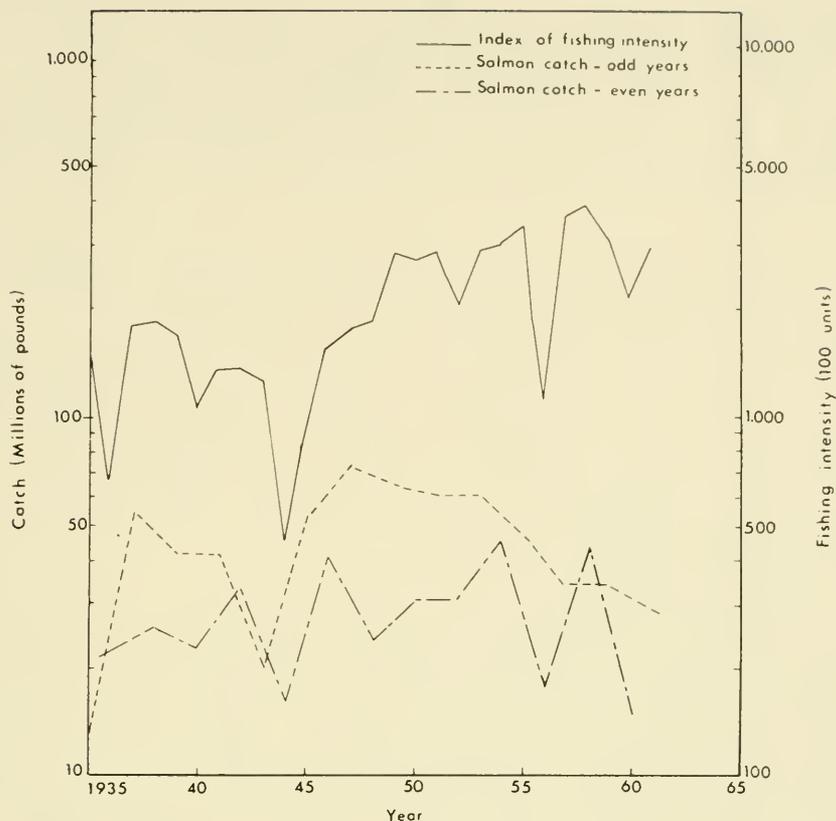


FIG. 20. Landings and index of fishing intensity, Puget Sound Salmon Fishery, 1935-1961.

Source: Landings — Robison, Ward, and Palmen, 1962 *Fisheries Statistical Report*. Index of gear — Computed from data supplied by Department of Fisheries showing maximum numbers of purse seiners, gill netters, and reef netters making significant landings.

have operated at a substantial loss. It would be difficult to find a riskier investment, even in periods of fairly good catches, than a salmon fishing vessel.

2. Gill netters

With the assistance of the Puget Sound Gill Netters Association a mail questionnaire was distributed to more than 600 gill netters. Survey personnel of the Department of Economics of the University of Washington interviewed as many gill netters as time permitted to obtain additional financial infor-

mation. The wide diversity of gill net operations and the fact that gill netting is invariably a part-time occupation make it difficult to develop data directly from income tax returns as in the case of the purse seiners. Nevertheless, sufficient returns were received to provide an over-all picture of the economic position of the gill net fleet.

For the years 1959-1961 total taxable income *from all sources* reported by the surveyed group averaged only \$5,560. As in the case of purse seiners, no deductions have been made for work performed on boats and gear by owners themselves. Gross incomes from Puget Sound fishing averaged \$2,324 for the odd years 1959 and 1961, and only \$1,711 in 1960, when no pink salmon were available. Net returns averaged less than half these amounts.

The casual nature of the gill net fishery, with its emphasis on part-time operation, is clearly indicated by the following figures. Twenty-five per cent of the respondents obtained some income from other salmon fishing. About 19 per cent had some income from other types of fishing, and more than 54 per cent earned some income from nonfishing jobs during the years 1959-1961. The number who drew unemployment compensation ranged from 17 per cent in 1959 to 25 per cent in 1961.

It was also interesting to note that the average age of the gill netters surveyed was forty-nine years; apparently this is no longer an attractive occupation for younger men. If income were increased we expect that the gill net fishery will be able to recruit and hold younger men.

Because the study was not authorized until after most of the fishermen were on the fishing grounds (many in Alaska), the number of responses was lower than had been hoped. Nevertheless, the evidence is clear that total incomes received by gill netters from all sources are slightly below the average incomes for all Washington residents, despite an investment of \$6,000 to \$7,000 in boat and gear. (On a replacement cost basis the investment required for a modern gill netter would range from \$11,000 to \$15,000.) Moreover, the income of gill netters, as might be expected, is highly variable from year to year.

3. *Reef Netters*

The number of reef nets operating in Puget Sound has been reduced substantially during the last few years. The reduction has improved the income position of the reef net gear although insufficient data was received to determine the earnings exactly.

4. *Incomes of Share Individual Fishermen on Purse Seiners*

The response to a mail questionnaire distributed to purse seine fishermen by Local 3, ILWU, was too scattered to provide an accurate picture of total income from all sources. It was possible, however, to obtain useful information on earnings from Puget Sound salmon fishing. Returns for 21 man/years indicated an average of less than \$1,100 per man/year from this source. This is consistent with the man-shares in the purse seine survey, which averaged about \$1,900, but included Alaska fishing. Also, the average man-share will always exceed the average earnings per individual share since many fishermen do not fish the entire season. It is impossible to earn, in purse seine fishing, even half of the average income received by all Washington State residents.

The principal outside job indicated by respondents was longshoring, which is even more erratic as a source of income.

One of the disturbing aspects of this "casual" labor force is the inevitable waste of involuntary unemployment. If a man wishes to fish during the summer, he removes himself from most regular employment and has great difficulty in finding other part-time work during the winter. This is evident in the fact that respondents drew unemployment compensation in 59 per cent of the man/years reported. This situation indicates not only an unsatisfactory income situation for the fisherman but an economic burden on other state residents who contribute to the unemployment insurance program.

The Relationship of Commercial and Sport Fisheries for Salmon

Although this study is concerned with biological, legal, and economic aspects of the Puget Sound net fishery for salmon, some reference should be made to the economic importance of the large sport fishery for salmon in the same area. There is no completely accurate way of estimating either gross expenditures by salt water

salmon fishermen or the net economic benefit derived from sport fishing. Because no license is required we do not have even moderately accurate estimates of the number of sport fishermen.

It is estimated that the number of salt water sport fishermen in Washington State ranges from 300,000 to 350,000. In recent years sportsmen have approached a million angler trips annually in Washington State, considerably more than half of them within Puget Sound and the Strait of Juan de Fuca area. Between 500,000 and 1,000,000 fish have been taken annually by sportsmen in recent years, about half of which are taken in Puget Sound and the Strait area.

The degree of competition between sport fishing and commercial net fishing in Puget Sound is not as severe as these figures might suggest, however. While sports fishermen do take some pink salmon (50,000 to 90,000 in odd-numbered years) the bulk of the sport catch is made up of chinooks and silvers. These species normally account for only about 10 per cent of the total value of the net caught salmon in Puget Sound waters, but the catch cannot be regulated separately from the other important commercial species. In addition, the peak of the sport fishery for ocean-run silvers occurs prior to the peak of their availability for commercial fishing.

These figures do not imply that there is no conflict of interest at all between commercial net fishermen and sportsmen. It does suggest the following conclusions: (1) greater efficiency in the commercial fishery would permit profitable operation without restriction of sport fishing, (2) sport fishing is now a major state industry which must be considered in any comprehensive management program, and (3) sportsmen as well as commercial fishermen should share in the costs of effective management and propagation of the Puget Sound runs in proportion to their use.

Effect of Gear Reduction on Earnings

Financial data obtained in the surveys of purse seiners, gill netters, and reef netters provide an alternative way to indicate the approximate savings that could be realized if the amount of gear were reduced. To do this, costs were broken down into three categories: (1) labor costs (including fishermen shares to owners), which vary directly with value of the catch of the individual boat; (2) running costs, which vary directly with actual fishing time, and include fuel, groceries, and part of repairs and net supplies; and (3) fixed costs which are encumbered for the season regardless of the number

of days a vessel actually fishes. This category would include investment and gearing costs such as depreciation, insurance, licenses, moorage, property taxes, and a portion of repair and supplies.

Assume that a reduction of one-third is made in the number of units of gear of all types, ignoring for the moment the difficulties of doing it. With the same escapement requirement, this means that two-thirds the number of men working more days per week in the season would be required to take the permitted catch. Investment and gearing costs would be reduced proportionately. Total running costs for the fleet would remain the same, since running time for a larger number of vessels will simply be reallocated to a smaller number fishing more days. (It is likely that running costs would be somewhat smaller with a smaller fleet and the same total fishing effort, but for the sake of a conservative estimate we have assumed them to be the same.) It is then possible to calculate the total additional amounts that would have been available for vessel owners and for share fishermen in representative years. The effect on the individual vessel will depend, of course, on the extent to which it fished in other waters or in other fisheries during the period when the Puget Sound season was in progress. We are primarily concerned with the impact on total costs and total earnings available to the fleet as a whole.

The results of these calculations for reductions of $33\frac{1}{3}$ per cent and 50 per cent in selected years are indicated in Table 4.

The resulting estimates of increased earnings available to share fishermen and vessel owners are generally consistent with those derived from the simulation program discussed in Section III. Total savings with a $33\frac{1}{3}$ per cent reduction in gear range from \$700,000 to more than \$2,500,000 depending on the size of the run and the ability of the fleet to harvest it. A 50 per cent cut would yield savings from about \$1,000,000 to nearly \$4,000,000. No effort has been made to segregate these to indicate the portion going to share fishermen and to vessel owners since this will depend in large part on the cost structure and crew arrangement of the individual fishing boat. The magnitude of the figures leaves no doubt, however, that a reduction in the number of units fishing would produce major increases in earnings. Regardless of the final disposition of these savings, it is clear that the economic position of all participants can be improved even if license fees were raised significantly.

TABLE 4. POTENTIAL SAVINGS FROM GEAR REDUCTION-
SELECTED YEARS

	1955	1956	1958	1959
<u>50 per cent Reduction</u>				
Purse Seine	\$1,950,000	\$ 553,000	\$2,822,000	\$ 670,000
Gill Net	462,000	573,000	814,000	294,000
Reef Net	227,000	150,000	135,000	88,000
Total Reduction in cost	\$2,639,000	\$1,276,000	\$3,771,000	\$1,002,000
<u>33$\frac{1}{3}$ per cent Reduction</u>				
Purse Seine	\$1,300,000	\$ 368,000	\$1,881,000	\$ 447,000
Gill Net	309,000	393,000	544,000	176,000
Reef Net	152,000	100,000	90,000	59,000
Total Reduction in cost	\$1,761,000	\$861,000	\$2,515,000	\$682,000

These calculations were based on the assumption that all gear is reduced proportionately in terms of number of units. From an economic standpoint there is no clear evidence that any of these types of gear is significantly more efficient than the others, at least from the data available. It seems highly likely that the wide variations in salmon runs in Puget Sound would make the gill net a more efficient type of gear under some conditions and the purse seiner more efficient under others. In all years there will be specific conditions under which no single type of gear could harvest fish appropriately. For these reasons we have assumed that a proportional reduction in gear would be most equitable and would probably be as efficient as any technique that might be employed. Because reef nets have already been reduced substantially, however, we have also considered the savings that would be achieved if the reduction in gear were confined only to purse seiners and gill nets. In all cases the reduction in savings would amount to less than \$200,000 per year in the years sampled if the number of reef nets remained at present levels.

It must be emphasized that these estimates are conservative, since

it has been assumed that all conditions of the fishery remain unchanged. Yet clearly there are important additional savings that would accrue if the amount of gear were reduced by one-third to one-half.

1. The reduction in interference and competition among individual boats in the same fishing area would increase the efficiency of individual units, particularly in seining.
2. If gear reduction could be accomplished in an orderly manner it should be possible to relax some of the restrictions on gear efficiency which are now required to keep the management problem within bounds. Fishermen could be allowed to gradually introduce new techniques such as monofilament nylon gill nets, the use of fish finding gear, and similar technical improvements if an appropriate gear reduction were possible. This could only be done after scientific study to provide factual information on the relative efficiencies of the gears proposed.
3. The risk of loss from breakdown would be minimized if each vessel were fishing a longer period. At the present time a breakdown occurring during the peak of the season, even if it means only the loss of a day or two of fishing, can mean financial disaster to a Puget Sound salmon boat.
4. The quality of the end product probably would be improved if deliveries to packers were spread out over a four- or five-day week. At present fish must be held under refrigeration in order to operate over a full week. In most cases quality does not suffer, but only at the cost of additional expenses incurred for refrigeration.
5. Most important of all, extension of the fishing week to four or five days would greatly assist the management program. Under present circumstances the flow of information coming to the Salmon Commission and the Department of Fisheries is so limited that it is most difficult to know precisely what is occurring in the Puget Sound waters during the closed period. Sample fishing can provide only a slight improvement. The longer the fishing week the greater the range and accuracy of information reaching the Commission and the more accurate its regulatory techniques can be made. The management problem would also be reduced with respect to possible margins for error. Under present conditions the mini-

mum indivisible unit is one day of fishing, and the present fleet is capable of catching a dangerously large proportion of given populations in even one day.

We conclude that there are substantial advantages, in terms of both sound management and economic benefit, to be gained from reducing the size of the salmon fleet of Puget Sound from present levels. Again, neglecting for the moment the question of how to accomplish this, how far should the reduction go? One has only to glance at the catch statistics, particularly for the dominant pink and sockeye salmon, to realize that wide variations in the availability of fish — sometimes predicted and sometimes not — are the rule rather than the exception. Clearly, then, we cannot expect to find one level of fishing capacity that is ideal for all circumstances. If the fleet is cut down too far, it may be unable to harvest fully abnormally large runs, particularly if they are unexpected. On the other hand the fundamental goal of the industry is to obtain the largest net economic benefit from the resource, and it is unwise to maintain a large and costly standby fleet, just to be sure of harvesting the occasional unpredicted large run.

The proper answer hinges on a number of factors that cannot be answered fully except in the light of experience. A major consideration is the question of how the reduction in the fleet is accomplished. If it is done by methods which tend to leave the more skilled and professional fishermen in possession of licenses, then the reduction in gear will not bring a proportionate reduction in harvesting capacity. Moreover, on a four- or five-day fishing week there is still room for a considerable increase in the intensity of fishing effort if the size of the runs warrants it. It has been pointed out that the real problem occurs only when an unexpectedly large group of fish appears at the very start of the season. Given three or four days notice, emergency procedures could easily be devised for licensing additional vessels attracted from Alaska.

The detailed analysis summarized in the third section of this report suggests that a reduction of one-third would represent a safe target. The fleet would still have ample catching capacity, yet the reduction would be large enough to produce important benefits in the form of higher incomes and more effective management. As long as flexible control over fishing time is retained, a moderate amount of capacity in excess of that required for an average year would seem to be sufficient for a fully economic operation, and the time required

to carry out a 33½ per cent reduction would provide ample opportunity to analyze its effects. In the more distant future further reduction may then be indicated.

We have considered carefully the possibility that restricted licenses might tend to drift into the control of processors. It has been evident throughout this study that the urgent need for capacity operation to achieve reasonable operating costs in the canning operation has led to a wide variety of open or concealed subsidy payments to fishermen. The fact that such payments by one packer are matched by others and are therefore largely self-defeating does not appear to have stopped the practice.

There is a strong possibility that the canners would again compete for a larger share of a limited supply of salmon by purchasing licenses in order to assure deliveries of fish. On the other hand, it has been argued that much of the financial control by canners over fishing vessels is a result of the dire financial situation of the fisheries. If a gear reduction program raises incomes to more satisfactory levels, it may be that fishermen would prefer to finance their own boats and gear independently and that the problem of extension of control over fishing by the processors will not arise. It is suggested that the legislature direct further attention to this problem. It would be possible: (1) to prohibit the ownership of licenses by packers; (2) to permit retention of licenses presently held but to prohibit the acquisition of additional ones; or (3) to permit packers to own licenses freely.

Alternative Proposals

It has been suggested that one alternative to gear reduction might be a system of random rotation of fishing days. This would involve dividing the fleets into segments with the starting dates and actual fishing dates of each segment so determined that no single group would be favored. The same division presumably would carry through for all types of gear. It is argued that under this type of arrangement the basic biological or management weaknesses of the present situation could be remedied without having to deal with the difficult economic and social problems involved in reduction of gear.

Discussions with qualified experts in the management field suggest that there would be administrative difficulties in handling a program of this sort, although these are less serious than they might appear. The proposal has not been analyzed in detail, however, since it obviously fails completely to come to grips with the economic

problem. As long as there is no restriction on new entry and no workable plan to reduce existing amounts of gear, the present situation of low and unstable incomes, intense rivalry among owners of different kinds of gear, and over-all inefficiency will persist. In addition, there is always the possibility that a strong increase in demand, coupled with a poor season in Alaska, would result in a sharp jump in prices and an even greater influx of unnecessary gear. The rotation scheme would do nothing to prevent this kind of development. Fishing boats can be built rapidly to enter what appears to be an attractive operation, but it takes a far longer period of depressed earnings to drive them out.

A second proposal might allow the appropriate administrative agency to designate the number of units of gear of each type to be employed each season without reducing the aggregate number of units available. Ignoring for the moment the practical problems of selecting those who are to fish, the proposal rests essentially on the idea that those unable to fish in Puget Sound will go to Alaska or, in a few cases, shift to other types of fishing. The principal advantage of this proposal is, of course, the additional flexibility it would provide. From the regulatory standpoint control over the number of units fishing, plus standby capacity sufficient to harvest the largest possible run, would be nearly ideal. Unfortunately, this proposal, like the first, does little or nothing to resolve the economic problem created by excessive costs in unutilized or underutilized fishing capacity. To push this capacity off on Alaska, which already has the same problems in acute form, is not a real solution.

If we are to achieve improved management, assured long run protection of salmon stocks, and badly needed improvement in the economic health of the industry, reduction of fishing capacity to a more sensible level seems essential. The problem of a practical and legally acceptable method of accomplishing this objective breaks down into several elements. (1) How should the reduction actually be achieved? (2) How rapidly should this reduction proceed? (3) On what basis should the restricted number of licenses be distributed to individual vessel owners? (4) How should the reduction in gear be distributed among the various types of fishing gear now in use?

Adequate answers to these questions must take into account not only the ultimate improvement in the economic situation of the industry and improved control over use of the basic resource, but

also the social problems involved in dealing with an overexpanded fishery. We specifically recognize the need for framing a program in such a way that hardship to individual fishermen and vessel owners be kept to an absolute minimum. Those who have invested in fishing equipment in good faith must not be deprived arbitrarily of the right to use their property, and reduction in gear must not discriminate against any group.

Effects on Other Fisheries

In Section VI we have recommended specific measures to reduce the amount of gear employed in the Puget Sound net fisheries conducted by American fishermen only. What repercussions might be expected in other fisheries if they are put into effect?

In Section VI we recommend that gear be acquired under a buy-back program and be eliminated from all Northwest fisheries. If this is not done, we shall simply create the same problem over again in other areas or other fisheries. In particular, it would appear important to prevent further concentration of salmon gear in Alaska or in the Columbia River fishery.

As long as the catch of Puget Sound sockeye and pink salmon is divided on the present basis, the proposed plan is largely independent of Canadian policy. Administration by the IPSFC would be improved even if the plan is adopted by only one of the two fleets.

Two important areas left untouched in this study are the outside troll fishery for chinook and for silver salmon. Both depend on stocks of fish taken also by inside net fishermen. The fleet reaction to regulations based only on optimal harvesting of pink and sockeye might have serious repercussions on the chinook and silver stocks. Even if gear taken out of the inside net fishery could be eliminated entirely from all other fisheries, the men cannot. Ultimately, it would seem essential to extend the regulatory concepts outlined in this study to all of the state's salmon fisheries. The same comments might be extended to the Alaska fishery. If the Puget Sound fishery could be strengthened through the measures recommended in this report and if Alaska were interested in pursuing the same type of program, coordination of the regulatory agencies involved would be highly desirable. Under present conditions it seems inevitable that reduction of gear in Puget Sound would result in some additional fishing pressure in Alaska.

Collection of Economic Statistics

This study considers a major change in fisheries policy — namely, the introduction of economic efficiency and the earnings position of the industry as important criteria for state legislative policy. If this is accepted as desirable, it would also be essential that the state set up machinery for regular collection of data required to assess the economic health of the industry as well as the biological condition of the resource. The additional work required to sample cost and income data would not be excessive, and probably could be handled effectively through the Department of Fisheries. The excellent cooperation afforded the University team by most fishing vessel owners, despite the very short notice on which the study was undertaken, suggests that it would not be difficult to obtain permission to sample operating statements regularly with complete assurance that no disclosure would be involved.

V. LEGAL ANALYSIS

Summary and Conclusions

The legal work of this project has been addressed primarily to the broad question of whether a legislative provision restricting the number of commercial fishermen in a major portion of the Washington salmon fishery would be constitutionally valid. Subject to some qualifications with respect to the details of the scheme and to the obvious fact that any answer is at best a prediction, the answer to the broad question is “yes.”

Certainly under the applicable decisions of the United States Supreme Court in the interpretation of the Equal Protection and Due Process Clauses, there appears no substantial obstacle. Earlier in the history of the Supreme Court, perhaps, such a scheme would have been held unconstitutional as some sort of unwarranted deprivation of property or liberty, or possibly as some sort of discriminatory denial of equal opportunity to pursue gainful employment. Modernly, however, the Supreme Court is most tolerant of legislative judgments on economic matters, allowing any legislation to stand which has these minimum requirements: (1) a rational determination that some benefit to the general welfare of the people will be served by

legislation, (2) founded upon some basis in fact, (3) plus a rational choice of means to accomplish the objective. The first section of the analysis is devoted to the development of this aspect of the decisional law of the Supreme Court, particularly to show what is meant by the references to "rational determination," "some basis in fact," and "rational choice of means."

The second part of the analysis concerns the development of these same constitutional concepts in the decisional law of the Washington State Supreme Court. This Court of course applies not only the provisions of the federal constitution, but also the corresponding provisions of the state constitution. Here, too, the general conclusion is the same, although the Washington decisions seem not so clearly to lead to that conclusion. This may be traceable to the fact that the Washington decisions have not had the benefit, such as it was, of such a clear-cut break with the past as occurred in the United States Supreme Court in the mid-thirties, particularly with reference to that Court's renewed respect for legislative regulation of economic affairs. This section treats the Washington cases in detail, developing particularly the aspects pertinent to the validity of the proposal under study and developing further some of the aspects of the constitutional doctrines discussed in the first section.

The third section applies the learning of the first two sections to the facts of the salmon fishery, showing how the legislative judgment could and should be sustained. Without any pretense at completeness or precision, it shows that the peculiarities and intricacies of the salmon fishery, in both its biological and its economic characteristics, plus the strong interest of the state in the salmon as a source of food and as a major factor in the economic well-being of the state, could, with the utmost of good sense, persuade the legislature that a restriction on the number of commercial salmon fishermen was necessary.

Certain legal concepts, which are, in a sense, purely collateral to the basic reasoning and analysis, are discussed in the next section, not only to point out their usefulness, but also to illustrate their undesirability if used without restraint. Under this heading are discussed the concepts of police power, of the "right-privilege" classification of occupations, and of "property" in fish.

In addition, certain cases had to be distinguished, as they are in the succeeding section, for, if not seen clearly, they could be major obstacles. The legislation in the first group contained either a gross

discrimination or, in some cases, a complete prohibition against non-resident fishermen in state waters. Quite properly, such provisions have been held invalid. There is no suggestion, incidentally, that such a distinction be incorporated in the proposal under study here. The other case here discussed, however, did involve a limitation upon number of commercial fishermen which was adopted by Texas in the mid-forties. Since the Texas court held the scheme invalid as violating the state due process clause, the case is discussed here in some detail. The deficiencies of the legislation are sufficiently identified and the differences from the proposal under study here are sufficiently described that the Texas decision can and should be avoided.

With respect to the particular details by which the legislature may choose to effectuate the limitation upon the number of fishermen, there has been less study, primarily because, at this stage of the proposal, the details have not yet been settled upon. There are, however, certain aspects which, it was felt, could be profitably pursued.

The first is the assumed provision for a "grandfather clause," to allow those presently licensed to continue to fish over some yet-to-be-determined period of time. As is developed in the analysis, such provisions are generally upheld when under an attack based on the concept of equal protection. Some care will have to be exercised in the detailed provisions of such a clause, but, generally speaking, any reasonable scheme should be valid.

Other details have not been pursued at length. Depending upon the reactions of the members of the committee to which this is addressed to the detailed recommendations contained elsewhere in this report, certain of the details which might be thought desirable ought to receive further legal analysis. These would include, for example: (a) the "buy-back" of licenses or equipment by the state in order to reduce the number; (b) the specification of the circumstances under which the licensee should be permitted to transfer his license and of the degree of control the appropriate state body should have over such transfers; (c) the taxes or fees to be charged the licensees either for the license, upon their catches, or upon any other incident of their operation, over and above the present fees and taxes; (d) any specification of the qualifications different from those now required, to include, for example, such items as a showing of a certain financial responsibility and capacity, a certain amount

of investment of capital, or any requirement of individual operation.

Except for (a), above, concerning the "buy-back," the general impression is that such other matters will present only minor complications if the control, taxes or fees, and the qualifications be kept within reason. The "buy-back" problems have been explored to some extent in preliminary work, but the results of that work have been incorporated into the report only to indicate the nature of the problems involved.

A. Introduction — The Presumption of Constitutionality

The broad question presented for legal analysis in this project is whether a legislatively-prescribed scheme for restricting the number of commercial salmon fishermen in certain waters of the State of Washington would be valid. The geographic area considered is that primarily involving the sockeye salmon in their migratory path through the Straits of Juan de Fuca and the waters inland from there, as they head for the spawning grounds in the Fraser River in Canada. The other aspects of this report, which present the biological and economic considerations bearing upon the general proposition, in general indicate that such a scheme is highly desirable.

The legal analysis can describe the predicted constitutionality of various alternative details of the scheme, even predicting better success for some than for others. Further, it can put in understandable terms the relative importance of various factors which will enter into a court's determination of the validity.

The starting point is principally a point of view, a matter of relative emphasis rather than of significant principle. It calls for a recognition of the separation of powers and sympathy for and indulgence toward the legislative process. In legal terminology this attribute is the "presumption of constitutionality which attaches to the enactments of the legislature." In more lay terms, we would say that the reviewing court must be shown some constitutional infirmity in the enactment, not that the legislation must affirmatively be justified. "It must be borne in mind that the state constitution is not a grant, but a restriction on the law-making power, and the power of the legislature to enact all reasonable laws is unrestrained except where, either expressly or by fair inference, it is prohibited by the state and federal constitutions. Where the validity of a statute is assailed, there is a presumption of the constitutionality of the legis-

lative enactment, unless its repugnancy to the constitution clearly appears or is made to appear beyond a reasonable doubt.”

The next step for analysis is thus made clear: What line or lines of constitutional attack ought to be anticipated? To answer this, take for a moment the position of the attacker: What aspects of the scheme seem most vulnerable? Since constitutional requirements are frequently nothing more than the expression of the requirements of our society in abstract terms, it might be helpful first to look at the problem in lay terms: Is there something about a restrictive scheme which might be unpalatable? Here the layman looks at the problem in a highly personal way, in asking how would this legislation affect him. Most apparently, it would make it more difficult than before to become a commercial fisherman; or, if he is now fishing, could he continue? Or, to put the matter slightly differently, what is going to determine whether he can fish? And on what basis will the decision be made, for example, that he can fish but the next applicant may not be able to, or *vice versa*. Is it fair to make this distinction among persons? Not quite so apparent, but perhaps of even more importance to the layman, is this: Although he would concede that, in many instances, the government of the state or city has had to restrict the number of persons in various business endeavors, he would like to be shown why, in the case of the fishing industry, it was thought necessary to do so. In other words, he would want to make sure there were reasons for the legislative action. By “reasons” here he means “legitimate reasons,” for he would say immediately that, if this were only a scheme to furnish higher profits for a certain small group, (*e.g.*, the present purse seiners), particularly if there were no provision for new entrants into the field, or if the admission of new entrants was left to the unlimited discretion of those now admitted, he would quite rightfully be most critical of the scheme.

Both the Washington State constitution and the United States constitution contain clauses which could be used as a basis for such an attack upon the licensing scheme. Since a clear understanding of these provisions is necessary in order to see how the legislature might constitutionally attempt to solve the problems of the salmon fishery, there is set forth first a basic analysis of the pertinent provisions. This analysis deals first with the development in the decisions of the United States Supreme Court and then with the similar development in the decisions of the Washington court.

B. Development of Pertinent Constitutional Clauses in the Decisions of the United States Supreme Court

1. Equal Protection

The Fourteenth Amendment to the federal constitution, adopted immediately after the Civil War as part of the new limitations then considered necessary to be imposed upon the states, contains the following:

“. . . nor shall any state . . . deny to any person within its jurisdiction the equal protection of the laws.”¹

This clause has had its greatest and most dramatic use in cases involving discriminations made on account of race, the most famous of these being the decision of the United States Supreme Court in 1954 in *Brown v. Board of Education*,² holding that a public school system which segregated its schools upon a racial basis violated this clause of the constitution. These racial discrimination cases have developed under sufficiently different considerations that they are considered only remotely connected with business regulations and, therefore, not worthy of detailed treatment here. They will accordingly be mentioned only in the few instances where certain particular relevance is found.

The use of the Equal Protection Clause in other, nonracial situations by the United States Supreme Court has been comparatively rare. Enough cases, however, do exist for a fairly rational, consistent pattern to have emerged. These situations have almost always involved some state regulatory practice directed toward a business activity in which some person claimed he had not received the fair and equal treatment required by this constitutional clause. A review of these cases is therefore pertinent.

The first case,³ decided in 1886, had an inter-mixture of racial discrimination. San Francisco, by ordinance, issued permits to those who would engage in the laundry business in wooden buildings. This ordinance seemed innocuous enough; the vice was that the administrator who issued the licenses systematically excluded all Chinese applicants, but issued licenses to all other applicants. Assuming that the purpose of the ordinance was to reduce the hazards of fire through the care in the licensing of laundry operators, the court invalidated the ordinance as administered because it could see no

1. U. S. Constitution, Am. XIV, §1.

2. 347 U. S. 483 (1954).

3. *Yick Wo v. Hopkins*, 118 U. S. 356 (1886).

reasonable relation between whether the applicant was Chinese or of other racial background and this purpose of the ordinance.

This case, *Yick Wo v. Hopkins*, has served as the leading case in the application of the Equal Protection Clause, having been found useful upon a much wider basis than solely racial discrimination cases. Thus, in the realm of regulation of economic activity, a substantial body of law has developed around the clause and its first application in the *Yick Wo* case.

It should also be emphasized that the history of the Supreme Court's attitude toward governmental regulation of economic activity in the last part of the nineteenth century and the first part of the twentieth century has shown a very substantial change. It cannot be denied but that, through both the Due Process and the Equal Protection Clauses of the Fourteenth Amendment, the Supreme Court had been very protective of business activity from governmental control for a substantial period of time lasting at least up into the 1930's, particularly in the latter part of that period. Because of the important and wide-ranging effect of the change brought about in the 1930's upon the Court in its attitude on these matters, the best and really only representative illustrations of the current application of the Equal Protection Clause are found in decisions which start at about that time and continue to the present.

Not that the principle has changed from *Yick Wo*; indeed, it has not. Only the degree of tolerance toward legislative judgment has increased, for the post-1935 court has been much more willing to find that the legislature could have seen a reasonable relation between the classifications which a statute effected and the determined ultimate purpose of the statute.

Illustrative of the earlier cases is *Smith v. Cahoon*,⁴ decided in 1931. In this case a Florida statute required, among other things, a bond or insurance coverage to protect the traveling public to be posted or carried by all carriers of goods, both common carriers and private contract carriers. The statute excepted, however, all carriers of agricultural products, dairy products, and certain fish products. The court invalidated the statute, seeing no relationship between what the product carried might be and the necessity for carrying insurance to protect the public. [It might be asked here to consider what the court would have done had there been a showing

4. 283 U. S. 553 (1931).

that: (a) the accident rate for the excepted carriers was lower than for carriers generally, or (b) carriers of those excepted products were so numerous and yet individually of such scattered locale on various farms and in seaport areas, and individually of such small scale that the enforcement of an insurance requirement would be much more expensive for them than for carriers generally. Would these factors have furnished a rational basis for the court to sustain the legislation?]

A somewhat similar case occurred in a 1936 case, *Mayflower Farms, Inc. v. Ten Eyck*,⁵ which involved a challenge to part of New York State's milk control law. The minimum price for fluid milk was legislatively fixed as of a date in April, 1933, at a time when the small distributors were selling their product to the retailers for about one cent per quart less than were the distributors of well-advertised brands. The legislature allowed this differential thereafter to persist, but only as to those who were in business on that date, thus excluding from its benefit those who would enter the milk business thereafter. Even though they would not have a well-advertised brand, they would have to sell at the same price as those who did have such a brand. In the face of three dissenters, the Supreme Court struck down the legislation as violating the Equal Protection Clause, seeing no relation between the classification separating those in business in April, 1933, from those who would enter it later and the purpose of the general statute, *i.e.*, to keep an economically healthy dairy industry in order to assure an adequate supply of wholesome milk to the consumers. The dissent, written by Mr. Justice Cardozo, joined by Mr. Justice Brandeis and Mr. Justice Stone, readily found reasons for the continuation of the price differential for only those in business on that date, to keep them as healthy competitors to the larger, more powerful distributors, who, if not so checked, might constitute too powerful a concentration of economic power for the public good. Mr. Justice Cardozo further found, though, that not the same considerations would apply to a person who later wanted to get into the business, in that he would not have the investment of capital already put in by those in the business on the April, 1933 date; further, the measure was then looked upon as a means, temporary in nature, to tide over until normalcy should take the place of depression; if such be the purpose,

5. 297 U. S. 266 (1936).

there was no need to make this price differentiation similarly available to newcomers.

Later cases have, in general, sustained the much more liberal or tolerant attitude of Mr. Justice Cardozo, allowing very great latitude for the exercise of legislative judgment. Typical of these is *Tigner v. Texas*,⁶ a 1940 case in which the court sustained a Texas anti-trust statute even though it excepted from its operation economic activities with respect to “agricultural products or livestock in the hands of the producer or raiser.” The appellant was accused of conspiring to fix the retail price of beer. The court, unanimous except for Mr. Justice McReynolds, speaking through Mr. Justice Frankfurter, said:

“In these circumstances, legislators may well have thought combinations of farmers and stockmen presented no threat to the community, or, at least, the threat was of a different order from that arising from industrialists and middlemen . . . The Constitution does not require things which are different in fact or opinion to be treated in law as though they were the same.”⁷

Two cases decided in the late 1940's will illustrate the extreme length to which the court has gone to sustain state legislation as against a challenge based on equal protection: In *Kotch v. Board of River Pilot Commissioners*,⁸ the complaining person showed that, over a period of years, the Board had admitted to pilotage only those who were relatives or close friends of the presently-licensed river pilots, and further claimed that he, too, was qualified to be a river pilot. Nevertheless, the court, by a 5-4 margin, refused to strike down the statute and these administrative practices, despite the fairly obvious favoritism. Consider what the court cites as its basis for decision:

“A pilot does not require a formalized technical education so much as a detailed and extremely intimate, almost intuitive, knowledge of the weather, waterways and conformation of the harbor or river which he serves. This seems to be particularly true of the approaches to New Orleans . . . In these communities [pilot towns largely peopled by pilots and their families] young men have an opportunity to acquire special knowledge of the weather and water hazards of the locality and seem to grow up with ambitions to become pilots in the traditions of their fathers, relatives, and neighbors.”⁹

6. 310 U. S. 141 (1940).

7. *Id.* at 145, 147.

8. 330 U. S. 552 (1947).

9. *Id.* at 558, 559.

In *Goessaert v. Cleary*,¹⁰ Michigan, by statute, had prevented women from acting as bartenders, but then excepted those who were the wives or daughters of a male owner. As against objection based on equal protection, the court upheld the statute, reasoning that the state “evidently believes that the oversight assured through ownership of a bar by a barmaid’s husband or father minimizes hazards that may confront a barmaid without such protecting oversight. This court is certainly not in a position to gainsay such belief by the Michigan legislature.”¹¹

Two recent cases will round out the picture:

In *Williamson v. Lee Optical of Oklahoma, Inc.*,¹² decided in 1955, the court held valid an Oklahoma statute regulating the prescription of glasses, the preparation of lenses, the fitting to the person, and the advertising incident to these activities. The act specifically excluded, however, the “sale of ready-to-wear glasses equipped with convex-spherical lenses,” certain sunglasses, and industrial glasses and goggles. The court held that such an exception did not constitute a violation of the Equal Protection Clause, saying:

“The prohibition of the Equal Protection Clause goes no further than the invidious discrimination . . . For all this record shows, the ready-to-wear branch of this business may not loom large in Oklahoma or may present problems of regulation distinct from the other branch.”¹³

In *Morey v. Doud*,¹⁴ decided in 1957, the court, by a 6-3 vote, held that an Illinois statute regulating “community currency exchanges” violated the Equal Protection Clause because it specifically excepted the American Express Company. (The statute also excepted Postal Telegraph Co., Western Union Telegraph Co., state and national banks, and the United States Post Office; but no point of these additional exceptions was made in the opinion, noting only that other considerations would apply to them.) The state sought to explain the exemption of the American Express Co. on the grounds of its world-wide operations, unquestioned solvency, and high financial standing, pointing out that the evil to be cured arose from the inadequate financing and lack of responsibility of small operators in the field who had sprung up during and after the depression primarily to cash checks and to write money orders. The court,

10. 335 U. S. 464 (1948).

11. *Id.* at 466.

12. 348 U. S. 483 (1955).

13. *Id.* at 489.

14. 354 U. S. 457 (1957).

speaking through Mr. Justice Burton, simply was not persuaded, saying that the distinction between American Express Co. and the companies which were subject to the act was not sufficiently related to the purpose of the act. At the same time, the court was struck by the accompanying economic advantages to American Express Co. This decision drew strong dissents from Mr. Justice Black and Mr. Justice Frankfurter, the latter being joined in his opinion by Mr. Justice Harlan. Mr. Justice Frankfurter said:

“I regretfully find myself unable to appreciate why the State . . . may not choose to allow small units to carry on a business so fraught with public interests under the regulations devised by the statute under review, while at the same time it finds such measures of control needless in a case of a ‘world-wide enterprise of unquestioned solvency and high financial standing.’ The rational differentiation is of course that the latter enterprise contains within itself, in the judgment of Illinois, the necessary safeguards for solvency and reliability in issuing money orders and redeeming them. Surely this is a distinction of significance in fact that the law cannot view with a glass eye.”¹⁵

From these cases one can extract two things: (a) a formula for applying the Equal Protection Clause: and (b) a sense for what the United States Supreme Court will do with any particular set of facts, in fitting them to the formula. First, for the formula, it seems accurate to state it thus: The Equal Protection Clause requires the state to refrain from only those discriminations which can be called “invidious.” An invidious discrimination is one in which, though the court finds the general legislative purpose to be valid, the court further finds that the classification of persons who are subject to the legislation has no reasonable relation to the purpose to be accomplished. For example, in the *Smith v. Goheen*¹⁶ case, the court assumed the purpose of protecting the traveling public to be valid, then found that whether the truck driver carried fish or washing machines had no relationship to accomplishing that purpose. The classification based on the type of product carried was thus a violation of the Equal Protection Clause. On the other hand, the court, particularly since the days of the depression, has been most tolerant in finding this reasonable relationship to exist. Illustrative of this tolerance is the opinion of Mr. Justice Douglas in the *Williamson v. Lee Optical*¹⁷ case, where he discusses certain examples of what constitutes rea-

15. *Id.* at 474.

16. 283 U. S. 553 (1931), discussed *supra*, n. 4.

17. 348 U. S. 483 (1955), discussed *supra*, n. 12.

sonableness for equal protection purposes. They are as follows:

1. In the same general field of commercial activity, the evil may be of different proportions or kinds, permitting differing kinds of legislative treatment. The *Tigner*¹⁸ case would illustrate this, where the court sustained the Texas anti-trust law even though certain agricultural businessmen and other men were exempt.

2. The legislature need not solve all the problems of a particular field at the same time. It may approach the problem piecemeal, as, for example, by dealing with only the severest manifestations of the problem. *Engel v. O'Malley*,¹⁹ a 1911 case, illustrates this. There the court sustained an exemption from a statute for licensing persons in the money-forwarding business of those in whose business the average sum received for safekeeping or transmission was more than \$500, the evil being found most severe with respect to those who forwarded small sums for newly-arrived immigrants, who were both ignorant and helpless. Or, it would seem that the legislature might try a rather small-scale remedy, with the apparent idea that it would see how this worked out first before trying any wholesale remedy.

Although other illustrations of legitimate purposes furthered by reasonable classifications are to be found in the United States Supreme Court decisions, they also appear with quite adequate treatment in many of the decisions of the Washington State Supreme Court. For this reason, further treatment of equal protection is given in that section, appearing in this report following the next section. The immediate next section deals with the development of due process in the decisions of the United States Supreme Court.

2. *Due Process*

The Due Process Clause of the Fourteenth Amendment to the federal constitution reads:

“. . . nor shall any state deprive any person of life, liberty, or property, without due process of law . . .”²⁰

A substantially similar clause of the Fifth Amendment imposes a similar restraint upon the federal government.

As with the Equal Protection Clause, the decisions of the United States Supreme Court in applying the Due Process Clause to regulations of economic activity have shown very dramatic change since

18. *Tigner v. Texas*, 310 U. S. 141 (1940), discussed *supra*, n. 6.

19. 219 U. S. 128 (1911).

20. U. S. Constitution, Am. XIV, §1.

the pre-1935 days. In the earlier, rather brief period of extreme protection to business activity, the court had struck down various state regulatory laws such as those regulating hours of work in a bakery,²¹ those outlawing “yellow-dog” contracts (in which the employee agreed upon taking his job that he would not join a labor union),²² and those fixing minimum wages for women.²³ With the change in the court in the mid-thirties, however, such regulations generally came to be upheld.²⁴

Currently, all that due process seems to require for legislative regulation of economic activity is that there be a legitimate purpose and a rational means for accomplishing that purpose. This, it will be noted, is strikingly like the test for validity under the Equal Protection Clause, the only difference being that in the latter, the element of classification is present.

The clearest and leading case is *West Coast Hotel Co. v. Parrish*,²⁵ a 1937 case challenging the Washington state law providing for minimum wages for women. The Washington State Supreme Court had sustained the statute; then on appeal to the United States Supreme Court that court affirmed the decision. In an attack on due process grounds, the employer argued that an earlier case, *Adkins v. Children’s Hospital*,²⁶ should control. In that 1923 case the court struck down, as violating the liberty of contract found to exist in the Due Process Clause, a minimum wage law for women in Washington, D.C., saying, in part:

“The feature of this statute which, perhaps more than any other, puts upon it the stamp of invalidity is that it exacts from the employer an arbitrary payment for a purpose and upon a basis having no causal connection with his business, or the contract or the work the employee engages to do. The declared basis . . . is . . . the extraneous circumstance that the employee needs to get a prescribed sum of money to insure her subsistence, health and morals . . . Certainly the employer by paying a fair equivalent for the service rendered, though not sufficient to support the employee, has neither caused nor contributed to her poverty. On the contrary, to the extent of what he pays he has relieved it. In principle, there can be no difference between the case of selling labor and the case of selling goods.”²⁷

21. *Lochner v. New York*, 198 U. S. 45 (1905).

22. *Coppage v. Kansas*, 236 U. S. 1 (1915).

23. *Adkins v. Children’s Hospital*, 261 U. S. 525 (1923).

24. See the discussion in the text, *infra*, n. 25.

25. 300 U. S. 379 (1937).

26. 261 U. S. 525 (1923).

27. *Id.* at 558.

By contrast, in the *West Coast Hotel* case, the court upheld the Washington State law, saying:

“With full recognition of the earnestness and vigor which characterize the prevailing opinion in the *Adkins* case, we find it impossible to reconcile that ruling with these well-considered declarations. What can be closer to the public interest than the health of women and their protection from unscrupulous and overreaching employers? And if the protection of women is a legitimate end of the exercise of state power, how can it be said that the requirement of the payment of a minimum wage fairly fixed in order to meet the very necessities of existence is not an admissible means to that end?”²⁸

A 1949 case shows the application of these considerations to the state restrictions upon types of employment: In *Daniel v. Family Security Life Ins. Co.*,²⁹ the court sustained a South Carolina statute which prohibited life insurance companies from also engaging in the undertaking business and the undertakers from acting as agents for the sale of life insurance. Even though the complaining company was the only company in South Carolina which was selling a sort of “funeral insurance” and also engaged in the undertaking business, the court nevertheless sustained the statute, saying:

“The South Carolina legislature might well have concluded that funeral insurance, although paid in cash, carried the same evils that are present in policies payable in merchandise or services: the beneficiary’s tendency to deliver the policy’s proceeds to the agent-undertaker for whatever the money will buy, whether or not an expensive ceremony is consistent with the needs of the survivors . . . It is said that the ‘insurance lobby’ obtained this statute from the South Carolina legislature. But a judiciary must judge by results, not by the varied factors which may have determined legislators’ votes. We cannot undertake a search for motive in testing constitutionality . . . We are not equipped to decide desirability; and a court cannot eliminate measures which do not happen to suit its tastes if it seeks to maintain a democratic system. The forum for the correction of ill-considered legislation is a responsive legislature. We cannot say that South Carolina is not entitled to call the funeral insurance business an evil. Nor can we say that the statute has no relation to the elimination of those evils. There our inquiry must stop.”³⁰

The licensing of persons to engage in particular businesses has been treated by the United States Supreme Court in cases other than the *Daniel* case just discussed, but, on the whole, these cases show the same shift in emphasis from being highly protective during the

28. 300 U. S. at 398.

29. 336 U. S. 220 (1949).

30. *Id.* at 222 and 224.

earlier, pre-1935 period, then very tolerant of state control thereafter. One of the earlier cases is particularly interesting because of the prophetic dissent of Mr. Justice Brandeis: In *New State Ice Co. v. Liebmann*,³¹ decided in 1932, Oklahoma by statute had provided that ice manufacturers and distributors in the state had to be licensed, and that before any new licenses would issue, a showing had to be made that there was a necessity for a supply of ice at the place where it was sought to be established, and further authorized the denial of the license if the present facilities were sufficient to meet the public needs. The court, in an opinion by Mr. Justice Sutherland, who, incidentally, also wrote the opinion in the *Adkins*³² case discussed previously, held the statute to violate the Due Process Clause, as infringing upon the liberty to engage in economic activity.

“Plainly, a regulation which has the effect of denying or unreasonably curtailing the common right to engage in a lawful private business, such as that under review, cannot be upheld consistently with the Fourteenth Amendment. Under that amendment, nothing is more clearly settled than that it is beyond the power of a state, ‘under the guise of protecting the public, arbitrarily (to) interfere with private business or prohibit lawful occupations or impose unreasonable and unnecessary restrictions upon them.’ ”³³

It is significant to note that the court in the *Daniel* case just discussed dealing with funeral insurance, says of this language quoted by Mr. Justice Sutherland, “According to the majority in *Liggett*, ‘a state cannot, “under the guise of protecting the public, arbitrarily interfere with private business or prohibit lawful occupations or impose unreasonable and unnecessary restrictions upon them”’. . . . But a pronounced shift in emphasis since the *Liggett* case has deprived the words ‘unreasonable’ and ‘arbitrary’ of the content for which respondents contend.”³⁴

To Mr. Justice Brandeis, the decision of the court in the *Liebmann* case was quite wrong. His dissent has, in fact, been frequently quoted in subsequent cases; by contrast, Mr. Justice Sutherland’s opinion has not stood the test of time. Mr. Justice Brandeis first emphasized the importance of ice to the economy and health of Oklahoma citizens; he then pointed out that home appliances for ice manufacture or cold storage were not then widely owned and many

31. 285 U. S. 262 (1932).

32. 261 U. S. 525, discussed *supra*, n. 26.

33. 285 U. S. at 278.

34. 336 U. S. at 225.

persons were dependent upon commercially manufactured ice, considered "as a household necessity, indispensable to preservation of food and so to economical household management and the maintenance of health."³⁵ He further stated:

"It is urged specifically that manufacturing ice for sale and distribution is a common calling; and that the right to engage in a common calling is one of the fundamental liberties guaranteed by the due process clause. To think of the ice-manufacturing business as a common calling is difficult; so recent is it in origin and so peculiar in character. Moreover, the constitution does not require that every calling which has been common shall ever remain so. The liberty to engage in a common calling, like other liberties, may be limited in the exercise of the police power. The slaughtering of cattle had been a common calling in New Orleans before the monopoly sustained in *Slaughter-House Cases*, 16 Wall. 36, was created by the legislature. Prior to the Eighteenth Amendment selling liquor was a common calling, but this court held it to be consistent with the due process clause for a State to abolish the calling . . . or to establish a system limiting the number of licenses . . . It is settled that the police power commonly invoked in aid of health, safety and morals, extends equally to the promotion of the public welfare."³⁶

That a state should have the power, as against a claim made upon the Due Process Clause, to make substantial changes upon property rights and other economic rights is very clearly pointed out in an opinion by Mr. Justice Rutledge in a 1948 case, *Republic Natural Gas Co. v. Oklahoma*.³⁷ Although the majority opinion disposed of the case on a purely procedural point and did not deal with the merits of the problem, Mr. Justice Rutledge's views on the merits of the problem were joined by three others of the court. Speaking of the state regulation of taking natural gas, he said:

"These peculiar qualities (of natural gas), moreover, have been reflected in the legal rights relating to the ownership of gas in place, as well as its extraction. They have been adapted to its nature and to that of the competitive struggle regarding it . . . these difficulties, intensified by the competitive struggle for the product and the inadequacy of common-law ideas to control it, have forced both the states and the federal government to adopt extensive regulatory measures in recent years. This has been necessary both to conserve the public interest in this rapidly depleting natural resource and to secure fair adjustment of private rights in the industry. Rather than being a sacred, untouchable enclave of the common

35. 285 U. S. at 287.

36. 285 U. S. at 303 and 304.

37. 334 U. S. 62 (1948).

law, the field by its very nature lends itself especially to governmental intervention for such purposes.”³⁸

Later on in the same opinion, the following significant passage is found:

“So far as the federal constitution is concerned, there is no unrestricted fee simple [a form of land ownership] in the right to drain gas from beneath an adjacent owner’s land. It is far too late, if it ever was otherwise, to urge that the states are impotent to restrict this unfettered race or to put it upon terms of proportionate equality by whatever measures may be reasonably necessary to that end. Indeed our constitutional history is replete with instances where the states have altered and restricted schemes of property rights in response to the public interest and the states’ local needs. In some cases this has gone to the extent of abolishing basic common-law conceptions entirely and substituting new ones indigenous to their areas and the problems they present. Perhaps the most extensive and obvious illustrations are to be found in the systems developed in our arid and mountainous western states for governing rights in the waters of flowing streams and mining rights in respect to precious metals. Others are not lacking.”³⁹

Still later, he says:

“Here as elsewhere, in considering the proper scope for state experimentation, it is important that we indulge every reasonable presumption in favor of the states’ action. They should be free to improve their regulatory techniques as scientific knowledge advances, for here too experimentation is the life-blood of progress. See Mr. Justice Brandeis dissenting in *New State Ice Co. v. Liebmann* . . .”⁴⁰

Similarly in a 1951 case⁴¹ upholding a city ordinance forbidding uninvited house-to-house canvassing by transient subscription-takers, the court dealt rather summarily with a due process argument that this restriction unconstitutionally interfered with a property right to engage in a particular economic activity. With reference to this argument, rested strongly on the much earlier *Liebmann* case, the court said:

“Decisions such as *Liebmann* and *Tanner* . . . are hardly in point here . . . Furthermore, neither case is in as strong a position today as it was when *Bunger* (a litigant in an intervening case) appealed . . . The question of a man’s right to carry on with propriety a standard method of selling is presented here in its most appealing form—an assertion by a door-to-door solicitor that the Due Process Clause of the Fourteenth Amendment does not permit a state or its subdivisions to deprive a spe-

38. *Id.* at 91, 92.

39. *Id.* at 92, 93.

40. *Id.* at 96.

41. *Breard v. Alexandria*, 341 U. S. 622 (1951).

cialist in door-to-door selling of his means of livelihood. But . . . we think that even a legitimate occupation may be restricted or prohibited in the public interest. See the dissent in *New State Ice Co. v. Liebmann* . . . The problem is legislative where there are reasonable bases for legislative action."⁴²

The decision in a 1957 case, *Corsa v. Tawes*,⁴³ upheld a Maryland statute which, in effect, completely eliminated commercial menhaden fisheries from the state's offshore waters. The statute in terms merely prohibited the use of purse nets within Maryland waters, but since it was shown that menhaden could be taken economically only by purse nets, the prohibition was effective as a practical matter. In the course of the trial of the case it was shown that the menhaden is an inedible fish used chiefly for oil and meal and similar products and, in the aggregate from all United States waters and adjacent high seas areas, constitutes a very substantial fisheries resource. It was also shown, however, that the legislature could have concluded that edible fish in Maryland waters relied upon the menhaden at least in some part as their source of food, and that Maryland enjoyed a substantial sports fishery in these waters in the pursuit of the edible fish and further that there was a large amount of economic activity within the state supported by the sports fishery. The menhaden fishermen, who had depended upon their take from Maryland waters for a substantial portion of their total catch, claimed that this complete prohibition deprived them of their liberty and property without due process.

Thus, the opinion of the court dealt with two aspects of the legislature's basis for action: (a) the administrative considerations in the enforcement of the ban on purse nets as they might wrongfully be used to take edible fish, and (b) the ability of the Maryland legislature to base its determinations upon the desire to promote a sports fishery, for the benefit of both the direct participants and the economic activity supported by the sports fishery, even to the extent of abolishing a commercial fishery in order to accomplish these objectives.

The opinion in this case was written by Judge Sobeloff of the Court of Appeals for the Fourth Circuit sitting as one member of a three-judge court in the District of Maryland. This court is of a special sort within the federal system designed to be convened

42. *Id.* at 631, 632, 633.

43. 149 F. Supp. 771 (D. Md. 1957); *aff'd.* 355 U. S. 37 (1957).

specially to hear challenges to state laws based on claimed violations of the federal constitution. In its opinion the court treated these two aspects of the case as follows:

First, as to enforcement, should the menhaden fishery be permitted, the court said:

“The difficulty of enforcement is also a salient feature entitled to weight. It was given point by the plaintiff *Corsa* while on the stand. Testifying that he was aware of the Maryland prohibition against purse nets within the three-mile belt, he stated with astonishing candor that he habitually fished for menhaden within this area whenever he thought he would not be apprehended. The difficulty of enforcement would be compounded if purse netting for menhaden were permitted within the three-mile coastal area. It is obvious that it would be more burdensome to police against purse netting for food fish if purse netters were permitted to enter the area in pursuit of menhaden; an enforcement official so testified.”⁴⁴

Second, as to the sports fishing and attendant economic activity, the court said:

“Decision as to whether the State’s interest requires a prohibition of all purse netting in this area in order to protect sports fishing, which itself supports a considerable industry in the State, is also a legislative prerogative. It is a legitimate objective for the State to sponsor sports fishing and the economic interests dependent upon it . . . the testimony also showed, and it is a matter of common knowledge, that sports fishermen seriously object to purse netting as interfering with their pursuits.”⁴⁵

What the United States Supreme Court thought of the fishermen’s argument is indicated in a brief memorandum decision delivered by that court on November 12, 1957: Upon the state’s motion to dismiss the fishermen’s appeal from the decision of the three-judge court “upon the ground that the questions presented are so unsubstantial as not to warrant further argument,”⁴⁶ the United States Supreme Court ordered, “The motion to affirm is granted and the judgment is affirmed.”⁴⁷

Thus, it is to be noted from this case that not only could the legislature effectively abolish an established commercial fishery, it could also do so for some reason other than the elimination of some hazard to health, safety, or morals. It was for the legislature to decide that it should put a high value on the sports fishery and its attendant economic activity and that in order to promote this value

44. 149 F. Supp. at 776.

45. *Id.*

46. Appellees’ Motion to Affirm, p. 1.

47. 355 U. S. at 37.

it could sacrifice a commercial menhaden fishery. It bears repeating that these are legislative judgments; the constitutional clauses do not require that one commercial interest, harmless and beneficial though it be and ancient and honorable though it be, must persist if, in the legislature's rational determination to promote by rational means some other legitimate value in society, the legislature decided also that the commercial interest must give way.

C. Development of Pertinent Constitutional Clauses in the Decisions of the Washington Court

1. Equal Protection

Generally speaking, the Washington State Supreme Court's application of the concept of equal protection has been similar to that of the United States Supreme Court. Of course the state court has the occasion to apply not only the Equal Protection Clause of the Fourteenth Amendment of the federal constitution, but also the corresponding clause of the state constitution. The United States Supreme Court, on the other hand, does not purport to decide the applications of any state constitutional provision.

The Washington court has, however, frequently stated that it considers the Equal Protection Clause of the federal constitution and the corresponding clause of the state constitution to impose the same limitation upon the state. The Washington state constitutional provision is differently worded. It reads:

"No law shall be passed granting to any citizen, class of citizens, or corporation other than municipal, privileges or immunities which upon the same terms shall not equally belong to all citizens, or corporations."⁴⁸

Of the two provisions the Washington court has said:

"... this court regards the equal privileges and immunities provision of Art. I, § 12, of the state constitution and the equal protection clause of the fourteenth amendment to the constitution of the United States as substantially identical."⁴⁹

As a practical matter, of course, it must be borne in mind that a challenge to a state regulatory scheme may well be first made in a Washington court, where both the federal and state constitutional provisions would be brought into question. Should this be the case, the Washington court will, of course, apply its own interpretation of what those clauses mean, and should a decision be made that both the federal and state constitutional provisions have been violated.

48. Washington State Constitution, Art. 1, § 12.

49. *Texas Company v. Cohn*, 8 Wn. 2d 360, 374, 112 P. 2d 522 (1941).

there will be no effective review by the United States Supreme Court, for that court will say that the decision is adequately sustained upon the provisions of the state constitution, even though the court in Washington considered that the federal constitution would also produce the same result. An example of this was seen in the handling of the recent challenge to the Anti-discrimination Act as it applied to the sale of housing to a Negro in the 1961 case of *O'Meara v. Board*.⁵⁰ In that case the Washington State Supreme Court decided that both the Equal Protection Clause of the federal constitution and the corresponding clause of the state constitution had been violated. The United States Supreme Court declined review apparently upon the ground that the decision rested upon an adequate independent state ground.⁵¹ In other words, if Washington wanted to invalidate its own law on the basis of its own constitution, the federal constitutional clause was not necessary to that determination, and the United States Supreme Court was not an appropriate agency to tell the Washington State Supreme Court that it had misinterpreted its own state constitution.

Because of this possibility, it is essential that an adequate analysis of the Washington State Supreme Court's attitude toward the equal protection concept be delineated and applied to the particular problem at hand.

The general principle is considered to be the same as pertains to the Equal Protection Clause of the Fourteenth Amendment: (a) find first a valid purpose or valid purposes for the legislation; then (b) find that the classification of persons effected by the legislation can rationally be conceived as furthering that purpose or those purposes.

Though instances are numerous where the court has recited the formula, two recent cases will be sufficient to illustrate its application. The first of these is the 1960 case of *Clark v. Dwyer*,⁵² where the

50. 58 Wn. 2d 793, 365 P. 2d 1 (1961).

51. 82 Sup. Ct. 866 and 867 (1962); the word "apparently" is used in the text because, in the absence of an opinion in elaboration (a rare occurrence), the court does not reveal its reason for denying review upon a petition in the circumstances of this case. Except for the fact that the state ground appeared adequate to sustain the Washington court's decision, the case seemed otherwise qualified for review by the Supreme Court. Another indication is that Chief Justice Warren and Mr. Justice Stewart are recorded as being of the opinion that the case be remanded to the Washington court to ascertain whether the judgment was based upon a non-federal ground adequate to support it.

52. 56 Wn. 2d 425, 353 P. 2d 941 (1960), *cert. den.* 364 U. S. 932 (1961).

court passed upon a grading system to be used in designating apples for market. By the legislation, the growers of red apples were required, in order for their apples to meet the "Fancy" grade, to have their apples show a certain per cent redness or, failing that, to have them classed as "culls." These "culls" had to be labeled as such and could not be shipped in boxes but only in baskets. Yet the growers of yellow apples were not required to observe the same scheme; they still had available to them a grade designated as "C" which could be shipped in boxes. Red apples formerly could be graded as "C," but the new legislation removed this category. The growers of red apples complained, saying that it was a violation of equal protection in that for them there was no longer a "C" grade, while such grade was retained for the growers of the yellow varieties. The court nevertheless held the statute to be valid, saying that the classification between the different growers was reasonably supportable. The court said:

"Article I, § 12 of the state constitution and the Fourteenth Amendment to the federal constitution . . . require that class legislation must apply alike to all persons within a class, and reasonable ground must exist for making a distinction between those within, and those without, a designated class. Within the limits of these restrictive rules, the legislature has a wide measure of discretion, and its determination, when expressed in statutory enactment, cannot be successfully attacked unless it is manifestly arbitrary, unreasonable, inequitable, and unjust . . . It may well be that the legislature found that the marketing of apples designated as 'C' grade in standard Washington apple boxes had no adverse effect on the market value and reputation of the fancy grades of yellow and green varieties, and, therefore no change in the grading system for these apples was needed . . . [and] that color differences in the yellow and green varieties of apples are much less pronounced than in the red and partial red varieties . . ."⁵³

The second case emphasizes that the court's function is not to pass upon the wisdom of the legislation, but rather merely to see that the legislature keeps within the broad limits of constitutionality—here, of making at least a rational selection or description of the persons to be affected by the legislation. In *Ragan v. City of Seattle*,⁵⁴ a 1961 case, the court sustained a limited-license scheme for juke-box operators in Seattle, as against an argument based upon the concept of equal protection. In the course of the opinion, the court said:

53. *Id.* at 435, 436; 353 P. 2d at 947-948.

54. 58 Wn. 2d 779, 364 P. 2d 916 (1961).

“We are impressed with Mr. Ragan’s arguments: that since many other tavern operators are permitted to own their own juke boxes, he should be accorded a like opportunity; that such individual ownership is the best way to eliminate any racketeering or coercive methods between the competing operators; and that, if the limitation of the number of juke boxes is the goal, the way to achieve it is to limit the number of juke boxes rather than the number of licensees; . . . However, we are not the duly elected members of the Seattle City Council, charged with the responsibility of enacting the legislation whereby the city limits and controls the operation of juke boxes within its limits. Whether the terms of an ordinance are wise or unwise is a question addressed solely to the city council . . . We cannot say that the legislation enacted by the city, regulating the operation of juke boxes is unreasonable or oppressive, or that it does not have a substantial relation to the accomplishment of purposes fairly within the scope of the police power.”⁵⁵

The court then quoted with approval the language of the United States Supreme Court from another case:⁵⁶

“It is enough for present purposes that the ordinance, in the light of facts admitted or generally assumed, does not preclude the possibility of a rational basis for the legislative judgment and that we have not such knowledge of local conditions as would enable us to say that it is clearly wrong . . .”⁵⁷

The Washington State Supreme Court has been fairly tolerant in deciding what purposes of legislation are to be considered legitimate, so far as application of equal protection standards is concerned. The usual statement is that so long as the purpose of the legislation is the promotion of the health, safety, morals or welfare of the people of the state, any legislative classification to further those ends is valid. The obvious purposes which fall within this broad definition would certainly include regulations pertaining to the qualifications of persons who serve the public for which a certain degree of skill is required. For example, legislation requiring certain standards for doctors or lawyers would certainly be sustainable. Or, legislation classifying persons as to age in the issuance of drivers’ licenses is clearly aimed at the legitimate purpose of promoting the safety of those using the highways.

More important to the problem at hand are cases illustrating that the Washington court recognizes less obvious illustrations of valid purposes than the previous examples given. For example, it

55. *Id.* at 786; 364 P. 2d at 920.

56. *Ohio ex rel. Clarke v. Deckebach*, 274 U. S. 392 (1927).

57. 58 Wn. 2d at 786, 787; 364 P. 2d at 920.

recognized in the case previously mentioned⁵⁸ dealing with the Anti-Discrimination Act as applied to the sale of housing that it was a legitimate public purpose for the legislation to try to prevent discriminations on account of race in the sale of houses, since such discriminations contributed to the existence of slum areas in large cities and to difficulties with juvenile problems and crime control. Or, as in the case concerning apple grading just discussed,⁵⁹ the court recognized it as a legitimate legislative purpose that the welfare of the apple industry be promoted. The court specifically noted that Washington is the nation's largest producer and shipper of apples and that the value of the Washington crop was about \$75 million annually. The court also pointed out that legislation need not be confined strictly to the preservation of public health, safety, and morals; it has a much broader base, carrying validity if it simply preserves or promotes the public welfare. Dealing with this particular segment of the state's economy, shown to be highly significant to Washington, the court said:

“The wisdom of this change [in the grading scheme] is a matter within the province of the legislature, not of this court, and its purpose, which we assume to be for the protection of the reputation of Washington apples and the betterment of the industry, and as a result of the general welfare, is one which could properly be served in the exercise of the police power.”⁶⁰

In a 1955 case⁶¹ in which certain off-shore fishing licensing fees were challenged, the court, in holding that the legislation was for a valid legislative purpose, first quoted from an earlier case dealing with a lower standard of care legislatively prescribed for the operation of automobiles (in order to avoid collusion between hosts and their guest-passengers): “. . . the state . . . may prescribe laws tending to promote the health, peace, morals, education, good order, and welfare of the people . . .”⁶² Then, as to the regulation of the fishing industry accomplished by the legislation under review, the court said: “We conclude that regulation and conservation of our salmon industry . . . promote the ‘good order and welfare of the people’

58. *O'Meara v. Board*, 58 Wn. 2d 793, 365 P. 2d 1 (1961), discussed *supra*, n. 50.

59. *Clark v. Dwyer*, 56 Wn. 2d 425, 353 P. 2d 941 (1960), *cert. den.* 364 U. S. 932 (1961), discussed *supra*, n. 52.

60. *Id.* at 433; 353 P. 2d at 946.

61. *Frach v. Schoettler*, 46 Wn. 2d 281, 280 P. 2d 1038 (1955).

62. *Id.* at 285, 286; 280 P. 2d at 1041, quoting from *Shea v. Olson*, 185 Wash. 143, 153; 53 P. 2d 615, 619 (1936).

. . .”⁶³ Later on, the court said, “The regulation of our salmon industry for conservation purposes certainly bears directly on our state’s general welfare.”⁶⁴ Still later it said, “It [the fishing industry] is an affair of great public interest and concern.”⁶⁵

The important thing to notice about the two foregoing cases is that the regulation was in the interest of promoting the economic welfare of the state. It had nothing to do with the health of the Washington residents, so far as the quality of food they ate was concerned. In the apple case, for instance, the red apple growers who complained were most insistent that their not-quite-so-red apples were every bit as healthful as the really-red ones; the important point, however, was that it was the redness quality which appealed to the consumer. Since he was most likely to be an out-of-state person, the only benefit to be derived by the State of Washington was in the increased well-being of the apple industry from the increased sales to be expected from the redness of the apples. Washington apples, in other words, compete well on foreign markets because the red varieties are held to a very high standard of redness.

One further aspect of the “valid legislative purpose” requirement should be observed: Occasionally, the argument comes up in a challenge to some incidental aspect of the legislation, not with respect to its main purpose. When this happens it is important to notice that in addition to a main legislative purpose, there are frequently one or more subsidiary purposes, all equally valid; usually these are presented for legislative judgment because they are involved in the means by which the legislature chooses to effect its primary purpose. To put this point in concrete illustrative terms: In *Campbell v. State*,⁶⁶ a 1942 case, the court dealt with a legislative requirement that a dentist could not conduct a dental office in his own name without being personally present in that office during a majority of the time that such office was open, thus effectively preventing “chain-dentistry.” The court first held that this statute had a legitimate purpose: “Certainly it is within the province of the legislature to protect the public against all forms of fraud and deception tending to conceal the professional identity of the dentist who is, in fact, rendering

63. *Id.* at 286; 280 P. 2d at 1041.

64. *Id.* at 288; 280 P. 2d at 1042-1043.

65. *Id.* at 290; 280 P. 2d at 1044.

66. 12 Wn. 2d 459, 122 P. 2d 458 (1942).

the service . . .”⁶⁷ Then the court dealt with an exception in the statute which provided that the prohibition of the statute was not to apply to persons who had such offices before the effective date of the act. To this proviso an objection had been raised “that it creates a specially privileged class. It is vigorously contended that the classification pursuant to which some dentists are permitted to conduct dental offices in a manner forbidden to others is arbitrarily rested solely on the mere caprice of time, and that such discrimination is completely lacking in any reasonable basis.”⁶⁸ To meet this objection, the court pointed to other considerations than just the principal one of preventing a fraud upon the public. They were three in number, only one of which in any real way furthered the basic scheme: (a) every statute has to have a beginning date; (b) persons had invested heavily in time, labor and capital in the establishment of chain dental offices at a time when such was lawful and to prohibit their operation would result in heavy financial loss; and (c) even those thus protected by the grandfather clause would “in the ordinary course of human events” not last into perpetuity. “In time, more or less prolonged, all such dental offices will cease to function.”⁶⁹

A further subsidiary purpose has occasionally been noted in cases dealing with grandfather clauses, where the person affected by the legislation claimed a denial of equal protection in the exclusion of the person presently in business at the effective date of the legislation: Particularly in an earlier era of United States Supreme Court history, legislation which applied in a sense retrospectively might well be considered in itself thereby unconstitutional as a deprivation of property. The understandable concern of the legislature for possible invalidation of its enactments from this source would thus furnish a legitimate purpose to be served by providing a grandfather clause. The Washington court in *Spokane v. Coon*,⁷⁰ a 1940 decision, discussed with approval a United States Supreme Court case⁷¹ in which this consideration was an important factor. In that case, the Kansas legislature had required that all black powder for use in a coal mine had to be delivered in the original sealed packages but then exempted those deliveries which were yet to be made under existing

67. *Id.* at 467; 122 P. 2d at 462.

68. *Id.* at 469; 122 P. 2d at 463.

69. *Id.* at 471; 122 P. 2d at 464.

70. 3 Wn. 2d 243, 100 P. 2d 36 (1940).

71. *Williams v. Walsh*, 222 U. S. 415 (1912).

contracts. In speaking of this exemption the United States Supreme Court is quoted as follows: “. . . [T]here are nevertheless other considerations to be taken into account. The statute is criminal. A retrospective operation of it was to be avoided, might indeed be illegal’.”⁷²

Purely administrative considerations also serve as a legitimate subsidiary purpose. Often, for example, a person will object to some legislative classification on the ground that either he should not have been included or that someone else who is likewise a source of harm to be avoided by the statute is exempted from its operation. Yet, such factors as the difficulties of effective enforcement as to the persons exempted from the statute, or the extra expense involved, will justify the classification. *State v. Kitsap County Bank*,⁷³ a 1941 decision, is a good illustration. In that case the bank argued that the state’s unemployment compensation statute was unconstitutional, objecting upon the ground, among others, that in providing for the law to apply only to those employers who had eight or more employees the legislature had further provided that where various “employing units” were controlled by “the same interest,” the total number of employees of all these units was the critical number: if it was eight or more, the act applied. The bank objected to this as an unreasonable classification of employers. The court, however, held the act valid, saying with respect to this particular argument:

“Obviously the reason for [the enactment of the provision concerning ‘employing units’ controlled by ‘the same interest’] was to prevent persons, who would otherwise fall within the classification of employers within the terms of the act, from evading the statute through various forms of disintegrated ownership and control, thus lessening the number of employees within the protection of the act . . . Contemplation of some of the practical difficulties in the administration of the act renders the matter even clearer . . . It cannot be held that the legislature, in failing to further refine the classification now under discussion so as to exempt therefrom persons who were not actually engaged in any evasive practice, was acting unreasonably, arbitrarily, or capriciously. The practical difficulties of devising a statute which would operate to prevent such practices, while not applying to other cases, and the expense involved in connection with the administration of such refined legislation, afford ample justification for the broad inclusive features of [the challenged section].”⁷⁴

That such subsidiary considerations can be a legitimate basis

72. 3 Wn. 2d at 252, 253; 100 P. 2d at 40.

73. 10 Wn. 2d 520, 117 P. 2d 228 (1941).

74. *Id.* at 525 and 527, 528; 117 P. 2d at 231, 232.

for legislative classifications of persons is important to the problem at hand, especially when the details of any particular scheme for restrictive licensing are scrutinized. This will be particularly true when one considers the characteristics of the grandfather clause, the transferability of licenses, or other similar details.

It must also be pointed out that certain imperfections in legislative classifications must be tolerated; in other words, the court does not expect the impossible from the legislature. Legislation of necessity has to be somewhat general, it must look ahead, it must try to envision all the circumstances which will come within the sweep of language employed, but it cannot meet the difficulties of every person who might be affected. All citizens must accept the discomforts of this inherent difficulty with legislation. Certain of these "imperfections" are so recurrently raised in litigation and held to be insufficient bases for invalidity that a separate enumeration of them is desirable:

First, it is not a basis for holding a statute to violate the equal protection concept that the particular litigant who complains of the classification is, himself, one who does not contribute to the evil sought to be corrected or avoided. To put the clear case first, suppose a 15-year-old boy sues the Director of Licenses to force the issuance of a driver's license to him, offering to prove that he is as competent a driver as all or most 16-year-old drivers. He reasons that since the legislative classification of persons into the group 16 and over and those under 16 is an attempt to license only competent drivers, and since he is competent, the regulation is unreasonable as to him. The court would certainly not be persuaded. The proper basis for the court's reaction would be that a legislature cannot be expected to effect its general purpose (here, safe driving) by exact measurements of the talents of each driver in the state. It is sufficient to make a good approximation of how old persons generally must be before they, taken as a whole, have the ability and judgment to be safe drivers.

The point, not with reference to drivers, but with reference to dentists, has been argued in litigation. The "chain-dentistry" case referred to earlier contains such an aspect. In that case, *Campbell v. State*,⁷⁵ the court said:

"It may well be that the operation of the office in Tacoma, which appellant desires to open under his own name, would, in and of itself,

75. 12 Wn. 2d 459, 122 P. 2d 458 (1942), discussed *supra*, nn. 66-69.

result in no harm to the public. The legislature, however, was entitled to consider and deal with the general problem of the commercial exploitation of the dental profession. If, in the opinion of the legislature, chain office' dentistry and dental offices conducted under corporate or fictitious names, or under the name of a dentist who has nothing to do with the practice of the profession in connection with the carrying on of the office, tend to introduce into the profession unscrupulous practices which tend to lower the ethics and standards of the dental profession, to the injury of the health of the community and the public welfare, the legislature had the power to place the limitation in question upon the general practice of the profession, even though in certain cases the act forbidden might not result in any of the evils which it was believed might follow from the frequent employment of the forbidden practice."⁷⁶

A further factor which the courts consider wholly immaterial in judging the constitutionality of legislation is the legislative motive, as distinguished from its purpose. Assuming the court has found that there is, indeed, a legitimate purpose to the statute, such as the promotion of the public health, the court simply will not inquire whether the motive of some of the legislators might, in any particular case, have been to favor one person who might benefit from the statute. A striking example of this occurred in *Continental Baking Co. v. Mount Vernon*,⁷⁷ a 1935 decision upholding a city ordinance licensing bakeries and bakery-product deliveries. The point for argument was an exception in the statute for retail stores making retail deliveries. After pointing to the legitimate purpose of the regulations and the reasonableness of the means taken to effect those purposes, the court dealt with the argument of favoritism as follows:

"The appellants [a state-wide concern with home office in Seattle] charge that the purpose of the ordinance is to hamper them in competing with local manufacturers of bakery products. We are not permitted to speculate on the motives prompting the city council in the enactment of the ordinance, so long as we find it reasonable on its face and within the city's power."⁷⁸

Recurrent throughout Washington decisions dealing with equal protection concepts is the thought that all persons "similarly situated" must be equally treated, or that the law must bear upon such people equally. This, it should be apparent, is but another way of saying that if the legislature wants to differentiate between groups of persons, there must be some basis for doing so in view of the objective to be accomplished by the legislation. As applied to a situation in

76. *Id.* at 467, 468; 122 P. 2d at 462, 463.

77. 182 Wash. 68, 44 P. 2d 821 (1935).

78. *Id.* at 73; 44 P. 2d at 823.

which it has become apparent to the legislature that the public good is served by restricting the number of participants in a given economic activity, there should be some rational step taken to effect such a reduction. Since this objective has no strictly personal characteristic such as how good a fisherman a particular person may be, then any scheme which is at least neutral toward applicants should be sufficient. In this sense it could be said that of all persons who would like to become fishermen, they all at least have an even and fair chance of becoming such. This might be compared to the fair and even chance which all persons have of becoming a doctor or a lawyer. Some may make it; others may not; but at least the legislature will have gone about it in a fair way. The law will "bear equally on all persons similarly situated."

It should be further emphasized that all legislation is bound to have its incidental good and bad effect which simply cannot be entirely eliminated, nor should the existence of this collateral effect be used as a basis for invalidating legislation. For example, in prescribing the location of a highway or a bridge, some persons as a purely incidental matter are going to suffer from the depreciation of their property; others are going to benefit from the increased utility of their property by its proximity to the highway or bridge. So it must be with other legislation. Here, a restrictive licensing system will probably benefit those who can become fishermen; and it is equally true that those who do not become fishermen will be hurt. These are not the primary consequences of the legislation, for its purpose was and is in entirely different terms. Rather, it is in terms of the larger public good, measured by the legislature and found by it to be served by the restrictive licensing scheme.

In *Campbell v. State*,⁷⁹ the case involving chain dentistry, the legislature permitted present operators to continue under a grandfather clause. The court dealt with the argument that the grandfather clause favored present operators in the following language:

"It is true that such persons may exercise a privilege denied to others, but this same result follows from many lawful statutory classifications. Certainly such persons are granted no monopoly in the sense that competition with them is limited. By any lawful classification, rights more or less exclusive are vested in particular classes of persons. If for this reason legislative classification is unlawful, it would seem that such classifications could seldom be sustained."⁸⁰

79. 12 Wn. 2d 459, 122 P. 2d 458 (1942), discussed *supra*, nn. 66-69 and 75-76.

80. *Id.* at 472, 473; 122 P. 2d at 464.

2. *Due Process*

The decisions of the Washington State Supreme Court with respect to due process of law as applied to economic activity stem in part from the constitution of the state and in part from the Due Process Clause of the Fourteenth Amendment to the federal constitution. There is such an intermixture between the two, plus a substantial body of law dealing with the same problems in terms of the "police power," that it is probably best to separate the various factors first, in order to promote a better understanding of the case law later discussed.

First, just as the Washington court has had occasion to apply the Equal Protection Clause of the Fourteenth Amendment, so it has also had occasion to apply the Due Process Clause of the federal constitution to various cases which have come before it. In addition, and unlike the United States Supreme Court, the Washington court also has occasion to apply the corresponding clause of the state constitution. This state clause is Art. I, §3, "No person shall be deprived of life, liberty, or property, without due process of law." This is substantially identical to the Fourteenth Amendment provision, which reads, ". . . nor shall any State deprive any person of life, liberty, or property without due process of law."

The Washington court has not made any differentiation between the application of the two due process clauses, frequently stating that they mean the same. For example, Judge Main in *State v. Pitney*,⁸¹ a 1914 case, said, ". . . [T]he due process of law clauses in the state and Federal constitutions are substantially the same."⁸²

A further terminology, however, so frequently appears, especially in the state cases, that some discussion is warranted: Often when the problem is whether some particular legislation infringes upon the due process clauses, the court talks in terms of what legislation is justified by the "police power."

At least for purposes of logical analysis the term is an unfortunate one, for it has led to considerable confusion. Properly speaking, it means only that so far as our formal scheme of government is concerned, the state is empowered to enact all laws except as the state and federal constitutions may impose restrictions. This power of the state has often been referred to as the "reserved"

81. 79 Wash. 608, 140 Pac. 918 (1914).

82. *Id.* at 616; 140 Pac. at 919.

power or as a reservoir of power. The difficulties have been introduced, however, in attempting to define its outer limits, thinking apparently that it had some such limits apart from those constitutionally imposed. In truth, there need be none, except perhaps as there might be some political philosophy about the right of the people to go outside of constitutional government. Presumably, however, our governmental system is complete, and so long as the definition of those outer limits of the "police power" coincided with the restrictions which the constitutions imposed upon the states, there was no real difficulty introduced in considering the police power as a separate entity. When, however, the police power was thought to be either something less than what the constitutions allowed or as something more, then logical difficulties were introduced which have plagued the courts. Unfortunately for the problem herein discussed, the difficulties may still persist in some degree.

That the police power is affirmatively larger than permitted by the constitutional limits was asserted, for example, in *Frach v. Schoettler*,⁸³ a 1955 case in which the court stated:

"Appellants' rights with reference to the 'due process clause' and the 'privilege and immunity clauses,' as set out in Art. I § 3 and 12, of the state constitution, and in § 1 of the fourteenth amendment to the United States constitution, are not abridged by the act in question. It is the established rule in Washington that none of these constitutional provisions applies to law enacted by the state legislature in the exercise of its police power [citing three earlier Washington cases]."⁸⁴

This statement was returned to the court in *Peterson v. Hagan*,⁸⁵ a 1960 case, where

". . . [T]he attorney general argues that the equal protection clause and the due process clause of the fourteenth amendment to the United States Constitution and Art. 1, § 12 of the state constitution do not apply to legislation enacted under the police power. This court itself has used such broad language . . . [But] we reject flatly the argument that the due process and equal protection clauses of the federal and state constitutions do not apply to statutes enacted in the exercise of the police power. Otherwise, the result would be a police state, and legislative branch of the government would be omnipotent."⁸⁶

More subtle and perhaps more inimical to the general welfare has been the other consequence, of conceiving the police power as

83. 46 Wn. 2d 281, 280 P. 2d 1038 (1955).

84. *Id.* at 291; 280 P. 2d at 1044.

85. 56 Wn. 2d 48, 351 P. 2d 127 (1960).

86. *Id.* at 52, 53; 351 P. 2d at 130.

being actually smaller than would be allowable under the constitutions. This was particularly acute in situations where the court considered that the police power could be exercised only to pass legislation furthering the “public health, safety, or morals.” Would this exclude legislation passed for some other purpose?

While this was concededly not the dominant limiting factor in the court’s opinion in *Seattle v. Ford*,⁸⁷ a 1927 case, the court there certainly had a very strict view of what was permitted under the “police power.” The ordinance being challenged was one requiring a \$10.00 per day fee for a hawker’s license. The defendant, in a meat market on private property, but near the public way, held up T-bone steaks and called to passersby in an effort to sell his wares. Apparently the passersby could be either on the sidewalk or on the private property, there being no barrier. The court held the ordinance unconstitutional, as outside the police power, saying:

“The courts will go far in sustaining the exercise of the police powers for the preservation of the public health and safety, and in so doing private rights in conflict therewith are overridden; but on the other hand, the courts are equally concerned to see that, under the guise of protecting the public, private business—especially that carried on upon private property—is not arbitrarily restricted or interfered with . . . Our own cases [citing two and referring to others as illustrative] in the main, relate to ordinances establishing fire limits, fire escapes, weights and measures, building ordinances and the like, and fall clearly within the public health and safety rule, or they involve businesses, though of a private nature, which are in themselves injurious and harmful and are therefore prohibitable. None of these cases is at all helpful here.”⁸⁸

In the material which follows, therefore, will be repeated references to cases discussing police power, where the case is discussed in the text as involving the due process clause. It will facilitate analysis if they are considered, conceptually at least, as measuring the same thing—the extent of legislative power. In the case of the “police power” approach, the measure is in terms of determining the size of the power; in the “due process” approach, the measure is in terms of determining the restrictions upon power imposed by the due process clauses. Under either approach, the result should be the same.

The growth in Washington law in the application of due process to state regulations of economic activity has been quite similar to that of the federal law under the federal constitution. Thus the current

87. 144 Wash. 107, 257 Pac. 243 (1927).

88. *Id.* at 110, 111 and 112, 113; 257 Pac. 244, 245.

test in the Washington court of adequacy under due process, for example, can probably be stated in much the same terms as for the federal court: If there be a legitimate purpose to be accomplished by the legislature and a rational means selected to effect the purpose, the regulation is valid. In the definition of "legitimate" as used here, about the most that can be stated is that the act must be intended to further the general welfare, or as sometimes stated, be for the public good. As will be developed, the earlier cases, some of them particularly, seemed to insist that the permissible categories included only those measures which were for the public health, safety, or morals. A recent case will illustrate the inadequacy of that specification of legitimate purposes. The case is *Clark v. Dwyer*,⁸⁹ the 1960 decision upholding the apple grading system described earlier in this report under the discussion of equal protection. It had been strenuously argued in the briefs submitted in that case that the apples relegated to the "cull" category were healthful and free of blemishes, and hence to change the grading system to call them "culls" did not promote health or safety, and thus deprived the growers of their property without due process of law. The court rejected this argument, saying:

"The wisdom of this change is a matter within the province of the legislature, not of this court, and its purpose, which we assume to be for the protection of the reputation of Washington apples and the betterment of the industry, and as a result the general welfare, is one which could be properly served in the exercise of the police power."⁹⁰

This was but a reaffirmation of the same view expressed and applied in a much earlier case, *State v. Pitney*,⁹¹ decided in 1914. In that case the court upheld a prohibitory tax on trading stamps used as "trade stimulants." Against an argument that there was nothing immoral, unhealthy or unsafe about the use of trading stamps, the court said:

"The early decisions define this power [of the legislature] as extending to those regulations promulgated by or under the authority of the legislature which had for their object the promotion of the public health, the public morals, or the public safety. Without reviewing the evolution of the law upon this subject, as evidenced by the decisions of courts of last resort, it may be said that, whatever may be the limits by which the earlier decisions circumscribed the power, it has, in more recent decisions, been

89. 56 Wn. 2d 425, 353 P. 2d 941 (1960), *cert. den.* 364 U. S. 932 (1961), discussed *supra*, nn. 52-53 and 59-60.

90. *Id.* at 433; 353 P. 2d at 946.

91. 79 Wash. 608, 140 Pac. 918 (1914), discussed *supra*, n. 81.

defined to include all those regulations designed to promote the public convenience, the general welfare, the general prosperity, and extends to all great public needs, as well as regulations designed to promote the public health, the public morals, or the public safety.”⁹²

This case, incidentally, was fully reviewed by the United States Supreme Court and there affirmed.⁹³ In that decision, the United States Supreme Court likened the use of trading stamps to gambling, pointing out that the trading stamp’s easy availability made the buyer think he was getting something for nothing, whereas, as a matter of fact, he was really paying for the products which the coupons brought him. The legislature was thus protecting the buyer against improvidence induced by his own greed. This, of course, is one of the justifications for laws against gambling. Perhaps one could fit this into a classification of a law enacted in the interest of public morality; it would seem more accurate to recognize both the trading stamp law and the gambling laws as separately maintainable upon the straight-forward basis that the legislature serves a public purpose in protecting a person from the unfortunate consequences of his own greed.

The claims asserted under the heading of due process protection of economic interests have been many and varied. They have included those which flow from ownership of land or other tangible property, from contractual relationships or relationships in commercial transactions involving negotiable instruments, and from the conduct of a great variety of occupations.

Two cases dealing with state regulations which restricted the time during which clams could be harvested commercially illustrates claims made on the basis of property ownership. In each of these the court decided that the restrictions could constitutionally be applied even to a person who wanted to dig his own clams upon his own land. In the first of these cases, *State v. Van Vlack*,⁹⁴ decided in 1918, the court said:

“. . . We are of the opinion that the act in question, as applied to private owners of clam beds in tide lands abutting on Puget Sound, is not unconstitutional. Let it be remembered that property in clams is not the result of human effort or industry; such property is acquired by the uncontrolled forces of nature. It cannot be said, therefore, to be unreasonable to so regulate the use and enjoyment of this manna-like possession by

92. *Id.* at 610, 611; 140 Pac. at 919.

93. *Pitney v. State of Washington*, 240 U. S. 387 (1916).

94. 101 Wash. 503, 172 Pac. 563 (1918).

a private owner as to conserve the interest, not only of the public, but of the private owner as well. He is not deprived of his property by the act in question.”⁹⁵

This case was approved and applied again to a private owner of the clams and clam beds under a similar statute restricting the time during which razor clams could be dug commercially. The later case, *Wiegardt v. Brennan*,⁹⁶ was decided in 1937.

In a somewhat different setting but similarly dealing with a claim based on ownership of property is a 1940 case dealing with an act passed for a different purpose. In this case, *State v. Sears*,⁹⁷ the court held constitutional a statute which prevented the owner of property from selling it at any price he chose. The statute, passed in 1939, was aimed at acts done with the purpose of injuring competitors or destroying competition, such as preventing unfair trade practices, outlawing “loss leaders” and sales at different prices for the same items sold by the same operator at two different stores within the community. By a 5-4 vote, the court upheld the statute, saying:

“We believe it has become firmly established that the police power of the state extends not only to the preservation of the public health, safety and morals, but also to the preservation and promotion of the public welfare . . . We may or may not agree with the economic philosophy of the unfair practices act, but it is no part of the duty of this court to determine whether the policy embodied in a statute is wise or unwise. It is primarily a legislative, and not a judicial, function to determine economic policy. If it be declared legislative policy to curb unrestrained and harmful competition, by measures which are not arbitrary or discriminatory, it is not for us to say the rule is unwise.”⁹⁸

Similarly, contractual relationships have been constitutionally subjected to substantial legislative restrictions. These instances for the most part have involved statutory regulations of hours and wages. The Washington case of *Parrish v. West Coast Hotel Co.*⁹⁹ was the case which, when it was decided by the United States Supreme Court,¹⁰⁰ became the leading case for the proposition that the state could constitutionally require a minimum wage scale for women. Yet when the case had been decided by the Washington court, that

95. *Id.* at 509; 172 Pac. at 565.

96. 192 Wash. 529, 73 P. 2d 1330 (1937).

97. 4 Wn. 2d 200, 103 P. 2d 337 (1940).

98. *Id.* at 204 and 207; 103 P. 2d at 340, 341.

99. 185 Wash. 581, 55 P. 2d 1083 (1936).

100. *West Coast Hotel Co. v. Parrish*, 300 U. S. 379 (1937), discussed *supra*, nn. 25, 27.

court also had held the state law valid. This position was reaffirmed in *Peterson v. Hagan*,¹⁰¹ a 1960 case dealing with a state fair labor standards act. While holding the act unconstitutional upon a narrow and strict interpretation of the requirements of equal protection, the court summarily disposed of the argument that due process forbids legislation which would apply generally to restrict the hours and wages of labor, saying:

“But since that decision [*West Coast Hotel Co. v. Parish*] and *United States v. Darby*¹⁰² [a 1941 United States Supreme Court decision] sustaining the constitutionality of the Federal Wages and Hours Act, the right of the legislature to regulate hours and wages is not open to serious question . . . *Seattle v. Smyth*¹⁰³ [a 1900 Washington decision], to the contrary notwithstanding . . . It remains only to say that *Seattle v. Smyth, supra*, is now overruled.”¹⁰⁴

Similarly, a legislative change in a former rule with reference to negotiable instruments used in commercial relationships can be effected without violating the due process concept even though the change is not for the immediate health, safety, or morals of the public and even though it may operate to relieve a bank of its own negligence, putting the loss on a person who acted without negligence. In this case, *Overlake Homes, Inc. v. Seattle-First National Bank*,¹⁰⁵ decided in 1961, the legislature had provided that the bank which honored a forged check could nevertheless charge the check to the account of the depositor whose signature was forged unless the depositor notified the bank of the forgery within sixty days after the cancelled check was returned to the depositor. The former rule under the non-statutory law had allowed the depositor a reasonable time after the discovery of the forgery, not necessarily this absolute sixty-day period. The court upheld the statute, saying:

“It is well settled that, inasmuch as banks are indispensable agencies through which the industry, trade, and commerce of all civilized countries and communities are carried on, the business which they transact, though for private profit, is of a pre-eminently public nature, and is therefore universally recognized as a proper subject of legislative regulation . . . That act did not deprive the plaintiff of any right which it hitherto had [the law had been changed before plaintiff deposited his funds], and it was well within the power of the legislature to change the common law . . . It must

101. 56 Wn. 2d 48, 351 P. 2d 127 (1960), discussed *supra*, nn. 85-86.

102. 312 U. S. 100 (1941).

103. 22 Wash. 327; 60 Pac. 1120 (1900).

104. 56 Wn. 2d at 54, 55; 351 P. 2d at 131.

105. 57 Wn. 2d 881, 360 P. 2d 570 (1961).

be presumed that the legislature determined that to promote the orderly and efficient conduct of the banking business, the duties of depositors, and the liabilities of banks should be defined more specifically than they were at common law."¹⁰⁶

Due process has often been asserted in an attempt to immunize persons in the conduct of their occupations from legislative control or prohibition. As a general rule, most of the state regulations have dealt with the validity of qualifications which have been prescribed by the legislature. An obvious example of a qualifications case is *Ellestad v. Swayze*,¹⁰⁷ a 1942 case holding that chiropractors could constitutionally be required to pass a basic medical examination. Others have dealt with architects,¹⁰⁸ plumbers,¹⁰⁹ barbers,¹¹⁰ etc. In nearly every instance the statutory scheme was upheld as being reasonably appropriate to promote the public good, although there were some cases in which the particular method employed by the legislature or by the administrators working under the legislative scheme ran afoul of some constitutional limitation. This happened, for example, with respect to pilots, in the 1939 case of *State ex rel. Sater v. State Board of Pilotage Commissioners*.¹¹¹ There the pilotage commissioners, under a legislative scheme for requiring examinations to determine that prospective pilots were qualified, were claimed to have used that scheme to refuse to permit otherwise qualified persons even to take the examination. The court held that if these claims could be factually established, the procedure would violate equal protection requirements because it appeared to be rank favoritism. Basically, however, such a qualification requirement would be above question.

The general principle was well stated by Judge Main in *State v. Pitney*,¹¹² a 1914 case referred to earlier dealing with a prohibitory tax on the use of trading stamps. After setting forth the broad purposes for which legislatures can enact regulatory or prohibitory legislation, in terms simply of serving the general welfare, he quoted

106. *Id.* at 884, 885; 360 P. 2d at 572, 573.

107. 15 Wn. 2d 281, 130 P. 2d 349 (1942).

108. *Sherwood v. Wise*, 132 Wash. 295, 232 Pac. 309 (1925).

109. *Tacoma v. Fox*, 158 Wash. 325, 290 Pac. 1010 (1930), overruling *State ex rel. Richey v. Smith*, 42 Wash. 237, 84 Pac. 851 (1906), where the court had held invalid a licensing scheme for plumbers.

110. *State v. Walker*, 48 Wash. 8, 92 Pac. 775 (1907).

111. 198 Wash. 695, 90 P. 2d 238 (1939).

112. 79 Wash. 608, 140 Pac. 918 (1914), discussed *supra*, nn. 81-82 and 91-93.

from an opinion of the United States Supreme Court in *Schmidinger v. Chicago*:¹¹³

“The right of state legislatures or municipalities acting under state authority, to regulate trades and callings in the exercise of the police power is too well settled to require any extended discussion . . . what such regulations shall be and to what particular trade, business or occupation they shall apply, are questions for the state to determine . . .”¹¹⁴

D. Application to the Particular Problem

The foregoing analysis of the constitutional requirements for the validity of state regulations of economic activity can, in general terms, be reduced to a fairly simple statement which, it will be noted, should satisfy the requirements of both equal protection and due process. It is this: regulations of a business activity are valid if they are the result of legislative judgment based on factual information, rationally deciding from those facts how to alleviate a harm which is currently being caused or threatened to be caused to the welfare of the persons within the state, or, affirmatively, how to further that welfare. That the legislature must make a rational choice based on those facts also implies that it should act fairly as among the different persons within the state who may be affected by the legislation. This latter requirement is often stated in these terms: any differences in treatment must be related to the problem to be solved, making only such discriminations among persons as could rationally be thought appropriate to the solution of the problem. It will be noted, incidentally, that this test does not require everyone to agree that the solution chosen by the legislature is the one that he, himself, were he a legislator, would have chosen. All that is required is that a reasonable body of fair-minded men could have chosen this particular solution to the problem.

One further subsidiary aspect should also be noted:

In determining the factual details which the legislature thinks to constitute the problem and the means appropriate to its solution, the legislature can inform itself as it chooses. Its decision to legislate thereupon will be sustained by the court if there is *any* basis in fact for it to consider that there is a legitimate legislative purpose to be served by the legislation it enacts. The methods employed by a legislature in this process are peculiarly its own and may range from research work such as this project with the University of Washington

113. 226 U. S. 578 (1913).

114. 79 Wash. at 611; 140 Pac. at 919.

illustrates, to committee hearings at which evidence is taken, to the most informal and casual contacts of the individual legislators with their constituents and others, to matters of common knowledge in the community or state. In this project, where there have been extensive biological and economic factual studies, several legislators themselves undoubtedly have other pertinent facts within their own knowledge, for this particular field of salmon fisheries is of major importance and significance in the history and present economy of the State of Washington.

Where in this portion of the report, therefore, references are made to factual details, they are made solely to show that there is *some* basis for legislative action. Undoubtedly there are more and possibly varying factual details in the minds of many persons both within and without the legislature.

This important viewpoint of the function of the legislature with respect to its factual basis for legislation has been forcefully stated on several occasions by the Washington court. Perhaps the best is in a relatively old case, in an opinion by Judge Main written in *State v. Pitney*,¹¹⁵ a 1914 case:

“In determining whether the provisions of a law bring it within the police power, it is not necessary for the court to find that facts exist which would justify such legislation. If a state of facts can reasonably be presumed to exist which would justify such legislation, the court must presume that it did exist and that the law was passed for that reason. If *no* state of circumstances *could* exist to justify the statute, then it may be declared void because in excess of the legislative power.” [Emphasis supplied.]¹¹⁶

A recent application of that same policy is seen in *Clark v. Dwyer*,¹¹⁷ the 1960 decision upholding a change in the color-grading system used for apples discussed earlier in this report:

“It *may well be* that the legislature found that the marketing of apples designated as C grade in standard Washington apple boxes had no adverse effect on the market value and reputation of the fancy grades of yellow and green varieties and, therefore, no change in the grading system for these apples was needed. The legislature *may have found it to be a fact* that color differences in the yellow and green varieties of apples are much less pronounced than in the red and partial red varieties, and have little significance in the mind of the purchaser.” [Emphasis supplied.]¹¹⁸

115. 79 Wash. 608, 140 Pac. 918 (1914).

116. *Id.* at 612; 140 Pac. at 920.

117. 56 Wn. 2d 425, 353 P. 2d 941 (1960), *cert. den.* 364 U. S. 932 (1961), discussed *supra*, nn. 52-53, 59-60, and 89-90.

118. *Id.* at 436; 353 P. 2d at 948.

No one would quarrel with the proposition that the wise use of a natural resource is a matter of utmost concern to the legislature and to the people generally of a state, not only in alleviating problems which may have arisen with respect to that use but also in affirmatively promoting and furthering that use in a way which will benefit the welfare of those persons. It would be apparent, therefore, that such concern could and should be felt by the legislature of the State of Washington toward the salmon fisheries of Washington, both from the standpoint of the consuming public and the very substantial economic activity which it supports.

Among the various aspects of the salmon resources with which the legislature can, does, and should directly concern itself are at least the following: First are the present uses for food, for recreation, and for commercial exploitation. Included in the last item is not only the commercial activity associated with the use of the salmon resource within the state for food and recreational benefits, but also the purely commercial aspect associated with the processing and shipment out of the state of the salmon for consumption elsewhere. Second are the long-term considerations: To enjoy the present uses over an appreciable period it has become apparent that affirmative steps have to be taken to insure a continuing supply of the salmon. Also, choices have to be made occasionally, for as our civilization becomes more complex, more and more of our structures, products, and waste products will add to the difficulty of insuring a continuing supply of salmon. Also, and closely related to this latter consideration, is the evaluation of various alternatives. How much is it worth to assure continued supplies of fish?

It bears repeating that these are legislative concerns; they are not the concern of the court. If any of these concerns has been the occasion for legislation, it is not for the court to say that it would have evaluated any of the factors differently or tried to achieve a different result.

With this suggestion of the possible legislative objectives, turn now to the problems which have faced the legislature in the accomplishment of these objectives. Here, too, it should be noted, it is the function of the legislature to measure the extent of the problem and to form its idea of how to solve the problem.

The first and most persistent problem stems from the acquisitive nature of man: In the absence of some type of governmental control over the fishery, there soon would be no fish. The basic reason for

this is that without some type of governmental control, there would be no limitation upon the availability of all fish to all comers at all times and all places. Given the population of humans and the numbers of fish and their value, they would soon be gone. In other words, there is no incentive upon each individual fisherman to quit fishing in the interests of conservation, for he knows that if he does not catch the fish, someone else will. Contrast this to the landowner who "tree-farms." Originally, when the supply of land and timber was more than adequate to fulfill the needs of man, the timber cutter simply moved from one location to another. But, as the sources of supply have dwindled, the timber-cutter is in the process of becoming a landowner who grows his own product. As part of that process, he, himself, sees to it that there is some continuing source of replenishment of the supply, and he can assure himself of this replenishment because he has control. When he stops cutting to allow regeneration, no one else can lawfully come in to take what is left. Not so with the fishery; so far we have not attributed to the fishing grounds the same incidents of area control that we do in the case of ordinary land ownership.

This, then, has been the primary reason for governmental control. For the most part it has taken the form, as all are aware, of restrictions upon the time and place for fishing and upon the gear which can be used.

It would be useful to recall the opinion of Mr. Justice Rutledge in *Republic Natural Gas Co. v. Oklahoma*,¹¹⁹ a 1948 decision of the United States Supreme Court, discussed more fully earlier in this report. In that case, Oklahoma had had to legislate special rules to cope with the problem caused by the mobile nature of underground gas in order to protect the owner of the ground area as marked out on the surface. Since the gas tends to flow underground toward the place from which it is being taken to the surface, without regard to man's division of the area into various land titles on the surface, each landowner benefits most if he extracts the gas as fast as possible. In this opinion the following comment is made with respect to this problem:

"These difficulties, intensified by the competitive struggle for the product and the inadequacy of common-law ideas to control it, have forced both the states and the federal government to adopt extensive regulatory measures in recent years. This has been necessary both to conserve the

119. 334 U. S. 62 (1948), discussed *supra*, nn. 37-40.

public interest in this rapidly depleting natural resource and to secure fair adjustment of private rights in the industry . . . It is far too late, if it ever was otherwise, to urge that the states are impotent to restrict this unfettered race or to put it upon terms of proportionate equality by whatever measures may be reasonably necessary to that end.”¹²⁰

This peculiar characteristic of these “mobile” resources is thus the primary reason for governmental control. So far, within the fishing industry, it has taken the form of restrictions upon the time and place for fishing and upon the form of gear which may be used.

The problems to which this project have been directed have been the inadequacies which the legislature has perceived to have resulted from that form of governmental regulation. Although the old form of those regulations, *i.e.*, the restrictions upon time, place and gear, has indeed been of substantial help in conserving the salmon resources, it has not wholly solved the old problem and, at the same time, has introduced a whole set of new problems.

The first of these is but a ramification of the old problem: As is outlined in other parts of this report, the peculiar fact of salmon migration is that it does not provide adequate escapement for spawning simply to insure that some total number of salmon be permitted to go upstream during the over-all season, without regard to when and from what subgroups of salmon those spawning salmon are selected for escapement. The fish apparently travel in rather discreet groupings, in fact in such small groups that, with a scheme of fishing regulation which allows unlimited fishing effort one or two days a week and then no fishing at all for the rest of the week, a highly unbalanced batch of salmon are allowed to go up for spawning. It should be emphasized, incidentally, that this paragraph’s coverage of this aspect is probably somewhat oversimplified; details are the subject for the biologists; it is sufficient for the legislative purpose that the legislator understand as well as he can the dimensions of the problem, have faith in his scientific advisers, and act rationally upon their advice. Certainly, there is sufficient recommendation from biologists and others familiar with the fishing industry for the legislature to take steps to remedy these undesirable consequences of uneven and largely uncontrolled fishing effort.

This phase is further complicated by the requirements of accurate measurement of salmon passage, both for escapement and for division of the Fraser River catch by the International Commission upon

120. *Id.* at 92.

an equal basis between the United States and Canadian fishermen. With long periods of no fishing followed by short periods of intense fishing, the ability to chart the various runs as they progress is made very difficult; a more sustained fishing effort, spread over most of the week, would greatly aid in predicting the run and insuring both the proper kind of escapement and, further, the proper division of the catch.

In addition to these strictly biological factors which constitute a basis for legislative action, there are certain related consequences which have an inter-mixture of economics. These, in turn, have a most important effect upon the sociological considerations which are also the proper subject for legislative concern. These, too, are the result of intense fishing effort expended for very limited periods of time. When the requirements of escapement dictate that the fishermen operate only two or three days a week, as is frequently the case under the present scheme, several undesirable consequences flow.

There is some reason to think that the enforced limitations upon gear have stood in the way of development of new techniques and equipment. Such devices and methods as monofilament line for gill nets and airplane and electronic locating have had to be prohibited for the rather odd reason that they would catch fish better than the old methods and equipment. Similarly, the rather difficult way for making a living which a two-or-three-day-a-week fishing schedule enforces or produces is likewise somewhat discouraging to the investment in new boats and gear.

Were those engaged in the fishing industry to have only their local associates for competitors, perhaps these factors would not be serious. But the complications which are bound to arise from foreign competition will become acute. Consider the following: the rapid improvement and expansion of Russian and Japanese fisheries, the attitude of the United States as a whole to encourage foreign trade by lowering or eliminating tariffs and other obstacles, the current and increasing practice of catching salmon on the high seas, and the increasing competition among fish products. Certainly, when the legislature considers these threats to the continued economy of the state and tries to plan to meet the new situation as it develops, it would seem to be the best of wisdom for the legislature to take whatever steps it considers necessary to encourage American fishermen. The current experience in England also furnishes the legislators with an object lesson, for England's long-protected, inefficient local

industries are now threatened with the keen competition from the other countries of the European Common Market if England joins the group; yet, England seemingly has no real choice, for its economic future fairly requires its entry into the group. It should, therefore, be within the realm of legislative judgment for the Washington legislators to take steps to insure efficiency, not to perpetuate inefficiency, within the fisheries.

The foregoing is a brief, simplified, and quite incomplete list of the problems faced by the people of Washington with respect to commercial salmon fishing. Its inclusion here is intended for only two purposes:

The first is to demonstrate that there are substantial elements of public interest associated with all aspects of the salmon fisheries of Washington, that there are continuing old problems and complex new problems which must be solved to insure the continued prosperity and well-being of the people in the state, and that these furnish a basis upon which legislative judgment may be made in carrying out the legislature's basic function — the enactment of those laws which, in its judgment, are for the good of the general welfare.

The second purpose is to demonstrate that there is one dominant characteristic of the present problems in the field which, if removed or substantially reduced in severity, would tend materially to improve the welfare of the people of the state with reference to the salmon fishery. The characteristic is obvious: The present problems are largely traceable to the fact that, up to now, the schemes for regulating the fishery have put no restriction upon the number of participants; in fact, it has been the fact that all comers could participate which has led to the highly undesirable characteristics of the fishery as outlined above.

These two purposes having been demonstrated, there remains for analysis only the task of considering the methods which may be employed by the legislature to accomplish the desired result.

It should be emphasized as a preliminary matter that, although the current problem is primarily one of the number of participants, the legislature can be and should be concerned also with the quality of the fishermen and the fishing equipment. Dominant, however, is the need to produce a more uniform fishing effort with accurate control over the catching process and extended over a more continuous period of time.

In this respect the problem, from a legalistic point of view, ought

to be compared with the very similar problem faced by a legislative body when it decides how to manage other similar functions or resources which yield best to restrictions upon the number of participants. For example, the radio broadcasting business started with a rush for all available channels of broadcast, with such a welter of overlapping and jamming stations that federal legislation became absolutely essential. Finally, under the 1927 act and the later 1934 act, the government has come to allocate the various wave lengths as among the various applicants upon the basis of who will give the best service to the public.¹²¹ It will be noted that this process is not simply one of weeding out the incompetent, but of choosing from among admittedly competent broadcasters. The state does the same for many similar functions, such as the granting of franchises for ferry crossings, intrastate bus lines, and the like. Similarly, where determinations have been made upon some ground other than purely physical limitations, the legislatures have also imposed limitations upon the number of participants. The most recent of these to undergo judicial scrutiny is Seattle's jukebox licensing scheme. Under that scheme, Seattle limits the number of jukebox licensees to one for every 10,000 residents. This scheme, incidentally, seems a rather approximate one; certainly a more logical one would have been to limit the number of jukeboxes directly, not as here by allowing any one licensee to have as many jukeboxes as he pleased up to an upper limit of 150. Nevertheless, the court upheld it in *Ragan v. Seattle*,¹²² decided in 1961.

Illustrations of the same sort of limitation upon number are seen in the liquor control statutes, where the Class "H" licenses are limited to not more than one for every 1,500 in population,¹²³ and in the various cities' taxicab licensing ordinances. Seattle, for example, limits the number of taxicabs to not more than one for every 2,500 inhabitants.¹²⁴

It should be noted, incidentally, that such a licensing scheme tends to put a value on the license, even though the licensing authority usually retains full power to determine who shall be a successor

121. For an excellent discussion see the opinion of Mr. Justice Frankfurter writing for the majority in *National Broadcasting Co., Inc. v. United States*, 319 U. S. 190 (1943), especially at 210-220.

122. 58 Wn. 2d 779, 364 P. 2d 916 (1961), discussed *supra*, nn. 54-55, 57.

123. Revised Code of Washington §66.24.420.

124. Seattle Ordinances §10.69.130 (Ord. #59866 §3, as amended by Ord. #79136, July 10, 1950).

or new licensee. Yet we permit this accumulation of value because of the overriding public interest served in the control of number of participants thus achieved. And, most important, the emphasis should be that whether to have such a limitation is a legislative judgment, not a court judgment. As Judge Hill for the majority in the *Ragan* case stated:

“We cannot say that the legislation enacted by the city, regulating the operation of jukeboxes is unreasonable or oppressive, or that it does not have a substantial relation to the accomplishment of purposes fairly within the scope of the police power.”¹²⁵

A somewhat similar case occurred in California recently, mentioned here because it, like the *Ragan* case, went to the United States Supreme Court, with results presently to be indicated. In the California case, *In re Petersen*,¹²⁶ decided in 1958, San Francisco’s method of licensing taxicabs was challenged as violating equal protection requirements. The system allowed taxicab operators to operate cab stands at only certain designated places around the city and further provided that only the operator who had the permission of the adjoining owner (usually a hotel operator or similar businessman) would be entitled to occupy that particular place. The court upheld this, with this language:

“If many cabs of different owners should try to park at one stand, an obstruction of traffic might result. The sole permittee who has a telephone connection with its exclusive stand would be in a better position to maintain a constant cab service at the stand, without an excessive supply of cabs at some times and a dearth at others. Exclusive stands may facilitate police supervision and may prevent disorderly and aggressive solicitation of one customer by drivers of different taxicab owners. Accordingly, we cannot agree that there are no rational grounds for the establishment of exclusive stands.”¹²⁷

Further on, with reference to the required consent of the adjoining owner, the court said:

“Under these circumstances it can reasonably be considered in the interest of harmonious relations and good service to give effect to the preferences of the occupants of the property in designating stands and their permittees. If the consent system also has undesirable features, such as the power of the occupant to exact payment for his consent, the weighing of the advantages and disadvantages is a matter of policy wholly within the legislative power of the municipality.”¹²⁸

125. 58 Wn. 2d at 786; 364 P. 2d at 920.

126. 51 Cal. 2d 177; 331 P. 2d 24 (1958).

127. *Id.* at 27.

128. *Id.* at 28.

This result was reached by a 6-1 vote of the California Supreme Court. The dissenting judge relied on both the Equal Protection Clause of the Fourteenth Amendment to the federal constitution and on the corresponding provision of the California constitution. This latter clause is nearly identical to the Washington state provision, California's reading, "... nor shall any citizen, or class of citizens, be granted privileges or immunities which, upon the same terms, shall not be granted to all citizens."¹²⁹

Similarly, the Washington decision in the *Ragan* case, dealing with jukebox licenses, where similarly there was little basis for limiting the number of licensees insofar as the qualifications of applicants was concerned yet a strong reason to limit the absolute number of participants, there were three dissenters to the six-vote majority. The dissenters relied upon equal protection concepts, quoting particularly the Washington constitutional provision, "No law shall be passed granting to any citizen . . . privileges . . . which upon the same terms shall not equally belong to all citizens."¹³⁰

Each of these cases was appealed to the United States Supreme Court. It should be noted, incidentally, that when the litigant claims he has had a federal constitutional right violated and the state court denies that such is the case, he has an absolute right of appeal to the United States Supreme Court. Yet, if the United States Supreme Court thinks the claim is not valid, not even reasonably debatable, that court will deny the appeal out of hand. In each of these cases, the litigant's appeal to the United States Supreme Court was based upon the Equal Protection Clause of the Fourteenth Amendment. Yet, the United States Supreme Court made short work of each case. In each one, the dismissal was in the court's standard language for this type situation, delivered in the *Petersen* case on June 15, 1959, and in the *Ragan* case on October 8, 1962: "The appeal is dismissed for want of substantial federal question."¹³¹

Under a scheme for limitation upon the number of participants, how may the legislature decide who shall fish? This matter, like all other matters in the regulation of economic activity, is one for legislative judgment. So long as the method employed is rationally in support of the objective, it will meet the standards of due process. Also, as far as the requirements of equal protection are concerned,

129. California Constitution, Article 1, §21.

130. Washington Constitution, Article 1, §12.

131. *Petersen*: 360 U. S. 314 (1959); *Ragan*: 83 Sup. Ct. 22 (1962).

if there be some classification of persons involved, as there obviously will be, the classification need only rationally relate to the legitimate objectives.

At this point it would be well to recall the earlier discussion of what constitutes legitimate objectives, particularly as they relate to the requirements of equal protection.¹³² It was there pointed out that, as incident to a principal legislative objective, there could be and often were subsidiary legislative objectives. In this instance it should be apparent that there will be that situation. The principal objective is, broadly speaking, the continued and improved utilization of the salmon resource for the good of the general welfare of the people in the state. Possibly we could also say that, as a more specific objective, the legislature wishes to restrict or control the number of fishermen, the legitimacy of which, as a legislative means to accomplish the broad objective, has previously been discussed. This could be considered a sort of subsidiary or implementing legislative matter, calling, again, for only those specific means for accomplishment as rationally relate to it. If, then, the immediate purpose be to limit the number, in as fair a way as the legislature can devise, any scheme which accomplishes this objective should be legitimate. Presumably here the fairest system would be by lot; it certainly would have the virtue of removing all suspicion of favoritism. It does not, however, rule out other devices; for example, a scheme based on the order of priority in application after a certain date should be sufficient.

The Washington legislature has provided for one such lottery with respect to natural resources in the statutes dealing with game animals. A special provision (R.C.W. 77.12.150) calls for a drawing by lot to determine who may hunt for excess game animals which may have been found to exist in any particular locality. Here the term, "excess," means that there are so many animals in a particular area that they are harming property or over-grazing their range. The object of the provision allowing a special hunt for this excess is thus to bring the game population down only to the maximum which can be properly sustained in the area. That the legislature should determine to use the special technique of limiting the number of hunters for this purpose seems at least rational, in view of the much greater control which is thus available, than if all ap-

132. See the discussion in the text at nn. 66-74.

plicants were to be granted permission to hunt for this limited purpose. The limitation on number of hunters was not the only way, it will be noted, by which the legislature might have tried to accomplish its objective. It could presumably have said that all applicants shall be allowed to hunt, but that the game director should so limit the duration of the hunt that the correct number of animals would be killed. But, this is a matter clearly within the realm of legislative choice. Since the legislature had decided, however, that only a certain number of hunters ought to participate and yet it further desired that all persons have an equal opportunity to take part, the only feasible scheme was to conduct a drawing. Here, too, the legislature could have decided to pick only the best qualified hunters to do the job; yet, again, this is a matter for legislative choice, for it can decide for itself how it wants to accomplish its objective.

It is possible, of course, that the legislature might wish to accomplish other subsidiary purposes in limiting the number of fishermen. For example, if a determination were made by the legislature, as is quite possible, that it wished to avoid the undesirable consequences of persons entering the fishing industry who were prospectively poor risks from a financial standpoint, an additional standard for licensees could also be specified. This type of qualification could of course be extended almost indefinitely, as the legislature deemed it advisable in the interests of the public welfare. Such matters as the person's ability to pay his crew, to have safe equipment, and to provide adequate refrigeration for the fish might well be considered to be influenced by the financial resources of the applicant, and thus such a standard could be considered highly material. Or, a person's demonstrated or otherwise established prospective ability to handle a boat or other technical qualification could well be prescribed by the legislature. If such matters be additionally considered necessary, the scheme would resemble most closely that followed by the federal government in determining who should have radio and television channels for broadcast. There the applicants are frequently all capable of meeting a minimum of quality; but, since the absolute number of participants must be limited, the choice is made, within that numerical limit, of the applicants who are best qualified. There could be no doubt that such a scheme ought to meet constitutional standards if employed in the fishing industry.

The additional subsidiary purpose of providing for administrative convenience is or may be important in the legislative scheme adopted

as incident to the restrictive licensing scheme for fishing. Certainly such matters as ease and effectiveness of enforcement are important. As in the California case dealing with taxicabs, where the court pointed out, "Exclusive stands may facilitate police supervision . . .,"¹³³ here in the fishing industry, the legislature could well decide that continued and improved enforcement of the proper escapement would be best facilitated by the restrictive licensing system. Furthermore, this conclusion should be constitutionally valid, even though someone else might decide that he could provide as good escapement by some other method. This has been suggested, incidentally: *i.e.*, not to restrict the number of fishermen but to stagger various separately-fishing groups throughout the week. That the administrative officials could or should consider this a difficult system to enforce, as apparently they do, ought to be a completely adequate reason for the legislature to reject it and choose in its place a restrictive scheme, even in the absence of other advantages to be gained from the restrictive scheme.

One other subsidiary purpose of the legislature, should it decide to adopt a scheme for restrictive licensing of fishermen, is the desire to ease or eliminate the hardship which such a scheme would impose upon present fishermen should any of them be told he could not thereafter fish. Such a consideration supports a classification of persons into two groups—those who have been fishing and those who would hereafter enter the fishery. This consideration is, of course, a frequently recurring one and one which has usually resulted in the enactment of a "grandfather clause." The validity of such clauses has been upheld in many cases, as against a claimed violation of the concept of equal protection. Because of the existence of one case in Washington dealing with such a clause in the fishing industry, a separate discussion of that case is, however, desirable. The case is *State ex rel. Bacich v. Huse*,¹³⁴ a 1936 decision holding invalid a provision in an initiative measure which limited the gill netters to only those who had licenses in the years 1932 or 1933. The court did not have pressed upon it the considerations outlined above which here furnish the basis for legislative judgment that the number of fishermen should be limited to some certain number. Rather, the measure looked simply like a device to preserve the benefits of the fishery to a few without any corresponding benefit to the state as

133. 331 P. 2d at 27.

134. 187 Wash. 75, 59 P. 2d 1101 (1936).

a whole. This is not the fact in the proposal discussed in this report.

The court was reinforced in this position in that there was no provision for new persons to get into the field. It looked for all the world like a scheme to preserve the benefits solely for the old-timers, and quite unlike the present proposal which is designed to insure a scheme for utilization of the salmon resources which will prove beneficial to the people of the state as a whole upon an enduring basis.

Also, the court in the *Bacich* case was additionally persuaded that the scheme was not even a rational one to promote the usual purposes of a "grandfather clause." Why, for example, were the 1934 licensees not included within the protection?

By contrast, "grandfather clauses" have frequently been upheld as against constitutional attack. The best example in Washington is *Campbell v. State*,¹³⁵ a 1942 decision discussed earlier in this report. There in a legislative scheme prohibiting "chain-dentistry" the court sustained a "grandfather clause" permitting present licensees to continue, saying:

"There must be a fixed time for the commencement of the operation of any law, and many statutory classifications are based solely upon the time element . . . Persons within the exception have previously invested time, labor, and capital in the establishment of chain dental offices, when that form of dental practice was recognized as lawful. To prohibit the continued maintenance of such established dental offices might well result in pecuniary loss while one who has not previously maintained any such office is not in the same manner affected by the prohibition of the statute."¹³⁶

Similarly, as earlier pointed out in this report, the legislature might well wish to avoid a charge of unconstitutional deprivation of property should a statute be made retroactive in the sense of prohibiting persons from carrying on their previous means of livelihood.¹³⁷ Although under present standards of constitutional law this result seems a very unlikely holding, certainly the legislature might avoid it. In the *Campbell* case, for example, the court put it thus:

". . . it would seem unreasonable to place the legislative authority of the state, when it appeared desirable to legislate against an existing evil, in the difficult situation of being compelled to choose between a course which would possibly render proposed beneficial legislation obnoxious, upon the constitutional ground that it unwarrantedly interfered with vested constitutional rights, or taking the other line, enact a law subject to attack for the

135. 12 Wn. 2d 459, 122 P. 2d 458 (1942), discussed *supra*, nn. 66-69, 75-76, 79-80.

136. *Id.* at 470; 122 P. 2d at 463, 464.

137. See the discussion in the text at n. 72.

reason that it could not operate *in futuro* because it undertook to preserve such vested rights.¹³⁸

E. Collateral Considerations

Often appearing in cases involving state regulations of various occupational activities are certain concepts which for the most part have not been discussed earlier in this report. While these are not considered crucial to the foregoing analysis, they recur with such frequency in this field of constitutional law that they must be separately discussed. Properly understood, they can be of considerable assistance; misunderstood, their application can be quite harmful.

1. *Police Power*

The first of these is the concept of "police power." This has been discussed earlier under the heading of "due process" and needs little further elaboration. As there pointed out, if by that term it is understood to refer to the fact that the legislature may enact all such laws as it sees fit except as controlled or limited by the constitutional limitations, clear analysis is facilitated. If, on the contrary, the police power be considered something apart from constitutional law, difficulties are introduced, whether the police power as thus understood be something less than the constitutional limits would allow or as something more.

The second and third concepts to be discussed here have that same characteristic: If they are considered apart from constitutional limitations and constitutional doctrines generally, they will lead to undesirable results, either in unduly limiting legislative power or unduly extending it.

2. *Right-privilege Dichotomy*

The second concept is that one's rights with reference to his occupation can be determined by the simple device of deciding whether, broadly speaking, his occupation is a "right" or a "privilege." Once that determination is made, all other consequences would automatically follow, for if it be labeled a "right" the legislature cannot circumscribe it, and if it be labeled a "privilege" the legislature can circumscribe it with all manner of control without limit. The absurdity of the proposition should be self-evident, but unfortunately for clarity in the development of constitutional law, it has not always been so apparent in decided cases.

The cases in which the application of this concept has been the

138. 12 Wn. 2d at 472; 122 P. 2d at 464.

clearest are those at the extremes of the spectrum between the highly regulated occupations at the one end and those relatively free from regulation at the other. Since the days of Prohibition at least, the liquor industry has been subject to very severe regulation. The amount has been so much that the language has become common, both in legislation and in court opinions, to speak as if to deal in liquor was a "privilege" and that the legislature could do anything it pleased in the regulation thereof. The reasoning as formulated usually is that, since the state could prohibit traffic in liquor entirely, as indeed it can under the Twenty-first Amendment to the federal Constitution, it can, therefore, surround any liquor business with any restriction without regard to any limitations of the constitution.

A hypothetical case might illustrate the proposition most clearly: This doctrine would, for example, justify a state to refuse a tavern license to a person because, and solely because, of his racial background. The case which tested the proposition in Washington, however, was not that extreme. First, attention should be called to its fore-runner, *Randles v. State Liquor Control Board*,¹³⁹ a 1949 decision. In that case Initiative No. 171, pertaining to Class "H" licenses, was challenged on several constitutional grounds. The court held against the challengers, sustaining the act. In the course of the opinion, the court repeated the right-privilege formula:

"There is no natural or constitutional right to sell or engage in the business of selling or dispensing intoxicating liquor . . . In considering claims of discrimination and the denial of alleged rights, the distinction between a lawful business which a citizen has the right to engage in and one in which he may engage only as a matter of grace of the state must be constantly in mind."¹⁴⁰

Yet the court proceeded to review all the claimed violations of constitutional right and passed on every one of them on its merits! Realizing the inconsistency, apparently, the court did acknowledge the difficulty which this right-privilege dichotomy had led to, as follows:

"The appellants are not before the court claiming they have been denied a license because of partisan considerations, race prejudice, special individual favoritism, or personal animosities, and we are not now called upon to decide whether the lack of a standard to guide the action of the board and thus prevent such discriminations might constitute a deficiency in Initiative 171."¹⁴¹

139. 33 Wn. 2d 688, 206 P. 2d 1209 (1949).

140. *Id.* at 694; 206 P. 2d at 1213.

141. *Id.* at 697; 206 P. 2d at 1214.

The later case is significantly different from the earlier one in just one important respect: The court held that indeed the constitutional rights of the litigant liquor dealer had been violated. In *Derby Club, Inc. v. Becket*,¹⁴² a 1953 decision, the court held that certain legislation pertaining to “bottle clubs” violated both the state and federal due process clauses. The reasoning by which the court came to this result is unimportant for present purposes; what is important is that the court, dealing admittedly with an activity previously labeled a matter of grace, actually found that the entity dispensing that grace, *i.e.*, the state, had to conform to constitutional standards in doing so! Of the nine judges, one dissented, but he did so on the merits of the constitutional question. He, incidentally, was the author of the opinion in the previous *Randles* case from which a quotation has been set out in the discussion of that case, above. In the present case, he modified his stand a little:

“Much greater latitude with reference to the issuance of a license can be extended to the liquor board than is the case where the subject matter is a business which a person has a legal right to engage in but which may be licensed for the purpose of regulation, or revenue, or both. In the latter case, the due process and equal protection clause of the Federal and State constitution must be given full force and effect, while in the former case they apply, if at all, to a very limited extent. I find no constitutional objections to the act in question with reference to such provisions of the constitution.”¹⁴³

Somewhat the same difficulty in conceptual analysis has been apparent in cases dealing with employment by some state or municipal entity. In 1959 the court dismissed an action by an Aberdeen policeman for pay he would have received but for a certain suspension from duty which, he claimed, was visited upon him “without cause and for political reasons.”¹⁴⁴ There was no hearing to determine the truth of his claims. The court said:

“Due process of law is not applicable unless one is being deprived of something to which he has a right . . . A police officer has no property right in public employment which is protected by the due process clause provisions in our State and Federal constitutions . . . [A police officer has] only the rights given to him by the legislation creating the civil service system under which he is employed.”¹⁴⁵

Again, the same type question might be asked: What result

142. 41 Wn. 2d 869, 252 P. 2d 259 (1953).

143. *Id.* at 885; 252 P. 2d at 267.

144. *Yantsin v. Aberdeen*, 54 Wn. 2d 787, 345 P. 2d 178 (1959).

145. *Id.* at 788; 345 P. 2d at 179.

would the court have reached if the claim of the police officer had been that he was suspended or dismissed because of his racial background?

In a later case dealing with employment by a state institution, *Nostrand v. Little*,¹⁴⁶ finally decided in 1961, the court was again faced with constitutional questions surrounding public employment. In fact, the earlier decision of the Washington court in this same case, rendered in 1959,¹⁴⁷ had been appealed to the United States Supreme Court and there, after hearing, remanded to the Washington court for further proceedings to determine a state law question which had not been raised in the earlier stage of the proceedings.¹⁴⁸ The United States Supreme Court deemed this question (whether the litigants were entitled to a hearing under certain circumstances) as essential to a decision on the constitutional questions presented. In the second phase of the case before the Washington court, the opinion refers to the Aberdeen policeman case in these terms:

“This court has very recently held . . . that, in the absence of civil service or other tenure rights, public employees may be discharged by their employers without any reason being assigned therefor. There is no vested right to public employment in the state of Washington unless the employee has some tenure rights provided for by law. Since the power to discharge is absolute except for such tenure rights, the discharged public employee is not entitled to a hearing regarding the reason for his discharge.”¹⁴⁹

Despite the possible inference from this language that constitutional considerations might have been thought immaterial in the mind of the Washington court, the opinion then proceeds to discuss the constitutional questions, deciding, incidentally, that the employees could be required to sign the loyalty oath which was the subject matter of the litigation.

The difficulty of this right-privilege approach was illustrated at the other end of the regulatory range in an early case dealing with a municipal ordinance which would have required the examination and licensing of those who engage in the business of shoeing horses. The court in this case, *In re Aubrey*,¹⁵⁰ decided in 1904, first differentiated the regulation of the medical profession as necessary to

146. 58 Wn. 2d 111, 361 P. 2d (1961).

147. 53 Wn. 2d 460, 335 P. 2d 10 (1959).

148. 362 U. S. 474 (1960).

149. 58 Wn. 2d at 123; 361 P. 2d at 558, 559.

150. 36 Wash. 308, 78 Pac. 900 (1904).

the public health but then spoke of horseshoers as being quite different:

“‘Liberty’ in its broad sense . . . means the right . . . of one to use his faculties in all lawful ways, to live and work when he will, to earn his livelihood in any lawful calling, and to pursue any lawful trade or avocation. All laws, therefore, which impair or trammel these rights—which limit him in his choice of a trade or profession—are infringements upon his fundamental rights of liberty, which are under constitutional protection.”¹⁵¹

The court was even willing to distinguish between a plumber and a horseshoer:

“The plumber’s business may concern and directly affect the health, welfare, and comfort of the inhabitants who have occasion to call such services into action in the community in which he plies his vocation, while the pursuit of the trade of a horseshoer, under ordinary circumstances and normal conditions, would have no such affect [sic].”¹⁵²

If faced with a showing that the safety of the traveling public was furthered by a legislatively required examination for automobile mechanics, is there any doubt but that the modern court would uphold such legislation?

The vice of this right-privilege test is its over-simplified, black-or-white approach. The choice facing the court is not, as is frequently put, whether the person has a right to some such broad sweep of activity as to engage in the liquor business without restraint, or a right to government employment under any and all circumstances, or to be a plumber, a doctor, a horseshoer without regard to qualifications or other consideration of public welfare; nor is the question, on the other hand, whether the government has an absolute, unfettered ability to deal as it chooses with those who wish to engage in certain occupations. More realistically, the question is highly specific: How does the particular regulation stand of its own merits, when the need to be served for the benefit of the general public is weighed against the curtailment of individual liberty which may be involved. Certainly in the realm of the regulation of economic activity generally, the courts have in reality applied only the more practical tests previously outlined: Legitimate legislative objectives, rational means to effect the objectives, classifications of persons upon a basis reasonably conceivable as relating to those objectives.

It will be noted that these cases so far discussed under this head-

151. *Id.* at 315; 78 Pac. at 902.

152. *Id.* at 316, 317; 78 Pac. at 903.

ing have not dealt directly with regulations of the fishing occupation. The importance of them to the restrictive licensing scheme under consideration in this project is this: The foregoing analysis should demonstrate that it is not a sufficient objection to the scheme to label the occupation of fishing as a "right" and therefore immune from regulation. On the other hand, it is equally obvious that the occupation cannot be labeled a "privilege" and therefore susceptible to regulation without limit. Even liquor dispensers have some rights associated with their activities; and, on the other hand, all manner of occupations are subject to myriads of regulation. The list is almost limitless; one need only inspect the ordinances of Seattle, for example, to see that some sixty occupations are licensed and that the list includes many time-honored occupations, many which could be called both "harmless" and "perfectly lawful." They would include such persons as locksmiths, junk dealers, massage parlor operators, and plumbers, to say nothing of fumigators, hotel runners and punch-board operators.

What must therefore be done is that which has been done in the earlier part of this report: Use the tests which have been developed for the application of the constitutional clauses. By their use the validity of the restrictive scheme should be apparent.

3. "*Property*" in the Fish

The third concept which has been used in deciding the constitutionality of regulations of economic activity is one directly concerned in fisheries regulation. This is the proposition that the state owns the fish as a sort of trustee for the benefit of all the people of the state. Here, again, as with the right-privilege concept, the proposition may lead to difficulty if taken too literally, for it certainly proves too much.

Certainly, if the state were the owner in the usual sense, many ridiculous results would flow: Just for example, a person taking the fish without permission would commit larceny; yet the state does not prosecute for larceny under these circumstances, for not only would no court permit conviction under those circumstances, there is also the appropriate sanction within the fishing laws themselves to apply to the person who violates the restrictions. Also, as any student of the law would be the first to point out, the state's control over the fish is not of the sort which is characteristic of ownership in the ordinary sense. Yet it took Mr. Justice Holmes to point this out in a very famous case in which Missouri argued that its property right

in migratory birds was sufficient to invalidate federal laws passed pursuant to treaty with Canada to regulate the taking of these birds. In that case, *Missouri v. Holland*,¹⁵³ decided in 1920, he said:

“No doubt it is true that, as between a state and its inhabitants, the state may regulate the killing and sale of such birds, but it does not follow that its authority is exclusive of paramount powers. *To put the claim of the state upon title* is to lean upon a slender reed. Wild birds are not in the possession of anyone; and possession is the beginning of ownership.” [Emphasis supplied.]¹⁵⁴

In a much later case, *Takahashi v. Fish and Game Commission*,¹⁵⁵ decided in 1948, the United States Supreme Court held that a California restriction of the offshore fishery which excluded aliens ineligible to citizenship violated the Equal Protection Clause of the Fourteenth Amendment. This holding was in the face of an argument by the State of California that it owned the fish and therefore could dispense its bounty to the persons for whom it held them, namely, its own citizens. The court disagreed, quoting Mr. Justice Holmes from *Missouri v. Holland* and adding:

“We think the same statement is equally applicable here. To whatever extent the fish in the three-mile belt off California may be ‘capable of ownership’ by California, we think that ‘ownership’ is inadequate to justify California in excluding any or all aliens who are lawful residents of the State from making a living by fishing in the ocean off its shores while permitting others to do so.”¹⁵⁶

It might be noted that the Washington statutes contain a similar restriction, excluding all aliens from commercial fishing.¹⁵⁷ This statute’s forerunner was upheld as against challenge on equal protection grounds in a case brought in the federal court but not reaching the Supreme Court of the United States. In that case, *Lubetich v. Pollock*,¹⁵⁸ decided in 1925 by the District Court for the Western District of Washington, the court relied entirely upon the ownership concept to justify the discrimination. It should be obvious that since the decision of the United States Supreme Court in the *Takahashi* case, the *Lubetich* decision is no longer good law, and Washington’s statute would very likely succumb under constitutional attack.

153. 252 U. S. 416 (1920).

154. *Id.* at 434.

155. 334 U. S. 410 (1948).

156. *Id.* at 421.

157. Revised Code of Washington, 75.28.020.

158. 6 F. 2d 237 (W. D. Wash. 1925).

In still another case where a state asserted that its strong right of control over the fish gave it power to enact regulations which discriminated unfairly against nonresidents, the United States Supreme Court pointed out that “[t]he whole ownership theory, in fact, is now generally regarded as but a fiction expressive in legal shorthand of the importance to its people that a state have power to preserve and regulate the exploitation of an important resource.”¹⁵⁹ This statement is Mr. Chief Justice Vinson’s, appearing in *Toomer v. Witsell*,¹⁶⁰ decided in 1948.

Yet, the Washington legislature and court both have insisted upon talking in terms of ownership. If by this term is meant the shorthand fiction to which the Chief Justice referred in *Toomer v. Witsell* no one could quarrel with that usage. The Washington court has not always confined its usage in that manner. An example may be seen in the 1925 case of *McMillan v. Sims*,¹⁶¹ where a State Fisheries Board order, made pursuant to statute, forbade the further use of traps in Skagit Bay. The court upheld the order as against a claim of violation of due process and equal protection concepts. Although the result could have been reached by orthodox use of these concepts, the court relied almost entirely on the implications of full ownership in the state: After stating an entirely valid constitutional law basis for the order and the lack of judicial concern with the wisdom of the order, the court continued:

“. . . we hold that no judicial question is presented by the allegations of the complaint which seeks [sic] to draw in question the wisdom, reasonableness, or even the capricious exercise of this power of establishing this preserve. The state does not have to base its action in the premises upon any reason or consideration with which the courts have any concern, no more than does any owner of property with reference to his lawful disposition of his property.”¹⁶²

The Washington court has, however, made one concession to the realities of constitutional law, for it has acknowledged that even the state ownership must be in conformance with the equal protection clause of the state constitution. A clear holding to the effect is seen in *State ex rel. Campbell v. Case*,¹⁶³ a 1935 decision upholding

159. *Toomer v. Witsell*, 334 U. S. 385, 402 (1948).

160. 334 U. S. 385 (1948).

161. 132 Wash. 265, 231 Pac. 943 (1925).

162. *Id.* at 272; 231 Pac. at 945.

163. 182 Wash. 334, 47 P. 2d 24 (1935).

Initiative No. 77 as it applied to a pound-net fisherman. The court said:

“But while the state owns the fish in its waters in its proprietary right, it holds title as trustee for all the people and for the common good and regulations made for the use of this common property must bear equally on all persons similarly situated.”¹⁶⁴

The purpose in treating the ownership concept in this report is to warn against undue reliance upon it to sustain legislation. Its vice, like that of labeling some economic activity a “privilege,” is that if valid in its literal sense it proves too much. Rather, it should be used if at all merely to point out the very high degree of concern which the state justifiably feels as to the salmon resources and the importance to the state that these be utilized to produce the highest public good. Should the legislature decide that both the over-all economy of the state and a continued source of supply of the fish will better be accomplished by a restrictive licensing scheme, there seems no doubt that as here used, the property concept will serve its best function in emphasizing that such action by the legislature will be within the bounds of constitutionality.

F. Certain Cases Distinguished

South Carolina, Maryland, Alaska, and Texas have all furnished cases involving the validity of restrictions upon the numbers of fishermen, but in each case the legislation was either in its express terms or in its apparent purpose largely for the benefit of residents to the exclusion of nonresidents. Such local favoritism is headed for sure trouble: Under the 1948 decision of the United States Supreme Court in *Toomer v. Witsell*,¹⁶⁵ the Court invalidated a highly disproportionate tax laid by South Carolina on nonresident fishermen operating in the offshore shrimp-fishing areas. The constitutional basis is Article IV of the federal constitution, which requires that each state treat out-of-state visitors the same as it does its own citizens.¹⁶⁶ The only concession which the United States Supreme Court has made in this requirement is to allow states to apply to nonresidents only such higher taxes or more stringent regulations as are made necessary to the enforcement of otherwise valid laws because of the

164. *Id.* at 339; 47 P. 2d at 26.

165. 334 U. S. 385 (1948), discussed *supra*, nn. 155 and 159-160.

166. United States Constitution, Article IV, §2: “The citizens of each state shall be entitled to all privileges and immunities of citizens in the several states.”

non-resident character of these persons.¹⁶⁷

In the Maryland situation, however, the resident-favoritism aspect of the law was not effectively challenged; rather, in the case which sought to do so, the decision went off on the basis that the persons were validly prosecuted for violating a regulation forbidding the use of purse seine nets by all persons, resident and nonresident alike, and thus the nonresident exclusion was not necessary to sustain the prosecution. This case, *Corsa v. Tawes*,¹⁶⁸ is discussed earlier in this report, in the section dealing with due process as developed by the United States Supreme Court.

In Alaska the statutory restriction on fishermen was again expressly in terms of favoring the in-state residents. The particular provision permitted the administrators of the state salmon fishery to close certain waters to all but resident salmon fishermen under certain circumstances, in order to allow each resident to catch a certain amount of fish before nonresidents were permitted to fish. As the District Court quite properly decided under *Toomer v. Witsell*, this provision clashed squarely with the provision of Article IV of the federal constitution just referred to. In this case, *Brown v. Anderson*,¹⁶⁹ decided in 1962, the State of Alaska had argued that its ownership of the fish permitted it to make such regulation as was best for its residents, as the fish were their "common property." The court said, however, "The ownership theory was put at rest, however, in *Toomer v. Witsell* . . ."¹⁷⁰ and then quoted at length from the opinion in that case.

Only in Texas was the resident favoritism less apparent. In fact, on the face of the legislation, it appeared solely as a matter of setting a quota for the total number of licensees. Yet the scheme was so inept as a direct means for effectuating conservation of the fish resources and at the same time so obvious a matter of favoritism for local persons to the exclusion of the nonresident, that it did

167. See, for example, *Mullaney v. Anderson*, 342 U. S. 415 (1952), where the court invalidated a \$50 license fee charged to nonresident commercial fishermen, upon a showing that the resident fee was \$5 and that the additional fee charged to the nonresidents could not be justified, under the evidence produced, as being traceable to added cost of enforcement of fishing laws because of the nonresident character of these fishermen.

168. 149 F. Supp. 771 (D. Md. 1957); aff'd. 355 U. S. 37 (1957), discussed *supra*, nn. 43-45.

169. 202 F. Supp. 96 (D. Alaska 1962).

170. *Id.* at 102.

not survive. The Texas court did not, however, invalidate the scheme on the basis of Article IV of the federal constitution, as the result in *Toomer v. Witsell* might have indicated or been sufficient to do; rather, the Texas court put its decision on the due process clause of the state constitution.¹⁷¹

The Texas court traced the history of Texas legislation as to nonresidents, pointing out that just prior to the enactment of the quota system under attack, the Texas laws had provided substantially the same type of highly discriminatory taxation against nonresident fishermen which had been invalidated in *Toomer v. Witsell* and that on the basis of the *Toomer* decision a federal court had invalidated the Texas system. Faced with this result, Texas enacted a scheme for limiting the number of licenses to be available to those persons who wished to take "edible aquatic life" in the offshore waters of the state.

The new statute was challenged by a group of nonresident shrimp fishermen. As previously indicated, the court struck down the statute on the ground that it did not meet the requirements of the state constitution's due process clause. The state had argued that the measure was enacted in order to further the conservation of the fisheries resources, on the simple theory that if there were fewer boats there would be more fish. The court simply was not convinced that the scheme provided any really rational means to accomplish that end. To say the least, the statutory scheme was most approximate. For one thing, the licensing scheme made no attempt to deal separately with the separate fisheries which the Texas waters supported. The court was at pains to point out that what might be wise in the way of increase in the number of licenses for one fishery might be disastrous for another fishery which captured some other form of "edible aquatic life." Yet the administrator had no way under the statute in which to make the limitations upon number of participants separately applicable to the various fisheries. Also, the statute apparently provided only for increasing the number of licensees beyond a certain number, should the administrator find it appropriate to do so; there was no ability to reduce the fishing should the need arise. Furthermore, there was no relationship established between the kinds of gear to be used in the catching of the products, even within the same kind of product. Putting all these gross ambiguities together with their highly speculative effect upon the promotion of

171. *Dobard v. State*, 149 Tex. 332 233 S.W. 2d 435 (1950).

wise utilization of the fisheries resources of these waters, the court could not see that the means employed by the legislature were reasonably in support of the declared purpose of conservation.

While the decision might be thought perhaps a bit strict in applying the rational means test under the due process clause, the decision seems at least defensible on these grounds. Furthermore, as suggested above, the legislative quota system had serious remaining overtones of favoritism to the in-state resident. In the first place, under the former highly discriminatory taxing scheme, nonresidents had nearly completely been excluded. Of the 1,450 licenses outstanding, only 6 were in the hands of nonresidents. Then, the new legislation directed that the quota system start with those already licensed, providing that they reapply during a four-month period after the effective date of the new statute. Then, should there be available licenses still remaining, priority was to be given to residents; only after that did the statute provide that nonresidents could be given licenses. As it happened, the court did not reach this aspect of the statute as a basis for finding its invalidity. Had that aspect effectively been put in issue and decision made thereon, it seems highly likely that the *Toomer* decision would have led to invalidation of the scheme as violative of Article IV of the federal constitution.

The restrictive licensing scheme under study in the present project presents none of the undesirable characteristics of the scheme employed by Texas. In the present scheme, for example, there is substantial evidence, both of a biological and of an economic nature, from which the legislature could with entire reasonableness conclude that some scheme for restricting the number of participants in the fishery was most needed. Furthermore, there is not the slightest indication of any favoritism based on residence. Indeed, its only real classification into any recognizable groups is that effected by a grandfather clause. As has been pointed out earlier in this report, such classification can legitimately be made, not just to avoid substantial hardship to a substantial number of persons but also to avoid the possible consequences of invalidity of the legislation for failure to make such provision.

Certainly the haphazard scheme employed by the Texas legislature represents the opposite extreme from the background for the restrictive scheme under study by this project. Here, one can readily see the thought given by well-informed persons, the years of careful

tagging and other experiments conducted by the Washington State Department of Fisheries, the collation and study of those statistics by the persons taking part in the current project, and the consideration of all the relevant factors by the governmental committees, and finally the deliberate action by the legislature itself, taken to promote the welfare of the people of the state as a whole.

G. Conclusion

The legal analysis in this report has obviously dealt with broad questions. The first has been basic to the whole project: would a scheme for restrictive licensing of commercial salmon fishermen on the specified Washington waters be constitutionally valid? As the foregoing material should demonstrate, the answer to this question, broadly speaking, seems to be “yes.” The only other question given extended treatment is whether a grandfather clause to assist in the transition into the full restricted licensing scheme would also be constitutionally valid. Again, as the foregoing material indicates, the answer to this question is also “yes.”

If legislation be proposed to effectuate this type of scheme, it will of necessity be in considerably greater detail than that shown in the form of the basic question here considered. Since the details are not readily predictable, however, there has been little attempt to anticipate them in any substantial degree. Only one has been extensively treated—the validity of a grandfather clause. When the full detail is determined, however, further legal analysis should be directed to the specific features.

One other detail which received some attention was a possible “buy-back” of licenses or equipment by the state in order to facilitate the reduction in the number of participants and the effective administration and enforcement of the program. With respect to this “buy-back,” however, there are some constitutional problems which ought to receive study, should such a detail be thought desirable in the general scheme. The problems center around provisions in the Washington State constitution requiring that “[p]rivate property shall not be taken for private use . . .”¹⁷² and that “. . . taxes . . . shall be levied, and collected for public purposes only.”¹⁷³ While the Washington court has decided two cases which bear fairly closely upon the “buy-back” proposal, these decisions did involve somewhat

172. Washington State Constitution, Art. 1, §16 (Amendment 9).

173. Washington State Constitution, Art. 7, §1 (Amendment 14).

different considerations. The first of these¹⁷⁴ dealt with the Land Settlement Act of 1919¹⁷⁵ which authorized the state to buy privately owned lands, improve their habitability and productivity, and then resell them. The court sustained the act, largely leaving to the legislature the determination that such use of the tax funds was for a public purpose, there being a reasonable basis for such determination. In a 1959 case¹⁷⁶ the court passed upon a taking of certain property under an act granting eminent domain powers to port districts for the redevelopment of substandard or marginal land. Here the court fully reviewed the publicness of the use there involved, since the applicable constitutional provision, unlike that pertaining to spending of tax funds, required a judicial determination of public use. In this latter case the court invalidated the particular application of the statute, but the facts seem so strongly different from what might reasonably be contemplated in a "buy-back" of fishing gear or licenses that this latter case might well be distinguished.

The California Supreme Court, on the other hand, has sustained a "buy-back" of fishing gear of certain commercial fishermen who were completely eliminated from certain waters of the state.¹⁷⁷ While the constitutional provisions of California and Washington are not identical, the general purpose of prohibiting the use of public funds for private purposes in the sense of a gift is very similar in each of the two constitutions. The California court readily found that the legislature could have had valid purposes to be served by the appropriation of the public money for this purpose.

In applying these cases to the problem at hand, it might be crucial, incidentally, to make some distinction between a scheme which forces the sale to the state and one which merely permits the state to purchase from willing sellers, for the amendment to the Washington constitution making it a court function to determine the public use applies apparently only to the "taking" of property.

Thus the legal aspect of the report in a sense leaves the work only partially complete, for the study of details as they may be formulated must yet be pursued. Similarly, the aspects of a "buy-back" need further scrutiny, for the treatment given here is most sketchy and intended primarily to indicate only the nature of the

174. *State ex rel. Reclamation Board v. Clausen*, 110 Wash. 525, 188 Pac. 538 (1920).

175. *Laws of Washington 1919*, c. 188, p. 583.

176. *Hogue v. Port of Seattle*, 54 Wn. 2d 799, 341 P. 2d 171 (1959).

177. *Dittus v. Cranston*, 53 Cal. 2d 284, 347 P. 2d 671 (1960).

problem involved. At this stage the legislative judgment both upon the desirability of the general scheme and upon the details of the scheme must be exercised. Then, expert legislative drafting must reduce the proposal to adequate statutory form, and careful legal analysis must be given to the particular details as they are thus delineated. The work here represented thus constitutes the essential groundwork for that to follow.

VI. A RECOMMENDED PROGRAM FOR GEAR REDUCTION

1. The number of units of gear of each type should be frozen temporarily at the level prevailing in the last fishing season. It would appear both feasible and desirable to reduce the number of licenses immediately by weeding out licenses for vessels which have not fished for salmon within the past few years. By eliminating much of the "blank ticket licensing" encouraged by the present system, it would be possible to start with a level of licensed gear which corresponds to the number of vessels actually fishing commercially.
2. License fees should be raised to levels which bear a more realistic relationship to the value of the fishing privilege conferred. We feel that this would eliminate much of the strictly casual commercial fishing and the quasi-commercial fishing of some sportsmen, both of which have complicated the regulatory problem without adding significantly to the effectiveness of the industry. It is suggested that the license fees be higher for vessels of greater productivity, though not necessarily proportionately higher.
3. A revolving fund, serviced out of license revenues, should be set up to permit the state to purchase licenses and gear at a specified percentage of the insurable value of the boat and gear at the option of the owner. Boats purchased under this scheme would be retired or disposed of in such a way that they would not create the same kind of problem in other related fisheries in the Pacific Northwest. Any fisherman relinquishing his license in this fashion would be permitted to re-enter the fishery, but only by purchasing an existing license.

A voluntary buy-back plan has a number of distinct advantages. By offering an opportunity for some vessel owners to disinvest on a voluntary basis, it would provide some tangible evidence of the effect of gear reduction without imposing hardship on any individual vessel owner. There would undoubtedly be a persistent tendency to retire less efficient units. It must be pointed out, that as vessels and licenses are retired, the value of the remaining licenses will increase since the earning power of individual vessels remaining in the fleet will increase. This could be offset, however, by an increase in license fees as returns to the fishery improve.

4. It is suggested that these licenses be made renewable in order to permit the licensee to invest in the necessary boat and gear with reasonable assurance of continued operation. It would also be essential, to insure flexibility and to provide some pressure to keep the most efficient fishermen in the industry, that licenses be transferable. The prices bid and asked for licenses would also provide a continuing check on the economic condition of the fishery. For purposes of statistical control, and perhaps to exercise some control over flagrant violators of regulations, all license transfers should be handled through the Department of Fisheries.
5. It is suggested that initially the licenses be issued for specified types of gear—purse seine, gill net, reef net, etc. It would not be wise, however, to freeze the situation permanently. The gear reduction program itself and technological developments may make it desirable to shift the proportions of the various types of gear. One effective way to accomplish this would be to permit substitution of one type of gear for another on a basis of productivity—i.e., a purse seine license could be acquired by relinquishing a specified number of gill net and/or reef net licenses. It is also possible that the same technique could be used to achieve a gradual shift to improved types of gear without increasing the over-all fishing capacity of the industry. Use of a much more efficient type of gear would be permitted only with a reduction of a sufficient number of licenses for standard gear to leave fishing capacity unchanged. If the licenses are freely bought and sold, this would permit the introduction of improved types of gear whenever it was

profitable to do so without putting additional pressure on the resource.

It should be stressed that these recommendations, if accepted in principle, provide for step-by-step reduction in fleet size, and do not contemplate drastic reductions in the first year or two. It should also be noted that even a $33\frac{1}{3}$ per cent reduction in gear would provide potential savings ranging from \$700,000 to as much as \$2,500,000 with an average of perhaps \$1,500,000. This would permit substantial increases in incomes to boat-owners and share fishermen and would still provide an annual revenue to the state sufficient to make a buy-back program self-financing.

It is obvious that a gear reduction program of the type outlined above would require a considerable amount of flexibility. It is therefore assumed that any action taken by the legislature would be permissive, the actual implementation carried out by the Department of Fisheries.

6. It should be noted that although the foregoing recommended program concerns itself with several details by which the over-all objective may be accomplished, the legal analysis in this report is primarily a delineation of only the underlying basis for validity of a limitation upon the number of participants in the fishery. Should the legislative committee to which this report is addressed hereafter decide to propose legislation along the lines here suggested, further legal study should be given to the particular details as then determined.

Explanation for Fig. 16 (p. 32):

1. Outer Strait area—Canada catch
2. Outer Strait area—U.S. catch
3. Inner Strait area—Canada catch
4. Inner Strait area—U.S. catch
5. Salmon Banks area—U.S. catch
6. Puget Sound area—U.S. catch
7. South Vancouver Island area—Canada catch
8. South Vancouver Island area—U.S. catch
9. Rosario Strait area—U.S. catch
10. Pt. Roberts area—U.S. catch
11. North Fraser area—Canada catch
12. Upper Fraser area—Canada catch

J July A August S September

VII. APPENDIX

An abridged dictionary of definitions for the Code names on the computer output for the Puget Sound net fishery simulation model.

UG1S*1	U. S. gill net catch of sockeye in the Strait area.
UG2S*1	U. S. purse seine catch of sockeye in the Strait area.
UG1S*2	U. S. gill net catch of sockeye in San Juan Islands area.
UG2S*2	U. S. purse seine catch of sockeye in the San Juan Islands area.
UG2S*3	U. S. reef net catch of sockeye in San Juan Islands area.
UG1S*3	U. S. gill net catch of sockeye in Upper Puget Sound.
SUG1S	Total U. S. gill net catch of sockeye.
SUG2S	Total U. S. purse seine catch of sockeye.
SUG3S	Total U. S. reef net catch of sockeye.
SUG1P	Total U. S. gill net catch of pink salmon.
SUG2P	Total U. S. purse seine catch of pink salmon.
SUG3P	Total U. S. reef net catch of pink salmon.
SUG1Z	Total U. S. gill net catch of silver salmon.
SUG2Z	Total U. S. purse seine catch of silver salmon.
SUG3Z	Total U. S. reef net catch of silver salmon.
SUG1Y	Total U. S. gill net catch of chum salmon.
SUG2Y	Total U. S. purse seine catch of chum salmon.
SUG3Y	Total U. S. reef net catch of chum salmon.
PBEG1	Per boat earnings of gill nets. Computed by dividing the total value of the catch of all species minus the operating costs of the maximum numbers of gill nets that fished one day during the season.
PBEG2	Per boat earnings of purse seines.
PBEG3	Per boat earnings of reef nets.
MAXG1	Maximum number of gill nets fished on one day.
MAXG2	Maximum number of purse seines fished on one day.
MAXG3	Maximum number of reef nets fished on one day.
GEG1	Gross earnings of gill nets.
GEG2	Gross earnings of purse seines.
GEG3	Gross earnings of reef nets.

NEG1	Net earnings of gill nets. The net earnings figure includes labor costs which have not been subtracted. The net earnings figure is computed by subtracting the operating costs and fixed costs from the gross value of the catch.
NEG2	Net earnings of purse seines. Net earnings of purse seines have been corrected for the incentive allowances.
NEG3	Net earnings of reef nets.
FICG1	Fixed cost for gill nets.
FICG2	Fixed cost for purse seines.
FICG3	Fixed cost for reef nets.
VBSFG	Value before subtracting fixed costs of the gill net catch.
VBSFP	Value before subtracting fixed costs of the purse seine catch.
VBSFO	Value before subtracting fixed costs of the reef net catch.
GG1T	Total number of gill net days expended on Puget Sound fishery.
GG2T	Total number of purse seine days expended on Puget Sound fishery.
GG3T	Total number of reef net days expended on Puget Sound fishery.
TOTHR	Total other gear.
ODDGS	Total catch of sockeye by all gear except purse seines and gill nets.
ODDGP	Total catch of pinks by all other gear except purse seines and gill nets.
ODDGZ	Total catch of silver salmon by all other gear except purse seines and gill nets.
ODDGY	Total catch of chum salmon by all other gear except purse seines and gill nets.
TOTSR	Total sockeye run to date for any given day in the season.
TOTPR	Total pink run to date for any given day in the season.
TOTZR	Total silver run to date for any given day in the season.
TOTYR	Total chum run to date for any given day in the season.
TOUS	Total U. S. catch of sockeye at any given date.
TOCS	Total Canadian catch of sockeye at any given date.
TOUP	Total U. S. catch of pink salmon at any given date.

TCOP	Total Canadian catch of pink salmon at any given date.
TOUZ	Total U. S. catch of silver salmon at any given date.
TOUY	Total U. S. catch of chum salmon at any given date.
CZC	Total Canadian silver salmon catch at any given date.
CYC	Total Canadian silver salmon catch at any given date.
UCSS	U. S. catch of sockeye salmon in the Strait at any given date.
OCSJ	U. S. catch of sockeye in the San Juans at any given date.
OCSU	U. S. catch of sockeye in the Upper Sound at any given date.
BOOZE*1	Total number of days the season was open in any given week during the season.
SILVS	Total silver catch to date in the Strait.
SILVJ	Total silver catch to date in the San Juans.
SILVU	Total silver catch to date in the Upper Puget Sound.
SILVI	Total silver catch to date in Inner Puget Sound.
CHUMS	Total chum catch to date in the Strait.
CHUMJ	Total chum catch to date in the San Juans.
CHUMU	Total chum catch to date in the Upper Puget Sound.
CHUMI	Total chum catch to date in the Inner Puget Sound.
PINKS	Total pink catch to date in the Strait.
PINKJ	Total pink catch to date in the San Juans.
PINKU	Total pink catch to date in the Upper Puget Sound.
PINKI	Total pink catch to date in the Inner Puget Sound.
VUSC	Total value of U. S. catch of sockeye salmon.
VUPC	Total value of U. S. catch of pink salmon.
VUYC	Total value of U. S. catch of chum salmon.
VUZC	Total value of U. S. catch of silver salmon.

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*Management of the High Seas
Fisheries of the Northeastern Pacific*

A Preliminary Survey of Current Issues

by

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ABSTRACT

A preliminary survey of the pressing fishery problems must recognize that claims to territorial waters by different nations vary in width from 3 to 12 miles, but exclusive claims to fisheries have been extended as far as 200 miles from shore by a few states. Consideration of the consequences of applying different methods of protecting the fisheries in the northeastern Pacific leads to the conclusion that fishery problems there can be solved best by treaties, but these, to be effective, must incorporate agreement on basic objectives.

The validity of the abstention principle as defined in the North Pacific Treaty and the need for such protection of fisheries which are controlled by scientifically based management programs are shown by the successful management of the northeastern Pacific halibut and salmon fisheries of this area. This is further supported by a consideration of both the biological and economic bases of fisheries management. Maximum sustained yield as defined by the North Pacific Treaty is not considered a sound basis for abstention or regulation, since it has been considered to be an absolute and single valued population parameter that must be defined and supported by biological data. The variability of this quantity makes the optimum economic yield a more usable objective.

Consideration of the qualifications for abstention listed in the North Pacific Treaty and the data available on the Bristol Bay halibut stock indicates that the latter fulfills the requirements for

abstention. Removal of this stock from the protection by abstention required special interpretation of the present treaty.

Evaluation of the legal, biological, and economic background of high seas fisheries leads to the conclusion that future progress in rational development of the northeastern Pacific fisheries will be aided by continuation of the principle of abstention as outlined in the present North Pacific fisheries treaty. Successful operation of the commission, however, seems to require alteration of the treaty to provide the commission with its own research staff and to charge it with the responsibility of handling the problems posed by the treaty and by the fisheries.

FOREWORD

This paper has been written against a rapidly moving background. Japan, Canada, and the United States have suspended, for a few months, their negotiations toward a new treaty to replace the 1953 International Convention for the High Seas Fisheries of the North Pacific Ocean. The negotiations to date have resulted in no essential change in the diverse positions of the three countries. In the meantime, Canada has announced her intention to extend her territorial limits to 12 miles. Japanese and Soviet fishing activity in the north-eastern Pacific has increased and is still increasing. Against this rapidly moving background the authors have tried to present some of the important data and arguments relevant to the pressing problems brought on by these events. We would be quick to note that in these few pages we have not given the exhaustive treatment to some of these issues they deserve. Further research on these issues is essential, and we hope will follow this writing.

It is with gratitude that we acknowledge the help given us by a number of people to whom we distributed an earlier draft of this paper, and who gave us many excellent comments and suggestions. These include Prof. W. W. Bishop, University of Michigan; Prof. Hans Linde, University of Oregon; Profs. Carl Bradshaw, J. A. Crutchfield, D. F. Henderson, G. J. Paulik, W. F. Royce, and Professor Emeritus W. F. Thompson, University of Washington; Mr. F. H. Bell, present Director of the International Pacific Halibut

Commission; Mr. H. A. Dunlop, retired Director, International Pacific Halibut Commission; Mr. E. W. Allen, attorney of the firm of Allen, DeGarmo and Leedy; Mr. DeWitt Gilbert, Editor of the *Pacific Fisherman*; and Mr. Harold Lokken, Manager of the Fishing Vessel Owners Association. The views expressed in this paper are, however, solely those of the authors, and are in no way attributable to those who have so kindly reviewed a preliminary draft.

Mrs. Helen Strickland, librarian, has checked the bibliography and Prof. T. S. Y. Koo has edited the manuscript.

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Management of the High Seas Fisheries of the Northeastern Pacific

by

Richard Van Cleve¹ and Ralph W. Johnson²

INTRODUCTION

On June 12, 1963 the ten-year period during which the North Pacific Fisheries Treaty between Japan, Canada, and the United States was to be effective came to an end. After this date any one of the parties to the treaty is free to give a one-year notice of intention to terminate. None of the countries has indicated this intention, but apparently Japan did request revision of the treaty, and negotiations toward this end were begun in June in Washington, D.C.

The North Pacific Fisheries Treaty was ratified on June 12, 1953 (App.). It established as one of its provisions the unique principle of abstention. According to this principle when a country has fully developed a fishery and, as a result of continuing scientific study, is regulating it so as to obtain the maximum sustained yield, newcomers who are parties to the treaty agree to abstain from fishing the stocks concerned. Under this provision Japan has, for the last ten years, abstained from fishing salmon east of 175° West Longitude and halibut of North American origin. Prior to 1959 the Japanese

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also abstained from fishing herring in Alaska, but in 1959, at the recommendation of the United States, the three countries agreed that this species in Alaska should be removed from abstention (INPFC, 1961). Herring along the inner coast of British Columbia were still protected by abstention of the Japanese. In the fall of 1962 Canada recommended, and Japan and the United States agreed to remove the herring stocks of the west coast of the Queen Charlotte Islands from abstention by the Japanese, at the same time agreeing to open halibut stocks in the eastern Bering Sea to Japanese fishermen. This recommendation was approved by the three governments in the spring of 1963.

Reports of negotiations in June 1963 in Washington, D.C., which were resumed September 16 in Tokyo, reflect the efforts of the Japanese to eliminate the abstention provision from the North Pacific Treaty, and the equal determination of the United States and Canada to retain this protection for their halibut and salmon fisheries. Published explanations of the views of the three countries are probably not too accurate or complete, since the negotiations have been closed to the public, but in essence the Japanese are said to maintain in part that by agreeing to abstain from fishing certain stocks in the northeastern Pacific they are weakening their position vis à vis other nations in the development of fisheries elsewhere in the world. On the other hand, the United States and Canada maintain that the stocks from which Japan now abstains exist only because of conservation measures imposed on United States and Canadian fishermen over many years, and that entrance of Japan into these fisheries will not only prejudice the economic viability of the fisheries, but will also endanger the conservation programs now in force.

The argument has been complicated by the relatively recent entrance of Soviet fishermen into the trawl fisheries of Bristol Bay and the Gulf of Alaska. Since the U.S.S.R. is not party to the present North Pacific Treaty and, so far as has been made public, has not been invited to participate, the future of the management of the fisheries in this area appears quite obscure.

The Japanese began fishing king crab in Bristol Bay in the early 1930's, without objection by the United States, and moved to enter the Bristol Bay salmon fishery before World War II. The U.S. State Department objected in November 1937 to their participation in the

Bristol Bay salmon fishery (*Pacific Fisherman*, 1939) and as a result of this protest, Japan in March 1938 agreed not to take salmon in this area.

Since World War II, Japan has expanded her fisheries eastward and has only been restrained from fishing salmon and halibut, and, before 1959, Alaska herring, by provisions of the North Pacific Treaty. The Soviet Union has increased her fishing fleet in the eastern Bering Sea manyfold since 1958, and has now moved into the Gulf of Alaska. As far as is known, Soviet fishermen have not taken the same species as have United States and Canadian fishermen, though some of our halibut fishermen have lost gear and have occasionally been forced off fishing grounds by Soviet trawlers. However, for the most part, the Soviets have concentrated on the taking of ocean perch in the Gulf of Alaska and have not taken halibut, and recently they have also fished for king crab south of the Aleutian Peninsula, indicating that certain fisheries can be developed in this area without interfering with the halibut or salmon. The Soviets, however, have made no commitment to abstain from utilizing any particular stocks of fish, and in fact have plainly stated that they plan to enter the halibut fishery in the Gulf of Alaska (Bevan, D. E. and O. A. Mathisen, 1961 and 1963; Kulikov, 1961).

The entrance of Soviet fishermen into the northeastern Pacific fisheries approximately five years ago has greatly complicated the requirements for management of these fisheries from 1953, when the present North Pacific Treaty was concluded. Since the Soviet Union is not party to any Pacific area fishery treaty with the United States and Canada, she is bound by no legal restrictions and can fish any species she desires outside United States and Canadian territorial waters. At the present time these territorial waters extend only three miles from shore. Even though Canada should extend her limits for fisheries to twelve miles, as she has recently announced she intends to do, unless an entirely new principle is developed for drawing base lines, this still will not protect the major offshore or high seas fishing grounds. At the present time Soviet fishermen can fish salmon and halibut on the high seas, as they are now taking ocean perch, and Canada, the United States, or Japan would not have any legal grounds for objection.

Japanese fishing interests have for some time been exerting pressure to change the North Pacific Fisheries Treaty and to have the

abstention concept removed from it. In fact, Oda (1960) indicates that Japan proposed to omit both halibut and herring stocks from abstention in the 1958 meeting of the International North Pacific Fisheries Commission. The Japanese have consistently maintained since 1958 that none of the stocks which are included in the Annex of the North Pacific Fisheries Treaty and are thus protected by the abstention principle, comply with the requirements for the application of that principle as set down in the treaty. At the same time they have asserted their right to develop the bottom fisheries south and east of the Aleutian Islands and the Alaska Peninsula, but have maintained that the principle of abstention prevents this development because it prohibits incidental capture of halibut. United States and Canadian fishermen on the other hand are fearful that relaxation of present restrictions on the Japanese take of halibut even as incidental captures will be the beginning of the end of the halibut fishery in the northeastern Pacific.

The entrance of Japan and the Soviet Union into the northeastern Pacific Ocean fisheries is, however, of more interest than its immediate effect on Canadian and United States fishermen. It provides a window into the future; a measure by which we can gauge the relationships that will develop as more of the oceans' fisheries become fully exploited and we face the problem of what to do when new states wish to enter a fishery that has already been developed and conserved by others. Viewed in this manner the problem is of special interest, since it underlines the urgency with which we must seek a solution for the immediate problems of the northeastern Pacific fisheries, and it points up the need for insuring the continued effective management of the halibut and salmon. Bringing these problems to light might also stimulate a more active search for effective solutions for the problems which we can foresee developing in the high seas fisheries in other parts of the world.

The recent book by McDougal and Burke (1962) provides a comprehensive analysis of the legal, biological, and economic aspects of high seas fishing. It is our purpose here to examine in some detail these aspects of fishing in the northeastern Pacific. Undoubtedly, some of the following comments would be relevant to fishery problems in other oceans. However, the unique character of each different region and each fishery suggests caution in transferring the solutions from one area to another.

We have especially endeavored to shed some light on a number of the more pressing issues before the negotiators now considering a new North Pacific Treaty, and to bring to light certain aspects of the problems involved in the current negotiations which may not have been thoroughly considered to date. We would be quick to note, however, that although we have tried to encompass the more pressing issues, and consider and sift most of the relevant economic and biological data, it has been impossible in a paper of this brevity to document fully some of the views expressed. This suggests the need for continuing research by those interested in these problems, and for a continuing exchange of views on how the conflicting hopes and desires of the various participants in these fisheries can best be resolved.

First we wish to examine the general rules or principles of international law that have special significance in the northeastern Pacific.

INTERNATIONAL LAW AND THE HIGH SEAS FISHERIES

The dominant principle in the present legal regime of high seas fisheries is that anyone is free to fish just about anywhere. This principle developed in the eighteenth and nineteenth centuries with the navigational needs of the great commercial nations that wanted to send their merchant vessels trading throughout the world. Navigation, not fishery, was their primary concern. Navigation has not lost its importance, but high seas fishing has, in recent years, become much more significant than in former years and has been increasing in importance at a constantly accelerating rate since the end of World War II. The resulting increase in competition for high seas fishery resources, along with a number of other factors, has brought about increasing claims to exclusive use of the high seas.

There has never been unanimity on the question of the scope of territorial seas. The great sea powers of the recent past—Great Britain, France, Japan, the United States, and Germany—have generally argued for 3 miles. Many other countries, such as Norway, Sweden, U.S.S.R., Spain, Portugal, and the Latin-American countries have claimed more extensive areas. At present the claims range from 3 to 12 miles. To illustrate, Japan, the United States, and Great Britain, among others, claim 3 miles; India, 6 miles; Mexico, 9

miles; the U.S.S.R., Colombia, Venezuela, Panama, and the United Arab Republic, 12 miles. Canada has recently announced its intention to go from 3 to 12 miles. An examination of recent history indicates a tendency toward a greater diversity, and toward greater expansion of these claims. However, no nation yet claims a territorial sea of more than 12 miles.

A number of countries also claim bays that are more than twice the width of their territorial seas. These claims are sometimes based on so-called "historic rights," i.e., claims which have been made over a substantial period of time and which, during that period, have received acquiescence by other nations. One of the most extensive such claims is that of the Soviet Union over Peter the Great Bay, 115 miles wide. A recent effort by the state of Alaska to claim, or induce the United States to claim, much of Bristol Bay on this basis failed (Rosenow, 1963), the U.S. preferring to adhere to the rule announced in Article 7 of the Convention on the Territorial Sea and the Contiguous Zone (McDougal and Burke, 1962, App. A) and claim only that portion of Bristol Bay which is 24 miles or less wide.

An increasing number of states are also making "specialized" claims to the sea, arguing for exclusive jurisdiction of the mineral resources or fisheries of the continental shelf, far beyond their admittedly limited territorial seas. The United States and many other countries now claim the mineral resources of the continental shelves off their coasts. Such claims, when limited to mineral resources, have not met with any substantial objection from other states. Off the coasts of Central and South America, Chile, Ecuador, Peru, Costa Rica, and El Salvador claim up to 200 miles of exclusive fishery jurisdiction. Argentina claims exclusive fishery jurisdiction over the continental shelf off her coast. These claims have met with persistent protests by several other countries, and in particular the United States. They have not, however, been withdrawn, and there appears to be little evidence at the moment that they will be. A few countries have announced an intention to establish fishery conservation zones off their coasts, to aid in fisheries management programs. Thus, in 1945 President Truman issued a proclamation saying the United States claimed the right to "establish conservation zones to regulate fisheries" over certain waters beyond the territorial sea. (U.S. President's Office, 1945). Although no such conservation zones have ever, in fact, been created by the United States the proclamation is said to

have "provided the impetus for a rash" of claims by other states to authority over areas of the high seas (as indicated above) (McDougal and Burke, 1962, p. 967). India has, since 1956, claimed a right to establish fishing conservation zones out to 100 miles beyond her territorial sea.

In view of these new claims, it is appropriate to inquire how effective a fishery management program might be in the northeastern Pacific based on such extended claims of jurisdiction. This is not to suggest, or recommend, at this point, the desirability of an extension by the United States or Canada of their jurisdiction over high seas fishery resources, but rather to engage in a limited exploration of the immediate consequences to fishery management activities of such an extension.

Extension of United States or Canadian jurisdiction over the high seas from 3 to 12 miles would have little effect on fishery management programs in the northeastern Pacific. An extension by Canada with the use of straight base lines could close the entire area inside the Queen Charlotte Islands (Hecate Strait) to foreign fishermen. It would preclude effective fishing off the west coast of the Queen Charlotte Islands and off Vancouver Island north of 50° North Latitude, where the continental shelf is generally narrow. A 12-mile limit from present base lines would leave the outer banks unprotected south of this parallel along the coast of Washington and northern Oregon as far south as Cape Arago. Off the coast of Alaska, a 12-mile limit would mean that Soviet and Japanese fishermen would have to stay farther from shore than at present. But the more productive outer banks in the Gulf of Alaska would not be included, and effective control of the various Alaska coastal fisheries would still be lacking. The expanded exclusive zones would not be large enough to cover the habitat of most commercially significant stocks of fish there. The fish would roam in and out of such areas without restriction and uncontrolled fishing outside the 12-mile limit could nullify management programs within those limits.

Extension of exclusive fishery jurisdiction to the edge of the continental shelf, or to 200 miles, would have a different effect. A 200-mile limit would be easier to administer, since it is much more easily found than is the "edge" of the continental shelf. In the oceans off most of the nations of the world a 200-mile limit would extend beyond the continental shelf, as the latter is normally defined.

Concerning its definition, Article I of the Convention on the Continental Shelf provides that the "shelf" refers "to the seabed and the subsoil of the submarine areas adjacent to the coast but outside the area of the territorial sea, to a depth of 200 meters or, beyond that limit to where the depth of the superadjacent waters admits of the exploitation of the natural resources of the said areas." Off some coasts there is a rather distinct shelf, with a noticeable drop-off, at about 600 feet. However, in other areas this is not so; the water depth increases gradually. In the northern Bering Sea between Alaska and Siberia, the "shelf" extends all the way across between the two land masses. The Bering Sea, as well as some other areas, where the continental shelf extends across international boundaries, would pose difficulties for the application of a continental shelf rule. Such problems deserve further consideration, but the limited scope of this article does not permit their analysis here. Nonetheless, we can examine profitably some of the consequences of the extension of exclusive fishery jurisdiction to the edge of the continental shelf, or to 200 miles from shore.

What fisheries would be affected by an extension of claims to the edge of the continental shelf?

Halibut have been fished to a depth of about 400 fathoms (2400 feet) in the northeastern Pacific. Other demersal (bottom living) forms of fish may be found to depths of about 500 fathoms (3000 feet). To include the major fisheries it would be necessary to locate the continental shelf at a depth of 500 fathoms. An exclusive fishery zone that includes water to such depth in the northeastern Pacific would accomplish the following: reserve virtually all demersal stocks of fish; reserve all pelagic (fish which live in the upper layers of water) species confined in these areas; probably make uneconomic the efforts by fishermen from other nations to exploit pelagic stocks such as herring, which occur close to the edge or over the continental shelf. In addition, the fishermen of the coastal state would undoubtedly be afforded greater protection in their investments in vessels and fishing gear by such an extension. Their competition would come primarily from their own countrymen, and such competition would be controllable by the coastal state.

Certain other effects of such an extended fishery jurisdiction deserve notice. This type of extension would, if carried out throughout the world, accrue to the advantage of those countries with broad

continental shelves, such as the United States off the coast of Alaska and in the Gulf of Mexico. It would not accrue especially to the benefit of coastal states with narrow continental shelves such as Chili, Peru, Ecuador, and the United States off the coasts of Oregon and California. It would have only slight effect on the fishing for pelagic species on the high seas, outside the continental shelves, such as salmon. In some cases, it might result in inefficient management, where one management program might be instituted inside the coastal state's jurisdiction and another program for the area outside that jurisdiction. Lastly, off the coasts of Alaska and British Columbia the various stocks of bottomfish might not be fully exploited in view of the lack of interest in these fish shown so far by United States and Canadian fishermen, and by the North American public, unless these two countries issued licenses to foreign fishermen to operate in such areas, under management programs devised by the coastal states.

Extension of United States and Canadian exclusive fisheries jurisdiction to 200 miles would have a somewhat different effect. In the northeastern Pacific virtually all the continental shelf would be brought within the jurisdiction of these two countries. Depending on exactly how the line is drawn, a section in mid-Bering Sea would still be excluded. Off the coasts of California, Oregon, Washington, and British Columbia, a "200-mile" line would be located far beyond the shelf and would encompass substantial portions of the high seas. Such an extension would eliminate foreign fishing from all demersal stocks and also from the pelagic salmon fishery as well as from the above-mentioned pelagic species which live closer to the continental shelf. Free fishing would then be confined to such high seas species as are regularly taken in the open ocean.

Undoubtedly any such extension of claims by the United States or Canada would bring strong protests from Japan and the Soviet Union, and from other countries. At the same time, it would encourage other nations to extend their own claims over similar areas off their coasts. Obviously, such a move would give additional weight to the extended claims of Central and South American countries over adjacent high seas, and would thus impose further burdens on the U.S. tuna and shrimp industries already harrassed in their efforts to fish off those coasts.

At the present time, there is little chance that the United States will extend its jurisdiction over any significant part of high seas

fisheries, beyond its presently defined territorial waters. Thus, to be practical, it is necessary to ask, what other routes are available to attain the goal of effective fishery management in the northeastern Pacific?

In theory, at least, all fishery management problems could be solved by means of appropriate international treaties. The difficulty, to state a truism, is in reaching agreement. Yet, as this is the most likely route to be selected by the interested countries, it will be well to examine some of its potential advantages and disadvantages.

There are, of course, numerous treaties in the world that regulate high seas fisheries. When one looks at the total ocean area and the total fishery resources of the world, however, it becomes apparent that these treaties cover only a very small portion of the area and the fish. In the North Pacific, while practically the entire area north of about 40° North Latitude is covered by treaties, only a small percentage of total fishery resources is actually affected by treaty regulation. Nonetheless, these treaties are important first steps and deserve close study.

In the northeastern Pacific Ocean there are effective the Fur Seal Treaty, the International Whaling Treaty, the Pacific Salmon Treaty, the Halibut Treaty, and the International North Pacific Fisheries Treaty. The Soviet Union is a party to the Fur Seal Treaty and the Whaling Treaty, but is not party to any of the others, and therefore is violating no international agreement or other laws by fishing freely up to the territorial limits of the United States and Canada. Japan, though a party to the International North Pacific Fisheries Treaty, is bound by the terms of that treaty only to abstain from fishing halibut south of the Alaskan Peninsula, salmon east of 175° West Longitude, and herring along the coast of British Columbia except outside the Queen Charlotte Islands. Japan is bound by the treaty to participate in conservation measures if the parties to the treaty can agree as to the character of such measures and that they are necessary. At present the treaty in no way affects her fishery for shrimp, for king crab, or for any other species along the coast of North America outside of territorial limits. These limits at present extend only three miles from the mean low tide line in both Canada and the United States.

The Convention on Fishing and Conservation of the Living Resources of the High Seas (McDougal and Burke, 1962, App. C)

adopted at the 1958 Geneva Conference, does not control high seas fisheries in the North Pacific, or anywhere else for that matter, since it has not been ratified by twenty-two nations, the minimum required for its effectiveness. Even when twenty-two nations have ratified the treaty it will be binding only as among those twenty-two, and otherwise will have little effect except as an advisory document. Neither the Soviet Union nor Japan has ratified and, unless they do so, will not be bound by the treaty. This treaty is, at present, hardly more than a declaration of good intentions by the delegates of the Geneva Conference, and cannot be expected to provide solutions to the more serious fishery problems of the world.

As more and more pressure is put on the high seas fisheries and more of them are fished beyond their ability to maintain their original abundance, the need for regulation and management increases. The extensive discussion and negotiation on fishery problems that has taken place throughout the world in the past ten years has sharply illustrated the need for intelligent management of this resource. Yet development of useful regulations depends upon voluntary agreement by the nations concerned, and before this can occur there must be a consensus on basic objectives.

In the North Pacific this need for agreement on basic objectives is as great as it is anywhere in the world, and is probably as difficult to attain as anywhere else. Two of the nations involved, Canada and the United States, are very much alike. The other two, Japan and the Soviet Union, are vastly different from each other and from the first two. We need but mention the wide disparity between the basic economic and political systems of the two North American countries, Japan, and the U.S.S.R. Then there is the great difference among these countries in the importance to them of high seas fishery as a food and as a source of national income. Also, because of the tastes of the American public, fishermen in the United States and Canada are interested primarily in salmon, halibut, herring, and crab. Soviet and Japanese fishermen are equally, if not more, interested in the vast and largely undeveloped demersal fishery of the area. The United States and Canada have no distant-water fishing fleet in the North Pacific. Both the Soviet Union and Japan conduct much of their fishing operations by means of such fleets. Not too much is known about the Soviet acceptance of the concepts, "maximum sustained yield" and "maximum economic yield," although there is

reason to believe that the first concept is generally accepted there. On the other hand, while Japan has indicated some acceptance of the maximum sustained yield concept, the Japanese, as will be pointed out below, take a considerably different view of the meaning of this principle than does the United States or Canada. There is little evidence to date that either the U.S.S.R. or Japan, or the United States and Canada for that matter, are willing to substitute "maximum economic yield" for maximum sustainable yield.

The above listing serves only to demonstrate the difficulty in locating and defining common objectives for fishery management of the North Pacific. Yet, only when these common objectives are agreed upon can an intelligent program of fisheries management be created for this area, and a treaty or treaties be prepared to carry out such a program.

Before endeavoring to suggest new lines of approach to the fishery management problems of the northeastern Pacific, it is appropriate to see what has been done in the past. As indicated above, treaty regulations to date, in this area, have been concerned with halibut and salmon.

HISTORY OF THE NORTHEASTERN PACIFIC HALIBUT FISHERY

The United States and Canadian fishermen and fishing industry have opposed the extension of Japanese fishing into the northeastern Pacific for a number of reasons. In the first place, they have had the northeastern Pacific fisheries to themselves since they were developed. In particular the halibut fishery in the northeastern Pacific has been completely undisturbed by other nations. An attempt by a British company to send a mothership with auxiliary fishing craft to the Pacific to exploit the halibut in the Gulf of Alaska in the 30's was thwarted by the Canadian and United States governments, after much prodding by fishermen and industry, through several actions including the closure of markets to halibut not taken in conformity with Commission regulations. These actions, combined with direct representations of Canada to the "mother country," sufficed to discourage the backers of that enterprise (*Pacific Fisherman*, 1937).

United States and Canadian control of the halibut fishery has been carefully guarded in the past, and for a good reason. It was devel-

oped by U.S. and Canadian fishermen with its real beginning occurring after completion of the railroads into the Northwest in 1887, which opened up the eastern markets. With each improvement in fishing equipment, such as the change from sail to steam, from steam to gasoline motors, and from gasoline to distillate to diesel fuel, the intensity of fishing increased and the fishery was pushed farther and farther away from the ports of landing. Since the market was greatly expanded after the means of transportation were found, the intensity of exploitation increased and first reached a peak of about 60 million pounds in 1912 off the coast of British Columbia alone and in 1915 totalled over 68 million pounds for the entire coast. Following World War I and the introduction of diesel motors, the area of exploitation was extended across the Gulf of Alaska, and the southern shores of the Aleutian Peninsula were brought within the range of the fishery.

The decline in both catch per unit of effort, or abundance, and the total catch occurred off the coast of British Columbia even before the First World War. A preliminary investigation of the condition of these halibut stocks was begun by W. F. Thompson in 1913. With the further expansion of the fishery after the war and the continued decline in the catch per unit of effort, a treaty was concluded between Canada and the United States which was ratified in 1924 and resulted, in 1925, in the formation of the International Pacific Halibut Commission. This treaty provided for investigation of the biology and supply of the fish, for a closed season of three months during each winter. By 1930 it had become obvious from the scientific investigation of the Halibut Commission's staff that the fishery was the primary cause of the decline in halibut catch, and a new treaty was concluded which empowered the Commission to change or suspend closed seasons and to set catch limits.

Regulation of the northeastern Pacific halibut fishery began in 1932, and since that time the Canadian and United States fishermen have been strictly controlled as to the amount and sizes of fish they are permitted to take from particular areas each year and when they may take them. It is only through these regulations that the halibut fishery has been rebuilt to the high level of abundance which is now being sustained by the stocks.

The record of the Halibut Commission shows a careful approach to the solution of the basic problem of restoring the fishery to a high

level of yield. While other nations and other organizations have talked and theorized about this problem or have ignored it, none of them have accomplished the task of rebuilding any of their fisheries. The Commission charted a new course in the virgin field of marine fisheries management. It is the only regulatory body in the world with practical experience in successfully accomplishing this objective. The staff of the Halibut Commission, moreover, is the only staff that has dealt successfully with the practical problem of rebuilding the productivity of a high seas species. Their success has not been the result of chance but has grown from carefully conducted research, and after the beginning of regulation, from a meticulous monitoring of both immediate and long-term effects of the fishery and of its regulation. Since the formation of the Commission, appropriations for support of the research and for regulation by the governments of Canada and the United States have exceeded several million dollars.

With special regard to the Bering Sea, the Halibut Commission staff first tagged halibut in the Bering Sea in 1930, when 570 fish were released. Aside from 322 tagged off Port Moller in 1947, 192 tagged in the same location in 1952, and 41 in 1954, the next major tagging experiment in the Bering Sea was in 1956 when 3,183 fish were tagged, and again in 1959 when 5,148 fish were tagged. (Reports of IPHC 13 through 32.)

In addition to tagging, the Commission inaugurated a program of sampling halibut catches from the Bering Sea, and deliberately developed its regulations in such a manner as to encourage the exploitation of the Bering Sea stocks. This is in keeping with the objectives of the halibut treaty, which are to provide for the proper management and full utilization of the halibut fishery. It is also in keeping with the provisions of the North Pacific Fisheries Treaty (App.) which indicates that the member countries should encourage and attempt to insure maximum utilization of the fish. These regulations provided for special seasons for the Bering Sea outside the seasons during which fishing is allowed in the Gulf of Alaska and off the coast of southeastern Alaska and British Columbia, together with provisions concerning ports of clearance and entry which further encouraged fishing during these seasons in the Bering Sea. On first impression it might seem that there is an inconsistency between (1) the Halibut Commission's position in encouraging more fishing in

the Bering Sea, and (2) the United States argument that there is a close association between the halibut stocks in the eastern Bering Sea and Area 3A³, and that the Japanese should continue to abstain from fishing in the Bering Sea. It is our view that this apparent inconsistency disappears with a proper understanding of the abstention principle. This is discussed more fully under "Qualifications for Abstention."

HISTORY OF THE NORTHEASTERN PACIFIC SALMON FISHERIES

The history of Pacific Coast salmon fisheries is covered by Rich and Ball (1928), Craig and Hacker (1940), G. H. Clark (1929), INPFC (1962), and others and will be reviewed here only briefly.

Intensive salmon fishing began in the United States with the inauguration of canning in 1864 on the Sacramento River, in 1866 on the Columbia River and in British Columbia, in 1877 on Puget Sound, and in 1878 in Alaska. The Columbia River fishery developed more rapidly than did those in other districts, and reached its peak catch in 1883, when the production was entirely chinook salmon. Fisheries regulations were first imposed in 1866 on the Columbia River when the size of traps was restricted. Regulation of the salmon fisheries in California was begun by the California legislature in 1872, and closed seasons were first imposed on the Columbia River by the Territory of Washington in 1877, and then by the state of Oregon in 1878.

Until Alaska became a state in 1959, the federal government regulated the fisheries and was the principal governmental organization concerned with commercial fisheries research in the territory. The first regulation of salmon fishing in Alaska was undertaken under an act passed by the United States Congress in 1896, but detailed regulation of the salmon fisheries in Alaska is always considered to have begun in 1924 with the passage of an act by congress which required the escapement for spawning of at least 50 per cent of those runs which could be counted through weirs. This act determined the pattern of fishery regulations in Alaska until the 1950's. Before this time, appropriations for regulation were too small to exercise any

³ The regulatory areas used by IPHC are described in the Commission's reports.

significant restriction on salmon fishing. After 1950 progress in salmon biological research permitted the development of more effective management based on more adequate information concerning the relationship between the fisheries, the number of spawners, the efficiency of the production of young, and the complex structure of salmon populations in different rivers.

Regulation of the salmon fisheries has been improved gradually over the years as the knowledge of the nature of the runs and their requirements for survival have become better understood. A major advance was made in the methodology of the management of salmon with the inauguration, in 1946, of regulations by the International Pacific Salmon Fisheries Commission of the sockeye salmon of the Fraser River. These regulations were based upon eight years of intensive investigation of the sockeye salmon fisheries and of the biology of the sockeye salmon of that river system. The requirements for regulation have been further refined as experience has accumulated on the effects of different kinds of regulations on salmon stocks in different areas. In Alaska the regulations are based upon research conducted by the Fish and Wildlife Service, by the Fisheries Research Institute of the University of Washington, and more recently by the state of Alaska.

Salmon regulations along the coast, which were at first aimed only at restricting the sizes of gear used in the rivers to permit some fish to escape, have increased in complexity with the growing complexity of the fishery. They now prescribe the size of mesh as well as the sizes and types of gear, sizes of vessels from which gear can be run, and the type of auxiliary equipment that can be used on those vessels. Escapement is further assured by closed areas including most streams and rivers, as well as areas around the mouths of streams. Closed seasons are also used including weekly closures along migration routes designed to permit escapement of segments of the runs. These fish are then given protection when they arrive on their spawning grounds (except for fishing by native tribes in Oregon, Washington, and British Columbia). The nature of the regulations reflects the attempts of fisheries management agencies to control escapement as best they can within their restricted powers. Meantime, information is gradually being accumulated toward the establishment of more effective regulations and management aimed at production of the optimum supply of salmon.

Accumulated knowledge and experience has proven that where good spawning grounds are available the most promising method of maintaining productivity of the salmon stocks is by natural propagation even where conditions on the spawning grounds have been altered by the activities of man. Artificial propagation is not yet efficient enough to maintain commercial fisheries economically. To maintain natural production it has been found that regulations must be imposed in such manner as to permit escapement from all segments of each particular stock that spawns in each tributary of the different rivers.

Perhaps most is known about the biology of the sockeye (or red) salmon. In this species the homing instinct is highly developed, and separate stocks seem to be specifically adapted to individual rivers. If, by improper regulation, escapement on a given river is reduced too much, the productivity of that stock will be impaired in succeeding years. It can be rebuilt only by stringent control of the catch. Apparently, each separate race is dependent upon its own ability to reproduce. There is little straying of sockeye between rivers and that which does occur into barren areas apparently requires many generations to adapt itself.

On this basis, the present concept of regulation of salmon is to allow an escapement of each stock which will utilize fully the available spawning and nursery areas. The proportion required varies greatly from as little as 12 to 15 per cent of very large runs to all of badly depleted runs.

The regulation of such variable runs is extremely complicated because large and small runs, healthy and depleted runs, regularly occur simultaneously in adjoining rivers or even among the parts of the run to one river. Any uniform or haphazard rate of fishing applied to these runs (as for example on the high seas) is extremely wasteful because of excessive fishing on depleted runs and underfishing on the large healthy runs. This need for careful regulation of the catch from each race has inspired the United States and Canada to ban high seas fishing for salmon with nets.

In addition to the need for selective and precise fishing on each race, it is desirable to catch salmon at their maximum size and best quality. Ricker (1962) has found that during their life in the ocean the populations of salmon, owing to their rapid growth rate, gain more in total weight than they lose through natural mortality. This

excess of growth continues up to the time they approach their natal streams, and they fatten extensively during their last few months at sea. Thus, by regulating the catch of each race individually at the mouth of each stream we can obtain the essential, selective escapement, maximum size, and best quality.

The nature of regulations under these circumstances requires further study to develop economic criteria upon which some judgment may be exercised as to the rate at which depleted runs should be rebuilt. Such regulations should be based on sufficient biological information and on regulations of such efficiency as to permit almost complete control of the size of escapement of each race.

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

On June 12, 1953, the "International Convention for the High Seas Fisheries of the North Pacific Ocean" came into effect between the United States, Japan, and Canada. As a part of this treaty, the principle of abstention was established and was applied to eastern North Pacific salmon, halibut, and herring. The Japanese agreed to abstain from fishing the northeastern Pacific stocks of salmon east of 175° West Longitude and halibut and herring of North American origin for five years or until June 12, 1958. Canada also agreed to abstain from fishing salmon in the Bering Sea. After June 12, 1958, the treaty provided that each stock of each of these species would be considered annually to determine whether or not it complied with the requirements of abstention.

Accordingly, since 1958, each year the fishery scientists of the three member countries to this treaty have met and considered the question of whether the different stocks of these three species comply with Article IV, which specifies the requirements for abstention. From an examination of the various reports of the International North Pacific Fisheries Commission several things become clear.

Japan has never conceded that any stock, salmon, herring, or halibut, complies with the requirements for abstention and, as indicated above, she proposed removal of both halibut and herring from abstention at the first opportunity provided under the treaty, i.e., in 1958 (Oda, 1960). In addition, Japan has declined to accept any

movement westward of the "provisional" line initially set at 175° West Longitude, even though, as pointed out below, the maintenance of that line permits the Japanese fishermen to catch a disproportionately great number of North American salmon. On the other hand, ever since the inauguration of the treaty, the United States and Canada have gradually conceded new areas and fisheries to Japanese fishermen, first releasing from abstention in 1959 herring in Alaska, and in 1963 halibut in the eastern Bering Sea and the herring stocks off the west coast of the Queen Charlotte Islands.

BIOLOGICAL BASIS OF FISHERY MANAGEMENT

One of the original objectives of the abstention principle was to permit the United States and Canadian fishermen to continue a carefully conceived program of management in the North Pacific, aimed at producing the optimum sustained yield, without having that program upset by the intrusion of other fishermen. Progress in the biological and economic aspects of fishery regulation since 1953 has continued to build the arguments favoring imposition of this principle, especially in an area having the particular characteristics of the northeastern Pacific. The basis of the principle, as well as its appropriateness to the northeastern Pacific, has developed through a number of different conferences and papers, and is still being studied. The biological theory was summarized in the 1955 Rome Conference, when the principle of maximum sustained yield was recognized by all nations as essential for production of food from the sea (United Nations, 1955). Biological theory was coordinated with economic theory by the joint conference of economists and biologists held at the University of Washington in 1959 (Crutchfield, 1959a) and in Ottawa in 1961 (Hamlich, 1962). Since some of this theory has been applied in the formulation of recent treaties it is necessary to review it briefly.

Baranov (1918) was first to develop the theory that under certain conditions of natural mortality, growth, and recruitment, there was a certain intensity of fishing that would result in a maximum yield. This is the theory that has led to the concept of "maximum sustained yield."

The mathematical model developed by Baranov was based upon

well known methods of computing compound interest. Assuming a constant natural mortality rate, a constant growth of 5 cm. per year based on some imperfect data on North Sea Plaice, and a constant recruitment, he was able to show that when the mortality rate was less than the growth rate, the total catch from such an ideal fishery would rise with the fishing rate until it reached a maximum and then would fall at higher fishing rates. At a maximum rate of fishing the catch would equal the weight of the fish recruited.

As the rate of natural loss was increased to equal or exceed the growth rate the maximum disappeared from the yield curve.

This relationship was later developed independently by Thompson and Bell (Thompson and Bell, 1934). They went farther than Baranov, however, since they demonstrated that by application of the theoretical relationships to the catch records of northeastern Pacific halibut they could explain the variations that had occurred in both total catch and catch per unit of effort on the basis of the changes that had occurred in the amount of gear fished. Again, the recruitment, natural mortality rate, and growth rate were all held constant in each model used. The theoretical models were fitted to the data by choosing different values for the natural mortality. The growth rate used was that determined for halibut by H. A. Dunlop, former Director of the IPhC. These models dealt with the changes that occur from year to year in the catch as a result of changing rates of fishing rather than confining their attention to equilibrium conditions. The major contribution of this work was to demonstrate that the fishery was the dominant factor in controlling the abundance of halibut. The situation was obscured by a paper published by Burkenroad (1948), which concluded that the change in abundance of northeastern Pacific halibut was due to a natural fluctuation in abundance and was not due to regulation of the fishery. Burkenroad's conclusion resulted from an improper use of data published by the Commission, as shown by Thompson (1950) and others. Nevertheless, Burkenroad was quoted by McDougal and Burke (1962), and by Fukuda (1962). It is now generally accepted by fishery scientists that the recovery and stabilization of the halibut fishery of the northeastern Pacific has resulted from the International Pacific Halibut Commission's regulations.

Later works by Ricker (1940, 1958) and Schaefer (1954) have expressed the same relationship in different ways. Ricker expressed the

relationships modeled by Baranov, and Thompson and Bell, in simple differential equations, clarified the basic relationships involved, and improved the methods of relating the various factors. Schaefer adopted the logistic curve as the basis of his model, fitting a parabola to the values of change in production from year to year plotted against the size of population measured by the catch per unit of effort. The apex of the parabola was interpreted as the point of maximum sustained yield for the fishery. However, this point varied widely with different assumptions made in the model and could not be determined with any exactitude, even for the halibut fishery, in spite of the excellent records available. This inexactness arose from wide variations of the observed data around the theoretical curve as well as from variations in the location of that curve with different assumptions as to catch per unit of effort at maximum population levels.

Schaefer (1957) attempted to refine this model for yellowfin tuna and plotted average annual values observed for the catch per unit of effort against effort. These points were fitted by a straight line that Schaefer called the estimated line of equilibrium catches. But here again the point of maximum sustained yield was only imperfectly designated by the approach of the equilibrium line to one of the curves of constant yield. (See Schaefer, 1957, Fig. 3.) Observed points also showed wide variations around the theoretical curve. Both Schaefer and Ricker concentrated upon production under equilibrium conditions rather than upon year to year reactions of catch to changing fishing pressure.

Using the assumptions of constant recruitment, natural mortality, and growth, Beverton and Holt (1957) incorporated the entire relationship into one differential equation. Their model differed from those of previous authors in the use of Bertalanffy's growth equation, and besides using separate values for natural mortality rates and fishing rates, their model used different ages for recruitment onto the fishing grounds, and recruitment into the fishery, as well as an assumed maximum attained age. Beverton and Holt were interested in demonstrating the consequences of using different mesh sizes in trawl fishing for demersal or bottom dwelling fishes and dealt mainly with equilibrium conditions at different levels of fishing.

These authors found that at any particular level of fishing intensity and rate of natural mortality and growth the catch rose to a

maximum as the age of recruitment into the fishery (the size of trawl mesh) was increased. The catch then decreased at greater ages of recruitment. At greater intensities of fishing they found that this maximum occurred at higher ages of recruitment and from this they developed their theory of eumetric fishing by extrapolating the model to infinite levels of fishing intensity and by permitting the recruitment age to approach a theoretical critical age attained by the fish. Beverton and Holt discussed the effects of changes in growth rate and natural rate of loss on this model, but they could not find sufficient data to provide a real basis for exploring the effects of such changes on the yield curves. They hypothesized that the yield would continue to rise as age of recruitment and fishing rate were increased. Such a continued increase in yield would require relatively minor changes in growth, recruitment, and natural losses as the standing crop was increased to very high levels by raising the age of recruitment. At comparable levels in virgin stocks natural mortality balances or exceeds recruitment and growth. It appears, therefore, that the extrapolation of their model beyond observed conditions requires more careful investigation before it can be accepted as valid theory applicable to natural populations.

The deterministic models described above have contributed a great deal to the development of the management of fisheries. The knowledge gained from them has been useful in the management of the northeastern Pacific halibut and the Fraser River sockeye and pink salmon. But it is unfortunate that the theory has occasionally been interpreted too literally in an attempt to generalize the objectives of management for all fisheries.

While under a particular set of conditions, a point of maximum yield probably exists which corresponds to some level of fishing intensity, this level can only be an average value in natural situations. It will have a standard error which will vary in magnitude in proportion as all population parameters vary with population size, with changes in environment, and as the species in question reacts to changes in the populations of other species which compose its environment. A single valued maximum sustained level of yield, therefore, probably does not exist for any population of any species of fish living under natural conditions. There is only an average value, around which the value for any stock may vary widely. Even for species with a large number of age classes, variations can be consider-

able, and all species involve so many relationships for which accurate measures have not yet been developed that designation of any single value as the maximum sustained yield in natural populations of fish is impossible. Theoretical values can be calculated and are essential in management programs, but are hardly appropriate to use as absolute values—which have to be justified and proven for any particular stock of fish.

Nevertheless, the values of maximum sustained yield that have been computed for such well-documented fisheries as the north-eastern Pacific halibut, are useful and are sufficiently accurate for management. For example, Chapman, Myhre, and Southward (1962) have developed refined estimates of potential yield and stock size of Pacific halibut. They demonstrate more clearly than has been done before the temporal changes in productivity due to the fishery. Their estimated maximum yields are probably as accurate as can be derived from a deterministic model with existing data. Though they are called only “first order answers” by Chapman (1963), their greatest disadvantage is that they cannot be justified as true values incorporating all possible variables which affect the populations of fish in nature. But they have played an essential role in providing preliminary answers for complicated ecological problems that so far have been beyond the scope of theoretical developments. Chapman points out the advantages of stochastic models over deterministic ones, and indicates that further real progress in understanding the complex ecological systems involving fishermen, fish, and environment will probably come through simulation programs with large computers using Monte Carlo techniques with stochastic elements. Such work can have little relationship to reality without a profound understanding of the qualitative as well as quantitative relationships within these systems. With the extensive information now available concerning the more important stocks and their fisheries there is at present an excellent opportunity for carrying out such computer studies. (See also Paulik and Gales, 1963.)

Needless to say, the above paragraph does not mean to imply that management of a high seas fishery should be dropped until final, totally complete data are available. On the contrary, it suggests the need for a continued program of progressive management, with a view to constant improvement and refinement of techniques.

ECONOMIC BASIS OF FISHERY MANAGEMENT

In 1956 the Food and Agriculture Organization of the United Nations held a round table discussion of the economics of fisheries in Rome (International Economic Assoc., 1957). This was one year after the conference on the "Conservation of the Living Resources of the Sea" held by the same organization. The economic conference was organized by the International Economic Association and did not include in its deliberations discussion of the interrelationship between biological and economic problems of fisheries conservation and control. This was first discussed jointly at a conference on the "Biological and Economic Aspects of Fisheries Management" held at the College of Fisheries, University of Washington on February 17-19, 1959. This discussion was continued at a conference sponsored by the FAO in Ottawa in June, 1961. In each succeeding conference it was progressively recognized that the aims of both the economists and biologists essentially agree. The more significant papers dealing with these two subjects have been published by A. Scott (1962), J. A. Crutchfield (1959b), H. S. Gordon (1954), and M. B. Schaefer (1954).

Summarizing briefly conclusions reached by these authors, the maximum sustained yield concept should be replaced by that of maximum economic yield or rent as the guiding principle in fisheries management. Because of the direct relationship between the amount of fishing (i.e., the amount of gear run) and costs, the theoretical maximum economic yield would probably lie somewhere below the theoretical maximum sustained biological yield and at a higher level of abundance.

Because of the nature of the high seas fish stocks as unowned or common property resource, there are few natural limiting factors which restrict entry by new fishermen. So long as each vessel can fish at a profit it will continue to do so, and other boats will continue to enter the fishery. A fishery management program guided by the maximum sustained yield concept may adequately conserve or maintain the resource, but will not assure the efficiency of the fishery. In fact, unlimited entry and a limited catch are almost guaranteed to insure inefficiency. On the other hand, if the guiding objective is maximum economic yield, then the management program would limit participation to a level which would permit the harvest of the

highest yield consistent with the maintenance of the stock, and which would bring to the participants the greatest net economic return. By thus restricting the number of vessels, fishing could be conducted continuously the year round, or in the case of a species such as salmon, during the entire period of a run so as to harvest a preset proportion of all parts of each stock. Such a guiding objective would also encourage continued improvement of the gear and methods of operation so as continually to improve the efficiency of the harvest.

In essence, therefore, the limitation of entry into a high seas fishery is necessary to prevent the overcapitalization of the industry and to obtain the greatest net economic benefit in the form of maximum return on investment. It may be readily admitted that there are serious problems in achieving this goal where there are two or more nations involved whose economic and social needs and pricing structures are different. But as between the two goals, maximum sustainable yield and maximum economic yield, the latter would clearly seem the more desirable.

The economic objective of maximizing "economic rent" developed in the conferences reported by Crutchfield and Hamlich was not adopted in the North Pacific Treaty of 1953, nor in the 1958 or 1960 conferences on the Law of the Sea, and in this respect, in part, the provisions for conservation of high seas fisheries made in the North Pacific as well as in the treaties which were formulated at these United Nations conferences have been justly criticized by McDougal and Burke.

An additional reason for limiting entry in a high seas fishery concerns the problem of efficient management. As indicated above, the work of the International North Pacific Halibut Commission in restoring the halibut fishery to a high level of productivity has proven the validity of the theory of the relation of fishing intensity to the abundance of fish. This has also been borne out by the later work of the International Pacific Salmon Fisheries Commission in its regulation of the sockeye and pink salmon fisheries of the Strait of Juan de Fuca, northern Puget Sound, and the Fraser River. The experience of these two commissions has proven that the effective management of fisheries, both anadromous and high seas, requires that the intensity of fishing be distributed among all elements of each stock in proportion to their productive capacity. In the halibut fishery this has required the Commission to resort to various devices

to spread the fishery over as much of the year as possible, and over the full extent of the regulated stocks. In the salmon fishery the limitations on authority of the Salmon Commission have so far prevented full accomplishment of this end. Restoration of abundance of the Fraser River salmon runs has attracted an excess of boats, fishermen, and gear with the inevitable result that limitation of the catch to levels required has demanded that the fleets be restricted to fishing periods in some cases as short as one day a week. This results in practically all fish present during fishing being removed, and those stocks which move through fishing areas during the closed periods being completely protected. In this rather simple case, the desirability of reducing the amount of fishing gear to a level that will permit almost continuous fishing during the runs is obvious. By such action a portion of all parts of each stock of fish will escape through the fishery, and thus all stocks would contribute to the catch in proportion to their abundance.

This problem was recognized recently in the state of Washington, where the state requested an analysis of the amount of gear in use in the North Puget Sound salmon fishery and its relationship to the efficient biological and economic management of the salmon runs. This study was carried out by the staffs of the College of Fisheries, Department of Economics, and School of Law in the summer and fall of 1962 (Royce, Bevan, Crutchfield, Paulik, Fletcher, 1963). The study indicated that the size of the fishing fleet on the American side should be reduced by at least one-third to provide a level of fishing intensity that would permit almost continuous fishing and would facilitate accurate scientific management. For reasons that are too complex to discuss here, the Washington Legislature took no action on this report in the 1963 session.

For the moment the problem of excessive gear has been met in the halibut industry. Under early regulations the total catch was severely limited in order to rebuild the stocks. These early regulations encouraged each vessel to catch as many fish as possible in as short a time as possible in order to be within the total quota. Limitation of catch and increase in the number of fishing vessels brought about a gradual reduction of the season to as little as 24 days.

However, through various modifications of the halibut treaty, the last one of which occurred in 1954, the Commission was given greater discretionary powers in opening and closing seasons in parts

of areas, and was able to manipulate the seasons and quotas in such a manner that the fleet was able to spread its catch over a longer season. This was made effective by a "voluntary lay in" plan of the United States and Canadian halibut fleets of eight days after each trip. While this was enforced by fishermen and boat owners as a rest period, it has aided regulation and has also reduced the storage period for the catch. The season has thus been lengthened as follows (IPHC, 1962):

Area 2	24 days in 1953	120 days in 1961
Area 3A	52 days in 1953	105 days in 1961

Experience with the halibut as well as with the sockeye and pink salmon fisheries of the Fraser River has demonstrated that to regulate a fishery for the purpose of increasing or stabilizing yield it is necessary not only to control the total catch, the size of fish, and the manner of taking each species, but it is also necessary to limit the total amount of gear in order to control effectively the rate at which the fish are removed from the stock within each season.

UNIQUE CHARACTER OF THE NORTH PACIFIC FISHERY PROBLEMS

In arriving at a rational set of common objectives for the North Pacific, it is necessary to consider the unique character of the fishery problems of this area. Some of these special problems are mentioned above. Others will be noted here. One of the most important features of this part of the high seas concerns the existence of large stocks of anadromous salmon of the genus *Oncorhynchus*, which have for years supported the largest fishery along the west coast of North America north of 40° North Latitude. While this fishery has been superseded in total volume by the trawl fishery for demersal forms, including flounders and rockfishes, the potential productivity of the salmon stocks remains. There is little doubt that the salmon stocks can be rebuilt to yield at a high level. The Pacific salmon are the only major species in the world which are exploited extensively on the high seas, and depend for their existence on the efforts of the nations which own the lakes and streams to which they return to spawn.

A second important unique character of the North Pacific is that even though the fisheries other than salmon and halibut have not been completely developed, extensive research has been carried out. Partly because of this experience, and for a number of other obvious reasons, the four nations involved have a combined scientific and administrative capacity that is probably unrivaled.

A third unique character of the North Pacific fisheries problems is that at present they concern only four major fishing nations, although as pointed out in the preceding section, these four nations (except for Canada and the United States) have widely disparate political, social, and economic attitudes which bear directly on the fisheries problems.

Because of the existence of these unique characteristics, as well as those developed in the preceding pages, a number of conditions and arguments become apparent that tend to favor the application of the abstention principle to the fisheries of this area.

One of the essential conditions that must precede the application of the abstention principle is the availability of a broad range of scientific information about the fishery. This includes information about existing as well as potential yields. Such scientific information is, in general, available in the North Pacific. In addition there are excellent scientific staffs which can obtain further data as needed.

In the case of salmon several arguments for abstention can be made and are only briefly summarized here: Salmon of the northeastern Pacific spawn in North American rivers. Continuation of the conditions which permit such spawning is entirely dependent upon the attitude and activities of the United States and Canada. The rivers in which these fish spawn are, in some cases, now being utilized for numerous other purposes as well. Considerable effort and expense is necessary to continue making them available for spawning purposes. In the past, this effort and expense has been made and present plans call for their continuation. The survival of the species is entirely dependent upon the continued effort of these two countries. Furthermore, because of the ease of catching salmon as they return to the spawning areas, these stocks could be completely destroyed by fishing at the mouths of the spawning rivers, except for the restraints imposed by the United States and Canada on their own fishermen. Another point is that the most economic place to catch these fish, because of their maximum size, is inside the territorial waters of

Canada and the United States at the mouths of the rivers to which they return to spawn. Lastly, the management of the stocks toward the goal of maximum sustained yield is most efficiently done at or near the mouths of the spawning streams. At this point, the fish begin to sort themselves out into separate and independent stocks, and it is possible to set rational limits on the numbers that are caught entering each stream. When fishing takes place on the high seas this type of control is impossible.

Concentration of salmon into restricted areas enroute to their spawning streams makes them particularly vulnerable to fishing. Theoretically, the salmon could be fished by a relatively small number of traps located at strategic points near the spawning streams. This type of fishing would provide maximum efficiency and minimum costs, so that essentially the maximum sustained yield of salmon is virtually the same as maximum economic yield. This relationship is not, in fact, altered by laws which prohibit such efficient fishing in favor of methods which guarantee participation of more fishermen.

In the case of halibut some of the same arguments apply; others do not. (The question of whether the Bering Sea halibut are being fully utilized will be discussed later.) Where a fishery such as the halibut is being fully utilized it is obvious that participation in it by additional fishermen from another country will not add to the total world food supply; it will only require that the total catch be divided among a greater number of fishermen and vessels. As pointed out by McDougal and Burke the entry of more fishermen will depress the economic condition of the fishermen of the first state. Also, the experience of the halibut and salmon commissions indicates that uncontrolled entry probably precludes successful management. In the case of the halibut, the fact that it has been fished exclusively by the United States and Canada, and that these countries have known their financial expenditures and self-imposed restraints would not be capitalized on by others, has probably been the most important factor in the development of extensive scientific data concerning the fishery, and in bringing about its reconstruction after the low yields of the 1920's. As the certainty of this restricted access decreases, there is an understandable decrease in the incentive to expend additional money, or impose further self-restraints, toward continued management. Then, also, there are other fishery stocks available in the

North Pacific that can be developed by Japanese and Soviet fishermen without having to jeopardize the already fully utilized halibut and salmon stocks.

Whether or not to continue the abstention principle, or to what extent it should be continued, is the subject of Japanese-Canadian-United States negotiations. A great deal has already been written about the Canadian-United States attitude toward abstention, and in general about management of the high seas fisheries. It is appropriate to examine in greater detail some relevant Japanese policies, inasmuch as they are considerably less well known in North America.

JAPANESE FISHING POLICY

Opposition to the principle of abstention has frequently been voiced by the Japanese fishing industry. This is in keeping with the past as well as present policy of the Japanese government and industry, which has been to maintain or increase their total catch by world-wide expansion of fishing. This was expressed by Kasahara in his 1961 lectures given at the University of British Columbia (Kasahara, 1961). This series of lectures presented an excellent review of Japanese literature on North Pacific fisheries and an excellent discussion of the fishing stocks in the North Pacific.

In discussing North Pacific fisheries Kasahara was critical of North American biologists for their overemphasis of conservation. In contrast, he pointed out that Japanese biologists were primarily concerned with the development of new resources. It is interesting to note that in this context a steady decline was demonstrated in the total catch of Hokkaido herring since 1900. Japanese scientists ascribe the disappearance of the Hokkaido herring to a change of ocean currents. Whether this decline in catch can be explained by natural causes or by depletion resulting from overfishing has not been proven, nor has any attempt been made to adopt remedial measures.

In discussing flounder stocks off the coast of Japan, Kasahara indicated that. . . . "In fact many of the flounder stocks in Japanese waters have obviously been overfished and some of the North American halibut stocks have gone through overfishing in the past too." (Kasahara, 1961, p. 80). It is noteworthy that the flounder stocks in Japanese waters are admitted to be overfished and to continue in

this state, while the American stocks of halibut were overfished in the past, but this condition has now been corrected by the regulations of the International Pacific Halibut Commission. In other words, the condition of overfishing was corrected by the United States and Canada, but has not been acted upon in Japan as far as we have been able to determine.

Kasahara also cites the decline in the Japanese sardines. The catch apparently reached a peak of about 6 billion pounds per year in the mid-1930's, but with both Japan and Korea fishing intensively, the decline of the catch was rapid, and in about five years fell to 400 million pounds per year, where it has remained.

Again, the papers quoted by Kasahara are most reluctant to admit that this decline had any connection with the fishery, although Kasahara stated that conservation measures might be useful in restoring the sardine stocks "by drastically reducing the fishing effort for a few successive years." "Unfortunately," he says, "the Japanese government is not in a position to enforce such drastic regulations as an experiment. In a way, this is a pity because such an experiment might make it possible to find means to restore the sardine stock to the level of the pre-declined period . . . one must admit that the possible reward is big enough to justify such a gamble." It appears that the Japanese government is unable to take the action which would be required to control the sardine fishery. Such action, of course, would be contrary to the policy of Japanese fishermen suggested by Kasahara which has been, in effect, of fishing areas and stocks until the yield was low enough to impose an economic limit to the intensity of fishing.

In a recent paper, Nakai and Hayashi (1962) have submitted further arguments that the sardine fishery was depleted as a result of natural causes. However, they conclude tentatively that the continuation of intensive fishing on adults is preventing the recovery of the fishery even though hydrographic conditions, to which they ascribe the decline in sardines, have now become favorable to the sardines. They therefore recommend restricting the Japanese sardine fishery to permit recovery of the stock. No action has been reported by the Japanese government.

In a 1955 report by Kubo, Hirano, Sano, Taguchi, and Kasahara on the Japanese home islands salmon fishery (INPFC, 1955), these authors reported that conservation measures in Japan were quite

different from those in the United States and Canada. They indicated that some of the most noticeable points of difference were that in Japan “(a) a great emphasis has been placed on artificial propagation programs which up to now have been regarded and enforced as indispensable conservation measures, as in Hokkaido; (b) very little effort, if any, has been paid to improvement of environments detrimental to the natural spawning and survival of fry; and (c) no action has ever been taken for directly controlling inshore catch of the ascending fish so as to assure spawning escapement.” “Lack of a conservation policy which assures the spawning escapement by adjusting the fishing seasons and by providing the catch limits is doubtlessly the most serious defect which may undermine salmon resources in this country (Japan).”

A search of the records has revealed no fishery that the Japanese have regulated for the purpose of maintaining yield. Restrictions of their fisheries have been primarily for economic reasons, and controls on fishing intensity seem to have as their primary purpose an adjustment of investment in gear and ships to the expected catch. Expanding fleets have, as far as possible, been accommodated by expanding into new regions. Their policy of expansion into new areas to maintain a growing fleet and to increase catches can work reasonably well as long as there are new areas available, but the time is rapidly coming to a close when new and unexploited fishing areas will be available.

The view has been expressed by several Japanese scientists, in conversations, that the overfishing of one species of fish will result in its replacement by another species which will maintain the total yield at the same or even higher level. They have intimated that the Japanese are interested in total yield of protein regardless of species, and that therefore it is not necessary to conserve any one of the principal species to produce the maximum amount of protein. However, this hypothesis does not seem to have been borne out in the oceans, and logically could hardly be expected to occur under natural conditions. Important exploited species of fish are normally dominant species in their particular ecosystem. Their dominance must have resulted from a greater rate of productivity, i.e., a combination of all factors that could make them more successful than competing species. Replacement by another species is possible if the dominant species is fished very hard and very selectively, but it could not be

expected that the new species would be as productive as the original one, since it was presumably unable to compete under natural conditions and, therefore, probably is innately less productive. The greatest production of fish from an area would logically appear to be obtainable by the intelligent exploitation of the most successful species. The hypothesis of replacement appears to be unjustifiable, at least until it has been fully tested and proven. It is also noteworthy that in general the most successful species are almost invariably the most valued (in price and marketability) as food.

QUALIFICATIONS FOR ABSTENTION

In the present situation, where revision of the North Pacific Fisheries Treaty is being considered and the eastern Bering Sea halibut have already been removed from the protection of abstention by the Commission, we must consider the provisions of the Treaty of 1953 between the United States, Canada, and Japan, which were set down to determine whether any "stock" may qualify for abstention by any of the parties to the agreement. These are listed in Article IV of the treaty (App.).

The treaty provides:

- (1) Determination of the qualifications of any stock for abstention must be made annually after June 1958—five years after the treaty went into effect.
- (2) Stocks may be added to the annex if they qualify for abstention.
- (3) A stock must "reasonably" satisfy *all* the following conditions for a recommendation to be made as provided for in Article III, Section 1(b).
 - (a) Evidence based upon scientific research indicates that more intensive exploitation of the stock will not provide a substantial increase in yield which can be sustained year after year.
 - (b) The exploitation of the stock is limited or otherwise regulated through legal measures by each party which is substantially engaged in its exploitation, for the purpose of maintaining or increasing its maximum sustained produc-

tivity; such limitations and regulations being in accordance with conservation programs based upon scientific research, and

(c) The stock is the subject of extensive scientific study designed to discover whether it is being fully utilized and the conditions necessary for maintaining its maximum sustained productivity.

(4) No abstention will be recommended where the stock is exploited in greater part by countries not party to the treaty.

Provisions of the 1953 treaty that are critical are the principle of abstention, the provision that this principle is effective east of 175° West Longitude, the requirement that a stock must *reasonably* satisfy *all* conditions for abstention, and the provision that evidence *indicates* that the stock is producing at its maximum potential level of yield and is being fully utilized.

Fulfillment of these requirements would appear to be fairly straightforward in the case of salmon runs if the size of escapement for different runs can be related to the total size of the resulting runs each year. This, however, is not a simple problem, and the relationship shows wide variations which at present are only partly understood. There is no doubt, however, that artificial propagation has so far not sufficed to maintain those salmon runs for which it is being used. In addition, it should also be obvious that substantial escapement is required to maintain runs by natural propagation. While the International Pacific Salmon Fisheries Commission seems satisfied that an escapement of 20 per cent of the Fraser River run should be sufficient to maintain it, this has not been established for any other stream. The proportion required can be expected to vary. It is also obvious that runs can be killed off if the escapement is sufficiently reduced. Much work remains to clarify the wide range of values between zero and "optimum" escapement. Above all, greater consideration must be given to determining the manner in which the size of escapement of components should be tailored to the annual variations in capacity of the spawning and rearing areas and to the nature of the relationships between the size of runs and the capacity of marine rearing grounds.

If the interpretation of requirements concerning scientific data now set out in the North Pacific Treaty is obscure for salmon, it is

even more obscure in their application to the halibut or, for that matter, to any other marine species.

Available facts on the eastern Bering Sea halibut stocks as determined by the International Pacific Halibut Commission are as follows:

- (1) The results of drift bottle experiments carried out by the Halibut Commission staff over 30 years ago indicate that there is a westward drift of water along the southern shores of the Aleutian Peninsula that moves through the eastern Aleutian Islands and turns eastward again into Bristol Bay. The later pelagic stages of young halibut are probably carried by this current into the eastern Bering Sea, and thus Bristol Bay is probably supplied with young fish from the spawning stocks in Area 3A. This may account, at least in part, for the presence of a large population of juvenile halibut in Bristol Bay (Thompson and Van Cleve, 1936).⁴
- (2) All tagging experiments conducted by the Halibut Commission in the eastern Bering Sea show the migration of fish from the Bering Sea into Areas 3A and 2. (See "Pacific Halibut Fishery Regulations effective June 8, 1963" for a description of these areas.) As a matter of fact, tagging experiments show that between 30 and 40 per cent of the tagged fish move out of the Bering Sea into Areas 3A and 2 (IPHC, 1961). This is a much higher rate of emigration than occurs from one area to another within what are considered to be inseparable stocks.
- (3) The catch of halibut by United States and Canadian fishermen in the eastern Bering Sea has increased rapidly since 1957 (IPHC, 1962). This growing fishery has been the result of a deliberate policy (mentioned above), followed by the Halibut Commission of regulating the fishery in such a manner as to encourage the development of halibut fishing in the Bering Sea. This is completely in accord with the mandate of the Commission, which is to provide for the full exploitation of the stock, and it is also in keeping with the spirit of the International North Pacific Fisheries Treaty which demands as one

⁴ Mr. F. H. Bell, Director of IPHC, has informed us that this has been confirmed by the capture of postlarval pelagic halibut in the eastern Aleutian passes.

of the conditions of abstention that the regulating bodies insure the complete and full exploitation of the stocks concerned.

- (4) Sampling of the catches of halibut taken in the eastern Bering Sea by United States and Canadian fishermen indicates a decline in the average age, size, and abundance of these fish. For example, in the 1960 Annual Report of the Halibut Commission the percentage of the catch that consisted of fish younger than 12 years of age was reported to have risen from 62 per cent in 1958, to 78 per cent in 1959, and 84 per cent in 1960. The preponderance of young fish in the catch is in sharp contrast to Area 3A, where fish under 12 years of age have averaged 55 per cent of the total catch during the past five years (IPHC, 1952-1961). This is the normal reaction of any stock, such as the halibut, to a heavy fishery, and indicates the gradual removal of the accumulated stock of older fish. It does not necessarily indicate an undesirable decrease in abundance, but the rapidity of the decline is indicative of a very high rate of removal. The fishing mortality calculated from the age composition is higher than on grounds where full utilization is recognized.
- (5) Finally, as stated in Report No. 30 (IPHC, 1961, p. 20), "Recoveries (of tagged halibut) within Bering Sea during the past three years from the 1956 experiments have provided first quantitative estimates of 38 per cent and 40 per cent annually for fishing mortality and emigration respectively. This fishing mortality rate is higher than that found in any other section of the coast, and indicates a high rate of utilization of Bering Sea halibut by the present fishery in that region. The 40 per cent annual rate of emigration accounts for the recovery of a high proportion of Bering Sea tags in Areas 3A and 2 and is evidence of a close relationship between the stocks in Bering Sea and those south and east of the Alaska Peninsula."

The first two points could mean a very close relationship between the eastern Bering Sea halibut stocks and the halibut stocks in the Gulf of Alaska and in Area 2. Of course, the extent of this relationship has not been developed sufficiently to provide incontrovertible evidence that these two stocks are actually dependent upon each other.

Unfortunately, investigations of the Commission do not provide complete proof of the exact nature and extent of the relationship between the eastern Bering Sea halibut stock and the stocks in Areas 2 and 3A. For example, probably because of the time of year that tags have been put out in Area 3A, and of the timing of the fishery in the eastern Bering Sea, there have been no recoveries in the Bering Sea of tags put out in Area 2 or in Area 3A, and thus there is no measure of the rate of interchange of the fish between these two regions. Since the origin of supply of young is fairly well established from Areas 3A, the movement of adults could logically be in one direction only. It must be remembered that the rate of emigration has been found to be very high (40 per cent).

While the measure of the mortality rate of the Bering Sea halibut stock is not considered accurate by some, the values obtained from tagging, from changing catch per unit of effort, and from age composition are consistent. However, the record is not yet long enough to be useful in constructing yield models. Therefore, it is impossible to *prove* whether the eastern Bering Sea halibut stock is being exploited too heavily or if it could support a more intense fishery. It is noteworthy that as of September 12, 1963, the combined efforts of the United States, Canadian, and Japanese fishermen have not yet resulted in fulfilling the 11,000,000 pound quota arbitrarily set by the North Pacific Commission for this season's Bering Sea catch.

If we accept the hypothesis that the eastern Bering Sea halibut stock is not an integral part of the Area 3A stock, then it would be necessary that it qualify on its own merits by "*reasonably satisfying all*" of the conditions for abstention. If we deny this hypothesis and maintain that it is a part of the Area 3A stock, then we would have to justify continued abstention on all of Area 3 including the eastern Bering Sea halibut. Under the circumstances the Halibut Commission apparently felt justified in encouraging an increase of fishing intensity on the Bering Sea stocks to make sure that they were being fully utilized.

It is obvious that we did not have sufficient information for the eastern Bering Sea halibut stock to prove conclusively that it complied with all of the conditions for abstention. On the other hand, there is good evidence that it qualifies by reasonably satisfying all conditions and from the "evidence that indicates" that it is fully utilized. In other words, the degree of compliance is certainly "rea-

sonable.” Justification of the North Pacific Commission’s action seems to hinge on their interpretation of the word “reasonable” in Article IV 1(b).

Article IV 1(b) of the North Pacific Treaty requires “reasonable” compliance of any stock with all the conditions of abstention. This assumes obviously that all parties to the treaty are equally interested in maintaining halibut productivity at a high level, and that each one is willing to permit the others to develop, without interference, sound management programs for stocks which require such control. However, if any one of the parties to the treaty operates under a different fishery philosophy and does not share in the objective of management toward maximum sustained yield, then the “reasonable compliance” of Article IV 1(b) becomes interpreted as “conclusive compliance,” meaning that each stock must comply strictly and completely with all conditions for abstention. This, it is suggested, is the view held by the Japanese, and is reflected in the recent “halibut” decision of the Commission. Run to its logical conclusion, this view can mean that it is well nigh impossible for any stock of fish to qualify for abstention.

This difficulty is compounded by the use of the terms in Article IV 1(b)(i) . . . “more intensive exploitation of the stock will not provide a substantial increase in yield which can be sustained year after year”: (b)(ii) . . . “the maximum sustained productivity”; (b)(iii) . . . “whether the stock is being *fully utilized*.” It was demonstrated by Thompson and Bell in 1934 that in the halibut stock any sudden increase in fishing pressure would naturally result in an increase in yield as the fishery reduced the accumulated stocks to a new and lower level. Thus, any increase in fishing intensity would be expected to result in an immediate increase in total yield. However, in spite of the fact that the increase in yield would disappear eventually, this disappearance, because of the normal fluctuations that take place in fish populations, might require some years; in fact, it would require at least the same number of years to reach stability, as there are age classes in the fishable population. The doubt about the meaning of the phrase “year after year” could be resolved if it were changed to read “indefinitely.”

As indicated above the condition of maximum sustained productivity is even more difficult to handle, as it is used without definition in the treaty. The treaty speaks of the level of maximum sustained

productivity of a stock as if this were some easily defined parameter which is characteristic of each stock. This is not true. Even under stable conditions of environment and fishing, the yield of any fish population will vary around some average. The extent of these variations will depend upon the nature of the species and its fishery, i.e., its rate of growth, rate of recruitment, rate of natural mortality, and the rate at which it is being harvested, as well as upon number of year classes. If the stock is characterized by few age classes, or if there are large and long-term variations in recruitment, growth, natural mortality, or in the conditions of the natural environment, then the population may be very unstable. Even so-called "stable" populations or stocks can show major changes in sustainable yield if changes occur in any of the major population parameters. Such a change was noted in the late 1930's in the growth rate of halibut on the Albatross bank in Area 3A (Chapman, Myhre, and Southward, 1962, p. 7).

Thus, while biologists might be able to prove to their satisfaction that the yield produced in any one year by any stock was the "maximum sustained yield" for that stock, the proof is difficult for some nonbiologists to understand. Moreover, even if the yield were the maximum for that stock, it would only hold in a strict sense for the conditions of that year, and would not necessarily hold for the next or for any other year. Moreover, natural variations could be expected in the productivity of a stock even under constant conditions of environment and fishing, because variation is a characteristic of biological organisms.

In addition to the above objections to the wording of the treaty, the present state of both theory and measurement of populations precludes the attainment of the accuracy of measurement which would be required to state categorically that any stock of fish was positively producing the maximum amount it could sustain. There may be a wide difference between theoretical calculations and the reactions of natural populations to fishing.

The term "full utilization" used in Article IV 1(b)(iii) is another snare closely associated in theory with maximum sustained productivity. This term has not been defined in the treaty, and is subject to different interpretations.

In connection with the above analysis of the treaty it should be remembered that there is a considerable economic risk in permitting

excessive, unregulated fishing for a stock such as halibut, which is known to have a limited capacity for replenishment. If the stock is heavily overfished, even for a short time, it can be reduced to such low levels of abundance that it is not economically exploitable. The history of this species, as well as others, has shown that it is much more difficult to rebuild a stock than it is to maintain it. When it has once been heavily overfished only severe restrictions on fishing effort, with consequent economic loss, will enable the stock to restate itself.

Another source of difficulty in the 1953 treaty concerns the location of the provisional line at 175° West Longitude, to the east of which the Japanese have agreed to abstain from fishing for salmon. In the treaty this line was explicitly defined as "provisional." Concerning its revision the treaty provides that "The Commission . . . shall . . . investigate the waters of the convention area to determine if there are areas in which salmon originating in the rivers of Canada and of the United States of America intermingle with salmon originating in the rivers of Asia. If such areas are found the Commission shall conduct suitable studies to determine a line or lines which best divide salmon of Asiatic origin and salmon of Canadian and United States of America origin, . . . and whether it can be shown beyond a reasonable doubt that this line or lines more equitably divide such salmon than the provisional lines. . . ." The United States has endeavored to relocate this line, but the Commission was unable to reach agreement. It is now a well-established fact that Asian salmon roam to the east of this provisional line, and North American salmon roam to the west of it. It would appear that as long as the line is left in the general vicinity of 175° West Longitude, there is no way it can be drawn to limit the Japanese only to Asian salmon. Then the question remains, what more "equitable" line can be drawn? Presumably the term "equitable" here does not apply to the problem of catching salmon when they are still only partially grown, as they are on the high seas, and where, for that reason, there is a considerable loss in the total poundage of fish available. Because of this last fact Canada and the United States have prohibited their fishermen from catching salmon with nets on the high seas. Except for catches of king and coho salmon by trollers, all salmon caught by fishermen from this side of the Pacific are caught at or near the mouths of the spawning rivers, inside territorial waters, where the

fish have attained their maximum size. Thus, the fishermen from this side never do catch any Asian salmon. It does not, therefore, appear to be possible to make an "equitable" distribution of Asian and North American salmon between the Japanese, Canadian, and United States fishermen by permitting the Japanese to catch some North American salmon, and permitting Canadian and United States fishermen to catch an equal amount of Asian salmon. The next best possibility would seem to be to attempt to prescribe the line in such a way as to prohibit any high seas catch of North American salmon by the Japanese.

Before making our concluding comments we feel that some mention should be made about the impact of the 1955 Rome Conference on current fisheries management practices, specifically with regard to the conditions necessary to support the abstention principle in the North Pacific. This has to do with a somewhat unrealistic attitude about scientific evidence which seems to have sprung from the 1955 Conference.

It will be recalled that the Rome Conference was the first time any official definition of the concept "maximum sustained productivity" as used in the 1953 treaty, was attempted. In the United Nations report it was variously called "average sustainable yield" and "optimum sustainable yield." It was defined as:

"The immediate aim of conservation of living marine resources is to conduct fishing activities so as to increase, or at least to maintain, the *average sustainable yield of products* in desirable form. At the same time, wherever possible, scientifically sound, positive measures should be taken to improve the resources.

"The principal objective of conservation of the living resources of the sea is to obtain the *optimum sustainable yield* so as to secure a maximum supply of food and other marine products. When formulating conservation programs, account should be taken of the special interests of the coastal state in maintaining the productivity of the resources of the high seas near its coast."

After defining the objectives of fishery management and in particular the optimum sustainable yield, the Rome conferees listed the types of scientific information required for a fishery management program. Throughout this section of their report they stressed the fact that effective conservation of any resource of the sea requires "scientific information." In the first place, they indicate that it is

essential that any nation engaged in sea fishing should collect adequate statistical records of fishing effort and catch, and should conduct pertinent biological and other investigations to serve as a basis for insuring conservation of the resources being exploited. Scientific information is also indicated as necessary to provide answers for such problems as, "(1) whether regulation of the amount, manner or kind of fishing may be expected to produce desirable changes in the amount of catch or its quality. (It is important to determine whether the amount, manner and kind of fishing are such that regulation would maintain or improve the quantity or quality of the sustainable catch, because only in this case is the application of regulatory measures indicated. In order to make such a determination it is often necessary to consider also the fluctuations in the fish population resulting from the effects of environmental factors unconnected with amount, manner or kind of fish.)"

The conference concluded that scientific information is required to decide the type of regulation which should be enforced to bring about the improvement of the quantity or quality of the catch.

The scientific information required is then listed, and almost every conceivable type of information concerned with biology of the stocks is indicated as being necessary, although the document thereafter stipulates that the scientific information required may include "some or all" of the types listed. At the present time there is no fishery investigation in the world which has provided, or could provide, all the data listed as being necessary under this section of the Rome Conference report. This is apparently recognized in the next section of the report by the statement that "in the case of some fisheries quite simple investigations will be adequate to determine the need for application of conservation measures and to indicate appropriate measures to be applied, although in other cases very detailed and extensive investigations will be necessary." The conclusion is that the requirements of each case must be determined by scientific evidence, although "scientific" is not defined, nor is it indicated what kind of evidence would be acceptable.

The point to be made here is that the laudable enthusiasm generated at the Rome Conference for the extensive utilization of scientific evidence in the management of high seas fisheries has, in some cases, tended to impose an impossible burden of proof upon those who, while admitting the ideal of working from totally complete

data, nonetheless realize that such collections do not at present exist, and in the nature of things probably cannot be developed practically for high seas fisheries. It is true now, and probably will always remain true, that management decisions concerning high seas fisheries will have to be made on the basis of partially complete scientific information. This does not suggest that we should change our ideal goal, but rather that we should recognize the practical needs and requirements of fisheries management problems, and proceed on the best evidence available. It would be a serious mistake if we were to accept the idea that no effective management decisions could be made without complete data. Such a requirement would frustrate any attempt at high seas fisheries management.

A SCIENTIFIC STAFF FOR THE INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

Under the 1953 treaty the Commission was organized into three sections, which have operated quite independently from each other. Each of these three sections has its own scientific research staff. There is no such staff for the Commission as a whole. The Commission has a director and an assistant director, but so far they have fulfilled only a coordinating function. But the primary coordination of research has been the responsibility of a committee on biology that has included members of the Commission and of the advisory committees. The actual research has been conducted by the separate, national research staffs, under separate appropriations from their respective governments.

This type of organization, which tends to keep to a minimum the power of the Commission and to assure that effective power remains distributed in the hands of the national sections, probably reflects the wide diversity and complexity of the opposing claims in the North Pacific. Management of these fisheries involves matters of sovereignty of the respective countries, as well as of national pride in their own fishing fleets. Discussions of management by the North Pacific Commission reflect the present high level of competition between the current treaty members, the basic suspicion by many of the nationals and industries of these countries of international organizations in general, and the desires of the national governments

to retain control of the investigation and management of these important fisheries.

One useful test of the desirability of the present structure, and the Commission's current method of operation, is a comparison with other international commissions which do somewhat similar work and which have proved successful.

It is of interest that the four international commissions which have been most successful in building effective research and management programs also operate in the Pacific Ocean. They are the International Fur Seal Commission, the International Pacific Halibut Commission, the International Pacific Salmon Fisheries Commission, and the Inter-American Tropical Tuna Commission. The Fur Seal Commission has been eminently successful in restoring the over-all abundance and the annual harvest of the fur seal herds of the Pribilof Islands. The Pacific Halibut Commission has been successful in restoring and stabilizing the productivity of the halibut stocks of the northeastern Pacific Ocean. The International Pacific Salmon Commission has shown eminent success in gradual solution of basic problems of conservation of sockeye and pink salmon in the Fraser River, in the management of the fisheries for both these species, and in the equal division of the catch between Canada and the United States. The Inter-American Tropical Tuna Commission has prescribed regulations for the yellowfin tuna in the eastern tropical Pacific after a thorough investigation of the tuna stocks and the bait fishes of this area. The results of this investigation have been accepted by the scientific world as an adequate foundation for the regulations that have been recommended. We may confidently expect that if the recommended regulations are followed, the yield of the yellowfin tuna in the eastern tropical Pacific will be stabilized in the future at a high level of yield.

In attempting to assess the reasons for the success of these four commissions it must be recognized that the problems they have faced are quite different from the problems faced by the North Pacific Commission. It would be impossible to prescribe exactly the same type of organization for the North Pacific Commission. For example, the interests of the parties to the North Pacific Treaty are much more divergent than are those of the parties to the Halibut, Salmon, or Tuna Treaties. While the interests of the various parties might have been equally divergent in the case of the Fur Seal Treaty, the fur seal

problems were much less complex, so that it was found possible to handle them by a simple matter of allocation of the harvest. Furthermore, it must also be recognized that the outstanding results of investigations of the three older fisheries commissions has been due in part to the excellent quality of the scientific leadership and staffs working in these three organizations. There is, however, little reason why such high quality personnel could not be made available to the North Pacific Commission if an appropriate structure were created to encourage independent, objective research.

The common characteristics of these different commissions are: (1) the treaties prescribe a clear set of objectives which were agreed upon by all parties; (2) a clear mandate was given to each of these commissions to put these objectives into force, and the commissions were given the power to accomplish these objectives; and (3) each one of these commissions has had a single research staff which has been responsible directly to the commission through a director. In the case of the Fur Seal Commission this has been the staff of the United States Fish and Wildlife Service. It was also the sole administrator of the fur seal management program and has accomplished both its management and research tasks with eminent success indicating that where the national sections are given an opportunity to operate effectively within the scope of their responsibility, they also can be successful in developing a conservation program. The halibut, salmon, and tuna commissions have hired their own research staffs which have operated under directors appointed by and responsible only to the commissions. Decisions by these commissions have all been by unanimous vote, sometimes after prolonged argument. However, for the most part these decisions have been based on the results of objective scientific research. Through the commissions this research has been tailored to fit the economic, social, and political needs of the fishermen and the industries of the respective countries party to each treaty.

The method of operation of the above commissions may be compared with the functioning of the North Pacific Commission in which, as noted above, the scientific investigations have been carried out by three independent staffs responsible to their respective national sections. The results of the investigations of these independent staffs appear to have been used as much for negotiation as they have been to enable the Commission to discharge the duties pre-

scribed under the treaty. Moreover, examination of the proceedings of the meetings give some indication that the scientists have been constrained to question and argue the results in a different manner and for different objectives than would probably have held if the results had not been points of negotiation. It is our opinion that this situation has resulted both from a lack of clarity in the treaty's mandate to the Commission as well as from lack of clarity in the objectives of the treaty. It has also resulted from the separation of the research into three independent sections responsible to each national section of the Commission rather than to the Commission as a whole. This has tended to preclude the possibility of a strong centralized leadership under a competent single director.

To correct this situation it appears that the treaty should be altered, first to clarify its objectives, second to clarify and make specific the mandate under which the Commission operates, and third to provide the Commission with a director of scientific investigations, adequately supported by appropriations from the three countries. The Commission should then engage a staff responsible to the Commission through the director.

As indicated above, it is realized that this approach presents some serious problems in view of the divergent interests of the three present parties to the treaty. These problems would be aggravated if U.S.S.R. became a party. However, if it is the desire of these four dominant fishing countries of the northeastern Pacific to develop a sound program of fisheries management which would be objectively and competently carried out, it is difficult to see how any other action can be taken with hope of success. It has been generally found in the case of international commissions that if the commission is provided with a staff which is responsible to it rather than to national sections that the staff tends to identify itself with that international organization rather than with any national point of view. It thus acquires a point of view which is identified with the treaty, it tends to view objectively the problems posed by the treaty and to develop solutions which are more likely to be acceptable to the different nationals, even when they originally had strong and divergent positions.

CONCLUSIONS

Discretion would no doubt dictate that having discussed the fisheries problems in the northeastern Pacific, the details of how to meet those problems should be left to those who renegotiate the North Pacific Fisheries Treaty. However, certain conclusions emerge so inevitably in the North Pacific fisheries, and they are derived so naturally from a consideration of the problems of fisheries management and development in this region that we feel they should be discussed here. They should provide a basis on which an effective program of development and management might be built.

Considering the present status of international law concerning high seas fisheries, treaties between nations interested in particular fisheries or areas of the oceans seem to provide the best avenue for the orderly development and management of high seas fisheries. The North Pacific Treaty has already been effective in protecting gains made heretofore in the management of salmon and halibut fisheries and could be made even more effective to deal with present and future problems by proper revision.

Effective management and exploitation of the fishery resources of the northeastern Pacific cannot be accomplished without cooperation by all those countries that participate in the fishery. At present this includes Canada, Japan, the United States, and the Soviet Union. Thus, any new treaty should provide for the adherence of all these countries, plus any others that might desire to participate in the future. Perhaps this could be covered in the way that it was in the Inter-American Tropical Tuna Treaty (IATTC, 1952), by the use of an open-ended treaty.

In revising the present North Pacific Treaty, the inadequacy of the concept "maximum sustained yield" as an objective should be recognized and maximum economic yield, or rent, should be given serious consideration and, if possible, substituted for the earlier concept. As a matter of fact, the optimum economic level of exploitation would require exploitation of the fishery at a lower level of yield, and maintenance of a higher level of abundance than would the criterion of maximum sustained yield. It seems essential that the economic effects of fisheries regulation must be given greater recognition in high seas fisheries management.

The unique character of the fisheries and the fish problems in the

North Pacific Ocean would indicate that the solution of these problems will require an approach which is probably different from that which will be valid for other parts of the world. Indeed, in most other areas of the oceans the fisheries problems have not been studied enough to determine their character. In particular we refer to the application of the principle of abstention to the North Pacific.

The principal task that faces those who will renegotiate the North Pacific Fisheries Treaty will be the definition of objectives. It would hardly seem possible to develop a workable treaty without agreement on objectives which are clearly defined and completely understood by all participants. While these objectives must provide for the full development of all fisheries, at the same time it is essential that they recognize the necessity for management, and for protecting the interests of those countries which have made extensive financial sacrifices, and subjected their fisheries to various restraints, to maximize fisheries which are still being fully utilized. The requirements which determine the application of the abstention principle should be formulated more precisely so as to eliminate, wherever possible, the disagreements about intent and meaning that have occurred under the present treaty.

The continued use of the principle of freedom of the seas to fishing seems to result in part from a feeling that the law must be the same for all uses of the sea. The comment of Professor Lipson (1958) seems appropriate here, when he says that no unitary rule could or should be devised to cover the overlapping types of zones and uses of the high seas. "There is no reason why one rule of law must apply to the regulation, control, prohibition, or mutual tolerance of such diverse activities as navigation, fishing, conservation of fisheries and cable laying. . . ." This thought applies equally to the need for recognition of different requirements of the fisheries in different parts of the oceans. Freedom of fishing is not reconcilable with development of effective high seas fisheries management practices.

It must be recognized that neither the biological nor economic aims of regulation are reconcilable with free entry into the fisheries of anyone who may want to exploit them. This means that entry into any fishery which does not have an infinite capacity for production will eventually have to be limited. The North Pacific Treaty should provide for some limitation of entry into the fisheries for salmon and halibut, and for other species that in the future become

fully utilized. For reasons indicated above we believe that the continuation of the abstention principle, as applied to halibut and salmon, is a rational means of apportioning the fishery resources of this area. As new fisheries become fully utilized, by whatever country, serious consideration should be given to the application of the abstention principle to that stock of fish.

Where two or more countries have participated in the development and full utilization of a stock of fish, then those countries should be entitled to share in that stock. Problems of allocation of the catch will arise. Yet the problems have been solved in the Fur Seal Treaty, and in the Salmon Treaty between the United States and Canada, and should be solvable for other fish stocks of the North Pacific.

One of the most important reasons for the difficulty in arriving at a common set of objectives for the management of the North Pacific fisheries is the lack of adequate data concerning the biological, economic, and social aspects of the fisheries. Research in all of these fields should be substantially increased and better coordinated. In particular, there should be a more efficient exchange of data and pooling of research resources between the four principal participants in this fishery. To facilitate this, we urge that either as part of the present negotiations, or possibly as a next step, an effort be made to create at least a data gathering and research coordinating international agency in which Japan, Canada, the United States, and the Soviet Union would all participate. Consideration of the method of operation of successful international commissions indicates that the best solution would be for the Commission to engage its own research staff which would be responsible to the Commission through a director.

Such a change in organization and staff would be especially important in aid of the orderly exploitation of undeveloped fisheries and in their eventual management. A primary requirement, of course, for such provisions would be that all nations or all states which participate in these fisheries should develop a system of accurate records of their landings by species, the amount of gear run, or the amount of effort expended and the locations where gear is run and the catches are made.

Finally, the conclusion reached by Ricker (1962) that the sea growth of salmon far exceeds natural mortality during the marine

period indicates that the harvest of salmon should be deferred until they have attained full growth, that is, until they have returned to the vicinity of their home stream. In addition, the harvest of salmon on the high seas precludes adjusting the catch to the productive capacity of individual runs. Efficient management demands that this be done. Undoubtedly, more accurate evaluation of natural mortality during the marine phase of salmon life history is needed. However, on the basis of present knowledge, objective consideration of the requirements for maximizing the productivity of salmon runs, either biological or economic, indicates that the high seas netting of salmon should be eliminated. Because of the requirements by salmon of special protection by the nation controlling its spawning areas, there are strong equities that favor limitation of the salmon harvest to the country, or countries, that provide these spawning streams.

The halibut fishery of the northeastern Pacific presents a more complex problem than the salmon, but its solution will probably be more general in application in other areas. The requirements for continued successful management of the halibut fishery appear to be in direct conflict with the desire of the Japanese to develop fisheries for bottom fish. Success of Soviet fishermen in fishing for ocean perch in the Gulf of Alaska without undue interference with U.S. and Canadian halibut and crab fishing indicates that the conflict between halibut fishing and fishing for other bottom species is not as absolute as the Japanese would indicate. On the other hand, there is no doubt that unrestricted development of bottom trawling would disrupt the halibut management program. The value of both the halibut fishery and the halibut management program demands that every effort be made to preserve both of them. This cannot be accomplished by arbitrarily abolishing abstention, nor does it seem that the demand for such action by the Japanese reflects such a vital and immediate need that precipitate action could be justified. It is our feeling that careful investigation of the relation of trawl fishing on different banks within the area of distribution of the halibut is called for. A concerted effort should be made to determine the extent and the manner in which such a fishery may be developed and still remain compatible with maintenance of the halibut stocks at their present high level of yield.

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APPENDIX

INTERNATIONAL CONVENTION FOR THE HIGH SEAS FISHERIES OF THE NORTH PACIFIC OCEAN

The Governments of the United States of America, Canada and Japan, whose respective duly accredited representatives have subscribed hereto,

Acting as sovereign nations in the light of their rights under the principles of international law and custom to exploit the fishery resources of the high seas, and

Believing that it will best serve the common interest of mankind, as well as the interests of the Contracting Parties, to ensure the maximum sustained productivity of the fishery resources of the North Pacific Ocean, and that each of the parties should assume an obligation, on a free and equal footing, to encourage the conservation of such resources, and

Recognizing that in view of these considerations it is highly desirable (1) to establish an International Commission, representing the three Parties hereto, to promote and coordinate the scientific studies necessary to ascertain the conservation measures required to secure the maximum sustained productivity of fisheries of joint interest to the Contracting Parties and to recommend such measures to such Parties and (2) that each Party carry out such conservation recommendations, and provide for necessary restraints on its own nationals and fishing vessels.

Therefore agree as follows:

ARTICLE I

1. The area to which this Convention applies, hereinafter referred to as "the Convention area," shall be all waters, other than territorial waters, of the North Pacific Ocean which for the purposes hereof shall include the adjacent seas.

2. Nothing in this Convention shall be deemed to affect adversely (prejudice) the claims of any Contracting Party in regard to the limits of territorial waters or to the jurisdiction of a coastal state over fisheries.

3. For the purposes of this Convention the term "fishing vessel" shall mean any vessel engaged in catching fish or processing or transporting fish loaded on the high seas, or any vessel outfitted for such activities.

ARTICLE II

1. In order to realize the objectives of this Convention, the Contracting Parties shall establish and maintain the International North Pacific Fisheries Commission, hereinafter referred to as "the Commission."

2. The Commission shall be composed of three national sections, each consisting of not more than four members appointed by the governments of the respective Contracting Parties.

3. Each national section shall have one vote. All resolutions, recommendations and other decisions of the Commission shall be made only by a unanimous vote of the three national sections except when under the provisions of Article III, Section 1(c) (ii) only two participate.

4. The Commission may decide upon and amend, as occasion may require, by-laws or rules for the conduct of its meetings.

5. The Commission shall meet at least once each year and at such other times as may be requested by a majority of the national sections. The date and place of the first meeting shall be determined by agreement between the Contracting Parties.

6. At its first meeting the Commission shall select a Chairman, Vice-Chairman and Secretary from different national sections. The Chairman, Vice-Chairman and Secretary shall hold office for a period of one year. During succeeding years selection of a Chair-

man, Vice-Chairman and Secretary from the national sections shall be made in such a manner as will provide each Contracting Party in turn with representation in those offices.

7. The Commission shall decide on a convenient place for the establishment of the Commission's headquarters.

8. Each Contracting Party may establish an Advisory Committee for its national section, to be composed of persons who shall be well informed concerning North Pacific fishery problems of common concern. Each such Advisory Committee shall be invited to attend all sessions of the Commission except those which the Commission decides to be *in camera*.

9. The Commission may hold public hearings. Each national section may also hold public hearings within its own country.

10. The official languages of the Commission shall be Japanese and English. Proposals and data may be submitted to the Commission in either language.

11. Each Contracting Party shall determine and pay the expenses incurred by its national section. Joint expenses incurred by the Commission shall be paid by the Commission through contributions made by the Contracting Parties in the form and proportion recommended by the Commission and approved by the Contracting Parties.

12. An annual budget of joint expenses shall be recommended by the Commission and submitted to the Contracting Parties for approval.

13. The Commission shall authorize the disbursement of funds for the joint expenses of the Commission and may employ personnel and acquire facilities necessary for the performance of its functions.

ARTICLE III

1. The Commission shall perform the following functions:

- (a) In regard to any stock of fish specified in the Annex, study for the purpose of determining annually whether such stock continues to qualify for abstention under the provisions of Article IV. If the Commission determines that such stock no longer meets the conditions of Article IV, the Commission shall recommend that it be removed from the Annex. Provided, however, that with respect to the stocks of fish originally specified in the Annex, no determination or recommendation as to whether such stock continues to qualify for abstention shall be made for five years after the entry into force of this Convention.
- (b) To permit later additions to the Annex, study, on request of a Contracting Party, any stock of fish of the Convention area, the greater part of which is harvested by one or more of the Contracting Parties, for the purpose of determining whether such stock qualifies for abstention under the provisions of Article IV. If the Commission decides that the particular stock fulfills the conditions of Article IV it shall recommend, (1) that such stock be added to the Annex (2) that the appropriate Party or Parties abstain from fishing such stock and (3) that the Party or Parties participating in the fishing of such stock continue to carry out necessary conservation measures.
- (c) In regard to any stock of fish in the Convention area;
 - (i) Study, on request of any Contracting Party concerned, any stock of fish which is under substantial exploitation by two or more of the Contracting Parties, and which is not covered by a conservation agreement between such Parties existing at the time of the conclusion of this Convention, for the purpose of determining need for joint conservation measures;
 - (ii) Decide and recommend necessary joint conservation measures including any relaxation thereof to be taken as a result of such study. Provided, however, that only the national sections of the Contracting Parties engaged in

substantial exploitation of such stock of fish may participate in such decision and recommendation. The decisions and recommendations shall be reported regularly to all the Contracting Parties, but shall apply only to the Contracting Parties the national sections of which participated in the decisions and recommendations.

- (iii) Request the Contracting Party or Parties concerned to report regularly the conservation measures adopted from time to time with regard to the stocks of fish specified in the Annex, whether or not covered by conservation agreements between the Contracting Parties, and transmit such information to the other Contracting Party or Parties.
- (d) Consider and make recommendations to the Contracting Parties concerning the enactment of schedules of equivalent penalties for violations of this Convention.
- (e) Compile and study the records provided by the Contracting Parties pursuant to Article VIII.
- (f) Submit annually to each Contracting Party a report on the Commission's operations, investigations and findings, with appropriate recommendations, and inform each Contracting Party, whenever it is deemed advisable, on any matter relating to the objectives of this Convention.

2. The Commission may take such steps, in agreement with the Parties concerned, as will enable it to determine the extent to which the undertakings agreed to by the Parties under the provisions of Article V, Section 2 and the measures recommended by the Commission under the provisions of this Article and accepted by the Parties concerned have been effective.

3. In the performance of its functions, the Commission shall, insofar as feasible, utilize the technical and scientific services of, and information from, official agencies of the Contracting Parties and their political sub-divisions and may, when desirable and if available, utilize the services of, and information from, any public or private institution or organization or any private individual.

ARTICLE IV

1. In making its recommendations the Commission shall be guided by the spirit and intent of this Convention and by the considerations below mentioned.

- (a) Any conservation measures for any stock of fish decided upon under the provisions of this Convention shall be recommended for equal application to all Parties engaged in substantial exploitation of such stock.
- (b) With regard to any stock of fish which the Commission determines reasonably satisfies all the following conditions, a recommendation shall be made as provided for in Article III, Section 1, (b).
 - (i) Evidence based upon scientific research indicates that more intensive exploitation of the stock will not provide a substantial increase in yield which can be sustained year after year,
 - (ii) The exploitation of the stock is limited or otherwise regulated through legal measures by each Party which is substantially engaged in its exploitation, for the purpose of maintaining or increasing its maximum sustained productivity; such limitations and regulations being in accordance with conservation programs based upon scientific research, and
 - (iii) The stock is the subject of extensive scientific study designed to discover whether the stock is being fully utilized and the conditions necessary for maintaining its maximum sustained productivity.

Provided, however, that no recommendation shall be made for abstention by a Contracting Party concerned with regard to: (1) any stock of fish which at any time during the twenty-five years next preceding the entry into force of this Convention has been

under substantial exploitation by that Party having regard to the conditions referred to in Section 2 of this Article; (2) any stock of fish which is harvested in greater part by a country or countries not party to this Convention; (3) waters in which there is historic intermingling of fishing operations of the Parties concerned, intermingling of the stocks of fish exploited by these operations, and a long established history of joint conservation and regulation among the Parties concerned so that there is consequent impracticability of segregating the operations and administering control. It is recognized that the conditions specified in subdivision (3) of this proviso apply to Canada and the United States of America in the waters off the Pacific Coasts of the United States of America and Canada from and including the waters of the Gulf of Alaska southward and, therefore, no recommendation shall be made for abstention by either the United States of America or Canada in such waters.

2. In any decision or recommendation allowances shall be made for the effect of strikes, wars, or exceptional economic or biological conditions which may have introduced temporary declines in or suspension of productivity, exploitation, or management of the stock of fish concerned.

ARTICLE V

1. The Annex attached hereto forms an integral part of this Convention. All references to "Convention" shall be understood as including the said Annex either in its present terms or as amended in accordance with the provisions of Article VII.

2. The Contracting Parties recognize that any stock of fish originally specified in the Annex to this Convention fulfills the conditions prescribed in Article IV and accordingly agree that the appropriate Party or Parties shall abstain from fishing such stock and the Party or Parties participating in the fishing of such stock shall continue to carry out necessary conservation measures.

ARTICLE VI

In the event that it shall come to the attention of any of the Contracting Parties that the nationals or fishing vessels of any country which is not a Party to this Convention appear to affect adversely the operations of the Commission or the carrying out of the objectives of this Convention, such Party shall call the matter to the attention of other Contracting Parties. All the Contracting Parties agree upon the request of such Party to confer upon the steps to be taken towards obviating such adverse effects or relieving any Contracting Party from such adverse effects.

ARTICLE VII

1. The Annex to this Convention shall be considered amended from the date upon which the Commission receives notification from all the Contracting Parties of acceptance of a recommendation to amend the Annex made by the Commission in accordance with the provisions of Article III, Section 1 or of the Protocol to this Convention.

2. The Commission shall notify all the Contracting Parties of the date of receipt of each notification of acceptance of an amendment to the Annex.

ARTICLE VIII

The Contracting Parties agree to keep as far as practicable all records requested by the Commission and to furnish compilations of such records and other information upon request of the Commission. No Contracting Party shall be required hereunder to provide the records of individual operations.

ARTICLE IX

1. The Contracting Parties agree as follows:

- (a) With regard to a stock of fish from the exploitation of which any Contracting Party has agreed to abstain, the nationals and fishing vessels of such Contract-

ing Party are prohibited from engaging in the exploitation of such stock of fish in waters specified in the Annex, and from loading, processing, possessing, or transporting such fish in such waters.

- (b) With regard to a stock of fish for which a Contracting Party has agreed to continue to carry out conservation measures, the nationals and fishing vessels of such Party are prohibited from engaging in fishing activities in waters specified in the Annex in violation of regulations established under such conservation measures.

2. Each Contracting Party agrees, for the purpose of rendering effective the provisions of this Convention, to enact and enforce necessary laws and regulations, with regard to its nationals and fishing vessels, with appropriate penalties against violations thereof and to transmit to the Commission a report on any action taken by it with regard thereto.

ARTICLE X

1. The Contracting Parties agree, in order to carry out faithfully the provisions of this Convention, to cooperate with each other in taking appropriate and effective measures and accordingly agree as follows:

- (a) When a fishing vessel of a Contracting Party has been found in waters in which that Party has agreed to abstain from exploitation in accordance with the provisions of this Convention, the duly authorized officials of any Contracting Party may board such vessel to inspect its equipment, books, documents, and other articles and question the persons on board. Such officials shall present credentials issued by their respective Governments if requested by the master of the vessel.
- (b) When any such person or fishing vessel is actually engaged in operations in violation of the provisions of this Convention, or there is reasonable ground to believe was obviously so engaged immediately prior to boarding of such vessel by any such official, the latter may arrest or seize such person or vessel. In that case, the Contracting Party to which the official belongs shall notify the Contracting Party to which such person or vessel belongs of such arrest or seizure, and shall deliver such vessel or person as promptly as practicable to the authorized officials of the Contracting Party to which such vessel or person belongs at a place to be agreed upon by both Parties. Provided, however, that when the Contracting Party which receives such notification cannot immediately accept delivery and makes request, the Contracting Party which gives such notification may keep such person or vessel under surveillance within its own territory, under the conditions agreed upon by both of the Contracting Parties.
- (c) Only the authorities of the Party to which the above-mentioned person or fishing vessel belongs may try the offense and impose penalties therefor. The witnesses and evidence necessary for establishing the offense, so far as they are under the control of any of the Parties to this Convention, shall be furnished as promptly as possible to the Contracting Party having jurisdiction to try the offense.

2. With regard to the nationals or fishing vessels of one or more Contracting Parties in waters with respect to which they have agreed to continue to carry out conservation measures for certain stocks of fish in accordance with the provisions of this Convention, the Contracting Parties concerned shall carry out enforcement severally or jointly. In that case, the Contracting Parties concerned agree to report periodically through the Commission to the Contracting Party which has agreed to abstain from the exploitation of such stocks of fish on the enforcement conditions, and also, if requested, to provide opportunity for observation of the conduct of enforcement.

3. The Contracting Parties agree to meet, during the sixth year of the operation of this Convention, to review the effectiveness of the enforcement provisions of this Article and, if desirable, to consider means by which they may more effectively be carried out.

ARTICLE XI

1. This Convention shall be ratified by the Contracting Parties in accordance with their respective constitutional processes and the instruments of ratification shall be exchanged as soon as possible at Tokyo.

2. This Convention shall enter into force on the date of the exchange of ratifications. It shall continue in force for a period of ten years and thereafter until one year from the day on which a Contracting Party shall give notice to the other Contracting Parties of an intention of terminating the Convention, whereupon it shall terminate as to all Contracting Parties.

IN WITNESS WHEREOF, the respective Plenipotentiaries, duly authorized, have signed the present Convention.

DONE in triplicate, in the English and Japanese languages, both equally authentic, at Tokyo this ninth day of May one thousand nine hundred fifty-two.

Annex

1. With regard to the stocks of fish in the respective waters named below, Japan agrees to abstain from fishing, and Canada and the United States of America agree to continue to carry out necessary conservation measures, in accordance with the provisions of Article V, Section 2 of this Convention:

(a) Halibut (*Hippoglossus stenolepis*)

The Convention area off the coasts of Canada and the United States of America in which commercial fishing for halibut is being or can be prosecuted. Halibut referred to herein shall be those originating along the coast of North America.

(b) Herring (*Clupea pallasii*)

The Convention area off the coasts of Canada and the United States of America, exclusive of the Bering Sea and the waters of the North Pacific Ocean west of the meridian passing through the extremity of the Alaskan Peninsula, in which commercial fishing for herring of North American origin is being or can be prosecuted.

(c) Salmon (*Oncorhynchus gorbuscha*, *Oncorhynchus keta*, *Oncorhynchus kisutch*, *Oncorhynchus nerka*, *Oncorhynchus tshawytscha*)

The Convention area off the coasts of Canada and the United States of America, exclusive of the Bering Sea and of the waters of the North Pacific Ocean west of a provisional line following the meridian passing through the western extremity of Atka Island; in which commercial fishing for salmon originating in the rivers of Canada and the United States of America is being or can be prosecuted.

2. With regard to the stocks of fish in the respective waters named below, Canada and Japan agree to abstain from fishing, and the United States of America agrees to continue to carry out necessary conservation measures, in accordance with the provisions of Article V, Section 2 of this Convention:

Salmon (*Oncorhynchus gorbuscha*, *Oncorhynchus keta*, *Oncorhynchus kisutch*, *Oncorhynchus nerka* and *Oncorhynchus tshawytscha*)

The Convention area of the Bering Sea east of the line starting from Cape Prince of Wales on the west coast of Alaska, running westward to 168°58'22.59" West Longitude; thence due south to a point 65°15'00" North Latitude; thence along the great circle course which passes through 51° North Latitude and 167°

East Longitude, to its intersection with meridian 175° West Longitude; thence south along a provisional line which follows this meridian to the territorial waters limit of Atka Island; in which commercial fishing for salmon originating in the rivers of the United States of America is being or can be prosecuted.

PROTOCOL TO THE INTERNATIONAL CONVENTION FOR THE HIGH SEAS FISHERIES OF THE NORTH PACIFIC OCEAN

The Governments of the United States of America, Canada, and Japan, through their respective Plenipotentiaries, agree upon the following stipulation in regard to the International Convention for the High Seas Fisheries of the North Pacific Ocean, signed at Tokyo on this tenth day of May, nineteen hundred fifty-two.

The Governments of the United States of America, Canada, and Japan agree that the line of meridian 175° West Longitude and the line following the meridian passing through the western extremity of Atka Island, which have been adopted for determining the areas in which the exploitation of salmon is abstained or the conservation measures for salmon continue to be enforced in accordance with the provisions of the Annex to this Convention, shall be considered as provisional lines which shall continue in effect subject to confirmation or readjustment in accordance with the procedure mentioned below.

The Commission to be established under the Convention shall, as expeditiously as practicable, investigate the waters of the Convention area to determine if there are areas in which salmon originating in the rivers of Canada and of the United States of America intermingle with salmon originating in the rivers of Asia. If such areas are found the Commission shall conduct suitable studies to determine a line or lines which best divide salmon of Asiatic origin, and salmon of Canadian and United States of America origin, from which certain Contracting Parties have agreed to abstain in accordance with the provisions of Article V, Section 2, and whether it can be shown beyond a reasonable doubt that this line or lines more equitably divide such salmon than the provisional lines specified in sections 1(c) and 2 of the Annex. In accordance with these determinations the Commission shall recommend that such provisional lines be confirmed or that they be changed in accordance with these results, giving due consideration to adjustments required to simplify administration.

In the event, however, the Commission fails within a reasonable period of time to recommend unanimously such line or lines, it is agreed that the matter shall be referred to a special committee of scientists consisting of three competent and disinterested persons, no one of whom shall be a national of a Contracting Party, selected by mutual agreement of all Parties for the determination of this matter.

It is further agreed that when a determination has been made by a majority of such special committee, the Commission shall make a recommendation in accordance therewith.

The Governments of the United States of America, Canada, and Japan, in signing this Protocol, desire to make it clear that the procedure set forth herein is designed to cover a special situation. It is not, therefore, to be considered a precedent for the final resolution of any matters which may, in the future, come before the Commission.

This Protocol shall become effective from the date of entry into force of the said Convention.

IN WITNESS WHEREOF, the respective Plenipotentiaries have signed this Protocol.

DONE in triplicate at Tokyo this ninth day of May, one thousand nine hundred fifty-two.

Note: The Convention became effective upon exchange of ratifications on June 12, 1953.

