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Docket Entry 280 - Filed Direct Testimony of J.E. Lasater

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UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT TACOMA

UNITED STATES OF AMERICA, et al., Plaintiffs, -vs- STATE OF WASHINGTON, et al., Defendants.	CIVIL NO. 9 2 1 3 DIRECT TESTIMONY OF J. E. LASATER

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This is the direct testimony of J. E. Lasater submitted on behalf of Defendent, Department of Fisheries, in this action. This Defendent expressly reserves the right to submit further testimony by Mr. Lasater, either oral or written, to rebut the testimony presented by the Plaintiffs in this case.

Q. Please give your full name and address.

A. My name is Jasper Elton Lasater and I reside at Route 8, Box 344G, Olympia, Washington.

Q. Where are you employed and what is your title?

A. I am employed by the Washington Department of Fisheries and my title is Assistant Director of Fisheries.

Q. What is your educational background?

A. I have a bachelor of science degree in fisheries from the College of Fisheries at the University of Washington. I took two quarters of post graduate studies to get several fisheries courses unavailable to me while getting my bachelor's degree. I have completed seminar courses in natural resources management at the University of California and at Penn State.

Q. Will you relate your experience in the fisheries field?

A. While in high school in 1940, I worked a summer in a fish hatchery near Libby, Montana, as a hatchery helper. While in college, I worked the summer of 1950 for the Oregon Fish Commission as a biological aide at Astoria, Oregon. There, I aided in studies of the trawl fishery and gathered biological data on the species of fish captured. During the summer of 1951 I was the boat operator of a 50-foot vessel chartered from the College of Fisheries by the School of Oceanography. The summer was spent investigating the physical characteristics of the waters of northern Puget Sound.

Beginning in April, 1951, I was employed by the Department of Fisheries as an assistant to the chemist at the Bowman's Bay Laboratory. In this position I worked on studies of the effects of pollution on young salmon by analyzing samples of waste and water for such things as dissolved oxygen, concentrations of waste materials, salinity, alkalinity and standardization of waste samples for testing. I also assisted in the care and feeding of test fish and equipment in experimental work.

In February of 1952, I was promoted to Biologist I at the same laboratory with the added duties of being in charge of

studies of the effects of pollutants on salmon food organisms and aided in studies of the conversion of young salmon from fresh water to salt water.

In October of 1956, I was promoted to Biologist III and made project leader in charge of sports fishery management and research for Puget Sound and the Strait of Juan de Fuca. Chief duties involved estimating salmon catches by species and area, the gathering of data on marked salmon and all pertinent biological data on the salmon being harvested. My duties were expanded in October of 1960 simultaneously with an advancement to Biologist IV. I then conducted sport fishery management for the entire state. My duties involved the design and execution of scientific experiments. In February of 1962, I was made a Biologist V and was put in charge of all marine management and research with responsibility for personnel, operations and budget of the projects concerned. My duties included the evaluation and action phases of management and research programs and I represented the Department of Fisheries in interactions with other governmental agencies at all levels. I advised the Director of Fisheries concerning policies in fisheries management.

In February of 1964, I was asked to be Assistant Director of Fisheries by Director George Starlund and have remained in that position and am now assistant to Director Thor C. Tollefson.

In this position I specialize in the operations of the Department of Fisheries rather than administration. My chief duties within the department are to supervise the operations of the Divisions of Patrol, Management and Research, Hatchery, Engineering, and Stream Improvement. I represent the department and the State of Washington in meetings and negotiations with organizations, Indian tribes, states, and the United States including negotiations with foreign governments.

Q. Directing your attention to the issue of treaty Indian fishing rights, is it the Department of Fisheries' position that treaty

Indians must fish under the same regulations as other citizens?

A. No. In the Puyallup case, the U. S. Supreme Court said that regulations for treaty Indians must be reasonable and necessary for conservation and meet appropriate standards. I believe that the all-citizen fishery can be restricted more severely and for other reasons than these.

Q. Are treaty Indian fisheries set apart in any way from other fisheries by the Department of Fisheries?

A. Yes. The Department of Fisheries in its policy and in its program and budget documents to the Governor and the Legislature identify three classes of clients: treaty Indians, sport fishermen, and commercial fishermen. In addition to this, a position has been set up assigning a fisheries biologist fulltime to work with Indian fishery matters. Part of his job is to establish regulations and procedures that are suitable to Indian people and to become familiar with Indians and their fisheries to better bring to our attention matters which should be used in managing Indian fisheries. The staff also has been advised that in recommending regulations for Indian fisheries, they are to consider that these regulations must meet the test of being both reasonable and necessary for conservation.

Q. What does the work "conservation" mean to you?

A. Conservation is the wise conduct of human affairs to preserve resources and use them in a prudent manner.

Q. Do you distinguish essential elements necessary in the practice of conservation?

A. Yes, a data base is essential so that judgments and decisions can be founded upon facts. Computer techniques have a phrase "garbage in, garbage out" and this applies to the human brain as well as computers. Human values must be factored in. Conservation of a resource is for human beings whether the resource is to be experienced through the senses or be consumed. In fishing, such values include the manner of fishing and the ultimate use of

the fish caught from both a social and an economic viewpoint. The most basic use of fish is for food and is to be counted in terms of calories and essential food elements.

Q. Are there other essential elements to be considered if conservation of salmon is the issue?

A. Yes. Salmon are a renewable resource. If their habitat is maintained and they are harvested at the proper rate, there will be salmon for use and enjoyment for all of foreseeable time. Further, salmon have a terminal maturity. They all die after spawning and individuals cannot be saved for the future. Within two to five years, depending upon the species, the harvest must be taken and the spawning stock secured to ensure another generation of salmon.

Q. Is the regulation of the fishery necessary for conservation?

A. Yes. Salmon are public property until they are reduced to possession by some individual. A fisherman has the incentive to catch salmon but rarely the knowledge to know, of his own accord, which fish must be allowed to escape. Further, the individual cannot be assured that other fishermen will not catch the salmon that he allowed to escape. History is consistent in that unregulated fisheries lead to depletion of the resource and conservation is not secured. Further, unless deterred, some people will fish or care for their catches in a manner that wastes the fish. If a set net is not tended for several days, the first fish caught will be rotten and unfit for human consumption. Last fall fisheries patrol officers seized a set gill net at the Stevenson area on the Columbia River with approximately 2000 pounds of rotten salmon in it. As another example of wasteful practice, I have heard it said that if the Indians wished to use explosives, such as dynamite, to kill fish, they would be within their treaty right to do so. Explosives can be used for fishing. Many of the fish that are killed by an explosion, however, sink and are not recovered. Immature fish, food organisms, and other plants and

animals essential to the ecological balance of the aquatic environment are injured or destroyed.

Q. Are regulations necessary for conservation always restrictive?

A. No, I can remember that during the large 1958 sockeye run fishermen in northern Puget Sound were given over 20 straight days of fishing with no closure. We have encouraged the Lummi Indians to fish for 7 days a week on the reservation when fall chinook of hatchery origin are dominant in the Nooksack River. We have asked the Skokomish Indians to fish 7 days a week in the Skokomish River for hatchery coho. On large runs it is necessary to fish hard for conservation purposes and regulations reflect this.

Q. Is it necessary for conservation that fishing in different areas in rivers be managed differently?

A. Yes. Salmon migrating from the ocean commonly delay at the river mouth and often at the lower reaches of the river. These are designated as milling areas. Proper regulation should allow some number of salmon to be caught and some number to escape. In a milling area salmon are subjected to nets repeatedly and escapement cannot be ensured. A weekly closure for escapement may go by and at the resumption of fishing the same salmon are still there. Net fishing is allowed in milling areas only under special circumstances and such fisheries usually involve hatchery stocks. As salmon leave the milling area and move upstream, they usually move steadily through an area that we call waters of passage. It is here that a portion of the run may be removed and the remainder of the fish will move upstream beyond the fishing area. Spawning escapement can be ensured if proper gear restrictions and fishing times are applied. Next upstream there will be holding water where the salmon congregate awaiting spawning time. Depending on the species and race of salmon, the waiting period may extend from a few days to several months. Salmon in holding areas present the same problems as fishing in milling areas and are even more confined. In addition, since they will no longer

feed and must exist and spawn using body reserves, harassment will use up irreplaceable stores of energy and can be expected to cause death prior to spawning. Such a loss of salmon is wasteful and diminishes the numbers of fish in the next generation. Spawning grounds will be found near the holding areas and generally upstream. Spawning salmon are a stationary group of salmon with even less of an energy store than in the holding areas. Further, harassment of salmon on the spawning grounds directly interferes with the act of spawning. Spawning areas should be closed to fishing.

Q. Is a particular area in a river always a spawning area or a holding area?

A. No. There are five species of salmon and a number of races with different times of migration and spawning areas. A given portion of a river may be spawning area for one species and water passage for another. If they are also separated in time, the area might be fished at one time and closed to fishing at another time. Each river must be fished according to its physical characteristics and the species of salmon which inhabit it. Exhibit F-1 is illustrative of the different areas on a river to which I have referred.

Q. We have used the term "manage" in referring to the need to achieve necessary conservation goals. Could you define what management is as it pertains to the salmon resource?

A. Management is a term that includes all of the organized activities of man aimed at conservation of a resource. Management can be separated in three main categories: (1) activities maintaining or creating an environment so that salmon may be produced in abundance; (2) regulations which ensure that sufficient salmon escape the fishery to ensure production of the next generation of salmon and, (3) regulations which ensure, to the extent possible, that all salmon not needed for spawning are harvested and used.

Q. Are the fisheries for salmon divisible into categories which

require different goals in management?

A. Yes, there are separate goals for the all-citizen commerical fishery, the sport fishery, and Indian fisheries.

Q. What are your department's goals for the all-citizen commercial fishery?

A. One goal is that the harvestable portion of a salmon run is regulated in such a manner that a fisherman has the opportunity to catch fish in quantities that will afford him a profit for his labor and his investment. A second goal is that salmon will be processed and marketed so that the public at large will be able to buy salmon for consumption. A third goal is that the economy and well-being of all of our citizens will be enhanced by use of the resource.

Q. What are your department's goals for the sport fishery?

A. One goal is a maximization of the recreational opportunity consistent with wise management. A second goal is that salmon are made available for the personal use of those who wish to fish. A third goal is that the fishery will enhance the economy and well being of all citizens by use of the natural resources of the state.

Q. What are your department's goals for the Indian fisheries?

A. The goals for the commercial Indian fishery are similar or identical with the goals for the all-citizen commercial fishery. In addition, it is our goal to make salmon available for the personal use of Indians who wish to fish. A goal unique to Indian fisheries is to make salmon available for ceremonial fisheries which have to do with their culture and religion.

Q. Are the fisheries that you have indicated managed differently?

A. Yes.

Q. In what way are they managed differently?

A. Commercial fisheries, both Indian and all-citizen, are limited in time and area but when allowed to fish there are no restrictions on the amount of salmon that can be taken by any individual.

Further, by their nature, different types of commercial gear are regulated differently. A reef net fishes at a set location and is dependent upon visual sightings of salmon and is fished only during daylight hours. Gill net boats are mobile and the nets work best in dim light so that fishery in confined largely to night hours. Purse seines are mobile and are a daytime gear. Trollers fish during the daytime with lures and are confined to the ocean. They fish over a relatively long season without intervening closed periods to meet the market demand for fresh salmon over a longer period of time. Most Indian commercial fisheries are in the rivers where set gill nets and drift gill nets are used. These fisheries occur on salmon which have left the more open marine areas and entered a funnel, so to speak. Since the fish are so confined and concentrated between two banks, the fishery must be carefully regulated to prevent over fishing. The sport fishery fishes for a longer period during the year than commercial fisheries in order to ensure a maximum recreational opportunity. The daily allowable catch is limited so that a long season can be allowed and meet conservation needs. Further, a bag limit is compatible with both recreational and personal-use goals. This principle is also exercised for treaty Indian fishing on the Columbia River where personal-use fisheries are allowed with dip nets and spears at places and at times that commercial fishing with gill nets is not allowed. Indian fishermen and their tribal leaders have expressed to me that they place a higher value on personal-use fisheries than upon commercial fishing. At a meeting in Department of Fisheries' offices, Yakima tribal leaders told me that their priorities ranked as follows: 1. salmon for ceremonial purposes; 2. salmon for personal use; 3. salmon for commercial sale. While at present no personal use seasons have been established in the case area, the department is willing to establish such fisheries for treaty Indians.

Q. Does the migratory nature of salmon affect regulations designed to conserve the resource?

A. Yes. As salmon migrate from the ocean to Puget Sound then to a river, they may be fished in all of these places. If all of the available harvest is taken in the ocean, then for conservation purposes Puget Sound and the rivers must be closed to fishing to obtain the spawning escapement. If all of the harvest is taken in marine waters, the rivers must be closed. The regulation pattern can create the need for closure for conservation purposes at a later time and in a different area of the migratory route.

Q. Is a regulatory standard that regulation must be "reasonable and necessary for conservation" and "meet appropriate standards" sufficiently precise to manage an Indian river fishery in Puget Sound and on the Olympic Peninsula coastal rivers?

A. No. The demand for salmon is such that all salmon taken can be disposed of, so lack of demand will not stop the fishery. If the conservation test were literally applied, other fisheries in the ocean and Puget Sound would have to be curtailed as the river fishery grew so that spawning escapement could be ensured. At some point all other fisheries would have to be completely closed and only then would it be literally necessary to halt the growth of the river fishery to conserve the resource. The converse would also be true. Too liberal regulation of salmon fishing in marine waters could bring about the closure of an Indian river fishery as being necessary for conservation. But since Indians and other citizens should have opportunities to catch fish, then the question of when it is reasonably necessary for conservation to close a fishery is more complex. Fair treatment for all fishing groups requires that standards be set for management so that all groups share the catch in a manner that will be fair to Indian treaty fishermen and to the all-citizen fishery.

Q. Is this fair share principle an essential element of managing an Indian river fishery to meet conservation needs?

A. Yes. The all-citizen fishery must be regulated so that treaty Indians have an opportunity to catch a fair share of the salmon harvest. Once a fair share is determined, the Department of Fisheries should be required to regulate the fisheries in such a manner that such opportunity is presented. The problem for us is that the courts tell us our regulations for an Indian fishery must be "reasonable and necessary for conservation" and "meet appropriate standards" but then never tell us what those terms mean. As I just pointed out, there is always a conservation necessity to regulate any fishery. Judge Belloni in Oregon interpreted these terms to mean that the Indians must have an opportunity to catch a fair share of the harvest. We accept that principle, but the term "fair share" is vague like the term "conservation" when you attempt to apply it in a management plan. What we need is direction from the court as to what would constitute a "fair share". We are hopeful this lawsuit will resolve this problem so that we can stop being harassed by lawsuits each time we pass a regulation and let us get on with our job which is to manage the fishery in the best interest of all of our citizens, Indians and non-Indians.

Q. If this court simply adopted the ruling of Judge Belloni in the Sohappy case to which you just referred, would that solve the problem of giving the department an appropriate standard by which to meet the requirement of a fair share?

A. No. We have adopted the principle of the decision by Judge Belloni to attempt to ensure Indians a fair share of the catch. He did not, however, define a "fair share". The result has been that many Indians are not satisfied with their share or with the fishery and have gone to court several times on the matter. Furthermore, the Columbia River fishery is quite different in character than the fishery in Puget Sound and has to be managed differently so that the decision or principles adopted there cannot be literally applied to a Puget Sound fishery.

Q. You mentioned that the Columbia River "fair share" plan is not appropriate for managing the Puget Sound and coastal rivers involved in this lawsuit. Why is that?

A. The fishery on the Columbia River involves an all-citizen fishery in the lower portion and an Indian fishery in the upstream area. The stocks are relatively unmixed or at least all Columbia River stocks are tending to be on a single migration path and can be followed directly from one area to the next. In Puget Sound we have diverse runs going to many rivers, mixed stocks, mixed species, and many different and more complex management problems. For instance, in the Columbia River on runs bound for above Bonneville Dam restriction of the all-citizen fishery will directly augment the Indian catch and the effect on escapement will be known with considerable precision. In Puget Sound a blanket restriction in northern Puget Sound, where there are mixed stocks of a number of species from many rivers, will have other effects, often adverse, than just increasing treaty Indian catches. For example, a blanket restriction could cause us serious difficulties with over escapement in rivers and streams where there are not Indian fisheries. In order to properly manage the fishery we need a definition of a fair share that fits Puget Sound and the coastal rivers and the Belloni decision does not do this.

Q. Does the Department of Fisheries have a management model to recommend to the court for the Puget Sound and coastal river area involved in this case?

A. Yes, we do. In general, this model would set aside for the Indians a percentage of the harvest from the fish produced by the rivers involved in their treaty fisheries. The percentage would be applied to the catch that is taken under state jurisdiction in areas that can be regulated by the State Department of Fisheries. It would then be the responsibility of the state to manage the fishery to ensure that this fair share reached the Indian fisher-

men.

Q. If the State of Washington is to be responsible for ensuring that the treaty Indians have an opportunity to catch a fair share of the salmon, should all salmon landed in the State of Washington be counted in determining the size of the harvest from which the Indians' share is to be measured?

A. No. The total Washington landings cannot be used to arrive at a fair share for two reasons: First, many salmon are caught and landed in the state that are bound for areas separate from treaty fishing areas. Many salmon caught in the ocean off our coast and landed in our state originate in California, Oregon or Canada. Catches of salmon in the Strait of Juan de Fuca through the San Juan Islands and northward to Canada are often fish bound for Canadian streams and particularly the Fraser River. Further, large areas, such as Willapa Bay, are not the usual and accustomed fishing places of treaty tribes. Only those salmon which are native to treaty fishing areas should be counted in determining a fair share because it was only those fish that the Indians in treaty times had an opportunity to fish for. Secondly, Washington cannot be held accountable for salmon harvested outside of its jurisdiction. Large quantities of salmon which are spawned in rivers and streams within the case area are harvested outside of state waters in international waters. This is sometimes a major portion of the catch of some species. Salmon so caught are taken by fishermen from other states as well as by Canadians. The state can likely regulate its own citizens in international waters, but cannot regulate the ocean fisheries to ensure that any particular share will migrate back to state waters. In setting up a fisheries management zone between three and twelve miles off shore, Congress specifically excluded state jurisdiction in those waters. The state cannot license fishermen or collect a landing tax for fish from outside of three miles of its shores. If further restrictions are necessary in inter-

national waters to ensure a fair share to treaty Indians, such regulations are within the jurisdiction of the United States Government. If the Canadian take is to be curtailed, the United States Government alone has the power to negotiate or reach agreement with Canada. The State of Washington cannot be responsible for matters outside of its jurisdiction.

Q. Is there a problem in ensuring that salmon native to areas fished by treaty Indians escape the ocean fishery?

A. Yes. The offshore fishery for chinook and coho salmon is taking a major portion of the harvest of those species and has led to severe restriction of the fishery in Puget Sound. Figures used by the United States in negotiating with Canada this year show that Canadian fishermen are taking approximately 83 percent of Puget Sound chinook salmon and approximately 65 percent of the coho.

Q. Should any salmon taken under the jurisdiction of the International Pacific Salmon Fisheries Commission count toward a fair share?

A. Yes. The Commission's regulatory activities are in the Strait of Juan de Fuca and northern Puget Sound, as explained in the joint biological statement on pages 101 to 103. The State of Washington, through its Director of Fisheries, shares in the management decisions of the Commission, and United States fishermen fishing under regulations recommended by the Commission are licensed and otherwide regulated by the state. Salmon bound for Indian treaty fisheries should be counted, but salmon bound for Canada should not be counted.

Q. In the management model you have proposed, why is the fair share determined in a percent of the available harvest spawned in the rivers within the case area on which there are Indian fisheries?

A. Essentially there are three reasons: (1) a percentage share affords a definite standard necessary for management planning; (2) a percentage share is conservationally sound; and (3) it is

the fairest method.

It is essential in planning the management of a complex area like this, where there are several fisheries, that we have fixed standards to work toward. If a fisheries manager asks me what to do and I tell him only that his management plan must be fair, he won't know how many fish should go where, and his plan will be indefinite and subject to constant challenge.

You have to understand how a manager works in order to appreciate the need for a definite standard to be applied to the fair share principle. The manager must take all the data available to him on the fisheries, including the species of salmon approaching, their probable migration route, their predicted run strength, and the expected fishing effort to carefully make estimates and plans as to how the fish will behave and how the fishermen will behave and where the catch will be taken. This must be done with considerable precision so that we have an idea of how the fishery will go in a particular year. Then we have a framework which can be modified as the fish show up, so that we can react to the actuality of the fish run that presents itself. Without a precise goal, it is impossible to plan, and advance planning is essential if the harvest of the fish is to be properly managed and the resource conserved. Time is of the essence, because the fish don't wait. They move very, very quickly. Salmon can move from the Strait, completely through the Sound and be in other fisheries in three days. Thus, I would say that any definition of a fair share must lend itself to a management plan that affords an opportunity for precise advance planning of the harvest. A fair share based on a percentage of the harvest meets this requirement because it gives us a definite goal to be working toward in planning the harvest in any given year.

As for the conservation of the resource, achievement of the necessary spawning escapement has to be the final goal. Thus, the management system has to allow the harvest to reflect the

actual run size of fish and vary with it and not separate from it. The percentage share does just that, since in abundant years the share is increased and in lean years it is reduced automatically.

Finally, the plan will be fair. Once the decision is made as to what percentage constitutes a fair share, then the management agency can plan and work toward that goal and achieve it and, I think, achieve it with regularity. If a run is poor, no one fishery is penalized more than another - all have to share in a reduced harvest. Conversely, if a run is large, all fisheries can share in the bounty thereof and no one then is short of fish due to some other standard that is not related to the size of the fish run.

Q. Why not just set a fixed quota for the Indian catch?

A. The fixed quota system would provide for a fixed standard. The fixed quota, however, does not meet sound conservation practices. On years when the run is low, the quota catch may very well exceed the number of fish available for harvest and the quota of fish will be taken directly from necessary spawning escapement. For instance, this year we expect a very small run of chinook salmon to return to Puget Sound from international waters. We have closed the commercial fishery and reduced the sport fishery. An Indian commercial net fishery with a fixed quota on this run could be expected to reduce the spawning escapement below necessary or desirable levels, and that would be unsound conservation. Furthermore, a fixed quota will be unfair to fishermen, both Indian and non-Indian, and may well be unfair to the state. On a year when the run is low and the Indian quota will take the entire harvest, the all-citizen fishery then must be entirely shut down to meet spawning escapement goals. On a year when the run is very good, the Indian will be fixed to a quota which will be low on that year and the all-citizen fishery will have a bountiful harvest and the Indian will only catch his fixed quota. Some years the return, and it may be true this year with chinook

salmon, would be so low that the state would be in the position of having legally to see that the Indians got a particular quota of salmon when that number might not even enter its jurisdiction at all. It would be unfair to the state to penalize us in such a situation. All fishermen want the opportunity to make a large catch and to fish with the least possible restrictions within any regulation plan adopted. A fixed quota is rigid and would depress a fisherman's ability to use all of his skills to the utmost. In addition, a fixed quota is foreign to the Indian manner of fishing. Even in treaty times and before, run sizes fluctuated due to combinations of natural circumstances and the Indian catches reflected this run strength.

A comparison can be shown between the workings of a percentage share and a fixed quota management system. Suppose that a particular run of salmon averages 5000 salmon. Escapement needs are 1000 salmon, thus 4000 salmon should be harvested. Assume that treaty Indians are to catch 20 percent of the harvest. If a quota is set it will be 800 salmon annually. If the run is average, or 5000 salmon, both the percent share and the quota is 800 salmon and the escapement goal of 1000 salmon can be reached. With a poor run of 1500 salmon, only 500 salmon are available for harvest and a 20 percent share is 100 fish. If a quota of 800 salmon is taken, the escapement goal will not be met as only 700 salmon will remain. Further, all other fisheries must be entirely closed and not share in the harvest. If the run is 10,000 salmon, 9,000 will be available for harvest. A 20 percent share is 1800 salmon and the escapement goal will be met. If these three years are summed up, under a percent share the spawning escapement would have been met each year and conservation served. In addition, the total Indian take would be 2700 salmon. With a quota, escapement needs would have been short by 30 percent on one year and the Indian take would be 2400 salmon so that under the quota, both escapement and the Indian catch

would suffer. I have illustrated these three examples on Exhibit F-2.

Q. In the examples you have used, there was widely fluctuating run size. Would fluctuations typical of those presented in the example be found in the river systems and watersheds involved in the case area?

A. Yes, they will be found. Survivals vary due to combinations of weather, river flows and such, and at times the result of spawning is that only one salmon or less returns for every salmon that spawns. We have had examples of where one salmon produced as many as 20 returning fish on the ensuing run, so that while I have shown examples that varied less than one in ten, we do have examples where runs have varied as much as 1 in 20.

Q. Do you have access to any statistics which would verify this fluctuation in run size which your example refers to?

A. Yes, I have. I can refer to the 1970 Fisheries Statistical Report of the Washington Department of Fisheries and find such examples. In the table on page 38, labeled Catch of Salmon on Puget Sound Excluding Off-Shore Catches and Number of Fish, there are a number of examples.

Q. Is the 1970 Fisheries Statistical Report a business record of the Department of Fisheries that is kept in the normal course of its business by the department?

A. Yes, it is.

Q. We will designate the 1970 Fisheries Statistical Report as Exhibit F-3 and request that it be admitted into evidence. Now, referring to the table that you mentioned on page 38 of Exhibit F-3, could you give us an example of this fluctuation?

A. Yes. This table is of the catches of salmon in Puget Sound from the year 1913 forward and in recent years. There are any number of examples here, but I can refer to the catch of silver salmon in 1960, which was less than 104,000 salmon, and to the catch in 1970 which was very nearly 850,000 salmon. Between these years,

catches fluctuated less extremely but were at times double other years.

Q. Why not just cut back on the all-citizen fishery in marine waters so that the treaty Indians can catch more salmon?

A. First, there would be no fixed standard so that the fisheries manager could plan a management outline for the coming season. He has no way of knowing how much to cut back, how many salmon the Indians will catch so that he can plan through to the spawning escapement. In these circumstances the manager might estimate how much he should restrict the all-citizen fishery and he might estimate how many fish the Indians might take and how hard they might fish and he might be wrong in either or both of these areas and find that he doesn't have enough fish left over to meet spawning escapement needs and conservation suffers. Further, the plan is not conservationally sound because our experience in trying to manage for the reservation fisheries is that there is a tendency of Indians to fish without regard to run size. In some cases overfishing has occurred because the Indian fishery does not properly reflect the size of the run and the capability of that run to produce a harvest over and above the spawning escapement. Nor will fairness be achieved by such a method because there is no way of knowing what share is fair to either fishery. You make estimates of what each will catch and chances are that neither fishery will believe that they have received a fair share.

Q. In the past, you have regulated the fishery to make an allowance for reservation catches without any authority to regulate on the reservation. Why can you not now just cut back the all-citizen fishery to make an allowance for an off-reservation fishery?

A. First, I would note that such management has not been without its conservation problems as I mentioned previously. But there is also an important difference between managing for an estimated reservation catch and an estimated off-reservation catch.

Reservations are fixed in location and in size. The physical limits of a reservation on a river limit the number of favorable places to fish and, therefore, a reservation fishery is by its nature self-limiting. But we are talking about an off-reservation fishery in which the plaintiffs claim usual and accustomed fishing grounds in all the streams, rivers and marine areas of the case area. There is nothing to limit such an Indian commercial fishery. The market for salmon is such that it can absorb all the available fish. They are valuable and the incentive to catch the fish is there, there is money to be made. In our experience, such fisheries will expand until something stops them. That something may be regulations or it may be that the catch becomes so great that spawning escapements suffer and the runs subsequently decline and conservation is not served.

Q. Do you know of any examples in the Indian fisheries where such an expansion occurred?

A. Yes, I do. That, for instance, was what the Puyallup case was all about in the original. A fishery began and expanded till the river fishery was at a maximum level; the fishery expanded with larger and larger and more complex nets to Commencement Bay at Tacoma so that the catch exceeded anything that the river could produce. Escapements to the hatchery and wild escapements suffered, and the total production of the river subsequently declined, as indicated in Exhibit F-4.

Q. We will submit Exhibit F-4 for illustrative purposes. Could you manage an Indian river fishery if the requirement were that your regulations meet a test of being the least restrictive regulations that would be reasonable and necessary for conservation?

A. No, I don't believe that we could. I don't think that we can ever meet that standard. I don't know of any management plan that I have ever seen or helped devise or have worked with that I, myself, could not challenge as not being more restrictive in some measure than some other plan. I am quite sure that such a

plan cannot be devised. It will always be open to such criticism because the term "least restrictive" becomes a matter of opinion and judgment and is not tied to the objective factual picture in any definite way. At present, the Department of Fisheries must show that its regulations are reasonable and necessary for conservation. We could better meet this if fixed standards are set. We cannot and will not be able to prove the negative, however, i.e., that no other system can be devised which is less restrictive.

Q. If Indian tribes could successfully show that their regulations were less restrictive than the regulations proposed by the state, what would be the effect on the management process if the court were to impose on the department the tribal regulations?

A. First, I would expect the Indian tribes to always be able to devise a less restrictive regulation than put forward by the department because up until the time the all-citizen fishery is reduced to zero, they will always be able to show that the department can meet the test of conservation by shutting down other fisheries. In this case, also, management will be so fragmented that it will be impossible to plan a rational fishery which meets the needs of conservation and, in fact, ensures a fair share to Indians. Furthermore, management will be taken out of our hands and placed in the hands of the court. My understanding of the Puyallup decision is that regulation of Indian off-reservation fisheries is the responsibility of and is under the authority of the state. It is critical that Indian input into the regulation-making process comes prior to the adoption of the regulations. Our state Administrative Procedures Act provides full opportunity for Indians to participate in the regulatory process. In addition, the department will and has made special efforts to include Indians in this regulation-making process. If the "least restrictive" standard applies, I would expect Indians in each case to prepare less restrictive regulations, and if they

were successful in challenging the state regulations, the entire regulation pattern for that season would be in jeopardy. Multiply that situation times the thirteen tribes who are plaintiffs in this law suit and you can imagine the chaos that would result in our management program.

Maybe if I give you a capsule summary of the steps taken to adopt regulations, you will appreciate why the Indian contribution should come in the planning stage instead of after the regulations' adoption in a court test over whether their regulations are less restrictive than ours. We have indicated the planning process in Exhibit F-5 which is illustrative. As soon as one salmon season is over and the data processed, planning begins for regulation of the next season's fishery. Months are required to make and refine predictions and test ideas for managing the runs brought up by department experts. The suggested plan is studied and alternatives weighed up to the director's level. The Administrative Practices Act procedures are brought into play, requiring at least 20 days between notification and a hearing. Hearings are held and the input received there evaluated and factored into the plan. The regulations must be adopted prior to first salmon runs in late spring and in time for notification of fishermen so that they, too, can plan their fishing season. If, after regulations are adopted, they are successfully challenged, there is no way to replan the fishing season before the salmon arrive. A far better standard is a method which would test the reasonableness and necessity for conservation against some definitive fair share principle.

Q. If a tribe fishes in marine waters where stocks of salmon from a number of streams occur, how might the treaty right be met?

A. In this case, Indians would be scheduled for more fishing time than is scheduled for the all-citizen fishery. For example, it would not be proper or possible to ensure the Makah Indians a particular share of all of the salmon in their usual and

accustomed fishing area. Salmon originating from California to British Columbia are found off Neah Bay. Instead, the Department of Fisheries has set a year-round troll salmon season for Makah Indians near the reservation and schedules more net fishing days in the Strait of Juan de Fuca than are allowed other fishermen. Similarly, the Squaxin Indians and the Tulalip Tribe may fish in certain areas within salmon preserves where no other people can fish with nets.

Q. Can the Department of Fisheries manage the Indian treaty fishery and the all-citizen fishery to prevent waste and over escapement?

A. Yes, provided that the plan for ensuring the treaty Indians a fair share is flexible so that the Department of Fisheries can set regulations which will respond to vagaries of run size and migration by species and race as well as weather and the changing of fishing patterns by Washington fishermen. A fair share expressed in percent of production leaves the management of the fishery in the hands of people trained and experienced in fisheries management.

Q. Have you arrived at any principles which would apply to the proper use of a flexible management plan based upon fixed standards such as the percentage share system you have proposed?

A. Yes. First, such flexibility is not to be used to detract from the treaty Indian catch. The need for such flexibility may often be used for conservation as well as fair distribution of the catch. For instance, in 1973 the chinook run is expected to be very small and should be protected. However, closely following and partly overlapping the chinook run we expect a large coho run. The large coho run should be harvested, but in so doing some late-running chinook will be taken. The department then could say that the coho must be taken for conservation purposes, but no chinook remain for the Indian catch also for conservation purposes. The percentage fair share would ensure the Indians their percentage of the harvest regardless, either directly or

to be made up in another species (for instance the coho) or as a debit to be made up the following year. Secondly, the manner and time of the all-citizen fishery is not a concern under the treaty right unless it detracts from the treaty right or physically interferes with fishing by treaty Indians. The claims or jealousies of other fishermen which are very common in fisheries management are without justification for the treaty Indians if they are in fact catching their fair share. The catch is the proof that other fisheries are being curtailed so as to meet the treaty right. Further, the state can then exercise its regulatory authority freely in managing the manner and places of fishing of its non-treaty citizens.

Q. Must all of the treaty Indians catch the fair share percentage in order that the treaty right can be met?

A. No. If the state can demonstrate that sufficient salmon were allowed to escape to the Indian fishery, but due to conditions beyond its control or reckoning the Indians did not catch a fair share, the state has met its obligations. Situations could occur where the Indians would make an insufficient effort to catch the salmon. A severe price drop could reduce fishing effort; a disaster such as a fire could destroy the fishing gear; or a sale of reservation timber and subsequent individual benefits might make the hard labor of fishing temporarily unattractive. Further, a natural disaster such as storms, floods, drought or changes in the behavior of the salmon might curtail the catch. Such occurrences are well known in the history of fishing and will always affect fishermen. When such things truly occur and can be documented, the state should not be penalized.

Q. Do you have any guidelines which have to do with the manner of fishing or the gear used by treaty Indians in the taking of salmon?

A. Yes. The state should seriously consider any method of taking salmon which is traditional to the Indian people or modern

methods and gear where it is applicable. The wishes of the tribe should be strongly considered in this regard. The state should be able to reject frivolous or negative practices. Under a "least restrictive" standard the state might be forced to prove that a particular poison should not be used or some mechanical fish-catching device quite foreign to the traditions of Indian and non-Indian alike.

Q. Could the wishes of the Indians affect the manner of fishing?

A. Yes, it could and the regulations of the Department of Fisheries reflect this. I believe the treaty right is a tribal right and that the tribe may wish controls beyond those deemed necessary by the Department of Fisheries. For instance, in the off-reservation area on the Nisqually River the tribe asked that our regulations include a minimum gill net mesh restriction of 6-1/2 inches and a weekend closure. Both were adopted, although neither was considered necessary by the Department of Fisheries. Further, the state should be free to negotiate agreements with the tribe which are of mutual benefit. The department now has working arrangements or contracts with the Squaxin, Lummi, and Tulalip Indians regarding salmon culture and sale of fish to the state. Such efforts might become more important to the tribe than some aspects of fishing and the tribes should be able to reach agreements with the state which they see to be in their best interests.

Q. If the court were to adopt the percentage-of-the-harvest method of defining a fair share for treaty Indian fishing, does the Department of Fisheries have a data base upon which it could manage the fishery on that basis?

A. Yes, we have. We have all of the standard data and fisheries statistics. In addition, this material has been analyzed with special consideration for catches of salmon production from Indian rivers and a report has been prepared.

Q. What is the name of the report that was prepared and by whom was

it prepared?

A. The report is entitled "Catches of Salmon from Indian Fishery Rivers of Puget Sound, Coastal Washington and the Strait of Juan de Fuca" and was prepared by Dr. Steve Mathews.

Q. Was Dr. Mathews working under your supervision at the time he prepared this report?

A. Yes, he was biometrician with the Department of Fisheries and was working on the statistics of the department. He prepared this report as a part of our regular duties in analyzing all of the fisheries that we manage.

Q. Could you explain what a biometrician is?

A. A biometrician is a statistical mathematician who specializes in the application of mathematics to biological systems and situations. In the case of Dr. Mathews, he was a fisheries biologist who worked for the Department of Fisheries for some time and then returned to the University of Washington for his doctorate in the mathematical field, so he has years of experience as a fisheries biologist as well as being a fine mathematician.

Q. We will designate this report Exhibit F-6. Mr. Lasater, are you an expert in the mathematics covered in this report yourself?

A. No, I am not, in the sense that I could say that the mathematical method is the best or only method to be used. I understand the method used.

Q. Are you satisfied, based on your experience as a biologist, that the method used reasonably portrays the distribution and catch of salmon from the rivers analyzed?

A. Yes, I am satisfied that this document does portray the actual situation in the fishery so that we can devise management plans from this data.

Q. We move the admission of Exhibit F-6. Would you explain the method used by Dr. Mathews in his report?

A. The first step was to gather together all pertinent data for analysis. This data would include catch statistics at all levels

to determine the harvest and all spawning escapements both to hatcheries and for wild salmon. Calculation of the distribution and contribution of the rivers to the various catches required the use of all data from the case area for contribution and distribution of marked salmon and tagged salmon. Consideration was given to any information regarding migration, routes and timing of the salmon.

Q. How does the data from the marked salmon and tagged salmon show the catch of salmon from a particular river?

A. Salmon are marked by placing some identification on them or a fin clip, excising one fin when they are very small at the time they are released from a hatchery or migrate to the sea. With careful allocation of these marks, confusion can be avoided and the salmon can be traced throughout their life in the marine fishery wherever caught. Our people sample catches, sport and commercial, from all of the fisheries that will fish on them, looking for marked salmon and noting the ratio of marked salmon to unmarked salmon. Since we can identify these fish as originating at a particular place and you have the ratio of marked salmon to unmarked salmon, you can multiply this ratio times the final catch and determine the origin and number of marked fish that have been caught in any particular fishery. Tagged salmon differ from marked salmon in that the former are captured in the rivers or in the marine areas when they are at a large enough size to have a tag affixed to them. They can then be identified as they migrate through the fishery and return to the rivers. Then as they are captured, you know in which fishery and its location. In addition, the fishery and the location of capture gives you the migration routes and timing. Tagged fish which are not caught in any of the fisheries will escape and can be counted on the spawning grounds or at hatcheries.

Q. From the tagging studies and marking studies, can you determine which fishery is taking the fish?

A. Yes. All the agencies along the coast that manage salmon or record catches sample for marked fish; therefore, at every landing port of any importance, the salmon landed are sampled to determine the number of marks in a catch. The actual catches are also recorded and the numbers of unmarked fish are recorded, as well as the location of where the fish were caught. This data can then be analyzed to show the numbers of marks found in each fishery, the proportion of those marks to the actual catch and, therefore, the actual contribution of those marked fish to that fishery.

Q. Would it be correct, then, that you could determine on the basis of your marked and tagged studies what portion of the fish, for instance, the Canadian fishery might be taken of Puget Sound origin fish?

A. Yes, this has been determined and the figures were used in the recent negotiations between the United States and Canada. Samples of salmon caught in the Canadian fishery showed that salmon with marks originating from the Puget Sound area were very common, in fact prevalent, in that fishery. This is direct evidence that the Canadians are intercepting Puget Sound salmon and can be used directly to determine the numbers.

Q. Have marking studies been done on every river analyzed in Dr. Mathews' study?

A. No, they have not. The contribution of some streams has been judged to be similar to that of other nearby streams where studies have been performed. For instance, no marked salmon have been released into the Nisqually River which will return prior to 1974. However, millions of marked salmon have been released from the Deschutes River a few miles to the south and from the Minter Creek hatchery to the west. Young salmon from these three streams must migrate northward through Puget Sound at the same time and it is reasonable to assume that they would behave in a similar manner in the fishery.

As mentioned, marking experiments have been begun on the Nisqually River and if differences become apparent, the data will be used to update the studies. Such experiments are part of a continuing effort to improve the data base.

Cooperation of Indian tribes is necessary in marked salmon experiments since the incidence of marks in the Indian catch is a necessary part of the basic data. In 1971 the Federal Government contended that the state had no jurisdiction over fishing within the boundaries of the old Puyallup Reservation. Pending a judicial determination of the reservation status, the department felt it was unfair to the Indians to subject them to arrest when the United States Government was telling them they could fish unrestricted, so the Department did not enforce its regulations and did not feel free to sample Indian catches in that area. In that same year, a

plant of marked coho salmon was due back in the Puyallup River so the department asked the Bureau of Sport Fish and Wildlife to get information on the catches so that the cost and the results of the experiment would not be wasted. No data was received and important information was lost.

Q. What was the purpose of Dr. Mathews' study?

A. Dr. Mathews wished to determine the ratio or the proportion of the salmon caught from particular rivers by the Indian fishery and by the all-citizen fisheries in the marine areas wherever they occurred.

Q. If fish are not marked or tagged, is there any way of knowing whether a particular fish that is caught originated in a particular stream?

A. Not directly, no.

Q. Would catch statistics alone then be able to give you the number of fish originating from a particular stream caught in marine environment?

A. No, they would not because the stocks are mixed.

Q. How, then, was Dr. Mathews able to determine the number of fish from a particular river that was caught in the marine areas?

A. It was necessary for Dr. Mathews to derive a calculation by which he could estimate the number of fish from a particular river in the marine area. Much of our information about the fish is indirect because you cannot just walk out and count them. You do sampling and marking identification studies, so most of the information is calculated and statistically estimated based on indirect methods.

Q. Is the formula on page 2 of Dr. Mathews' report, in which he states that the $TMC_{i\ j}$ is equal to $R_{i\ j}$ times the sum of $E_{ij} \neq H_{ij} \neq F_{ij} \neq I_{ij}$ a formula to determine the number of fish caught in the marine environment of a particular species from a particular river?

A. Yes, it is. The symbols are identified on p. 2 of Dr. Mathews' report. The TMC_{ij} is the total marine catch of a particular species from a particular river and is the product of the equation.

R_{ij} is the average ratio of the all-citizen marine catch to the return to the river. It is derived from marked fish studies, primarily, and any other pertinent data, whereby the number of fish caught in the marine area from identifiable fish can be compared to the actual observations of fish bearing such a mark which return to the river. This ratio is multiplied times the sum of 1) the average annual escapement of the species to the river which is derived from index counts in spawning areas; 2) the average annual hatchery escapement of the species where it is applicable by actual counts at our hatchery racks; 3) the average annual river sport catch of the species in that river derived from punch cards; and 4) the average annual Indian fishery catch of the species in that river derived from the fish tickets that are received from the sales of those fish. These last figures reflect the Indian commercial catch. Thus, Dr. Mathews' figures do not include the Indian personal-use catch, nor do the calculated percentage shares.

Q. When you say average annual, what period of time are the figures in this report averaged over?

A. Six full years of natural escapement data were used as the base years. 1965-1970 was used in terms of estimates for chinook, coho, chum and sockeye salmon. Pink salmon, which run only every other year in Puget Sound, were compared over six odd-year cycles from 1959 to 1969.

Q. Would the figures for the average annual natural escapement count, hatchery escapement count, river sport catch count, and Indian fishery catch count be based on actual counts made of those fisheries for escapements?

A. Yes, each count is based upon physical counts or physical reporting of the catch, such as somebody weighing and counting the fish and putting them on a fish ticket and sending that information to the department.

Q. Could you give us an example of how this formula might work in determining the total marine catch from a particular species of a

particular river?

A. For instance, if the ratio of marine catch to the river return, as found by tagging and marking studies, was 2:1, then for every salmon that returned to the river, two are caught in the ocean. If the return of salmon to the river was 5000 chinook, as determined from the actual counts of the river fisheries and escapements, the ocean catch of salmon from that river would be estimated at 10,000 salmon.

Q. Did Dr. Mathews then break down the marine catch into the catches of specific fisheries in marine areas?

A. Yes, he did. It is important to know where the fish are caught, which fisheries catch them, and in what numbers in order to manage the fishery.

Q. What was the basis of his determination as to the breakdown of the catch to specific marine fisheries?

A. The marked fish, tagged fish studies, once again, will show the ratio of the catch of fish of that particular mark in the particular fisheries. With enough of these studies, then, one can get a pretty good idea of the distribution of catch from the various areas and rivers of Puget Sound into the various fisheries in the marine areas.

Q. What then was the sum product of the analysis of Dr. Mathews?

A. His final product is a series of figures which show the distribution of the catch and the return to a number of important rivers in Puget Sound. These figures will show the Indian catch, the river sport fishery catch, the hatchery spawning escapement, and the wild spawning escapements as their total return to the river. It will show the distribution of the marine catch from that river in such areas as the California troll fishery, the British Columbia troll fishery, the Washington troll fishery, Oregon troll fishery, sport fisheries in British Columbia, Washington and Oregon, the net fisheries in Canada and the Strait of Juan de Fuca, net fisheries Johnson-Georgia Strait area in Canada, the Washington net

fisheries in outer Puget Sound, inner Puget Sound and the sport fishery in Puget Sound.

Q. Has your department prepared exhibits showing the distribution of the catch from rivers upon which there are Indian fisheries?

A. Yes, we have.

Q. Were these exhibits prepared on the basis of the figures contained in Dr. Mathews' report in Tables 1-27?

A. Yes they were.

Q. We will mark these exhibits as follows and move their admission:

Exhibit	F-7	Estimated Catch and Escapement of Salmon Originating from Several Puget Sound and Coastal Rivers on which Indian Fisheries Occur.
Exhibit	F-8	Estimated Catch and Escapement of Salmon Originating from the Hoh River.
Exhibit	F-9	Estimated Catch and Escapement of Salmon Originating from the Hoko River.
Exhibit	F-10	Estimated Catch and Escapement of Salmon Originating from the Nisqually River.
Exhibit	F-11	Estimated Catch and Escapement of Salmon Originating from the Nooksack River.
Exhibit	F-12	Estimated Catch and Escapement of Salmon Originating from the Puyallup River.
Exhibit	F-13	Estimated Catch and Escapement of Salmon Originating from the Quillayute River.
Exhibit	F-14	Estimated Catch and Escapement of Salmon Originating from the Skagit River.
Exhibit	F-15	Estimated Catch and Escapement of Salmon Originating from the Skokomish River.
Exhibit	F-16	Estimated Catch and Escapement of Salmon Originating from the Snohomish-Stillaguamish Rivers.
Exhibit	F-17	Estimated Catch and Escapement of Salmon Originating from the Southern Puget Sound.

Q. Would you please describe the Exhibits F-7 to F-17.

A. Exhibit F-7 shows calculations of the distribution of the average annual catch from a composite of the Hoko, Quillayute, Hoh, Skokomish, Southern Puget Sound streams, Nisqually, Puyallup, Snohomish, Stillaguamish, Skagit and Nooksack Rivers. Exhibits F-8 to F-17 show the catch distribution for particular rivers. Included for each is the spawning escapement and the amount of the catch taken within three miles of the coast or within state jurisdiction and that taken outside of three miles.

Q. The tables and figures show a great variation in spawning escapement. Can you explain this?

A. Yes. The biology of the salmon is a major factor. Among other things, pink and chum salmon go to sea as small fry and rearing space in the river is not a limiting factor, but mortality at sea is high. These salmon require that a large part of the run escape to spawn. On the other hand, fall chinook rear in the river for about 120 days, so their mortality at sea is less and few spawners are needed. Coho rear in the river for a full year but their numbers are limited by rearing space in the stream during the summer low flows. Further, a pink salmon will carry about 2,000 eggs, a coho about 3,000 eggs, and a chinook salmon about 5,000 eggs with corresponding spawning requirements. The character of the river is also important. For instance, a river which has a limited spawning area for coho but a great deal of rearing area can be cropped heavily. In some cases we rely on experience alone to know that a particular escapement produces the maximum run from a river.

Q. What do the tables in Exhibits F-7 to F-17 show about the fisheries on the stocks and rivers indicated?

A. The table in Exhibit F-7 for the aggregate of the several rivers will provide an understanding of all the tables in Exhibits F-7 to F-17. First, for chinook salmon the greatest part of the catch is taken outside of state jurisdiction. Of the catch within state

jurisdiction, Indians take 7.8% of the total runs while the all-citizen fishery takes 18.8%. Second, for coho the major part of the catch also comes in waters outside the state jurisdiction. Within state jurisdiction, Indians take 7.8% of the runs and the all-citizen fishery takes 17.9%. Third, for pink salmon, over half of the catch is taken outside of state jurisdiction, and within state jurisdiction Indians take 8% and the all-citizen fishery takes 25.9% of the run. Much of the Pink salmon catch is taken under the management of the International Pacific Salmon Commission. Fourth, few chum salmon are taken outside of state jurisdiction since very few take lures or bait in ocean waters. Indians take 19% of the total run and non-Indians take 24%.

Q. What conclusions do you draw from Dr. Mathews' report and the tables in Exhibits F-7 to F-17?

A. First, with chinook, coho, and Pink salmon, a great portion of the catch is taken in international waters which are not under jurisdiction of the state. Secondly, the Indian fishermen take a significant percentage of the salmon from these rivers especially when compared with the all-citizen catch within state jurisdiction. Further, data so compiled and analyzed forms a basis for calculating and managing a fair share of the catch for treaty Indian fisheries.

Q. Earlier in your testimony you indicated that the United States, in negotiating with Canada this year regarding the interception of salmon from one nation by the fishermen of another nation, contended that Canadian fishermen were taking approximately 83% of Puget Sound chinook salmon and approximately 65% of the Puget Sound coho salmon. Were these percentages derived by calculations similar to those performed by Dr. Mathews in his report?

A. Yes, the calculations were derived in the same way and from, in great part, exactly the same marking and tagging studies. The material derived for the Canadian catch, in fact, was part of these same calculations. Now, I think it is significant that the Canadian scientists also agree within a very close margin with these salmon

figures based upon their analysis of the same fisheries with basically the same marking and tagging information.

Q. Would you say, then, that the methods used by Dr. Mathews have found general acceptance among fishery managers on the Pacific coast?

A. Yes, these methods are in general use, and Dr. Mathews is well known to other fishery managers along the coast and has a good reputation among them and with the College of Fisheries at the University of Washington where he now works.

Q. In addition to the study performed by Dr. Mathews, does the department have any other studies which it has prepared which would assist it in managing the fishery under a percentage share basis?

A. Yes, we have a report entitled "Salmon Escapement and Desired Escapement Levels to Certain Puget Sound Systems Containing Indian Fisheries" prepared by the Washington Department of Fisheries staff and dated March, 1972.

Q. We will identify the study you have just referred to as Exhibit F-18. Was this exhibit prepared under your over-all direction and supervision?

A. Yes, it was.

Q. Have you reviewed this study on salmon escapement and desired escapement levels?

A. Yes, I have.

Q. Based on your experience as a fish biologist, would you say that the information contained in this study truly portrays actual escapement and desired escapement to the river systems studied?

A. Yes, I do.

Q. We move the admission of Exhibit F-18.

In examining the tables contained in Exhibit F-18, it is often the case that the actual escapement levels do not meet the desired minimum escapement goals. Can you explain why there are these discrepancies?

A. Yes, the people responsible for preparing these tables are assigned to managing the fresh-water portion of the system - the escapement. Their job is to determine what is best for the fish. It is not their job to determine what's best for human beings and the fishermen and the catching and using of the resource. Therefore their goals are idealistic when you consider that in a fishery you are managing the catch and the fishery species for the benefit of the human race and not for the fish species involved. For example, this year we are expecting a very small run of chinook salmon back to Puget Sound. We have set seasons which close the commercial fishery and curtail the sport fishery on this run. Even so, we are doubtful in some cases that spawning escapements will be met. On the other hand, we have predicted a very good run of coho salmon to Puget Sound. Now when the coho arrive, the last portion of the chinook salmon run will still be in fishing areas. To say that all of the chinook salmon should be saved would require foregoing a very good silver salmon harvest. This is not in the interest of the State of Washington or of conservation of the coho salmon stock.

Q. Would the desired minimum escapement goals indicated in those tables be used by the department to diminish the fair share of the harvest for Indians?

A. No. Under a percentage fair share any plan of the Department of Fisheries to increase the spawning escapement to a particular river would require that restrictions be placed upon both fisheries to meet that goal; otherwise the fair share idea is violated. If we allow the all-citizen fishery more salmon, then we owe a percentage to the Indian fishermen--so we would want to treat them both the same to avoid a debit to the Indians that would have to be made up that year or the next.

Q. How would hatchery production apply to treaty Indian fisheries?

A. Standard hatchery plants which have been made over the years and which are regularly scheduled would be included in productivity

over and above natural production. As the hatchery production of the state increases, plants of salmon to treaty Indian fishing areas would increase. Hatchery plants to rivers with Indian fisheries are a routine matter with the Department of Fisheries, as illustrated by Table 29 in the Joint Biological Statement prepared for this case.

Q. Would the productivity base change from time to time and, if so, what would be done?

A. The base will be revised upward or downward as new information is made available and will be re-evaluated every 5 years in any case. The data base is not perfect and may never be since the world constantly changes. Further, rivers may change or be changed and production altered accordingly. If the Stream Improvement Division builds a fish ladder to make an area above a falls available to salmon, the productivity of the stream increases. If a slide destroys spawning area, productivity decreases. Changes in marine waters affecting survival also affect productivity.

Q. What will be done if more data is needed to refine calculations of productivity?

A. Special studies will be made to acquire the data. Department of Fisheries staff is steadily involved in such work since it is needed for many purposes. The techniques are known, and a number of projects scheduled for the 1973-1975 biennium are of this nature and affect the case area. In committing itself to a fair share for Indians, the Department of Fisheries will be committed to establishing a sound basis for its management program. Just as an example of what is being done, this year alone the department expects the return of eleven million tagged or marked fish.

Q. Suppose new runs of salmon are established, how might the Indians share in these?

A. As soon as such runs are established to the point that they can support a fishery in the usual and accustomed area, such runs will be added to the base and a share establised for treaty Indians.

Some species and races of salmon are particularly attractive for adaptation to Indian river fisheries. Spring run chinook salmon, for example, run when salmon are relatively scarce and are of excellent quality in river fisheries. Not only would they supply subsistance when salmon are scarce, but the market price would be high.

Q. Is the Department of Fisheries now working toward the establishment of such runs?

A. Yes. With thoughts of both the sport fishery and the Indian fishery, we are now selecting strains of salmon and testing hybrids which will contribute to the fishery early in the year, have a higher quality in river fisheries, and which can be managed separately from the all-citizen commercial fishery. One of these is the hybridization of Puget Sound chinook salmon with the Rivers Inlet stock from British Columbia. Another example is rearing experiments using the remnant stock of spring chinook from the Puyallup River system.

Q. How will salmon taken on an Indian reservation count in reckoning a fair share?

A. Salmon taken on a reservation will not be counted as part of the fair share unless they are transported off the reservation and sold. Personal-use salmon will not be counted as a part of the fair share. I have heard it said for many years in the Department of Fisheries that if the Indian fishery was for personal use, any problems would be of a minor nature. On the other hand, the department is willing to count the sport catch as part of the all-citizen harvest in establishing a share.

Q. Why are commercial reservation catches to be included in calculating the Indian fair share catch?

A. There are a number of reasons.

1. The reservation catch on a stream could be increased to the point that it took the entire harvest and the state would still owe the Indians a share which it could not possibly

deliver.

2. Catches taken off-reservation would be taken to the reservation and sold from there, or simply reported as being taken on the reservation at the time of sale. There would be little chance of proving otherwise and the fishery would be unmanageable.

3. There would be an incentive to over fish, which the state could not control, and spawning escapements would suffer. As the run diminished, accordingly the productivity of the river would be reevaluated downward and the calculated fair share diminished. Salmon management would suffer, the Indian share would suffer and relations between the state and the Indians would be impaired.

4. Indians with a reservation would have a great advantage over those without. The treaty fishery would then have different values for different treaty tribes, which is not fair on the face of it, and relationships between the tribes and the state and the tribes would suffer.

Q. You have stated that Indians would share in any increase in the productivity of a river. Are there any examples where such has already occurred?

A. Yes, there are a number of examples. Fall-run chinook are not native to the Skagit River and plants of these fish from the Skagit Hatchery now regularly augment the Swinomish Indian catch. Hatchery plants have held up the catches of the Lummi Indians from the Nooksack River. Their catches would be very low without hatchery augmentation. The Skokomish Indians have had a great increase in their chinook catch, as is shown in Exhibit F-19. In addition, they have been encouraged by the department to fish harder on the hatchery portion of the coho run.

Q. We will submit Exhibit F-19.

Does the Department of Fisheries furnish salmon to Indian tribes?

A. Yes. Certain of the salmon arriving at hatcheries are not needed or are not desirable as spawning stock. The early arrivals in a

run often will not ripen properly, yet are in the best condition of any for fresh or canned use. The department plans for some extra salmon, rather than fall short of spawning needs, and needs some extra fish so that only the best fish are used for propagation. The milt from one male salmon will fertilize the eggs from several females, thus many males are surplus in artificial propagation. Finally, in many cases salmon which have been spawned are quite edible and in fact make a superior hard-smoked product. Salmon, as described, have been made available to Indian tribes for a number of years. A listing of these and the considerable amounts taken are shown in Exhibit F-20.

Q. We will submit Exhibit F-20.
Would such salmon count as part of the fair share?

A. Such salmon would not count unless they were sold and thus put in commercial channels. Otherwise, they would fall in the same category as personal-use fish.

Q. Do the Indians value such salmon?

A. Yes. The department receives requests from a majority of tribes and arranges for a way for older Indians and non-fishing Indians to get fish for their use. It is also a source of food for the poor. For example, a few years ago I met with the leaders of the Suquamish tribe on their reservation at the home of Mrs. George. They told me that the tribe did not wish to encourage Indians to fish for salmon in the small streams near their reservation, but salmon were a part of their diet and they wished to continue to eat salmon. They made it known to me that they wanted some salmon from the early part of the run in bright condition for fresh fish and canning and some salmon at near spawning time for smoking. Salmon have been made available to the Suquamish tribe as a result of that meeting.

Q. What unit will be used in calculating the fair share?

A. The share will be calculated in numbers of salmon by species. Salmon are accountable in numbers and such a system is manageable

and fair. If salmon are protected by regulation in an all-citizen fishery and have a lower value in an Indian harvest in the river, there should be no penalty for the people who were prohibited from catching them when of a higher value. If Indians catch spring chinook which are of high value in a river, the value should not be counted against them either. The department will have as a goal, management of Indian fisheries to achieve the highest value consistent with the species of salmon and the location of the Indian fishery.

Q. Will Indians have an opportunity to catch their fair share of salmon when it is of a higher value?

A. Yes, Indians can participate in the all-citizen fishery.

Q. Do you believe that acounting by number rather than value satisfies the treaty right?

A. Yes, at treaty times the greatest proportion of the Indian catch was in rivers where values on the average are lower in today's non-Indian market place. Further, even though the trading of salmon was common, the bulk of the catch was used for subsistance. The Indian people, in private conversation, public hearings and court cases have stressed the importance of salmon for subsistance.

Q. Is it necessary to regulate a personal-use fishery?

A. Yes. Some areas, such as spawning areas, should not be fished at all for conservation reasons. Regulations are also necessary to prevent abuses which would affect the resource or other fisheries. But a personal-use fishery does not have to be as restrictive as a commercial fishery. As I indicated earlier, we are willing to set up personal use seasons for Indians.

Q. How would you consider salmon caught by treaty Indians if they were commercial fishing in areas open to all citizens?

A. The Indians would have a choice in that case. If an Indian fished under treaty right, he would get a free license and would not be required to pay landing taxes on his catch. Any salmon sold would be included in the fair share. He could, on the other hand, buy

a commercial fishing license, pay the taxes, and obey all the regulations pertaining to non-Indians and his catch would count as a portion of the all-citizen catch.

Q. How would the Department of Fisheries identify treaty Indian fishermen?

A. There is a problem in knowing whether a person is an Indian and specifically a treaty Indian. Further, the treaty right is a tribal right and not an individual right. The Department of Fisheries would depend upon the tribes to furnish to the State a list of people from that tribe eligible to fish. We believe that the tribes will guard the treaty right and would not include people on the list who should not fish as tribal members. In addition, by relying on the tribe the state would not stand between the tribe and its members in exercising any authority they may have in regulating their people.

Q. I am now drawing your attention to methods for managing the fisheries to ensure a fair share for Indians. Is it expected that the Indians will catch exactly their share in any given year?

A. No. Management is not that precise and, even if it were, regulations would have to be extremely dictatorial to achieve exact figures.

Q. If variation is to be expected, how will Indians be assured of their fair share?

A. The fair share is to be accountable annually and may show a credit or a debit which will be carried over to the next year. A balance will be drawn every 5 years as a measure of performance. Any debit found at that time will still be owed to the Indians.

Q. Since there are several species of salmon of different values, how will these be accounted for?

A. The share will be calculated by each species so that treaty Indians will get a share of all species native to their fishing areas. If during the fishing year it is apparent that the fair share of one species is not going to be met, the department will have the right to make it up by increasing the catch of other species. In this

case, value must be taken into account. It would not be fair to equate a 20 lb. chinook salmon at a higher price with a 6 lb. chum salmon at a lower price. If one species is to be substituted for another, an equivalence in values based upon prices received by Indian fishermen would be necessary.

Q. Would such balancing-out during the season always be possible?

A. No. For example, if the deficit occurred on a very large run of one species of salmon and the runs following are weak, it might be biologically impossible to make up the difference in that year.

Q. If in a particular year the Indians do not catch a fair share, what is to be done?

A. Any imbalance is to be adjusted in the following year. A deficit will require that the all-citizen fishery be curtailed further to increase the Indian catch. A credit would be made up by increasing the all-citizen fishery relative to the Indian fishery.

Q. Suppose that a chronic deficit develops in an area due to some management difficulty?

A. Specific increases in the planting of hatchery fish will be made to bring the catch up. Such plants would be over and above standard scheduled releases which are counted as part of the productivity of the system.

Q. Is the cooperation of the treaty tribes necessary to ensure a fair share?

A. Yes, and, in addition, to ensure conservation of the resource. As a part of the necessary data base, the treaty tribes should furnish catch and fishing effort information to the Department of Fisheries concerning reservation landings. Salmon catch management comprises three parts: run size, catch, and escapement. Both fair share and escapement ensurance require good current information concerning catch. Doubt as to the size of the catch causes a manager to set conservative seasons to protect the escapement and more emergency closures become necessary. Advances and improvements in management depend upon a sufficiency of correct data. Suppose that

two strains of salmon have been planted in a river and each group has an identifying mark so that their relative survivals can be assessed. A lack of catch data and marked salmon information will cause the experiment to fail with a waste of manpower and materials. Further, future catches will not benefit from the selection of a superior stock of salmon. One has but to scan the table of contents of the Joint Statement to see that the vital statistics of the salmon is a basic requirement for anyone engaged in management.

Q. Suppose that more than one tribe fishes a given river; how is the fair share to be divided among the tribes?

A. The Department of Fisheries has no basis for dividing the catch between individual Indians or tribes or bands thereof. At the time of the signing of the treaty and before, I assume that the Indians decided matters of fishing areas and catches in some manner. Situations will arise where fishermen from several tribes will fish the same area unless other arrangements are made. In other cases, one tribe fishes the lower reaches of a river and another tribe fishes further upstream. For instance the Puyallup Indians fish downstream from the Muckleshoot Reservation. The Muckleshoot Indians are dependent upon sufficient salmon escaping the Puyallup fishery to provide for a reservation catch.

Q. Do you know of any instance where Indians regulate their members to avoid conflict or over-harvest due to competition for salmon?

A. Yes, the Quinault, Hoh and Quillayute Indians are under the same treaty but have agreed that the people who live on the river shall fish that river and shall not fish upon the other rivers.

Q. How will the state responsibility for ensuring a fair share be accounted for, if not by tribe?

A. The accounting will be based upon the productivity of the rivers and streams and the total catch of treaty Indians therefrom. Jurisdictional disputes or arrangements are to be settled by the tribes as Indian business, and the Department of Fisheries would honor agreements made where practical and the needs of conservation

were met.

Q. How does the all-citizen fishery affect the fair share for treaty Indians?

A. Due to geography and salmon migrations, the all-citizen fishery, with some exceptions, takes place prior to the Indian fishery. The all-citizen fishery must then be regulated with sufficient accuracy that salmon escape to supply an Indian catch and proper escapement.

Q. Do you forecast the strength of salmon runs?

A. Yes. Predictions are made for each species. Counts of salmon on the spawning grounds show the potential egg deposit for the next generation. As the eggs develop samples are taken to determine the survival of both eggs and fry. Survival to fingerling or migration stage is determined directly by observation or by measuring factors that determine survival. For instance, river flow during their fresh water existance is directly related to coho abundance. In some cases, acoustical surveys are made to determine the abundance of young sockeye. While this accounting is not exhaustive it is indicative of the methods used. Further refinements and new techniques are being developed year by year.

Q. Are forecasts based upon the abundance of your salmon refined at a later date?

A. Yes. As salmon enter the fisheries, their abundance is noted as well as the timing of the run, whether early, normal or late. Catch per unit of effort is analyzed, as well as total catch, and compared with the data and experience of past years to determine run size. New estimates are made as often as they are needed for management, most often on a weekly basis but at times from day to day in critical situations.

Q. How are salmon runs protected from over harvest when the runs from a number of rivers are mixed together?

A. Predictions will show the expected strength of a particular species in general, and regulations will set a generous season if a large

run is expected, and fewer days if a smaller run is the case. In such areas it is common to have three days per week of fishing. Thus, four days are closed and salmon migrate from the areas where all are mixed to areas where fewer runs are involved. Fishing times then may be either increased or reduced depending on the relative strength of the stocks remaining. Finally, as salmon approach a particular river, regulations can be specific for that stock even though some salmon bound for other rivers are still present. For example, we have in the past asked the Lummi Indians to increase their fishing effort on the hatchery-produced chinook run in the Nooksack River for the reason that we could not increase the harvest in marine areas where stocks are mixed, and it was necessary to restrict fishing to protect runs migrating to other rivers. The same has been true with the Skokomish Indians on the Skokomish River.

Q. Will you explain how a salmon run is managed as it enters the net fisheries of Puget Sound and proceeds to southern Puget Sound?

A. The first fishery entered will be a gill net fishery in the outer Strait of Juan de Fuca. Few purse seines fish there due to adverse conditions. Near Discovery Bay purse seines become important in the fishery. If these waters are under control of the International Salmon Commission, as they are during most or all of the summer, regulations are basically for the management of Fraser River pink and sockeye salmon. Salmon bound for Puget Sound may be either over or under harvested at that point. The state often requests special consideration for the protection of Puget Sound stocks. In Admiralty Inlet along Whidbey Island, salmon from Hood Canal and the Snohomish, Stillaquamish and Skagit Rivers are mixed with southern Puget Sound salmon. Closure lines are often drawn here since salmon bound for streams to the east will tend to be more prevalent along the Whidbey Island shore. The remaining stocks bound for Lake Washington and streams to the south are managed as a unit until they near Tacoma. Here a part of East Pass

is closed for the protection of salmon bound for the Puyallup River even though salmon bound for streams further south such as the Nisqually River, the Deschutes River and Minter Creek are present. Any Nisqually River salmon so protected will enter the Nisqually Indian fishery. Measures to protect other runs have produced excess escapements to Minter Creek which has a hatchery. Here special seasons with a limited number of vessels are managed to take any excess. The artificial run at the Deschutes River has not required special management to date. The salmon preserve extending southward from Fox Island south of Tacoma is closed to commercial fishing except for special fisheries such as at Minter Creek and the Squaxin Indian treaty fishery. If the Nisqually Indian fishery did not exist such a large preserve would not be required.

Q. Is the principle of managing the all-citizen fishery to provide an Indian take new to the Department of Fisheries?

A. The Department of Fisheries has in my memory always found it necessary to take into account Indian reservation fisheries and regulated other fisheries accordingly. The first priority is protection of the spawning escapement, and the Indian reservation catch must be estimated in advance and allowed for. Since the Puyallup decision, off-reservation fisheries have been established and more restrictive regulations have been necessary to accommodate them for the reasons that I discussed earlier.

Q. Is the management task ended when salmon have been ensured for the Indian fishery?

A. No, since spawning escapement must still be ensured, regulation of the Indian fishery is necessary.

Q. Under a fair share what will be the management goals of the Department of Fisheries in regulating the fisheries?

A. 1. Ensure that there is sufficient spawning escapement.

2. Meet the fair share requirement for treaty Indians.

3. Manage the all-citizen fishery in the best interest of the state

of Washington.

Q. If a fair share is establised would a management plan emerge immediately in its final form?

A. Not in its ultimate final form, no. But we would begin to manage according to the percentage share model I have been discussing. An extention and modification of present management techniques would give us a good workable beginning. However, new data and experience generated both by the department and Indian fishermen could be expected to be used to improve management. I would expect the greatest variance from desired goals to occur during the first 5 years of operation. As explained earlier, variances in catch would be made up on the following years. If escapements are impacted, hatchery plants will be used to augment runs.

Q. The use of a trap at each river mouth has been proposed as a means to manage salmon precisely and economically. Theoretically, how would such a trap be established and operated?

A. No other fisheries would exist, and the trap would capture all of the salmon returning to the river. The precise number needed for escapement would be placed upstream and all others harvested.

Q. Do you have experience which would relate to the construction, maintenance and operation of such a trap?

A. Yes. I have observed the construction and operation of conventional salmon traps such as those operated by the Swinomish Indians. A dam with fishways operates as a controlling device, and salmon are easily led from a fishway to a trap or enclosure much as the department facilities are operated at the Tumwater fishways. Hatchery racks are intended to stop a salmon run so that salmon are taken for spawning and others put upstream for natural spawning.

Q. Under actual operating conditions is such a trap feasible from a physical operating standpoint?

A. No, it is not. The experience with conventional salmon traps does not apply since they are fishing devices and are not designed or intended to capture all of the salmon or stand up to the entire

flow of a river. The trap would have to control all of the width and depth of the river at the greatest flows which would occur during salmon runs. Floods could be expected to endanger, damage and destroy the trap. The trap would not only have to resist water flow but the shock or impingement of any logs and debris brought down. I was working at a salmon barrier and trap on the Baker River one night when the river went from summer low to extreme flood in a matter of hours and blew out a well-constructed facility made of heavy timbers. A year ago this winter the Engineering staff of the department dynamited the hatchery rack at the Green River Hatchery to alleviate flooding and to save the rest of the facility. That rack is on Soos Creek which is normally a minor stream.

Q. Would salmon be protected and controlled by such a structure?

A. No. Salmon generally delay at such a structure before finding or attempting to enter a fishway or trap. Such a delay uses time and energy intended for migration and spawning. After sufficient salmon are taken for spawning, hatchery racks or a portion thereof are generally removed to allow unimpeded passage. Chum salmon, in fact, may refuse to use a fishway at all. During floods and high water, damage to the structure is most likely and salmon passage and trap facilities most difficult to control. Salmon migration peaks in most rivers during high water. Our experience with weirs placed in rivers for the enumeration of salmon runs first causes a delay in migration and then a blow out on high water and the salmon escape freely.

Q. Have you looked into the cost of a trap which would completely control catch and escapement?

A. I have asked the Engineering staff of the department for estimates of the magnitude of the task and costs for a large river, the Skagit, a medium sized structure such as the hatchery rack on the Kalama River, and a small structure such as the hatchery rack on Soos Creek. On the Skagit River the unit would be composed of the following:

1. A barrier incorporating a drop of 8 feet completely across the river.
2. Fish ladders and capture and sorting devices on each shore.
3. Two residences for permanent crew.
4. Upstream safety device for small boats.
5. Access roads.

Such a system would not cost less than 6 million dollars. Once completed, operation and maintenance must be scheduled. This would require the following:

1. A minimum of 6 people full time.
2. Debris handling by 4 men plus equipment.
3. Security on a 24-hour basis to prevent poaching.

Even so, with the best design known salmon would delay from 2 to 4 days before entering the fishways.

The hatchery rack on the Kalama River is not kept in the river year-round. On those years when floods have come early while we were still trapping salmon, major damage has occurred. This rack is 249 feet long and when in operation requires three men full time, a mobile home at the site, and a tank-hauling truck. The cost of replacing this rack would be approximately $160,000.

Q. Would you expect legal problems?

A. Yes. The control of river flows in any way affects property, and experience would lead us to expect legal difficulties. Further, the blocking of a navigable stream is a Federal matter and might require the additional cost and operation of a marine railway. Locks do not work since they readily pass salmon as well as boats.

Q. Would a trap really allow precise management?

A. No. In order to know precisely how many salmon to harvest, the run size of each species must be precisely known. With no preceding fishery there could be no refinement of the original estimates. A test fishery with a controlled fleet to assess the run size as it approached through Puget Sound would require such an array of vessels that we might as well let the fleet operate. Further,

test fishing is not precise unless it works on unmixed stocks. In my estimation, a test-fishing fleet would have to operate continually in the vicinity of the river mouth. In summary, either precise information on run size will be lacking or the test fishing fleet will approach the scale of an independent fishery.

Q. Would you expect controlling traps to be acceptable to fishermen?

A. No. A single agency, presumably governmental, would operate the trap. The catch would be portioned out under some allocation plan to those individuals entitled to salmon. Such an operation is contrary to the traditions and culture of United States citizens, Indian and non-Indian alike. I cannot believe it to be compatible with a treaty right to fish in usual and accustomed places.

Q. Let's turn our attention to procedures for regulating and managing Indian treaty fisheries. How would the Indians be able to express their viewpoints?

A. Indian fisheries will be accorded a separate regulation hearing, as the commercial and sport fisheries are now regulated. Previously, Indian off-reservation fishing regulations have been made a part of the commercial fishing regulations. An exception may be the Columbia River where both the treaty Indian and the all-citizen fisheries are in the river and are closely related. The Department of Fisheries wishes to develop direct open and continued lines of communication with Indian tribes. We hope to see the day when the Indians will understand and have trust and confidence in the regulation adoption procedure.

Q. What responsibilities will the Department of Fisheries assume in ensuring that Indians understand fishing regulations and the basis for their establishment?

A. Prior to the setting up of any regulations, the Department will furnish information to each tribe including the following:

1. The base upon which the fair share is calculated.
2. Predicted run sizes.
3. Expected catch for the year.

4. Proposed open and closed areas and times.

5. Proposed fishing gear restrictions.

6. Calculations of previous season's catch.

7. Comparisons with catches from other pertinent fisheries.

8. Factors affecting run size.

9. Hatchery plantings which will affect returns and harvest.

10. Any other pertinent or useful information and data.

An example of the type of information furnished to the public by mail is in Appendix III of the Joint Biological Statement.

Q. How will treaty Indians participate in the formulation of regulations for treaty Indians?

A. Treaty Indians will be encouraged to become knowledgeable of and participate in the formulation of regulations for Indian fisheries. Tribes will be encouraged to contact the department prior to a hearing so that any counter proposals by the tribe shall not result from misunderstanding. In addition, there are options in management for achieving the same goal. The department would seek information from the tribe as is shown by the following examples:

1. If fishing is to be limited to 2 days per week, which 2 days would the tribe prefer? Are weekend days or working days more desirable to the Indians?

2. If there are to be daily fishing hours, as are common with gill net fisheries, what hours are most desirable?

3. If the catch is to be limited, would the Indians prefer restrictions on the length and number of gill nets fished so that there could be more fishing days, or vice-versa?

Q. How would the tribes be informed of any regulations adopted?

A. Upon adoption of any regular regulations the department now mails a copy to the tribal chairman, the tribal secretary, and the tribal office or council. In the future, it may be desirable to include the individual fishermen of some tribes. Any fish committees will be included once their names are made available to the department. A procedure for contacting fishermen concerning emergency regulations

must be worked out with each tribe.

Q. Do state laws already provide procedures for involving the Indians in the regulation-making process?

A. Yes. The Administrative Practices Act goes far in safeguarding the public in that regard, and is followed by the Department of Fisheries. An outline of the basic elements of this legislation is to be found in Appendix II of the Joint Biological Statement. An effort will be made to explain regulation adoption procedures because Indians must understand such processes before they can be expected to use them with confidence.

Q. Are other avenues of contact open to Indians and to the department?

A. Yes. Indians will be consulted or furnished with information from time-to-time by arrangement of either the tribe or the department. Most of the information generated by the department is available upon request. Persons will be made known to the tribes, that they can feel free to contact for information. Either party should contact the other if problem areas are foreseen or begin to develop.

Q. What agency is best qualified to manage salmon fisheries in the State of Washington?

A. The Department of Fisheries. The elements needed are enabling legislation, a firm data base and a staff that is experienced and capable in salmon management. The Department of Fisheries has these necessary elements and, in addition, is innovative and progressive in the field of salmon management. The Department of Fisheries has 50 biologists trained and qualified in data collection and analysis, 40 trained patrol officers whose primary mission is to protect the resource, 14 trained persons employed in data processing and statistical analysis, and about 12 administrative or line supervisory managers. As to education among the biologists and managers, 43 have bachelors degrees in fisheries or related sources, eight have masters degrees and two have doctorates. Their experience averages .75 years as a Biologist I, 8.21 years at the biologist II level, 12.7 years at the Biologist III level,

and 18.7 years at the Biologist IV level. The two research scientists who have PhD degrees average 14.5 years of experience.

Q. Would you outline the background of experience of Washington State Government in managing fisheries?

A. Management began when the Washington territorial legislature dealt with harvesting procedures in the Columbia River in 1871. Following statehood in 1899, management of fisheries began in earnest and has continued in varying and increasing complexity to this time. Modern scientific management of salmon truly began following World War II. Progress has been great by any standards. When I first started work with the Department of Fisheries in 1951, it was commonly said that the salmon were on the way out due to fishing and environmental changes. I heard that in 15 years the salmon fishery as we knew it would be gone. Twenty-two years have passed, the salmon fisheries are still here and, more important, no one says that the salmon fisheries are doomed.

Q. What experience does the department have in managing Indian fisheries?

A. Acknowledgement in 1968, due to a U. S. Supreme Court decision, that recognition and protection of treaty Indian fishing rights must be a distinct goal of its regulatory program, the Department of Fisheries began adopting special regulations which allowed certain treaty Indians to fish by means and at places otherwise forbidden by State law to Indians and non-Indians. Off-reservation fisheries have been established for the Hoh, Quillayute, Makah, Tulalip, Puyallup, Nisqually and Squaxin Indians. Even though their treaty or tribal status is in doubt, Muckleshoot, Duwamish and Snoqualamie Indians have fished in Lake Washington and the Duwamish River under permit from the Director of Fisheries. The regulations adopted are found in Appendix II of the Joint Biological Statement. More such regulations might have been adopted, but the guidelines from the Puyallup decision "meet appropriate standards" and "reasonable and necessary for conservation"

are argumentive so that any regulations proposed are opposed by Indian and other citizens alike with the threat or actuality of court action. Progress is necessarily slow and difficult under these conditions.

Q. Does the Department of Fisheries possess enough information concerning salmon and fishing to manage an Indian fishery?

A. The department has statistics relating to all aspects of managing the resource including the following:

1. Catch statistics by area, time, species, gear, etc.
2. Spawning ground information including area, time, species, sex ratio, etc.
3. Catch per unit of effort by gear, time, species, area, etc.
4. Hatchery releases by river system, numbers, time of release, size at release, etc.
5. Biological information on migration, timing by species, river system, etc.
6. Historical records.

Q. Does any other organization possess such a data base?

A. No, it is and has been the responsibility of the Department of Fisheries to collect and analyze all such data. Other organizations such as Federal agencies or the University of Washington have some of the data mentioned; however, they use the data base of the Department of Fisheries in any in depth or comprehensive studies or analysis.

Q. Does the Department make use of machines for storing, processing and analyzing data?

A. Yes, along with other standard equipment, the department is using the latest (third generation) computer equipment, an IBM Model 65. This equipment generates statistical reports in one-to-ten minutes which would take approximately 30 people 3 calendar months to produce. Great amounts of information are therefore available for use on a day-to-day basis as needed. Experiments are designed and computer models constructed and used so that the management capabilities

of the Department of Fisheries is increasing at a steady rate. For example, F-21, which I will use for illustrative purposes, demonstrates the value and use of computer capability. It portrays the catch of coho salmon as the run progressed through the Puget Sound fishery. It shows the size of the catch each day by management area with each star representing 100 salmon and the blank spaces indicate days closed to fishing. In the Strait of Juan de Fuca, it will be noted on page 1 of the exhibit, a sizeable catch was made in July and August. These were the Fraser River run of salmon which are quite early compared to the Puget Sound runs. They never do enter Puget Sound proper. Curtailment of the fishery on that group of salmon would have had little or no effect on Indian fisheries in the case area. The run represented by catches in early August represented salmon bound for Puget Sound, and the progression of that run can be followed on page 2 of the exhibit, into Admiralty Inlet along Whidbey Island. From that point it can be seen that coho salmon rapidly spread throughout Puget Sound. You will note that the catch on September 13th is high. This date was the opening of the season. The high catch represents an accumulation of salmon and does not reflect the migration pattern of the run. The figure portraying the central Puget Sound catch on page 3 reflects emergency changes made as the run and catch progressed. You will note the extremely good catches on the opening day, September 13th, were followed by an extreme decline on the 14th, 15th and 16th. This led the department to believe that the run might be small but early in timing, and protection was needed. The following week two days of fishing were allowed and catches did indicate a small run. Two days only of fishing were scheduled for the next fishing week, but catches on September 27th and September 28th indicated new run strength and two more fishing days were allowed that week. From then on catches declined because the run was ending and the salmon not caught had passed into salmon preserves and rivers closed to the commercial fleet. Much other

data is processed and used simultaneously with these print-outs, such as: fishing fleet size, the catch per unit of effort, the distribution of the fishing fleet, the geography of the areas fished, the speed of salmon migration, the relative numbers of hatchery and wild fish, the efficiency of the fishing gear, and the presence of other species of salmon at the same time.

Q. How is the department equipped to carry out the research and development necessary to manage on a fair-share percentage basis?

A. A capable staff is a key element in research and development, and I have commented on the qualifications of our staff. Good equipment must be at hand and the department is sufficiently equipped for the needed experimental work or can arrange for necessary equipment. The department has much waterborne gear, mobile trailers with scientific equipment, field laboratories, etc. Further, hatchery science is improving rapidly and is maintaining flexibility and adaptability so that hatchery capabilities will be a major aid in any salmon management plan developed.

Q. Does any other agency have an ability to manage salmon fisheries in Washington comparable to that of the Washington Department of Fisheries?

A. No other agency has the data base, staff, management experience or knows the state of the art in managing fisheries in Washington as does the Washington Department of Fisheries. This is due to the responsibility, organization, and experience of the department as well as to a progressive attitude toward fisheries management.

Q. Are Indian tribes capable of proper salmon management?

A. No, they are not for several reasons.

1. They lack authority and have not shown the will or ability to exercise control of tribal fishermen in off-reservation areas.
2. They do not possess an adequate data base in their own fishing area, let alone the information necessary to balance their fishery with the all-citizen fishery.
3. Indian tribes do not have a staff of expert fishery managers.

They do have good fishermen but that is quite another thing.

Q. Do you know of examples of poor management by Indian tribes?

A. Yes, one example is the catch of sockeye from the Ozette River. The Ozette River flows from Ozette Lake to the Pacific Ocean in the extreme northwest corner of the State. The area is unpolluted and, since few sockeye salmon are taken by the Washington ocean troll fleet and net fishing for salmon in the ocean is not allowed, virtually the entire run enters the river. Little fishing had gone on for some time due to the remoteness of the area which had led to abandonment of Indian residence in the area. Indians once again began net fishing for sockeye salmon in the Ozette River and in 1948 the catch was about 4,000 salmon. Catches rose to over 17,000 salmon and by 1952, one cycle of salmon later, had fallen to about 3,000 salmon. As is illustrated in Exhibit F-22, catches have continued to decline and now number less than 500 salmon annually. The Ozette River salmon run was grossly overfished by Indians on the Ozette reservation, and continued fishing of the remnant run left is preventing its recovery.

The Quinault River sockeye run is managed by the Quinault Indian tribe. The spawning tributaries above Lake Quinault and the lake are in relatively their native state. It is true that the river and its tributaries shift about considerably which does affect spawning, but the river has always done so by its nature. Even though regulated by the tribe, sockeye salmon catches on the average have steadily declined over the years. Exhibit F-23 illustrates Quinault sockeye catches since 1936. Prior to 1950, catches exceeded 200,000 on two years. Prior to 1957, catches exceeded 100,000 salmon on eight years. Since 1956 the catch has never reached 100,000 salmon. Exhibit F-4 shows the catch of chinook salmon by Puyallup Indians and the return of adults to the Puyallup hatchery. The very large catch in the early 1960's precipitated the Puyallup court case and was followed by a period of no fishing so that the run might be re-built. Then the Puyallup Indians and

the Federal Government claimed that Indians could fish as they chose within the boundaries of the old reservation and catches of chinook rose markedly in 1971 and 1972. About 1,000 chinook salmon are required by the Puyallup Washington State salmon hatchery. Keeping in mind that the catch or hatchery take in one year affects the return of salmon 3 and 4 years later, it can be seen that the large catches in the 60's is related to a poor hatchery return with no Indian fishing following 1965. The run was recovering following the closure of the river to fishing in 1966, as can be seen by the steady increase in the hatchery escapement in 1967, 1968, 1969 and 1970. The increase in the Indian catch in 1971 and 1972 has once again dropped the hatchery run below a level needed for hatchery operation. Since hatchery chinook salmon have a higher survival rate than do wild fish, over-fishing has a much greater impact on wild fish. The wild stocks of salmon have suffered severely from over-fishing by Puyallup Indians. As is shown in Appendix III, Table 5 of the Joint Biological Statement, in 1971 the department of Fisheries set one day each week of fishing from August 15 through September 18 to protect the expected poor chinook run. In that year Puyallup Indians sold chinook salmon on 31 days prior to September 18. Both the hatchery and wild segments of the run were over-fished. Once a chinook run is fished to a low level it takes a minimum of three cycles, or 12 years, to expect recovery. The Puyallup Indians effectively undid the recovery of the chinook stocks of the Puyallup River from the previous over-fishing. In spite of the many effects of civilization on the Puyallup River system, it is a good salmon stream. It is my opinion that, properly managed, a treaty Indian catch of between four and 5,000 chinook salmon could be maintained. Added hatchery production might increase that level.

Q. Does the Department of Fisheries plant hatchery-reared salmon which contribute significantly to Indian catches of salmon?

A. Yes. Table 29 of the Joint Biological Statement shows salmon plants

into the watershed of the Skokomish River, Nisqually River, Nooksack River, Puyallup River, Skagit River, Snohomish River, Sooes River and Quillayute River, all of which border or flow through Indian reservations. Of the 14 Department of Fisheries hatcheries shown in Figure 43 of the Joint Biological Statement, eight are located on streams which presently support an Indian fishery. These plantings augment the Indian catch and often to a high degree, as is shown by the following example. Exhibit F-19 shows that the catch of chinook salmon by Skokomish Indians from the Skokomish River did not reach 1,000 salmon prior to the construction and operation of George Adams Hatchery. On the first return of four-year-old chinook salmon, the catch was nearly 3,000 salmon and now ranges between 5,000 and 13,000 salmon annually. Catches of chinook salmon by Skokomish Indians are roughly 10 times those prior to the operation of the hatchery.

Q. Will successful management of treaty Indian fisheries depend in any way upon cooperation with Indian tribes?

A. Once a fair share is established so that Indians and non-Indians alike will have an objective measure of the Indian right, cooperation between the state and the Indian tribes will be much easier. Cooperation will be beneficial to Indian fishermen and useful in fisheries management. A fishery is for people and if they understand and can take part in management, regulations are easier to enact and enforcement is a routine matter. Much time, energy and money is saved and human happiness is increased. Cooperation will ensure that fisheries regulations are adapted to the Indian way of life and the business atmosphere of the tribes. A number of fishing regulations which do not matter one way or the other to the state could be adopted at the wishes of the tribe.

Q. Does the Department of Fisheries work in cooperation with Indian tribes aside from regulatory matters?

A. The department has a long history of working with Indian people which has persisted even at times when tensions were high regarding

treaty rights. The Department and Indians have a broad common interest in salmon which has enabled us to stay in communication with, know as individuals, and work with most Indian tribes. The following examples are not exhaustive but provide an overview of programs whereby the department works with Indian tribes.

1. Salmon eggs provided for educational purposes

   Example - The Skokomish Indian people, through guidance provided by a fisheries biologist from Small Tribes Organization of Western Washington, Inc., have developed a small educational salmon egg-hatching station on their reservation. The Washington Department of Fisheries has provided the chum eggs necessary for this small educational hatchery since its beginning, approximately 3 years ago. In 1972, the department provided 100,000 eggs for this station.

2. Hatchery releases of juvenile salmon made at such locations as to provide maximum harvest by Indian fisheries

   Example - Two Department of Fisheries-operated salmon hatcheries are located within Hood Canal's drainage system. The George Adams Salmon Hatchery is located on a tributary of the Skokomish River immediately above the Skokomish Indian Reservation, while the Hoodsport Salmon Hatchery is located at Hoodsport on a small tributary of Hood Canal. Both hatcheries produce coho and chinook salmon. The Hoodsport Hatchery has also been able to develop relatively small pink and chum runs.

   In order to reduce the numbers of adult salmon which have returned to these two stations in excess of the department's propagation requirements, the department has developed a program highly beneficial to the Skokomish Reservation Indian fishermen.

   Coho eggs for both stations are taken at the George Adams Hatchery while fall chinook eggs, for both stations, are taken at the Hoodsport Hatchery. River flows at time of coho entry into the Skokomish River are such that coho escapement to the

hatchery is ensured. Thus, maximum harvest effort on both chinook and coho is beneficial to the Indian fishery without damaging the resource.

This management procedure resulted in approximately 21,800 coho being caught by Skokomish Indian Reservation fishermen in 1970. Of those coho caught of hatchery origin, 50% were estimated to have been produced by the Hoodsport Hatchery. An additional 12,700 fall chinook were caught while only 1,356 fall chinook were allowed to escape to the George Adams Hatchery. With George Adams' fall chinook eggs ensured from Hoodsport Hatchery, this relatively small escapement has not been cause for concern in the past.

3. Hatchery production released into non-hatchery streams

Example - One of the few rivers on which an Indian reservation is located in Puget Sound, which does not have a salmon hatchery on it, is the Nisqually River. However, to supplement the natural production of this river, the Department of Fisheries has made hatchery releases into this stream from its hatcheries located elsewhere. In 1971, 5,865 lbs. of fall chinook fry and 27,419 lbs. of coho yearlings of state hatchery-reared fish were released into the Nisqually River. This program was continued in 1972 and is programmed for 1973.

These plants will increase the number of salmon returning to the Nisqually River above those which are produced naturally, thereby increasing the number of salmon available to be caught by the Nisqually Indian fishermen.

4. Hatchery production releases into barren areas

Example - The headwaters of the Klickitat River originate on or above the Yakima Indian Reservation. Construction of fish passage facilities in the upper river at Castile Falls has opened an additional 20 miles of spawning and rearing area. Spring chinook and coho salmon juveniles have been and are being released into the upper river to take advantage of this

potential production area and in an attempt to establish a natural run above the fishways.

Any additional production realized from this program directly benefits the Yakima Indian dip net fishery located on the Klickitat River near its mouth as well as all Columbia River fishermen, Indian and non-Indian, both commercial and sport.

5. Salmon runs developed where none existed previously

Example - Several low-water upstream migration blocks occurred naturally in the Klickitat River (RM 2.2) prior to 1955 when the last fishway at these lower falls was completed. Due to these falls, only spring chinook were able to migrate into the Klickitat River prior to this time. Spring chinook, migrating upstream during high-flow periods, were able to negotiate the falls. In 1945 and 1951, respectively, fall chinook and coho were introduced into the Klickitat River in anticipation of the fishways being completed and used by these species.

In 1950, construction on the Klickitat River Salmon Hatchery was begun. Construction was completed in 1954. A total of 4,551,542 salmon juveniles consisting of spring chinook yearlings, fall chinook yearlings, and coho yearlings were released by this station in 1972. The 1971 Klickitat River Indian dip net fishery reported catch was 289 spring chinook, 2,466 fall chinook, and 4,055 coho.

6. Cooperate State-Indian fresh-water rearing programs

Example - The Tulalip Indian Reservation contains an ideal fresh-water rearing pond of approximately 2-1/2 surface acres with a direct outlet into Tulalip Bay. An agreement between the Department of Fisheries and the Indians was reached in the fall of 1970 for this pond to be used to rear coho salmon juveniles with the state supplying the fish and feed while the tribe supplied the necessary manpower and need. The fish were provided to the tribe in February, approximately 3 months prior to their normal release period. Natural spawning area is not

available at this rearing location, and the eggs are not needed by the Skykomish Hatchery. Thus, total harvesting effort is allowed on the reservation (Tulalip Bay) after the adult fish have passed through an extensive commercial net and sport fishery conducted by both Indian and non-Indian fishermen.

In 1971, 28,333 lbs. of coho yearlings, 50% of the Skykomish Hatchery coho production, were released from this pond. In 1973, an evaluation of the comparative production success of this program was begun by marking approximately 50,000 coho juveniles at the Skykomish Hatchery. These fish are to be released (along with 450,000 other coho juveniles) into this pond to again be fed and released as yearling coho in the spring of 1973. Indian people were hired to mark these fish with funds supplied through the Bureau of Sport Fisheries and Wildlife and with equipment and facilities supplied by the Department of Fisheries. In 1973, 25% of the feed costs for this program will be supplied by the Tulalip Indian Tribe.

7. Cooperative State-Indian salt-water rearing program Example - The department has cooperated fully with the Squaxin Island Indian mariculture program since its inception several years ago. The department has provided the chinook which the Squaxins rear in their salt-water ponds. In exchange, the Squaxins have released a specific poundage of relatively large salt-water reared chinook which have contributed to the local sport fishery at a very high rate. These delayed release and large chinook (2-to-3 per pound as compared to 100 per pound normal hatchery release size) tend to remain in Puget Sound and enter sport fishery catches.

In 1972, 6,000 lbs. of fall chinook were provided to the Squaxins. A total of 17,500 lbs. of chinook is presently being released by the Squaxins for the department. These fish have been marked and the catches will be evaluated in the continuing program of enhancing Puget Sound sport fisheries.

8. State-Federal cooperative salmon plantings into reservation waters

The Bureau of Sport Fisheries and Wildlife operates the Quilcene Salmon Hatchery on the Olympic Peninsula. The hatchery facility programs several plantings into rivers running through Indian reservations. One example is the White River (Muckleshoot Reservation), a major tributary of the Puyallup River.

However, due to disease organisms which are specific to the area of the Quilcene Hatchery, the Department of Fisheries does not want these fish released into inner Puget Sound rivers. Therefore, rather than simply bar this transfer of fish, the Department of Fisheries releases salmon juveniles into the White River from its Puyallup Hatchery. In turn, the Quilcene Hatchery releases an equal poundage of young salmon into the streams of our choice of the Olympic Peninsula.

9. Hatchery surplus salmon carcass give-away programs

The department's hatchery system usually receives salmon in excess of its propagation needs, especially coho salmon. It is the department's policy to provide numbers of these fish, which are fit for human consumption, to our economically-depressed Indian people.

Indian tribal representatives are contacted when these fish are available and it is their responsibility to see that these fish are distributed to their respective tribal members. In 1972, 256,194 lbs. of salmon which had returned to the department's hatcheries were provided to Indian people.

10. Cooperative State-Indian rearing programs which provide maximum benefit to all resource user groups

Example - The Lummi Indians are operating a salmon and steelhead hatchery on Skookum Creek, a tributary of the Nooksack River. Once this hatchery is able to develop its own salmon runs, its future egg source will be ensured. Until this time, however,

the Department of Fisheries has agreed to supply this Indian hatchery with eyed-eggs at approximate cost or by having the Indians release a pre-agreed upon number of juveniles in lieu of any monetary exchange. In this manner, the salmon resource of this area will have been increased to the benefit of all citizens while placing a minimum financial burden on all interested parties.

Included also are two letters, marked Exhibits F-24 and F-25 for illustrative purposes, one from the department to an Indian tribe and one from an Indian tribe to the Department, which show the advantage of mutual benefit through cooperation.

J. E. Lasater
Assistant Director of Fisheries

Subscribed and sworn before me this 9 day of July, 1973.

Dorothy B. Bunn
Notary Public in and for the State of Washington residing at Olympia, WA