8-17-1973

Docket Entry 328 - Filed Deposition of Loyd A. Royal

UNITED STATES DISTRICT COURT

WESTERN DISTRICT OF WASHINGTON

UNITED STATES OF AMERICA,

Plaintiff,

Muckleshoot Indian Tribe, Squaxim Island Tribe of Indians, Sauk-Suittle Indian Tribe, Skokomish Indian Tribe, Stillaguamish Tribe of Indians, Quinault Tribe of Indians, in its own behalf and on behalf of the Queets Band of Indians and Makah Indian Tribe, the Lummi Indian Tribe, Quillayute Indian Tribe, Upper Skagit River Tribe, Hoh Tribe of Indians, and Confederated tribes and bands of the Yakima Indian Nation,

Plaintiff-Intervenors,

vs.

THE STATE OF WASHINGTON,

Defendant

Thor C. Tollefson, Director of Washington State Department of Fisheries, CARL CROUSE, Director of Washington Department of Game, Washington State Game Commission,

Defendant-Intervenors.

Civil No. 9213

DEPOSITION OF LOYD A. ROYAL

HELEN I. LANE
OFFICIAL COURT REPORTER
COURT HOUSE
CHEHALIS, WASHINGTON 98532

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CORRECTIONS

NOTE: Frazier River is spelled Fraser River.

P. 15; L 6-9: Should read:

rate. Regardless of the extent of that mortality, the ocean appears to be consistently rigid in its environment and the relationship of that environment to mortality is likewise consistent.

P. 16; L 15: Change "escape" to "escapement"

P. 18; L 5-7: Should read:

Steelhead, because there is a space limitation with spawning sockeye which is not the case with Steelhead.

P. 18; L 9: Change "fish" to "sockeye"

P. 20; L 9: Insert "egg" in front of "taking purposes"

P. 25; L 21: Insert "Steelhead" preceding "population"

P. 32; L 13-14: Should read: ", regardless of the usual and accustomed fishing grounds,"

P. 34; L 3: Insert "coho" in front of "escapement"

P. 43; L 5: Change "escapement" to "catch"

P. 49; L 17: Delete "from identifying the coho to fish and wildlife services of three states." (The thought is not changed.)

P. 52; L 24-25: Should read: "to the total population on a biological basis".

P. 53; L 4: Should read: "this occurred in Oregon as well"

P. 53; L 7: Change "sections" to "biological characters"

P. 61; L 10: Eliminate "organizations" and "such as fisheries on"

CORRECTIONS

P. 62; L 22: Change "indisputable" to "disputable"

P. 63; L 2-3: Eliminate "it deserves"

P. 79; L 23: Eliminate "non smolt"

P. 95; L 24: Last sentence should read: "With sockeye we can take a scale off of five hundred fish and tell you where they came from -"

P. 101; L 1: Change "fisheries" to "Fisheries Department"

P. 101; L 23: Eliminate "good"

P. 106; L 8: Eliminate the words "not" and "not normally"

P. 108; L 2: Eliminate the word "cross"

P. 119; L 9-10: Should read:

"they spent most of the time fishing off the trap leads, those that caught fish."

P. 128; L 18: Change "measure" to "pass"

P. 128; L 23-25: Change to: "Any place on the Fraser River where the spawning grounds are on relatively large rivers and a large number of fish are involved, that is why they went to tagging in these locations, although in some"

P. 150: L 12: Eliminate "once in a blue moon" (contradiction of thought)

Loyd A. Royal

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UNITED STATES DISTRICT COURT

WESTERN DISTRICT OF WASHINGTON

UNITED STATES OF AMERICA, Plaintiff, Muckleshoot Indian Tribe, Squaxim Island Tribe of Indians, Sauk-Suittle Indian Tribe, Skokomish Indian Tribe, Stillaguamish Tribe of Indians, Quinault Tribe of Indians, in its own behalf and on behalf of the Queets Band of Indians and Makah Indian Tribe, the Lummi Indian Tribe, Quillayute Indian Tribe, Upper Skagit River Tribe, Hoh Tribe of Indians, and Confederated tribes and bands of the Yakima Indian Nation, Plaintiff-Intervenors, vs. THE STATE OF WASHINGTON, Defendant Thor C. Tollefson, Director of Washington State Department of Fisheries, CARL CROUSE, Director of Washington Department of Game, Washington State Game Commission, Defendant-Intervenors.	Civil No. 9213 DEPOSITION OF LOYD A. ROYAL

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BE IT REMEMBERED that at 8:30 o'clock a.m. on May 25, 1973, at the law offices of Dysart, Moore, Tiller and Murray, Centralia, Lewis County, Washington, before Helen I. Lane, Notary Public in and for the State of Washington, appeared the witness herein.

Plaintiffs Muckleshoot Indian Tribe, Squaxin Island Indian Tribe, Sauk-Suittle Indian Tribe, Skokomish Indian Tribe, and Stillaguamish Indian Tribe, being represented by their attorney, Mr. David H. Getches, Boulder, Colorado; the plaintiff United States of America, being represented by Mr. George D. Dysart, Assistant Regional Solicitor for the United States Department of Interior, Portland, Oregon;

The defendant Washington State Department of Game being represented by the office of the Attorney General per James E. Cufley, Jr., Assistant Attorney General; the defendant State Department of Fisheries being represented by the office of the Attorney General, per Earl R. McGimpsey, Assistant Attorney General.

This deposition is taken pursuant to Notice and subject to the Rules of Discovery.

WHEREUPON, the following proceedings were had and done, to-wit:

LOYD A. ROYAL, (called as a witness at the instance of the Plaintiffs, being first duly sworn, on oath, testified as follows:)

EXAMINATION BY MR. GETCHES:

Q Mr. Royal, will you please state your full name, age and address?

A My name is Loyd , spelled with one "L", Allen Royal. I was born February 27, 1908, and I live at 917 Ham Hill Road, Centralia, Washington.

Q Have you ever had a deposition taken before?

A No - - wait a minute, you mean in relation to this case?

Q In any case.

A I believe I had a deposition taken when I was employed by the Washington Game Department in relation to another case. I forget the case.

Q How long ago was that?

A Within the last year.

Q Then you understand that everything you say is being taken down by the Court Reporter, and it is necessary to speak loudly and clearly for her to get everything down, and also, you understand that what you are saying is under oath and subject to the penalties of perjury as if it were made in a courtroom? Obviously, there is a more relaxed atmosphere than a courtroom, if you want to drink coffee or take a break, just let us know, and we will arrange for that.

I take it you have chosen not to have an attorney present today?

A That's right.
Q It's important to give us the best answers to the questions which we ask, although there will be an opportunity to read the deposition and change any answers you have given so although you should be aware, that any change you make can be commented on at the time of trial. We will not make attempt to trick or mislead you, if there is ambiguity in the question, just ask for clarification, we will be glad to give that.

Can you give us your educational background, please?

A I graduated from Olympia High School in 1923, entered the University of Washington School of Fisheries the following fall; due to absences for work, I did not graduate until the late 1929, or '30, I forget which. At that time I received a Bachelor of Science degree, and later, through contact with the University of British Columbia and at the suggestion of the people at British Columbia, I was awarded an honorary doctor's degree of that school in 1965.
Q What was your major in college?
A Fisheries.
Q Where were you employed following graduation?
A Having worked for the Washington Department of Fisheries in 1928, and at other times prior to graduation from the University, I was employed by them as a biologist.
Q How long were you in that position?

A I became Chief Biologist about 1935, and shortly thereafter, Assistant Director. I retained that position until I entered the military service early in 1943. On return from military, due to the passage of the Military Service Act and change of administration and a new director, whom I did not know, both positions which I had held prior to the military service were filled by, it happened, friends of mine, and to solve the situation the Director of Fisheries created a stream improvement division, and I was appointed head of that. About 1947 or '48, I was reappointed to the position of Chief Biologist and on January 1, 1949, I became Chief Biologist for the International Pacific Salmon Fisheries Commission located in New Westminster, British Columbia. In August of that year, the director of the Commission passed away, and I was first appointed Acting Director and after a few months, became Director, a position which I held until voluntary retirement, March 1, 1970, at which time I accepted the position as Fisheries Research Co-ordinator with the Washington Game Department, chief terms of reference, which were to examine their anadromous trout program and make recommendations in relation thereto. I retired completely March 1, of this year, and intend to stay retired.

Q So, how long were you Director of the International Pacific

Salmon Fisheries Commission?

A Twenty-one, plus years.

Q What were your duties in that position?

A To administer or to direct the staff of some forty people, including engineers, fisheries scientists, clerical help and field assistants in fulfilling the terms of reference of the Commission which was to protect, preserve, and extend the sockeye and pink salmon fisheries of the Frazier River and regulate fisheries of the two countries within the treaty boundaries toward that end, and divide the catches equally between the fishermen of the two countries.

Q Is it fair to say that in the various positions you have filled, you have become rather intimately familiar with the habits and generally, the biology of all varities of anadromous fish which are common to this area of this country?

A Certainly anadromous fish, first salmon, and now steelhead, although the fundamental dynamics of the various species, whether trout or salmon, are much the same and I have supervised, and carried out personally, scientific work throughout the four decades that I was associated with them.

Q Have you written any articles in professional journals or books in your field that have been published?

A Yes. Most of my writing was under the name of the organization rather than personally. I prepared all the annual reports of the commission, and the State Department of Fisheries, when I was with them. I have been associated intimately, both professionally, and personally, and as supervisor, with some of the recognized best fisheries scientists of North America.

Q Of the things that have actually been published, can you give citations or the names of the articles?

A Well, of course, there is this report for the Game Department, which is a public document.

MR. GETCHES: We might say, the report the witness is referring to is entitled, "An Examination of the Anadromous Trout Program of the Washington State Game Department". It is dated October 30, 1972, and this has been introduced as Exhibit #8 of the Deposition of Clifford Mellenbach (phonetic) and we will not, for the purpose of economy, here introduce it, although it will be referred to quite a few times.

A (continuing) I forget the title, but I prepared a paper for the Fish Cultural Conference of Canada, presented in Ottawa, about 1953, this dealt with the effects of the fisheries on the productivity of the sockeye salmon. There was also a publication with the Principal Oceanographer of Canada, situated at the biological station - -

the Pacific Biological Station at Nanaimo, B.C., John Tully, Junior Author, and I was the Senior Author. In general, I, again, forget the title but it dealt with the effects of ocean currents and weather on the migration characteristics of salmon, primarily sockeye, and its relation to management.

There were others, but I don't remember enough details about them.

Q Suffice it to say, that there were quite a few published and non published works in your field that you have produced. Are you a member of any sportsmen's group?

A No.

Q Are you a fisherman, yourself?

A Yes.

Q Steelheader?

A No. Nor, a salmon fisherman. I am a trout fisherman.

Q Have you, in the course of your duties for the Commission, and for the Department, Fisheries or Game, attended sportsmen's meetings?

A With the Department of Fisheries I attended sportsmens meetings, principally, the Washington State Sportsmens Council.

Q What was the purpose of these attendance in these sessions?

A Merely to be available so they could express their opinions, which is common in a democracy.

Q That was the policy of the Department, to seek out those views?
A That's right. I would not say seek out, but to be available to receive.
Q This was the Department of Fisheries?
A Yes.
Q Was that also done with the Department of Game?
A No. I attended no sportsmen's meetings - - oh, I attended one, as a guest. My terms of reference, I do not recall any activities in that connection.
Q What was the length of employment as Fisheries Research Co-ordinator with the Department of Game?
A Exactly two years.
Q Now, what were the duties of your position as Fisheries Research Co-ordinator?
A As I said earlier, it was primarily to examine, almost solely, to examine the anadromous trout program with the Washington State Game Department, and render a report. My title was misleading, by the necessity of Civil Service, but my activity was solely toward that end, and any related matters.
Q So you were an employee rather than an independent contractor?
A That's right.
Q You were paid on a salary?

A I was Civil Service status and paid salary on a monthly basis.

Q What was your salary in that position?

A Is it important? I think that's a personal matter.

Q Well, is there a Civil Service grade?

A Yes, but I don't know what it was. I am perfectly willing to answer the question, but I think it ranges beyond the purpose of this deposition.

Q Well, you need not answer the question. What were you specifically asked to do, what were the terms of your assignment?

A There were no limits, it was to prepare a report and make recommendations.

Q You were limited to a two year period in which you had to do this?

A I limited myself, because I was sixty-five the 27th of February, and I wanted to retire at that time.

Q Did you have others in your supervision in this position?

A No.

Q But you did have the cooperation of the Department of Game?

A I had the full cooperation of the Department at all times.

Q Everybody? Also the Department of Fisheries?

A Yes, my relations with the Department of Fisheries were very good.

Q Were any specific assignments made other than the general assignment given to you during the course of this two year period?

A Not that were not related to the original terms of reference, I did write three reports.

Q Were those - - what were the three reports?

A The one already mentioned, and I wrote a report on the relation of Indian fisheries to fisheries management as related to my terms of reference and also in dealing with my terms of reference, I became involved in the effects of pollution in Grays Harbor to the anadromous fish runs, primarily steelhead. I wrote a report on that, with recommendations to the Director. Unfortunately, I do not have a copy of that with me, but it is referenced in detail, discussed in some detail in this main report.

(Discussion off the record.)

Q (By Mr. Getches) You referred to the memorandum on fisheries management, or a report on fisheries management, is that the memorandum to Carl Crouse dated May 3, 1971?

A That is correct.

Q The subject there is the relation of the Indian fishery to fisheries management, and unless some of the other counsel would like to make this an exhibit to the deposition, I think we can refer to it, as an attachment to

affidavit of Loyd Royal, dated February 2, 1972, and filed in this case as Exhibit #3, at approximately February 2, 1972.

MR. CUFLEY: Is that Exhibit #3?

MR. DYSART: Exhibit #3 to his affidavit.

Q (By Mr. Getches) So, you were not specifically asked to do those three studies, but you found them necessary in the course of your overall assignment?

A That is correct. And, I thought they were - - I wrote special reports on them, because they required more details to explain them, than I felt were necessary to include in the main report.

Q Now, are you still employed, or retained in any way by the Department of Game?

A I am neither retained by the Department of Game, or retained by a single person nor do I intend to be.

Q Who supervised your work when you were employed at the Department of Game as Fisheries Resource Co-ordinator?

A I was answerable only to the Director of Game. I had free, uninhibited access to all operations and information dealing with my terms of reference.

Q Were you solicited to do this job, or did you ask?

A I was, yes.

Q Would you happen to have in your possession a copy of the directive of March 1, 1971, referred to in the transmittal

letter to this report that begins, in accordance with your directive of March 1, 1971, the writer has reviewed all aspects of the anadromous trout program of this Department?

A Unfortunately, I do not. I probably would not have thought of it, in any event, I have one day which was hopeless to try to collect, so I brought the records in my personal possession. I do not have those terms of reference.

Q (By Mr. Dysart) Could we ask that, either Mr. Royal, if you can try to obtain, or perhaps if Mr. Cufley can get it, I assume from the Game Department, if we could have that? It was in writing?

A Yes. In detail. I think, primarily, it was set up on a Civil Service form as to my duties.

MR. CUFLEY: I will try to find, it may be in the personnel file.

A (Continuing) I don't have a copy in my personal possession; as a matter of fact, I am rapidly getting rid of everything related to fisheries or anything else.

MR. GETCHES: We will designate that Deposition Exhibit #1, and it will be supplied later from Mr. Cufley's office.

Q (By Mr. Getches) Did you get any additional instructions other than the March 1st, 1971, directive?

A I did not.
Q Was any suggestion made to you that you prepare this memorandum on the relation of the Indian fisheries to fisheries management?
A I did not.
Q Could you give your best short definition of conservation?
A Wise use.
Q Okay; can you elaborate on that definition as relates to the management of fisheries in particular?
A It is to first, recognizing that a particular animal, whether it be steelhead, or anything else, is considered a resource, the first responsbility is to protect it, probably your second responsibility is to regulate any use to the end that the resource is maintained or increased - - a renewable resource.
Q Is it relevant what use the resource is put to within the definition?
A I think it is the use that is socially recognized as most desirable, whether it be in the end, economic, or any other - - esthetic and we could add other adjectives.
Q Turning now to some elements of fisheries biology, what are the various factors determining the size of a run of fish?
A Well, I could write quite a document on that subject, but trying to minimize it, it is the environment for

reproduction, the living environment, possibly the range of habitat. I think that summarizes it pretty well.

Q I take it that information about each of these elements is necessary in order to make predictions about the size of a run?

A May I ask what you are referring to specifically? Let's narrow the range down so I can answer more intelligently.

Q Referring specifically to the anadromous fish, the problem of predicting the size of a run of anadromous fish in a particular river? I take it, it would be helpful to you to have as much information as possible about each of these three elements, reproductive environment, living environment, and range of habitat?

A In regard to the anadromous fish, or as a matter of fact, in any other fish, as long as your reproducting stock is adequate, and there is a rather wide limit to the definition of adequacy, the production of young is also adequate, and more than sufficient to maintain the stock under average conditions. Wide variations in juvenile to adult survival take place early in life, and in the case of an anadromous fish, the factors leading up to mortality either occur in fresh water, or - - that is the variation of survival rate, either occur in fresh water or are caused originally in the natural state by the environmental factors in living area in fresh water. The mortality

may occur later, still, early in life, but the causitive factors appear to be caused in fresh water. There is no evidence except in unusual, rare, years that the ocean causes wide variation - - which is the principal period of the fish's life, causes wide variation in mortality rate, regardless of the extent of that mortality, the ocean appears to be consistently rigid in its environment and its relationship of that environment you find in its broadest sense, morality. This is evident also in marine fishes, whenever a dominent survival year past the early life history of cod, or sardine, or herring, never, whenever a dominent population occurs, the dominence of that population is never destroyed naturally, and it is almost impossible to destroy its dominance by harvest.

Now, one can discuss the details of what I am saying a considerable period of time, but I don't think it would be particularly fruitful except as relates to other things. Now, mind, I define all this in the natural state, but man, with artificial culture practices could be precreating things that modify that statement, bringing the estuary possibly into importance and even the continental shelf. This is a considered and informed opinion, but not a fact, not a proven fact, I mean.

Q So, what you have said, one of the main things you have

said, as I hear it, the spawning area is of critical importance?

A I would say it is of lesser importance in the natural state.

Q But, among all the factors, that is at the top of the list?

A I think the living environment, in the early life history of the anadromous fish is most important to determine the survival rate.

Q I see, but not the estuary and not the - -

A Not in the natural state, but a number of things are happening, as I said, due to man's influence, changing, in my opinion, the statement that I would make and have made in relation to the natural state. I think I said that with an adequate escape in the natural state there was always more than sufficient young produced to maintain stock, but the limits of survival of that stock was set primarily by the enviroment of the living stage in fresh water.

Q You refer to adequate escapement, is it possible to, in studying particular streams, determine what numerically, or what percentage wise is adequate escapement of the natural run?

A Yes.

Q Once you have determined that, can you - - I presume you

then can determine - - ?

A (interrupting) With stream rearing salmonids, as I said, living space determines population, not the spawning numbers, as long as it is a reasonable number. There is no conflict for space in the present day harvested runs for the spawners to find adequate spawning ground. As far as the stream rearing salmonids are concerned, it is the rearing habitat that is the important thing.

Q If you know a great deal about the rearing habitat, and a particular stream, in the particular stream, can you then determine what, with some precision, what the escapement goal for that stream is?

A Yes, within - -

Q Within reasonable tolerances?

A Yes, within practical limits.

Q Once you determine that, I presume you are able to determine what percentage, or what numbers of a particular run in that river is harvestable?

A Yes, but in deciding on that number, depending upon the species, in the case of Steelhead, it has to be rather broad, because in administering the resource, trying to pinpoint the number required on a very narrow limited basis, would cost so much money that the resource wouldn't return the amount of money expended. Now, with more abundant species, for instance , in the case of the

Frazier River sockeye where you have a large number of fish spawning in a limited area, you can make first, the determination of the number of fish that can physically spawn in that area. Now, sockeye are different than Steelhead, because there is a space limitation with Steelhead, which is a stream salmon, and with the sockeye, a lake-rearing salmonid, it's rather simple.

We have devised formulae for setting up escapement requirement in advance of the fish run, we predict the runs, usually successfully, but not always, we set the number of fish required based on physical limitations of the area, and modified by other factors, the effect of dominant year, classes, it's all very complicated to express in words here, but the lake rearing capacity usually, in the case of sockeye in the Frazier River, and I think this applies most places, will absorb, usually, the number of fry produced by the maximum number of spawners because the stream rearing salmon, you have to, where you do not have many fish first, it's very difficult, economically impossible, to accurately enumerate the escapement to know how much escapement you have. You can index it, but you cannot enumerate.

Q It can be done, but it's extremely expensive?

A It would cost more than the resource is worth, I probably have more experience in enumerating escapement than any

person in North America, in twenty-two years of dealing with the sockeye, and pink salmon, we had to know accurately for management purposes because they were not stream rearing salmonids, how many escapement we had, and we had to know it on a weekly basis, and we had to check it on the spawning grounds to get the net escapement because sometimes mortality occurred enroute.

But, where you cannot corral a fish to a point where sampling is possible, such as tagging, and the physical factors permit an accurate statistical sampling, which does not exist with steelhead, about the only thing you can do is index it, have a wide limit on the requirements of escapement since you are dealing with small numbers and as I recommended in this report, where obstructions are - - I didn't say obstructions, but I meant that - - where there are dams, fishways, or racks for example, it is highly desirable, for management purposes, the escapement be enumerated since they would be physically observed and physically enumerated.

Q These escapement enumerations, I take it, being more difficult with stream rearing salmon and salmonid such as steelhead, is more costly, given sufficient funds to do the job, can you achieve the same kind of accuracy as you do with sockeye?

A I think you would do harm to the resource in order to do

it, and I would certainly hesitate to recommend something that cost $10.00 for every dollar's worth of value, no matter how you calculate the value, that is what I feel about it, my personal opinion with Steelhead - -

Q You could reach the same level of accuracy, but it would perhaps - - ?

A You have to physically handle the fish and whenever you have to do that, with Steelhead, other than for example, taking purposes, it is my opinion you have damaged the run, I think the record will show that.

Live counts, observations during spawning, most years would give you an index of variation, but even then, it is subject to considerable error because, wet springs, physically, it's impossible to make a comparable live count to a dry spring.

Q Will you define what you would term the most desirable means of determing escapement counts for Steelhead and then indicate what percentage of error would occur in your opinion, under that system?

A I think for practical reasons, which involves economics of managing the resource, that live count index as a general application is the best you can do, but error in some years can approach 100%. But, you have to throw those years out as far as escapement, you are dealing with such a small number of fish and if your safety

factor is sufficient, economically, it's not worthwhile, but adding further, I think the catch as computed from the punch card, while it is, in my opinion, subject to a possible bias error and my opinion is supported by statiticians, including Oregon State University and that is discussed at length in this report.

I think that probably is the most consistent index of abundance and escapement, as I said in this report, under the present fisheries, and that includes all fisheries as they exist in Puget Sound at least, not necessarily the Columbia River, the escapement tends to be fixed inside a number, but not in percentage.

Q It's a fixed number then, in each stream?

A That's right. It tends to be.

Q It tends to be?

A If you have a small run, you get the same number of escapements because of the character of the hook and line fishery which usually occurs after any other fishery, and is related to fishing interest.

Q This number of fish that escape, is generally in the area of the optimum in terms of stream rearing capacity?

A I would say this, that probably represents a surplus, but a practical surplus. In other words, due to all the complications involved, the surplus is far cheaper economically or any other way, within the definition of

conservation as practiced, far cheaper, and is probably the only system that is economically practical and I think that is behind all the restrictions against taking Steelhead, is that very fact.

Q Based upon what you said earlier, about being something close to a fixed number for each stream, would you say it is impractical or impossible to determine a state wide percentage escapement goal?

A Well, each stream has its own conservation problem, every stream represents a separate population, so you can't have a state wide goal. It's not reasonable, it's improbable, impractical.

Q If you studied the streams of Puget Sound Drainage, could you come to an accurate figure, an escapement number for each of the streams, a pretty accurate number?

A It would have to be for each of the streams, as I said, you can't enumerate these things, you merely - - not from a practical standpoint - - I think the State and its management of the Steelhead resource has been from a practical, economic standpoint, has regulated the fishery, the Steelhead fishery, in such a manner that the most practical escapement, even though it may represent a surplus, has been achieved, and would probably be the only method in my opinion, although I have not - - my terms of reference didn't require an analysis of the economics

of that, from a detailed standpoint. I think it's the only method which will work within the limits of the value of the resource. No matter how you measure the value of it.

Q If you were given an assignment to quantify an optimum escapement goal on each of the five rivers, it could be done reasonably accurately, is that correct?

A Quantify, that means - -

Q Come up with the number of fish that escape out of each river.

A I see no purpose to it in the case of the Steelhead. In the case of more numerous stream rearing salmonids, such as the coho, it becomes a problem, but even there, to my knowledge, the Department of Fisheries of the State of Washington has never attempted to do it because of the intricate, expensive magnitude of the problem. They have never considered it practical to do so.

O It could be done?

A They have a surplus in most cases.

O If you wanted to do it for Steelhead, you could do it, is that correct?

A I question the word want?

Q If you were directed to do it, or the Washington State Game Commission determined to do it?

A I would question the directive. I would question it as

being unnecessary and waste of money.

Q If it were determined that there was, for whatever policy reason, a desire to harvest the optimum of fish each year from each stream or from one particular stream, a means of determining that would be to find out the optimum of fish that need to escape to perpetuate the resource and then be sure that that number of fish escape - -

A I would have to argue very vehemently in the case of Steelhead, that the directive was wrong and I would not take the job.

Q Assuming it is necessary?

A I have just said, it is not necessary, I have studied the fishery and the size of the population is so small, so small, relatively, and the task of avoiding a surplus is economically impractical. The surplus is not detrimental to the maintenance of the population, and I don't think under the variable physical conditions that occurred in the stream, high water, for instance, that the job could be done year in and year out with any accuracy without physical barriers which fall within the impractical economic limits in relation to the value of the resource.

Q But you have testified that the number from year to year stays fairly constant, in the number of fish that are needed for escapement?

A Under present regulatory conditions, yes.

Q If that number stays fairly constant, my question is, if you want to or needed to, could you determine what that number was for any particular stream?

A For one year, possibly you could, but it would cost a lot of money.

Q And once you determine that, it would be a figure that would not vary greatly from year to year, so you wouldn't have to do it every year, you wouldn't have to determine a new escapement goal every year?

A Not under the present regulatory conditions. Furthermore, I want to clarify, you either go out and build a very expensive structure which physically stops the run, where you can either count the fish by observation or physically handle them and count them, that is the only method to my knowledge which you can get an accurate estimate, a reasonably accurate estimate. I say reasonably accurate because any obstruction holds up the fish and all of them do not necessarily go through.

As I said, I am probably more experienced with sampling, tagging and sampling, later sampling - - in other words enumerating the total population by sampling, tagging and later recoverying, your errors would be so great and in a positive direction, that they would not be relative to anything in relation to the management of the resources.

Q I think we have established then, correct me if I am wrong, if, for instance, you were directed or the fisheries biologists were directed to determine the number of fish that needed to reach the spawning ground in say, the Skagit River, you could determine, with reasonable accuracy, the number of fish that need to reach the spawning ground?

MR. CUFLEY: What fish are you talking about?

MR. GETCHES: Steelhead.

A You mentioned the Skagit River, I am a little handicapped in answering your question. In the first place, I had a reputation over some forty years as a biologist and as a practical administrator, that people don't tend to set policies in contradiction to my expert opinion, so I am, when you say I am directed - - I would be directed to do this?

Q (By Mr. Getches) Or if you wanted to do this as an academic matter?

A I wouldn't want to do it as an academic matter because I wouldn't see any biological or practical purpose to it in the case of the Steelhead because it's a lot easier to guaranty a surplus - -

Q You see no practical purpose in determining how many fish need to escape in order to preserve the resource?

MR. CUFLEY: Again, we are talking about Steelhead,

are we?

A I would say this, that to get any better information than what we have, which is definitely, in my opinion, in most cases under the existing regulations, surplus, to refine that figure would be economically a waste of time, and in my judgment, if I were to do that, it should be challenged as a waste of money.

Q (By Mr. Getches) Is it your testimony that it is impossible to find out what the optimum number of Steelhead for escapement in any particular river system is?

A I do not say that.

Q Is it possible to determine the optimum escapement number for any particular - -

A Yes, but there are far greater problems.

Q I realize that, what I am trying to establish, whether it can be done?

A It can be done.

Q If it is done, and you know the approximate number of fish in a run, you can then determine the optimum number of fish to be harvested?

A For that one stream.

Q All right, is it possible to each year, to take a stream and reasonably accurately predict the run size?

A No. Not anymore.

MR. CUFLEY: Again, what are we referring to, Steelhead?

THE WITNESS: I assume so.

Q (By Mr. Getches) So it's not possible to predict run size?

A It used to be, within reasonable limits, which you would not accept, you probably would not accept - - 30% variation, 20% or 30%. I think we have enough information in the natural state to predict steelhead runs to whether they are going to be good, average, or poor, but we have so fouled up these streams with fish cultural operations involving all stream rearing salmonid that you can't predict anything anymore until we get a new set of measurements or else correct the situation we have caused.

Q (By Mr. McGimpsey) Can you predict, say as a run begins, as it begins its return for fresh water, at that time, can you reasonably, accurately, predict the size of that run?

A Well, I assume you mean after you have harvested some of them?

Q No, before a harvest begins, but as they begin returning from the sea.

A As far as Steelhead are concerned, my original reply covers the situation. You probably could, with some degree, with a practical degree of accuracy predict whether the run was going to be good, average or poor.

But, I do not think, due to the artificial factors introduced by man, that you can do that at all anymore until we set up a new set of criteria.

Q And these artificial factors are primarily the propagation activities of man?

A Yes.

Q (By Mr. Getches) Now, we were talking about escapement goals a few minutes ago, I think you indicated that a percentage goal is kind of meaningless, since it varies from stream to stream in terms of the number for Steelhead and other stream rearing salmondis, is that correct?

A No, I didn't indicate that. Excuse me, in the case of Steelhead, the production of that stream is related to a combination of physical size plus its rearing capacity for a particular species involved. So, I think those things can be rather simply measured which would mean that the percentage formula within reasonable limits of variation would always apply to all of them. In other words, one stream may have poor productivity, very limited rearing area, and naturally, it produces 500 steelhead -- well, to put 100% of those fish up there will not increase the run one iota. It will still only produce an average 500 Steelhead. Another stream, which is a large water shed and productive rearing area will produce many times that, but a percentage of that is in relation to its

productivity, and that percentage, getting back to escapement again, can vary from a practical standpoint in management, must. Whether it's fifty, or sixty, or seventy per cent, is of no moment because surplus escapement in the case of the stream rearing salmonid has never been demonstrated to be harmful, they have a natural adjustment period so early in their life history that any surplus fry are lost very early in life and don't live sufficiently long to cause any harm to those fry which are more capable of absorbing niches and habitat.

Q What is a safe percentage figure that you would apply to the returning run in any river in the Puget Sound drainage?

A On Steelhead?

Q On Steelhead.

A I think you would have to possibly relate it to other information, or information on other species, but I think I stated in this report that the percentage required is rather low.

Q Such as?

A Certainly 20% is more than adequate in my opinion, in any stream rearing salmonid where living space is the main control of the population, adequacy of it, but whether the escapement is actually 50%, I know that 50% probably

approaches the average.

Q So, although 20% probably would be adequate for most streams; 50% comes closer to the actual escapement?

A 50% to 30% seems to be in those places where it was fairly well measured in isolated cases in Oregon and Washington. If my memory serves me correctly, it varies between, under modern fisheries, in highly utilized streams, between 50% and 30%.

Q (By Mr. Cufley) Excuse me, are we talking about natural conditions or conditions that man has - -

Q (By Mr. Getches) You were describing the situation as it now exists, is that it?

A Well, you have a highly variable set of conditions, yes, as far as fisheries is concerned, the harvest, yes, I believe that the escapement in some places is as low as perhaps 25% or 30% but more likely I think it is in the neighborhood of 50%.

Q So, typically, there is ten to thirty per cent of the fish that reach the spawning ground that are not actually necessary for perpetuation of the resource at this time?

A If you are speaking academically, that is probably true; from a practical standpoint, you need those to avoid spending so much money that the resource is not worth, to harvest them.

Q Theoretically, they are very harvestable fish within limits of conservation, if they were harvested, the run would be perpetuated?

A There are a number of things involved here. You are making the harvest of a resource, you do it so that you cannot be accused of special privilege. How you harvest those if you did harvest them, which I would rather, if you have an increased harvest interest, or a broadened harvest interest in this case, this case involves the Indian fisheries and the Indian fishery only, I have my personal opinions regarding the value of this testimony. But, the Indian fisheries, due to its modern permitted character of using gill nets and set nets, regardless of the local custom of rearing, is going to have to be operated at the mouth of the river. They can't operate any place but the mouth of the river so you are presumably discussing the increased harvest or sharing of the harvest by the Indian population which will - -

Q I would like to limit the question to, is it true that under present circumstances there tends to be an excess of ten to thirty per cent beyond that number of Steelhead needed for escapement that is a potential harvestable number of fish?

A That is what I am getting at. You use potentially, and harvestable, to change the existing regulations.

Q I don't want to talk about regulations.
A You can't look at harvest by hook and line when you talk about going from one gear to another, then you open up a whole series of things which raises the desirability of the harvesting - -
Q If those fish were taken, if the ten to thirty per cent more fish were taken out of a typical Puget Sound drainage stream, and we are talking about Steelhead fish, would there be adequate fish for escapement?
A Yes. I would have to say so, but I question the practicality of it, of considering the point that you are opening up, because that is not my decision.
Q Well, the point that I am trying to get at it - -
A There is a surplus, I am saying that the surplus itself, it's not practical in my opinion to harvest that surplus even though the surplus exists, and there is from ten to - - I will accept your figure that you just gave, that could be harvested, but the question of being able to harvest them raises a whole new set of questions.
Q Well, we will get to those questions. I am trying to establish that there is a surplus of a fish available for harvest. I think that in your report you have indicated that there is an escapement of salmonid on Washington streams that has far exceeded the amount to maintain the maximum natural production?

MR. CUFLEY: What page is that, please?

MR. GETCHES: Page seventy-three.

A I don't - - well, I did say the recommended escapement to absorb the rearing capacity of Minter Creek is far below the usual escapement in spite of a major commercial and sport fishery during the salt water life history of the species. There's no question but what there is a surplus, the fisheries department has found that the only safe way to manage fisheries, from an economic, practical standpoint is to have a surplus and the game department has found the same to be true. And, to do anything else with this particular species, we did not do it with the sockeye or the pink salmon or we never obtained the desired escapement with the pink salmon because the runs were so decimated we built them to a size to fill up spawning ground but with the sockeye we announced the escapement in advance of the run, numerically, and we achieved it or we reported our error and in an annual report by stream so when I say that I am not prejudiced, I am agreeing that we did it with the non stream rearing salmonids, practically, and efficiently, but I agree with the fisheries and game department that the surplus is the only practical way to deal with stream rearing salmonids.

Q Although, as your report indicates, at page eighty-one, you say "The number of adult stream rearing salmonid

available for reproduction is usually in excess of that required for producing juveniles to utilize the stream rearing capacity"?

A Yes. I didn't say there was any harm done.

Q Yes, but if you are able to quantify that excess number, then that number of fish would clearly be harvestable, is that right?

A Well, I will say that in the case of Minter creek, I built the station, or it was my recommendation and I was intimately associated with the original operation, it was quite easy to enumerate, in relation to that particular station, in the small creek, to enumerate the escapement. I might say after extensive work in trying to enumerate the escapement visually, a hundred fish was the most I estimated occurred as far as coho was concerned. We put in a weir for assessment and it was over 2,000. Dealing with the method of escapement, that was the error between visual and physical handling.

It took about - - the station had been operating since the late thirties, of course, these answers have come up as far as the desired escapement is concerned, back a number of years ago, but it took quite a few years to arrive at a definition of the optimum escapement in Minter Creek, even with the expensive station and expensive operation, one to two biologists, year after year

and to conduct these operations, Salo and Bayliff reported on this problem in 1958.

(Recess taken for ten minutes, reconvened at 10:20.)

BY MR. GETCHES:

Q You indicate on page fourteen of your report, since there is no commercial season for Steelhead in marine areas, the Indian Reservation Fishery will usually harvest fish that are wholly deductible from the potential hook and line catch, rather than from escapement, are you referring to Steelhead there?

A Only, yes.

Q Is this Indian reservation catch a catch by gill net?

A I am assuming so in the statement and that the Indian Fisheries is below the sport fishery, which is usually the case, but not always.

Q You are indicating here that the impact of this fishery is primarily on sportsman and not on conservation itself, is that right?

A Under present circumstances you could reach a stage, and I believe the Puyallup River did, where they were actually impairing the escapement. That is a matter of management status that I don't know, I do know the Indian Fisheries of gill nets, that it gets back to the discussion you shut me off from, the Indian Fisheries, that this case is all about. Due to the fact that when they would use

gill nets and set nets, permissively, which they never used in the Frazier River anyway, you would have to go to the mouth of the smaller rivers, it doesn't apply to the Columbia, but Green River, for instance, it has to be done in the mouth of the river, and the Duwamish, the Skagit - - with rare exceptions on the Skagit, it has a few exceptions due to its size.

In order to operate, they have to go to the mouth of the river. They are catching the fish before the sportsman or the white people have a chance to conduct their harvest with hook and line, so that the fixed escapement theory or philosphy, because it has some fact behind it, if you have only five hundred fish available and your normal escapement is two hundred and fifty, and the Indians at the mouth of the river catch two hundred and fifty, the catch would be zero, theoretically.

If you have a reservation half way up the stream and there is a major sports fishery below it, or hook and line fishery, only that portion of the run that goes past the reservation fishery would be effected, you understand that, as I am expressing it?

Q Yes. The quote that I read from your report would indicate though, that if on reservation fisheries, the Indian fisheries took up to the number of fish necessary for escapement, that there would be zero hook and line

fishing available to the sportsman, is that right?

A Yes, and that might not require very much regulation because of this reducing interest - - steelhead is awfully hard to catch, with hook and line, by most people. When the word gets out that fishing is poor, people don't go there because they are not going to spend the effort.

Q This is a self-correcting kind of theory?

A Yes, it is.

Q In the statistical section, you have referred to a series of reservation fisheries, but this would apply to on or off reservation fishing alike, wouldn't it? You have used it as an example because there is actual on reservation fishery?

A That is true.

Q But would apply - -

A Most of them are at the mouth of rivers, but it is deductible from the sport catch even though it is on the reservation fishing. But, if our country makes these decisions or treaties you have to live with them and live up to them, but the effect on the resource, theoretically, was considered in making the treaty, so you live with it.

Q Considering all the means you know of, of harvesting fish, what is the most efficient means you are aware of, for taking fish?

A Efficient in terms of economic operation?

Q In terms of being able to take the larger number of fish.
A You mean currently in operation, well, yes, which eliminates fish traps.
Q No, if it's fish traps, so indicate.
A I think I can say that the more favorably located fish traps caught far more fish, individually, than any other gear. There were some with very poor fish locations, when they didn't even put them in operation prior to initiative seven-seven, except in known big years of big runs. There is the physical qualification of the trap location, Lummi Island, for example, was called the million dollar trap.

Purse seine is next, prior to initiative seven-seven Purse seining was the next more efficient followed by gill net, and that doesn't mean the return per man effort is most efficient, I am talking about the number of fish caught in the unit of gear. The purse seine has from five to nine men on it, and the gill netter has one.
Q In terms of regulation, if you are not concerned with who gets the fish, or any other social policy, you want there to be enough fish to get to the spawning ground to perpetuate the resource, and you want to catch the maximum number of fish that are left over, what means would you choose to catch the maximum number of fish and be assured that a number, a sufficient number of fish got to the

spawning ground?

A You mentioned that if I am not concerned with the social aspects of the situation?

Q That's right.

A I don't think that you can add that statement in there, because our entire life, we are a society, and we have legislative processes which set up what we are to do.

Q I am asking you only from a physical standpoint, is it within the realm of physical capabilities?

A Well, I suppose you can go out and in a kill with rotenone, kill half the population if you want to harvest them, you can harvest them, there is nothing against eating fish killed with rotenone.

Q Could there still be an adequate number of fish left for escapement?

A By selection of the rotenone, you could come close to regulating the fishery. You want to know the best, most efficient way, you say the most efficient way to - -

Q I mean the most precise means.

A I think it might be a question - - precise means - - might be argumentative because one physical form of harvest and a means of killing them, and later collection, I don't know.

To answer your question, it depends entirely on first, if you are talking about catch fish, physically, and

harvesting them, it has to be qualified by physical conditions of where you have got to operate.

Q Sure, if you are talking about a stream or river harvest, what I am trying to ascertain, what is the most efficient and regulatable means of harvest of fish so that you can allow the optimum to go for escapement and harvest the rest?

MR. McGIMPSEY: What do you mean by efficient, Mr. Getches?

MR. GETCHES: Efficient, catch the most fish.

MR. McGIMPSEY: You mean, economically feasible as well as physically efficient?

Q (By Mr. Getches) I want to know what means you would use to harvest fish in order to capture the most fish without impairing escapement goals?

A I can't answer that question from an arbitrary standpoint, I have to consider all the ramifications of it, and I would say hook and line is not the most efficient, but the most practical, as far as Steelhead is concerned.

Q Hook and line is the most practical?

A Yes, from a management standpoint, you can't have anything else, to my knowledge.

Q It is more practical than putting a trap at the mouth of a stream and catching every fish and releasing that number necessary for escapement?

A Well, in the first place, no one would let me do it.
Q I am not asking what is legal, and I am not asking what is socially desirable; I am asking what is physically the easiest way to catch the maximum number of fish and allow for escapement. I am suggesting that maybe a fish trap, is that right?
A It would depend entirely on the - - ignoring all the limitations of society, some places it would be physically impossible to build a fish trap and harvest Steelhead, from a practical standpoint, most places. At least, again, I have to bring in the economics of it, if you want to put up ten or fifteen million dollars, I can build something at the mouth of the Skagit River, where I could control the run of Steelhead, put one over and take one, and put it in the box, it would take, well, a great amount of money and no one would consider it practical. There are other streams where you would go to racks, where the water flow - - where hydraulically, you can put it in, a rack or a trap, an obstruction where the fish, in order to get over, would have to go through there. For a reasonable price, not beyond astronomical limits, you can put in, the same as the fish management agencies do, for Salmon or Trout, they put in racks, stop the run, count the fish - - that's a small stream - - other places where you have estuaries, you use gill nets, but the

escapement measurement would not be precise in any manner of means. You get high water and your escapement past your gill net could be ninety-nine per cent, you get moderate water or low water, or after a rain, where the water becomes murky, maybe the escapement is ninety-eight per cent, which makes a great deal of difference for a particular day.

Q Is it fair to say that - -

A (Continuing) Put in enough gill nets, of course, I will have to change my percentage figure.

Q It would be variable to the same degree? If you had absolute control over the fisherman, with hook and line, gill net, fish trap, would it not be true that as between the three, the hook and line would be the least efficient?

A Yes, in terms of catching the maximum number of fish consistently. Under certain circumstances, a trap would be useless. Under certain circumstances, the gill net would be useless. The hook and line fisheries, the physical conditions for operation of hook and line fishery are throughout the river, whereas the others have to be located where the physical factors are proper.

Q On the balance, though, is not the hook and line the least efficient means of harvesting Steelhead?

A That is correct, and that is the reason it is used to

get this guarantee of this escapement.

Q Does hook and line have any adverse effects or aspects to it?

A Looking at it in a broad sense, I would say no. You might have a small hooking mortality, but there again - -

Q By that you mean fish that are partially caught and get away?

A Yes.

Q With injuries?

A Yes. I don't doubt that there is some of that. In fresh water, they are very resistant to it; in the high seas the toll of fisheries destruction is terrific, but in fresh water, where they are not feeding to any great amount, the metabolism is down, I don't say - - I would admit probably there is a mortality, but it's more at a minimum because they are not, it's not like hooking and releasing trout that are actively feeding, where they swallow the hook. Very seldom, I don't think a Steelhead could swallow a hook very far in its mature state, but there would be mortality, but with surplus - - .

I would like to point out many times Steelhead are caught that show evidence of being caught before. They will bite any time. I have heard stories, this is a matter of hearsay, but I have heard stories of catching Steelhead a second time and have afterwards, they identify the

Steelhead as the same one, but that is hearsay. It's not of my own knowledge.

Q How does the punch card system work, briefly?

A It's a sampling method of determining a catch, you buy a license for a Steelhead, a punch card now, you are given a card and legally required to return said card at the end of the Steelhead season and upon catching of every Steelhead you are to punch a hole in the proper date and write in the name of the river. At the end of the season, these cards are sent in.

Like a good many laws, it is impossible to completely enforce it, and lots of people don't send in the cards. So, you have a non response.

Q That is unlawful?

A I believe it is now. That is my impression, but perhaps -

MR. CUFLEY: I think it's the same thing with the Salmon punch card.

A (Continuing) But, it's not necessary that you get all the cards back. Theoretically, on that basis, you would have a complete enumeration.

Q Is it primarily statistical promotional, or to provide some control on the number of fish taken?

A It's a statistic, theoretically to tell you whether statistically, for management, it's to tell you whether the run is up or down, and it's to tell you how many fish

caught, and then, as I used it first, I had to prove to my satisfaction and to anybody else's critical satisfaction, I hope, that the punch card system was useable. There is an error of non response, but human bias is consistent and in Oregon, they found out it was fifteen or sixteen per cent.

Q Is there also the possibility of abuse in terms of excess fishing that goes unreported, that this could be undetected?

A I wouldn't say it was wide spread, because when you are out in a boat, you catch a Steelhead, or even on the bank, at any time when you are actively fishing or close to the fishing grounds, you are checked and you have a Steelhead in your possession and you haven't punched your card, you are under arrest.

Q You have to punch your card at that time?

A That's correct. I would say that there is very little violation of that, I don't say there isn't any, all laws are violated, I think, but from a total standpoint, I don't think it's very great. However, I am not in the management or enforcement business, I have to take information that is given to me verbally, as far as those sort of things are concerned.

Q In your employment with the Department of Game, you have had an opportunity to examine their files and data in some

detail, I presume, is that right?

A That's right.

Q What type of escapement data does the Department of Game have on Steelhead?

A They have two sources. May I ask a question? All of this information is in the report, and this report is filed as a matter of record and available as evidence in the court case, do we have to go into this?

Q We don't need to go into detail, what I am interested in is the form of necessary escapement data that is maintained by the Department. Is it in terms of spawning bed count, or what is it?

A I am put in a position of being critical, I was required to do a critical analysis and I have made recommendations which I understand are also a part of the report and I have found that a great deal of the record - - with the matter of personal knowledge, I was unhappy with the record keeping department. As a matter of fact, I had to spend two months on the planting records before I could use them, and that's fully outlined in detail in here. They do have, in recent years, they have made a number of aerial counts. They have trap records, two or three locations, but they have been relying on the punch card catch for most of their management data.

I made a recommendation that they set up two or three

desirable, practical counting stations. I don't know whether I said two or three, I said several, as a day to day index of what was going on in the Steelhead run, and that was one of my recommendations, which is included in this report which is a matter of record.

Q That is the document entitled recommendations?

A Yes.

MR. GETCHES: That, I don't believe is in evidence, we will have that marked.

(Deposition Exhibit No. 2 marked by the court reporter.)

Q (By Mr. Cufley) I think it is an appendix, the recommendations is an appendix?

A Yes, the reason is, as I understand it, this letter of introduction of this report - - quote, detailed recommendations, based on findings in the attached report and relating to management, will be forwarded under separate cover. Unquote.

MR. DYSART: May I ask a couple questions - - I don't - as an identification, I don't mean to interrupt the normal trend here - -

Q (By Mr. Dysart) Mr. Royal, I have a copy of a document, and all of us apparently have the same copy, consisting of twelve unnumbered pages, is that - -

A That is correct.

Q There is no signature or anything on the document that identifies what it is, but do you recognize that as your recommendation?

A That is correct.

Q And are these twelve pages the complete document? There was some failing, it seems to stop in the middle and we wondered whether there was more to follow?

A There was one thing, and it was referenced in the text of this report, that the research program would be submitted, that was never done.

Q I see, that was one question I did want to get into. I notice several references about see my detailed research; you say that was never submitted?

A Never, I verbally tried to sell the program on the Columbia River which would have found out a great amount of information by coordinating the present activities of present agencies, from identifying the coho to fish and wildlife services of three states.

Q These unnumbered pages are the final recommendations?

A Yes.

Q I don't think this has been put in evidence before,so let's make this Deposition Exhibit No. 2, and we will refer to it as your recommendations later in the deposition.

A Actually, it was considered a personal, confidential report to the director, but I have been told by the

Department that somebody requested it, and it became a matter of record, so on that basis, I can't say that it is personal or confidential anymore.

Q Have you any information that any of the recommendations in this report have been accepted by the Department of Game, in practice?

A Yes, I have been away since March 1, and I don't know what has been done since then, but planting time, planting size, a number of things of that nature, are being religiously adhered to.

Q In your administrative recommendation, number one, you say, quote, it is strongly recommended that the division, under the division chief, be divided in three units. Unquote. Has that been done?

A I don't know.

Q (By Mr. Cufley) May I interject, approximately when did you submit the recommendation, I presume it was not on the date of the report?

A No, it was after that. I don't know, I think there was a letter of transmittal to the director, but all I have ever seen is this.

Q Do you have an approximate idea?

A It was probably early in 1973.

Q (By Mr. Getches) Do you know, looking at the administrative recommendation number two, recommending, quote,

the primary responsibility for investigation and other actions in respect to water use, including pollution, which might impair game fish populations, should be removed from the regional biologist and transferred to the Environmental Management Division, unquote. Has that been implemented, to your knowledge?

A Please understand, these were sent in, early sometime in 1973, and I left March 1, and I have no interest in the fisheries whatsoever since that date.

Q So you wouldn't know whether these things have been implemented?

A I couldn't care less.

Q All right.

A I was very sincere in making the recommendations.

Q One thing you point out in here, the Steelhead escapement data is severely lacking?

A That is detailed data.

Q Yes, now, what is the effect of not having - -

A What page are you on?

Q There are a couple places where you make reference - - well, on point seven, you recommend that special effort be expended in obtaining Steelhead escapement figures and all escapement data should be summarized. How would this help the Department?

MR. DYSART: There are two sevens, you are reading,

I think, from the one under operational recommendations?

MR. GETCHES: That's right.

MR. DYSART: I have numbered my pages for convenience, in pencil, it's the ninth page.

A Please understand that there are two types of statistics, there are statistics merely for the resource identification magnitude, and there are biological statistics for management. They have no biological statistics, they don't know, they know the catch. The catch is not broken down into different ages of maturity; for instance, three years in the ocean type, or two years in the ocean type, or two years in fresh water type, and one year and three years, they are on an annual basis only. They are not on a daily basis. There is no need, really, for assembling data in total population, thence it seems to be the case that the regions function in relation to the variations I am talking about, but I have moreorless told the Department through that (indicating the exhibit) for the research supervisor or director or chief, or whatever you want to call it, which I have recommended, that he should have data, if and when they appoint one, and if they don't appoint one, they should have it then in the management division which would tell what is happening to the total population on a section-weight-year-basis, for instance, it was obvious in 1963,

that the run of - - or '73, that the run of three year old, normal hatchery fishery was way down, it was so obvious because there are six or seven pound Steelhead and this occurred in Oregon at Wells Well. But, the three year in the ocean type, nine to twelve pound fish, made up a great percentage of the catch.

Well, the typing of these various sections are important, in relation to analyzing the total catch, whether the three year in the ocean type come in late or early, but there is no record whatsoever of the number of two year in the ocean hatchery fish, and three year in the ocean hatchery fish. There is only total catch figure on the record of hatcheries Steelhead, or of Steelhead taken, both. Nobody knows how many wild fish were taken, whether we are completely destroying the wild fish population,there is no data on it. Whether the Fisheries Department is destroying it with their planting of stream rearing salmonids. I know of no data on it, I don't think the Fisheries Department has on coho, but that is not a part of this discussion.

Q Has the Fisheries Department, if the data were kept as you say it should be kept, would it be possible to increase the catch to save money and provide greater enhancement of natural runs, is that fair to say?

A I said in here that we had a density factor appearing on

the Steelhead which we could not define as to its character. I have said in here we do not know whether we are completely destroying wild population, but I presented a great deal of data to prove that increasing the plant of Steelhead is not increasing the production in terms of catch. Initially, it did have decidedly, but now that those plants have been increased, decidedly, there is no more increase in production. So, I said that we had to eliminate all of our bad practices that we could control, and which were obvious, and after that, then we can start to approach and analyze what this density factor was, trying to define it, but to continue to increase the plant was a waste of time under the present circumstances.

A lot of things had to be corrected, the bulk of this report is building up to an analysis of population dynamics and the effect of hatchery operations on those dynamics. Now, we can control a lot of them, but numbers alone may eventually, just physical numbers, I don't say it will, but physical numbers have been known to create stresses which prevent the population from getting any larger. This eventually could apply to another stream fishing salmonid, salmon, but whether or not that density barrier is going to be in relation to the position of the particular species in the

salmonid complex, the total complex. I don't know. Apparently it is going to be.

Q Is this recommendation for better record keeping toward the end of increasing the total number of harvestable fish?

A That is the only way we have any hope of obtaining that, I guaranteenothing, I only point out the obvious things that are wrong, and we correct those, and then we go from there.

Q As another recommendation, under administrative, I believe number five - - rather number seven, you say quote, there is serious need for establishing close and continuing administrative liaison with all other agenices involved in raising stream rearing salmonids, particularly the Washington Department of Fisheries, to eliminate those practices which tend to create either undesirable inter specific competition, or which tend to reduce or eliminate natural reproduction. Unquote. I take it from that, that in reproduction you have identified some problems with their segregated system?

A A great number of them, whether that has been done or not, I don't know.

Q Would you think it would be desirable to have much closer interchange of information then, amongst the other technical people within the two departments?

A That is a secondary thing, but the primary thing is to obtain unified fish cultural practices, which are directed for the maximum production, and not in competition with maximum production.

Q Could this be done by having the same team of biologists managing the Steelhead and other anadromous fish resources and planting programs?

A I would hope so.

Q Could you give a brief definition of the inter specific competition you have referred to here and extensively in your report?

A It is the effect of competition between two or more species on the survival of the other.

Q Would you see any problems with all of the salmonid resources of the state being managed by one department rather than two?

A I am not qualified to answer that question.

Q You do see problems with it being managed by two departments?

A There are always problems between departments, but normally they are solved by proper liaison. Apparently there exists at this time a communication problem, I have said it is not satisfactory in regard to the problems raised. Please understand that the recommendations and considerations of this report as far as the published

literature is concerned is rather progressive and is not necessarily accepted by all biologists, particularly those who are not good population dynamics people. It is going to take time for all these things to be accepted, although it's received favorably, no argumentive response to the report.

Q In your recommendations here, you refer to the hatchery program, and in recommendation number six, under administrative, you say, quote, in view of the negative results accruing from the recently increased planting program of anadromous trout, further expansion of this program should be discontinued - - . Unquote. What are the negative results you are referring to?

A No return.

Q No additional return?

A No additional return. Per unit of additional plant, you get the same number back from two million, for example, we'll say to be arbitrary, as you would from three million.

Q How are the decisions made as to numbers of fish that are planted in each river by the Department of Game?

A That, I didn't go into that subject.

Q You don't know how that is done?

A No, that is a management policy, and I was not concerned with it.

Q How are decisions made about where to place the fish in the stream rather than planting?

A That, of course, is a management decision, but it is based upon a certain amount of findings by both Oregon and Washington, and I think the management division has demonstrated that they are familiar with the known facts required by research and they are generally following that.

I discussed the details of that, but I didn't make specific recommendations; rather, fish can come back to the planting location, and I think I said that in order to get a maximum return, there might have to be a compromise between the maximum production and maximum harvest as far as planting locations are concerned. I think I said something of that nature in this report.

Q Isn't it true that the number of adults produced per number of planted fish is a function of the type, places and number that are planted?

A Yes, but there are other factors, several other factors.

Q What are some of those?

A Time, places, numbers, well, size, for instance, if they are not right size, you won't get anything back. If they are not of good quality they will immediately go into stress and probably die of disease if they do migrate; if they don't migrate, no matter what the quality is, they

will die. There's no food for them.

Q You have indicated as plant size has increased, the run size has not increased in recent years.

A That is the origin of the density barrier discussion, as originated - - the only way to control it is to cut out our known bad habits, ourselves, despite all the agencies involved, all of them cut out their bad habits. Then, we start from there, trying to understand the density barrier.

Q Has there been much research in the density barrier by Department of Game?

A To my knowledge, no one has recognized it, that it existed. I think the situation is going to get worse before it gets better.

Q In your recommendation number eight, under administration -

A Incidentally, the Federal Government itself is involved in a more limited way in the same bad habits.

Q You refer to adverse hatchery practices, particularly those related to coho and chinook salmon - -

A They are all listed in this report.

Q Since we are referring to recommendations, could you just summarize briefly?

A Well, I don't know if I can remember all of them or not, but the major factor involves the creation of residualism, making a desert out of our streams without producing fish

from the residual fish, that is the major bad practice, planting pre-smolts, and I am not - - the Game Department is probably freer from that by and far than the Fisheries Department is.

I am not - - don't misunderstand, I am not criticizing, I am merely pointing out that these things are occurring and that I have inferred they have not been recognized, the effects of it, but if you are a hatchery superintendent and first you take more eggs than the capacity of the hatchery and if an accident occurs, you have the surplus to replace those lost by the accident. But, in any event, you end up in the existing practical operational sense with more fish than you can raise to migratory age, so you plant them.

Well, the planting of those, they become competitive, first with the wild fish and for a time with the hatchery fish during migration. They eventually die from starvation, and they create a desert of the stream and no wild fish can survive because there is no food for them, that is in a general sense, I don't say no wild fish survives, but you create, you tend to create a desert without producing anything.

Q So, it's possible by stocking pre-migratory fish of either salmon or Steelhead to destroy the wild population?

A That's correct. Furthermore, it is possible to destroy

the ability of the properly planted fish,too, from going into a stress and dying from vibrio at the mouth of the river because migration is not here today and gone tomorrow. It is here. It is release today and two weeks later in most cases they may or may not be in salt water.

During the summer, if there is no food they are weakening and beginning stress so when they hit salt water, the enter salt water and encounter the existence of disease organizations,organisms , such as fisheries on - - they are very vulnerable to virulent outbreaks and eventually mortality.

Q Did you uncover in producing this report that either the Department of Game or the Department of Fisheries had identified - - physically reduced or destroyed the natural runs through planting pre-smolt fish?

A Well, there was very strong evidence from the number of wild Steelhead that was declining, and that was discussed to some length. It was not positively related to planting practices, it was merely identified that it had declined and it was decided in this case, this was the reason.

Q Well, part of the problem, I take it, that you have identified, is the hatchery practice of each of the Departments, separately, and part of the problem their failure to coordinate amongst themselves?

A That's correct.

Q Some of your statistics on page seventeen and eighteen of the report in the table identified as table six, indicates high returns of hatchery fish in the early months of the run, with the percentages and numbers of wild fish increasing in the last four months, where is this differential in return time?

A Well,anumber of biologists would possibly say it's because you take the early eggs originally of the wild fish, the early maturing eggs and have concentrated on doing that on each succeeding generation whether they be hatchery or wild. I don't think there is any positive answer, although as I say, a number of biologists would state that.

I think that there is another possibility that their accelerated rearing produces the same size fish in one year, compared to a wild fish of two years. It could be responsible, but there is no way of settling such a diverse explanation for this thing. It could develop, be either one and probably is, or it may be combination of both. But, the fact that the hatchery fish come back earlier than the wild fish is not disputable.

Q It's not planned that way?

A No.

Q Could it be resolved?
A It's desirable from a harvest standpoint, because it deserves, December is a better fishing month with hook and line than January, usually, Also - -
Q But didn't it tend to concentrate fishing, evidentally, on an annual run, disproportionate with that later month of the runs?
A No, not at all, it's just a contrary - - it's all tied in with this fishing interest, if they are going out when the fish are easiest caught, there are lots of fisherman that would want more March fish, but normally very few fish are caught in March, primarily because a lot less fish are available and a lot less fishing interest then, because of that - -
Q What fishing does take place in March is almost exclusively or disproportionately upon the wild runs?
A Well, to a large extent, to a greater extent than the hatchery run, yes, but your escapement there again, your escapement in March is probably higher than - - but again, it's probably a surplus, but we don't know how many wild fish are included - -
A In your report at page thirty, you characterized the present means of measuring the effects of the planting policies

and survival rate as being haphazard, is the word you use? On page thirty? Would you indicate how those means of measuring those effects could be improved?

A Are you quoting the report accurately? Quote, record keeping from the central office for earlier years has been far from satisfactory, unquote. Is that the statement you are asking about?

Q At the top of the page.

A Oh, at the top of the page, I see what it is. I would answer that question by saying that the records are not consistent, are not complete, and they are not always required for the use of the organization, rather, they have been maintained by individuals and not available for collective consideration.

Q Are hatchery fish easier to catch than natural fish?

A You have not identified the species, in the case of the cutthroat, sea run cutthroat, there is data available and that indicates that they are far more availabe to hook and line fishing.

Q Has it been shown with Steelhead, too?

A No.

Q Do you have any opinion on its application to Steelhead or other salmonids?

A I tried to find information on that, and was unable to do so.

Q Now, you indicated at various places in your report that the inter specific competition and intra specific competition between the planted and wild fish result in survival of the stronger fish at that particular time, does this lead to the overall survival of the stronger strains of fish?

A Well, the answer to that is that in all wild animals, regardless of whether it's cold blooded or warm blooded, this is the natural selection, the stronger survive as contrasted the weaker ones. There is no argument about that question, that operates all the time.

Q So, there might be some positive genetic type changes?

A Well, there is, yes, but that is a natural selection, it goes on all the time within the limits of the capacity of the environment to maintain a population. You don't increase the population, you get stronger individuals. Conceivably, if man moves in with a weaker fish, which we did with hatcheries for fifty years, you produce nothing.

Q Are hatchery fish both Steelhead and other salmonids generally a weaker strain of fish than the wild fish?

A Oh no, we get - - they used to be when they were planted as fry, they were so weak that you had one hundred per cent mortality in certain cases.

Q But these - -

A And that weakness has been measured in size alone.

Q Are hatchery fish usually smaller fish?
A Not in the adult stage, they might be slightly smaller, but it's not of any significant difference.
Q They are physiologically identifiable?
A They are weaker at least until in the final adult stage, they are certainly weaker through the early life history. The whole purpose of improving diet and quality, quote quality, unquote, is to improve the strain, the strength of the hatchery fish in relation to - - not necessarily in relation to the wild, but in relation to his ability to survive.
Q In your opinion is it important to maintain as much as possible a natural run or is it just as desirable to supplant the natural run with artificial stock?
A Theoretically, it has not been proven yet, but theoretically, the purpose of the hatchery fish is not to be in competition with the wild fish, which they are due to our bad habits now, but to be supplemental to the wild.

In other words, eliminate if you can all the fresh water living., as far as the hatchery fish is concerned, giving the wild fish a chance to function just as if the hatchery was not operative, because with the exception of the down stream migration period, if you are operating properly, you have removed the hatchery fish from any demand on the living environment of the wild fish. So,

the two are additive, because when you make the competitive, you are wasting your money and maybe doing more harm than good eventually.

Q Do I read your report correctly in a number of places, indicating that hatchery fish don't reproduce themselves very well in natural habitat?

A We don't know, that is a great void, and a very difficult thing to prove. One thing you do know, is that wild fish, by natural selection, migrate and spawn at a time suitable for maximum survival rate. That is a genetic adjustment. If you change the time of spawning and the time of migration of any particular species by hatchery operation, you have changed the relationship of the returning adult to his productive and living environment.

So, you can assume, number one, that at least no good is going to be accomplished by it, and more probable, the reproductive capabilities in terms of returning adult is going to be impaired if it is subjected to natural reproduction. It's a very difficult thing to prove, because when you take a mature adult out of the stream, you don't know whether he is wild or hatchery returning. You've got to prove that before you start finding out whether there is any wild fish left. Maybe they are all naturally produced, that hatchery fish and the original stock is gone, but it's a complicated thing, and I didn't

spend too much time on trying to figure out or see whether it was practical to find that out or not.

Q So you don't really know whether the plants have enhanced a natural run in the rivers?

A Not as far as natural runs, you know they have enhanced the catch.

Q But if they ceased, the question is, would there be a permanent enhancement of the recurring runs of that fish in that river?

A I think with some species, and I know this of my own knowledge, after you have generated a returning hatchery run, if you allow them to spawn naturally, I don't know if this is the case of the Steelhead, but I have allowed transplanted returning runs of fall chinook to be put above the racks over 6,000 of them, as a matter of fact, and there was not a hundred fish came back. They were incapable of reproduction.

What the reason is for that lack of reproduction, maybe the gravel was too small in the recipient stream, but there is very little known about the ability of hatchery fish to accept, except you do something like that where you involve the whole run, you can find out very readily if you had been hatching fish for a long time, you close the hatchery and you get no fish back, you have destroyed the wild run, and the capabilities of the wild

fish that have responded naturally to reproduce, otherwise, you would get fish back.

Q Based upon your observations and research, is it fair to say that the salmonid resource that tends to perpetuate itself, tends to be the natural ancestory rather than hatchery ancestory?

A I think we have reached the stage where it could easily be the other way, and further, we have reached the stage where we either produce them artificially, such as the lower Columbia River or we won't have any, because the conditions for natural reproduction have been so impaired that if we are going to maintain production, the stream itself is no longer capable of producing sufficient fish to maintain a resource of interest.

I say we are reaching that stage, and have reached it in specific instances.

Q Is there any evidence that the wild stocks will tend to replinish or rebuild if the inter specific and intra specific competition is eliminated?

A Yes, there is.

Q Do you think - - are you finished?

A Well, I have answered the question in the affirmative, I haven't as to data.

Q If planting ceased, would the wild runs tend to level off at some level - - at the level they once were as wild

runs before?

A No, because to my knowledge, there is no stream that in itself is in its original condition for productivity. All of them have been impaired in some manner by man. There is no such thing as man improving environment, in his development of the water sheds, his mere existence is detrimental.

Q But other things being equal, there is a rebuilding capability in the wild runs?

A I just answered that same question.

Q Right, but you say that because of some man-made factors they would have a different leveling off at the maximum stream rearing capacity?

A I'd go further, and say they can't.

Q One of the purposes of the artificial propagation program of the state should be to rebuild a natural run in the streams to the level of the stream rearing capacity, is that correct?

A No. Our end point is to produce, it should be to produce artificially an augmented population of fish over that which the stream is capable of producing naturally.

Q Over that?

A Over that, instead of that, we tend to produce a large number of artificially produced fish which is acclaimed with great vigor by everybody, but at the same time we

have, by our own production disguised the possibility, the elimination of the wild population.

Q Couldn't you reduce the number of fish that were necessary to plant by developing an artificially propagated fish as a natural run? In other words, establish them as a permanent run in a river so that they regenerate, couldn't that be done?

A I have answered that question already.

Q Well, isn't it possible?

A The accepted purpose of our official propagation is to increase the resource without impairing that produced naturally, which costs you nothing. But, the natural resource, the capabilities of the natural resource through natural propagation is diminishing continually; that variable rate between streams depending upon how much impact man has had on that stream, hydraulic projects, exporting logs to Japan, or what have you, the mere logging of a water shed has a major impact on stream rearing salmonids, and it will never recover one hundred per cent, not in the forseeable future.

Q Don't you believe it is possible to rebuild that natural run?

A It will rebuild itself, almost spontaneously, to the rearing capacity of the stream. Any animal population, the natural propagation will take place to the rearing

capacity very readily, if given opportunity. No reason to believe with some exceptions, that if it were left alone, that the wild population has ever declined of its own accord. Where it was left alone unmolested, the size of it I should say, was related to the capacity of that stream to produce. If you affected the stream, then it declined.

Q Through artificial propagation means, can you establish a permanent run of fish in a river or other body of water, referring to salmonid fish?

A Well, usually, yes. I think - - that is, I personally have done it in a very large sense, because I was, with another individual in fish and wild life service, Al Kemmerick, and myself, created Lake Washington run of sockeye which is naturally maintained now. Once the pollution was cleared up in the lake, it appears that is related to the ability of the transplanted population to reproduce successfully.

Q Was that historically a body of water that had sustained - -

A I think it had a sockeye run originally. It had a native land locked sockeye population up to the time it was planted. But, the native population was destroyed or reduced, it was probably destroyed through changes in the overall water shed by man.

Q Including pollution and the changing of the characteristics

of the land?

A I think it disappeared long before there was any pollution of consequence in the lake. Pollution merely prevented its restoration by artificial aids until the pollution was eliminated and then it was able to reproduce. I can give you other examples.

Q Would the natural runs which you say could rebuild to the stream rearing capacity - -

A I am saying they don't have to rebuild, under normal conditions, they are already - - if we are not destroying their capabilities, they are already absorbing the reproductive capacity of the stream, but if we move in and destroy their capabilities by inter specific competition and population declines, if we withdraw activities, then the answer is, it will rebuild again of its own accord.

It doesn't need rebuilding, it can do it itself. But, from the management standpoint, once the natural stream rearing capacity is rebuilt with natural stock, there wouldn't be enough fish produced to meet the user demand.

Q Because of the decimation of the environment, or impairing of the environment?

A Yes.

Q But absent those man-made causes, there would be enough for fisherman?

A I don't think anybody has ever been satisified, be it dollars or fish, Indian or whites, Germans or Russians. No such thing as satisfying people, you merely produce as much as you can and justify the position that you have taken with whoever you are representing.

Q This reduction of the natural runs is primarily due, then, to perpetuation of man's activities?

A Yes, the environment in which they exist now, we have added the fish cultural problem, which I think can be eliminated.

Q The Department of Game has often said about sixty per cent, or more, of the current harvest of Steelhead is hatchery stock, is that accurate, within your knowledge?

A My observation, and analysis of this data, says it is probably closer to eighty per cent in the major streams, and could be even ninety. There is quite a discussion of that in this report.

Q Yes, I think you indicate in the report, too, that the picture may be reflective of the fact that hatchery practices have lead to a reduction of wild runs?

A That doesn't follow necessarily, because you have increased the production.

Q Yes, but it has been at the expense of the wild run, nevertheless?

A There is an indication that it has been, but the degree

of that, we are not measuring the wild population.

Q Is there any indication of what the wild population of any of these streams is, or is there any indication of what the stream rearing capacity of the stream is?

A That's correct, it's considerably less than the present production in all probability in all streams.

Q So production is artificially increased above the stream rearing capacity to satisfy - -

A It's only a question of eliminating intra specific competition, and competition between the species produced from the hatcheries.

Q Can we double the amount we have now with the same amount of effort?

A No.

Q Isn't it misleading for the Department to take credit for the large per cent of fish - - shouldn't they be credited for that number of fish that are harvested over and above the natural stream rearing capacity?

A With the natural stream rearing capacity at the current time, in most Steelhead streams, very low, if not almost gone, and if they are ninety per cent of the catch or eighty per cent of the catch, or seventy-five per cent of the catch, still hatchery fish, and production is doubled what it used to be you are not going to get into details, specific details, of anything except that you

have increased production and it is the hatchery fish and you are getting your money back on the basis of that.

Q You say the Department says - -

A I certainly would not critidze any statement that the Department has made. To my knowledge, I have not heard them all.

Q If the Department says that sixty per cent of the harvest is hatchery fish, that does not mean that the Department is responsible for placing sixty per cent of the fish in that stream?

A Until they prove that I am right, they have no knowledge of what the wild fish run is. Neither do I by actual, direct evidence. I have indirect evidence that the wild run has declined, I have brought that to their attentions, so they are perfectly ethical and perfectly accurate within their knowledge to date of making that statement. I think their sixty per cent is low, on the basis of what they are using to make the statement on, it's probably closer to seventy per cent, or seventy-five per cent, from my analysis.

If, in fact, sixty, seventy-five per cent of the fish that are actually caught by sportsmen are hatchery fish, if they have destroyed the wild population which I can't prove they have and they have no knowledge of, then they can't claim the sixty per cent.

Q Wouldn't there also be an error due to the fact that most of the fishing effort takes place earlier in the season, and that is when most of the hatchery fish are there?

A That creates even more evidence in their favor, because, the wild fish are later and in an area of low intensity and the escapement catch-escapement ratio probably favors escapement more in the wild fish, whatever the number exists, maybe until we get some evidence - -

Q But the sixty per cent, or seventy-five per cent figure tends to be higher than the number of total fish in the stream, for which the Department of Game can claim planting credit, due to that fact?

A Well, if you want to be biased, which is really what you are doing in making that statement, if you have no knowledge that the wild fish run has been impaired generally speaking, until I wrote this report. that point was not made, you can't make that statement.

Q I was getting at the effects of the - -

MR. McGIMPSEY: Instead of asking the leading question, why don't you ask his opinion and take it from there? I will object to the form of the question.

MR. GETCHES: Your objection is not well taken, unless you choose to represent Mr. Royal as his attorney.

MR. McGIMPSEY: I will object to the form of the question.

(Reporter read the question beginning on Line 9, page 77.)

A Again, I will say, if you have no knowledge, which they did not have, until I wrote this report, or any inference -

Q (By Mr. Getches) I am not asking about that.

A All right, you are perfectly justified in making the claim, the answer is yes, they can make the claim.

Q I am not asking about the question of whether or not the planted fish compete or destroy wild runs, the question I was asking has to do with the fact that there is higher effort and higher harvest earlier in the season due to the fact that there are hatchery plants that return earlier than the wild runs and that tends to reflect, does it not, a greater harvest of hatchery fish, than wild fish, because that is when the effort is concentrated?

A That wouldn't amount to very much, because if the wild population was large enough, it would be harvested at the same rate. You get to a reducing harvest interest and when you say Game Department says sixty per cent of all fish taken are hatchery fish, that is a fact. I think it's seventy per cent, the only reason that it is debatable is because of the statistics involved.

Q I don't think you understand the question I was asking. That is, does the number of fish that are harvested, the

percentage of fish harvested, accurately reflect the percentage of hatchery fish that are in the streams?

A Fairly close, because the number of fish in March and April is so low that it wouldn't effect the total very much. All you have to do is go to the months of high catch and you do not have any wild fish in December and very few in January, but you do have a preponderance - - the percentages are all here, all you have to do is take the percentages and these tables, times the catch as far as the harvest is concerned, and you can - - you will find the error doesn't amount to very much.

Q All right, we will rely on those figures then.

A I don't think it's a pointof great moment, the point of great moment is whether or not we can maintain natural reproduction at its maximum, and add more fish to the total catch and the total run by eliminating the competition between the species. I think we have covered that quite clearly.

Q On page ten of your May 3, 1971, memorandum, entitled Relation of Indian Fisheries to Fisheries Management, you say, quote, despite the effectiveness of modern fishing gear, unrestricted fishing on the reservation has not yet disturbed conservation of the non smolt Steelhead population, unquote. Can we assume, therefore, that it is possible for Indians to net fish for Steelhead

consistent with conservation under these circumstances?
A Well, I'd go further and say that it is due to geographical limitations of the reservation size. If you will remember correctly, I inserted wise use in my definition of conservation. While the question of Indian fishing on the reservation is not in dispute, the principlesstill apply, or exist, that the United States Government, in so doing, gave a portion of the resource to the Indians at the expense of the non-Indians which is the same as saying that by taking of fish on the reservations near the mouth of the streams with modern fishing gear you are removing from competitive use that segment of the population represented by the catch.

If the reservation , like the Nisqually, is above a certain area, why, then you have removed a segment of the population from general use or competitive use. But, it's not for us to consider one way or the other. If the treaty on the reservation is wrong, in respect to the wise use of the resource by all concerned, and considered so, then it's up to the United States Government to, through negotiations within the provisions of the treaty to purchase back the resource, but to date no one has raised the question and the non white has learned to accept in most cases, not always, the Yakima River is one exception, has learned to live with the provision of the treaty. Wise

or unwise.

Q But, on reservations as such, has it not, as you say, seriously disturbed the conservation of the Steelhead?

A No.

Q Would it be possible, - -

A Except on the Yakima River, and possibly others.

Q Is it possible, in your opinion, to provide for a limited and well regulated net fishery for Steelhead outside the reservations, consistent with conservation?

A I don't think that question is answerable in that the net fishery is involved, and the second principle that you are talking about, and no one has defined the limit. And, the answer is, I can't answer your question until I know the legal definition of what you are talking about.

Q Well, I am making it a hypothetical, indicating - -

A I can't answer a hypothetical question, I have to have legal definition of what the question is as to the extent, as to lots of things.

Q Could a management system be devised whereby there was gill net fishery for Steelhead that prevented it from being inconsistent with conservation?

MR. MCGIMPSEY: This is off the reservation?

MR. GETCHES: This is anyplace.

A I think the question has to be decided legally before I answer that question.

Q (By Mr. Getches) Leaving aside the legalities?
A Well, you set up some hypothetical situations here that don't exist yet.
Q We may or may not know, whether it exists as a legal matter, but if you were told as a biologist, that the Court had decided that Indians are entitled to net fisheries for Steelhead outside the reservations, and you were asked to design a regulatory scheme that would protect the conservation of that resource, could it be done?
A It would depend entirely on the area of the fisheries involved.
Q Let's say the Puyallup River?
A Well, you have set up a hypothetical set of conditions, so I will have to set one up too, regulation of an Indian fishery is very difficult, if not impossible, on the basis of historic fact.
Q What facts?
A They do not tend to obey regulations.
Q What do you base that opinion on?
A On the historic history of Indians when involving white man law.
Q Do you know of instances where Indians have failed to obey white man's law that would indicate there is a racial tendency not to?

A I think it is evident that they do not accept law with the same seriousness as we do. Genetically, they have never had to, but - -

Q When you say genetically they have never had to, what, historic evidence do you have?

A Their society did not operate that way. Let's not get into that, you are setting up a hypothetical thing, and frankly, from a practical standpoint, I think the answer is no, I have said that the reason that we can live with the reservation fishery is because of the restricted area. Now, you remove that restriction and my answer is no.

Q All right.

A Further, it is in conflict with my definition of wise use.

Q Let me vary the hypothetical slightly to say this, the Washington State Legislature decided that there could be a limited commerical fishery for Steelhead, and it was your task to make sure the Steelhead resource is not wiped out, and thereafter you had to recommend to the regulatory authorities what limitation should be placed on - -

A The answer is, I don't know.

Q Well, wait until I finish the question. You were asked to make recommendations concerning times, places, types of net that could be used, do you think there is a regula-

tory scheme that could be devised to provide for such a fishery?

A I doubt it, on the basis of my own experience.

Q Do you think the regulatory scheme that provides for one net for one day would make impossible such a fishery consistent with conservation?

A I don't know, I would have to - - it's possible that one net for one day could destroy a run of fish, of Steelhead, I would have to see it in practice to see if it were limited to that.

Q But I am asking you if you could make recommendations to a regulatory body about it?

A I think it has to be decided whether or not you have a right to do that first, before you even worry about the effects of it.

Q No question about the State of Washington has a right to establish net fisheries for Steelhead?

A That is questionable; you have not proven they have a right to do that.

Q Very well, there used to be such a thing, there still is such a thing in other states.

A You have not proven it is constitutional.

Q For the purpose of the question, we can assume hypothetically, that the State has a right, if it chose to establish such, I don't think we can get into an argument

as to whether it's constitutional or not. As far as the question itself, it's a hypothetical question, it does not necessarily reflect the facts as they are.

I am asking you as an expert to give me an opinion as to whether there are possible regulations that could be designed for net fisheries, for Steelhead?

A By Indians, or specifically not by Indians?

Q Not by Indians.

A All right, leave off the word Indians, I would have to say, on the basis of the judgment of all the management agencies, that I can accept, my opinion is, that hook and line is the only safe way to harvest Steelhead. I am in complete agreement that hook and line fishing is the only safe way to harvest Steelhead, and that efficient gear such as gill nets, set nets, purse seines, or traps, endanger management or else put the cost of management beyond the value of the resource.

Q Do you know of any other type salmonid fish that represents equally low percentage of total number of salmonid fish as do the Steelhead?

A Only the cutthroat.

Q There are no other salmonid, or fish, that represent such a small percentage?

A No, Salmon are by far the dominant over anadromous trout.

Q But there are no varities of Salmon that are as small?

A No, nowhere near it.

Q What is the smallest species of the Salmon other than the Steelhead?

MR. McGIMPSIE: You mean in number or in size?

Q (By Mr. Getches) In this area, percentage, total numbers.

A Total numbers?

Q Right.

A I haven't the statistics available to me, I would have to quote an opinion based on my background that probably the average, it's been changed, it may be coho, because coho produce every year, and pink Salmon, pink Salmon used to be the most numerical one, they only occur every other year. The coho appear every year. I think the pink Salmon, no question they are still the most abundant when they do occur, but if you have to average them out on an average annual basis, it makes it questionable whether it's pink or coho.

Does that answer your question?

Q I think there were some statistics someplace in your report relating to the Columbia River, and I think that it gave a statistic of seventy-five per cent Chinook?

A That is on the Columbia River, that is why I asked you which area.

Q Yes. I think it was ten per cent Steelhead, fifteen per cent remaining?

A Ten per cent Steelhead, yes, approximately. Puget Sound is much lower on Steelhead, those are approximate figures, because I pointed out, it's difficult to pinpoint the exact percentage.

Q Well, I wondered among the fifteen per cent of the remaining types Salmon, sockeye, coho, chums, do you know what the smallest percentage figure for any one of these remaining Salmon would be? You said coho was the smallest?

A In that instance, I would have to say possibly - - I don't know at the time, but it may have been that coho or chum Salmon may have been less than the Steelhead, but above the Bonneville Dam, the answer is Steelhead would be more than coho.

Q Do you know what percentage the coho would be of the overall picture?

A No, I didn't try to break that down. I didn't feel it was important except I was merely trying to establish the minority position of the Steelhead in the overall complex.

Q Is it your testimony that a net fishery for Steelhead by any one is necessarily inconsistent with conservation?

A With practical conservation, yes. In other words, harvesting of the resource is in a manner which will not jeopardize its proper management. I am merely saying I agree

with the Legislative branch on this, on their handling of the Steelhead problem, whether it involves the true Legislative branch or whether it involves the executive branch in the legal functioning.

Q If the Legislative branch changed their judgment on this, do you think there is a practical physical way to manage a net fishery for Steelhead?

A I think it would be a poor way. I don't say it could not be done, but I think it would be a very dangerous way of doing it.

Q Leaving aside the value judgment part of it, would it be biological possible to tell people when to put the nets in and where to put the nets in, and when to pull them out?

A With Steelhead it would be very difficult. You cannot predict the run. You would still have to be guaranteed the same surplus escapement, and when you go to a net fishery, on a minor population, you are restricting the use of the resource to a very small number of people. Now, you are allowing the entire population to utilize the resource, but you can't do it with net fishing.

You are granting special privilege when you do it. Now, the whole history of populations of animals, as I pointed out in this report, when they reach the stage of special privilege, it endangers the population, whether

it be ducks, buffalo, and so forth, then you restrict its use for the best national consumption of the whole population. That is a matter of historic record, and that, I think the precedent is important, whether it be social or legal.

So, the whole question is whether you want to break that precedent and continue special privilege as opposed to public use, when there is not sufficient resource for public use. We are breaking precedent, and we have never granted special privilege when a resource went beyond, at least in the food resources.

Q You make a statement on page thirteen of your memorandum of May, 1971, quote, It appears that the modern interest of most Indians in off reservation fishing is solely economic since his cultural and religious ties can be maintained on the reservation. Unquote.

Now, what is the basis for making that statement? What do you base that statement on?

A Personal experience on the Frazier River and twenty years in the State. Practically all fish taken off the reservation and on the reservation, as a matter of fact, are sold.

Q So why do you indicate a difference between the two locations?

A Merely because we have to, we have agreed that they can

do that on the reservation. They have not agreed that they can do it off the reservation, and it's a point to consider in determining whether that agreement is made off the reservations or not made off the reservations.

Q Are you aware of Indian tribes in this State that have no reservation?

A Yes.

Q Where would their cultural and religous ties to fishing be exercised then?

A That is up to the United States Government. In most cases they took it away from them, or allowed them to lose it, it's not for me to answer.

Q You say on the same page, quote, the desire for the individual Indian for monetary affluence is not different than any other race,such a desire is insatiable - - unquote, and so forth, end of quote. On what do you base that opinion?

A I think it's a matter of record that when Judge Maloney allowed the Indian fishing with set nets and gill nets above Bonneville Dam, that certain Indians, through their own government, I guess you would call it politics, in the legal sense, received by andlarge a major share of the benefits from that operation, and I think the same is true on the Puyallup. In other words, there is no demonstrated difference in modern day Indians to obtain-

ing personal benefits, economic benefits, even at the expense of his own tribe. How they do that is of no interest to me, I am only interested in the fact that they do it, and I think the statement is generally fundamentally sound.

Q But you do indicate there is a, while there is this similarity in this insatiable desire for economic gain, there is a difference in the way that Indians relate to regulation and legal restrictions?

A That's right.

Q Now, are you aware of Indian tribes which have enacted or enforced regulations concerning their members on the reservation fishing?

A Quite a number, I am also aware that these so called conservation regulations are disguised, frequently disguised and frequently not enforced, on the Nooksak, where a lot of fixed - - the existence of nets during closed season is in evidence, they are allowed to fish for their own use during closed season, and for commercial use during the open season. They also in some instances, the agreements have been made on the Yakima for the Indians not to fish in the fish ladders, and fish a certain distance away, and for years, the agreements were made and violated the next day.

I am not familiar with the situation today, but I

think that there is a little more acceptance of the agreement, but it's so close to existing fish ways that the run is almost exterminated. So, there is no conservation for all practical purposes on the Yakima.

Q So you are aware of regulations, but you indicate you don't think they have been adequately enforced?

A Or adequately lived up to. I think the Department of Fishers could provide more evidence on that than I can.

Q Do you think that the Indian tribes are capable of regulating their own members' fishing on or off reservations?

A Yes, where they have sole control over the fishery and it is their resource, and not in competition with whites or non Indians. Wherever it is in competition, they would have comparable difficulty and have had in the past, trying to live up to conservation agreements or enforcing them.

Q If the Indians regulated their own off reservation fishing, couldn't the same result in terms of conservation be achieved as if they were regulated by the Department of Fisheries and Game?

A I have already made a statement that a net fishery off the reservation creates special privilege and as such, is extremely difficult to regulate, even though the regulations are complied with, and that is not in accord

with precedent.

Q Would you apply this opinion to net fisheries of all varietis of salmonid fish?

A No, there are net fisheries in the mouthsof rivers and far beyond the mouthsof rivers, and species, the migration characteristics and spawning characteristics of species, numerical abundance, the number of fish to be physically harvested, set up a whole new set of conditions that do not apply to Steelhead.

Q Do you think it would be possible to have Indian tribes managing the off reservation fishing of their members, all varities of salmonids except the Steelhead?

A Where you have a great deal of fish, you brought out the theory of benevolence here, I don't think Indians can manage it, no.

Q Why is that?

A Because these fish are transient and subject to harvest, even by other nations, if they demanded to do so, even on the high seas, you can't isolate a particular fish and turn it over to an isolated group for management when they have no access to the daily knowledge that is necessary to relate all the commercial harvest mortalities.

Q Couldn't they do this effectively through exchange of information?

A It's too slow.

Q How is it done, say by two states, or two nations?
A Usually that does not involve the areas of extreme vulnerability, but I probably handled the worse one, that is the Frazier River where we even went to hours and week fishing, but the exchange of information was so, it had to be so rapid, done by radio and as one man I have many times gone into meetings and have not the answers ten minutes before the meeting and the regulation was in effect within twelve hours.
Q Aren't the fish we are talking about the Salmon?
A I am talking about the Salmon, I am not talking about Steelhead.
Q Aren't all the fish that are in the rivers and streams of Puget Sound Drainage under the regulatory authority of more than one sovereign at one time or another?
A Define sovereign.
Q State, nation?
A State, nation; well, in either, a period of high utilization and high demand, I think it is under the State of Washington's jurisdiction, exclusively.
Q What about the high seas?
A The high seas, I think that if the high seas fishery had been allowed to expand, there wouldn't be a Salmon fishery in the State of Washington.
Q What I am trying to establish is, that these fish are at

one time or another under the regulatory authority of various bodies and governing authorities?

A The high seaswas never utilized except with hook and line by North American fisherman to any extent except off the mouth of the Straits of Juan de Fuca. It was only the Japanese on the high seas, and a treaty was so arranged with the Japanese which they would not fish in the area of the North American Salmon. To prevent a disastrous situation on the Frazier I personally, I made a major effort, a success effort, to attract the attention of the State and Federal governments of Canada and United States to closing the high seas to everything except hook and line fishing, and was successful in so doing, with the support of Canada and the United States and the western states.

Q So, even under very difficult circumstances, involving several governments, it is possible to manage a fishery resource that crosses their jurisdictional boundaries?

A With extremely large number and susceptibility to very unusual managment technique to which the Steelhead is not susceptible, you cannot identify a wild Steelhead from a hatchery steelhead yet, I think it cannot be done; you can't identify the origin of the Steelhead, or the racial origin (sic). With salmonids we can take the first off of five hundred and tell you where he came from

in the Straits of Juan de Fuca, we broke down the catch by origin and from fishing located - - or calculated escapement by river of origin. You could not do anything of that nature with Steelhead, and we were dealing with millions of fish, not thousands.

Q Do you think it is possible for the Salmon fishing of the several Indian tribes in this State to be managed by those Indians tribes in cooperation with the Department of Fisheries?

A As far as Steelhead is concerned, the answer is no, and I am highly doubtful if the others can.

Q Even though they - -

A (Continuing) Unless they are physically limited to harvesting the run in such a manner that the escapement is automatically protected, then the situation can be handled.

Q But don't you think it can be?

A It cannot be legally done, I don't think.

Q Don't you think that could be done if proper regulations were enacted by tribal authorities in cooperation with the State authorities?

A The answer is no.

MR. McGIMPSEY: Let's break for lunch - -

MR. GETCHES: Let him finish his answer.

A (Continuing) Don't ask me anymore questions about the

Indians obeying the law, because I can give you good examples - - up in Canada they are allowed to take fish for their own use and they sell every one.

Q Are you aware of the meeting that took place on October 2, 1972, concerning possible establishment of Indian net fisheries for Steelhead on the Puyallup River of the Washington State Game Commission?

A I think that one took place, yes, but I didn't participate in it.

Q This is while you were employed there?

A Yes.

Q Were you consulted about the meeting or asked to make any recommendations?

A Not to the best of my memory, I was not. There was no question in their minds about the problem of administration, and they handled the whole thing. I did not participate in any manner, shape or description.

Q There was no question about their recommendations or anything?

A Not what I thought about them, no.

Q But they didn't ask you?

A No, there was no interest in what I thought about it. They did read this; I will admit this.

Q At the meeting?

A I don't know.

MR. DYSART: By quote, this, unquote, he is pointing to the May 3rd, 1971, report?

THE WITNESS: That's right.

Q (By Mr. Getches) Did you know Mr. Millenbach's (phonetic) recommendations to that meeting?

A No, I had nothing to do with the management of the Game Department, it was extremely investigative, other than the Indian reports, the pollution report, which I found involved my answers in this report.

(Noon recess taken at 12:15; reconvened at 1:30 p.m. All participants present.)

DIRECT EXAMINATION BY MR. DYSART:

Q Mr. Royal, I am going to try to skim down on my notes to avoid repetition of the questions, some of these may be a little bit out of logical order, I may jump around a bit, but that is because I don't want to repeat questions that Mr. Getches has covered, and I don't want to take anymore time trying to go through and organizing these into perhaps the most logical form.

As I gather from both your report and what you have said here today, the principal concern that you feel with the fish culture program at the present time is that we are putting the fish into the river to finish their rearing stage in excessive quantity in terms of rearing capacity of the streams, is that correct?

A That is correct, that is one of my concerns.

Q Would it be accurate to say that you believe, that you think we should strive more to use the rivers as a highway to the sea of the fish, and to rear them either in rearing ponds or some other artificial environment to a greater stage than we now do, before liberating them?

A I agree with the principle which is used as far as fish culture is concerned. We should use the streams solely as a highway to the sea, completely substituting for the rearing environment by the hatchery or - - by the hatchery. And that all fish planted should be at the migratory stage.

Q Do you have any idea as to what additional area of rearing ponds, if those were to be the thing that would be used, would be required to accomplish this on the scale of the present amount of fish cultural activity?

A At the present time, I am of the opinion that there should be no increase in the rearing of the salmonid or the number planted, until the meaning of the effect, or the effects of the great increase in the planting of the salmonids of all species, the effect of that, on the survival of each other, each of the species and the total salmonid complex is better understood.

In other words, you can say that I am opposed to further expansion of rearing of salmonids even though we

correct our bad practices, until we understand what this apparent density factor that is appearing represents.

Q When you say you are opposed to expansion, you mean expansion in terms of number of fish reared or amounts of existing rearing capacities?

A Either one.

Q If we talk in terms of Salmon - -

A One is supplemental to the other, or related to the other, it's synonymous, if you don't need facilities you are not going to raise fish and if don't need fish you are not going to build more facilities.

Q My understanding, we are rearing up to a certain stage, and we are liberating and completing the rearing in the streams?

A In certain cases, or partially so, but the real thing I think you are interested in, and it is in the report, is that we increased our Steelhead plant of good smolts at migratory time and approximately the right size, and we got back practically no increase in returning adult. That is what I am talking about with the density barrier, there was nothing wrong with the planting of these fish that represent the forty-three per cent increase in the plant, but no fish came back, as a matter of fact, at this turning point, we have raised the number of fish planted so rapidly that we are just now starting to get - -

and the fisheries increased their number of pre-smolts so rapidly in recent years, we created a situation which is not clear, it's confused.

There is a possibility that we may be in a period where the Steelhead production is going to go down. There is an indication of it, but it is not clear whether it is a temporary situation or not.

I have recommended very clearly in here regarding Steelhead plants and regarding planting of pre-smolt salmonids of all species. It is very clear in here.

Q The thing I am trying to get at, whether you feel we should cut back on the production of the fry in order to bring it down to the level that you feel the stream can support now, or should we maintain existing production by simply holding them longer before liberating them so that when we do liberate them, they can use the stream essentially as a highway?

A I want to clarify this. The Game Department has not been guilty to a large extent of planting pre-smolt Steelhead. There has been, the main guilt, if you want to call it that, or the main impact of the planting, the pre-migratory fish has been with Salmon, but what effect that has had on the good migratory Steelhead survival, I don't know. But, as far as the Steelhead, which is what I am testifying on, not the Salmon, with rare exception, in

recent years, and particularly now, I am sure that - - you asked me if the Game Department was implementing - - I am sure that they will never plant any pre-smolts, but they cull out, sometimes if - - arbitrarily, if they have ten thousand culls they know are not going to make smolt size by the proper time called for in the successful release, they may take and dump them in the river in certain cases. Usually, they hold them and plant them in the reservoir.

There's been a definite attempt to plant pre-smolt coho fry, but that is not my - - that is part of the basis for the recommendation for a closer unified policy.

Q Is that the adverse hatchery practices you spoke of in your report?

A Basically, not - - recommendation number eight, I think it was, planting fish in March when they shouldn't be planted until mid May, regardless of species - - I am not trying to pick on anybody, I am trying to lay down certain principles of what bad hatchery practices represent, whether they be in the Game Department or in the Fisheries Department.

You read between the lines and read the data, you will see who is most guilty, I am not trying to attack an organization, I am laying a foundation for what is apparently wrong and finding what is apparently right and

pointing out things that we have not defined and should better understand as far as future implementation and production is concerned.

Q Do you know whether there has been any study, any by either of the State departments, to determine which rivers should be managed primarily as Salmon rivers and which ones primarily as Steelhead or all located as between rivers?

A No purpose to that, because you deal with the original salmonid complex, and you accept responsbility for maintaining each to the maximum extent, but perhaps in planting of pre-smolts we become over enthusiastic with a particular species at the expense of others.

But, there is up to a point, there is a nitch for Steelhead that is not filled by a coho or chinook, even though they live in the same stream, perhaps since all fish are competitive for food - - even suckers - - at some stage of life, the whole fish biolomous (phonetic) is competitive for the same food supply at some stage in their life history, suckers, for example.

I don't believe I said so in the report, but there is another possibility that the elimination of these non resource fish, the same as elimination of scrap fish in the lakes that has been tremendously successful by using rotenone, they call it, lake poisoning, that is something

that should be given very serious consideration in the streams as to practicability of carrying it out without damaging anything. In that case, suddenly, you might be able to double the Steelhead and coho production in a stream by eliminating competitors, that might hold greater promise, but I didn't get into detail on that, I don't think I mentioned it in the report.

I discussed it with the management staff of the Game Department from time to time, but I never actually laid out a program. It is worth studying, in other words, duplicating the lake poisoning program for salmonids in the streams.

A study, the possibility of being able to do it, you have an entirely different physical condition, it goes over miles and miles, the Skagit River might be a hundred and fifty miles long, we'll say, you go up if you want to clear it up, you can go clear to the head waters.

Q As I understand from what you have said here, and written, one of your criticisms is, the big factors in terms of enhanced Steelhead program are the density barriers on some of these rivers and what you refer to as adverse hatchery practices, particularly with regard to chinook and coho, which I take it means too many pre-smolts in the stream for what the rearing capacity will accommodate?

A Yes.

Q We have management divided between two agencies, one being responsible for Salmon and the other Steelhead, what I am asking, do you feel a situation here where each department is putting its production into the streams without proper coordination as to how many of the products of either department should go into that stream - -

A You are eliminating the Federal activities, all three of them?

Q Yes, three management agencies.

A I would say this, up until now they probably have seen no necessity for our harmonizing our activities within certain principles. This report has raised a great number of issues. These practices are just not in the State of Washington, it's true, through lack of information, lack of knowledge, of population dynamics by individuals, that this - - anybody dealing with anadromous fish can be innocently guilty of what I am saying here. The purpose of this report is to wake everybody up, not to say something is wrong.

I am not trying to establish culpability. My recommendations, I am sure, will receive harty accord by the hatchery division in the State Fisheries Department, because I have talked about this thing for two years with them. The Fish and Wild Life, at Portland office, the whole core of this, merely a matter of discussing what is

right in a big organization. Just give it time.

Q Just to be clear on one point here, you have referred to the stream rearing salmonid, are you talking about all species of the Northwest Salmon and Steelhead?

A Sockeye is not stream reared, Salmon, chinook, Steelhead, and sea run cutthroat.

Q What about coho?

A Coho is not stream reared, not normally. Pinks go directly - - so do sockeye, when they leave the lake, they go to salt water.

Q Several times you spoke of the number of escapements remaining fairly constant under present regulatory conditions and you seem to be emphasizing the qualification, that is, the hook and line fisherman, what are the conditions you consider are significant ones interms of that qualification of your answer?

A It is the law of diminishing interest.

Q But the present regulatory condition means limiting the fisheries, Steelhead fisheries, to hook and line fishery?

A Yes, or I will qualify that by saying while the Indian net fisheries on the reservation is usually at the expense and not in competition with the non Indian fishery until it exceeds the allowable catch which it does not do normally, due to the geographic limitations of the reservation on the streams, let me put it this way - -

The Indian net fishery does not interfere with the escapement as long as the escapement is in surplus over that which the stream would normally receive. That formula is not precise, please understand that.

Let's take the reservation at the mouth of the Quinault River, for instance, and they caught fifty per cent of the Steelhead run, theoretically, the sportsman would not fish above, would not fish in the Quinault River, but they do, and they catch a certain amount of fish. It's merely an informal control, or control tendency.

Q Now, without regard to the legal question of whether the estuary at the mouth of the Puyallup River is or is not a legal Indian reservation, and as you may know, that is in legal controversy at the moment; irrespective of whether it is a reservation or not, is it your feeling that an Indian net fishery in that portion of the Puyallup River, that the Puyallup tribe claims is Indian reservation, would not be detrimental to the Steelhead conservation on the Puyallup River?

A It has been.

Q Have there been times, has it been consistently detrimental?

A All I know, the testimony was to the effect that the escapement of the Puyallup hatchery in the South Prairie Creek is practically eliminated during the course of the

fishing, it can be, and as I said, it is. Any net fishery removes all the cross protection of hook and line fishery, it's a special privilege whether it's legal or not.

Q Disregarding any policy considerations, I am interested now in terms of what is its effect on the maintenance of Steelhead runs?

A I was not talking about policy, I am talking about facts. Gill net fisheries, due to the efficiency, would reduce the number of people that could operate, without effecting the escapement, so it becomes a special privilege. All people can't use the resource then if they take it. It's like commercial fishing in Puget Sound, the only reason it exists is because they are used to harvest the surplus that the public cannot harvest. When that resource gets down, for instance, to where the public can harvest the resource for personal use, then special privilege according to precedent would go. It's not a policy, it's a matter of fact.

Q Well, in your research, in connection with your report and also your May, 1971, report, did you look at the Puyallup River, and did you ascertain whether there was an extensive sports fishery on the Puyallup River upstream from the immediate division of the main mouth?

A I didn't make a detailed study of the Puyallup River. I

understand whether this has relation to what you are talking about, the Steelhead run in the Puyallup River was a complete failure this year. Whether that has any relation to what you are talking about, it's in a sense, hearsay, it's departmental report, whether it's hearsay or not, it is not of my own knowledge.

Q Is Puyallup unique in having this failure this year?

A It was considered so, yes. Production is down in practically all streams, but the Puyallup was considered a complete failure. It is a dangerous thing, I have testified to that several times, hook and line fisheries for all concerned is fair and equitable, and a safe way to harvest a small resource whereas introduction of net fishing is dangerous and has been considered so on the basis of the Legislative and Executive policy in the State of Washington, ever since 1932.

Q You spoke earlier, and part of what you just said, I suppose is just also getting back about the Salmon being the dominant species of the rivers and therefore greater or fewer Steelhead and greater restraint needed for Steelhead, basically, what is the distinction between Salmon and Steelhead that makes Salmon the dominant species in this? What is the biological difference there?

A First, I didn't - - I object to one of your statements, you said I said Steelhead required greater protection than

coho or other stream rearing salmonids. I didn't say that, I merely said that the practical, economic way of managing Steelhead runs because of its small size and of the difficulty in enumerating, etc., that greater tolerance should be used in allowing escapement for the management purposes. It was impractical to pinpoint it because the economy was not involved to justify, like it is in coho, or chinook or pinks, or sockeye, which are not stream rearing salmonid, but go ahead - -

Q All right, what is it about either the makeup or the biology of Steelhead as compared to the Salmon or the environment in which he lives that accounts for the Salmon being dominant in the streams?

A Well, we have assumed that the fact that the Steelhead spends from mainly two years, but up to three years in fresh water, whereas the spring chinook and the coho spend one and - - less than one, that that was a contributing factor.

Number two, the Steelhead, the hydraulic character of the streams, and the availability of food supply, due to these hydraulic characteristics, which in a sense defines the number of niches for a steelhead, controls the number that can be produced.

Q Now, let me stop you a moment - - when you say food supply, is this a matter of timing of their rearing, or is there

any difference, esentially between what the Salmon eats and what the Steelhead eats?

A There is very little difference, but there is a difference in aggressiveness, the difference in habitat, you see each animal defends his habitat, he usually establishes a territory and defends it, and the Steelhead requires a territory which is limited in number, it's considered limited in number, and due to that, the Steelhead may or may not get sufficient food due to the competition of the other species in the other sections of the stream.

So, therefore, the number of Steelhead is limited. I am not sure that it's that simple, but I cannot offer any explanation or opinion as to anything that would change the complexion of that original definition or opinion by most biologists.

The only thing is, the more productive a stream, the higher the minority position of the Steelhead; no where has it been the dominant species, no place. But, in the upper Columbia where the food or water is alkaline, and the food supply greater than in the non alkaline streams of Western Washington, the Steelhead run has been a much higher proportion of the salmonid complex than in Western Washington. I think that summarizes it.

Q Do you have any feeling that if the Steelhead were artificially reared to the migration size - -

A Which most of them are.
Q So that the river, in other words, they went directly to the sea - -
A Which most of them do.
Q That this would change the balance and bring the Steelhead closer to being a majority?
A No, I have said the Game Department does not very often plant pre-smolt Steelheads.
Q Do you think over a continued period of this, it might cause Steelhead to become closer to majority or even a majority of species, or a dominant species in the streams?
A I don't think it ever will, and that may be the reason the density barrier is showing up on Steelhead first because of this minority position which we do not understand completely. That is why I said I don't think hydraulic characteristics of a stream itself, the physical characteristics is entirely the answer to numerical position or percentage position of the Steelhead in the salmonid complexion. There are other things, but I don't know what they are.

If we planted, no matter how many Steelhead we plant in a stream, I think the density barrier - - and no matter how many Steelhead we plant in a stream, I think the density barrier - - and no matter under how favorable conditions - - I think the density barrier is

going to show up. What level that is can vary, but it's still going to be there, and what causes it, I cannot tell you.

Q Now, there is nothing to indicate that you can increase greatly the number of Steelhead produced in the State of Washington?

A Not at the present time, certainly.

Q You referred to the Lake Washington run of sockeye, which you said that you and Al Kemmerick were instrumental in getting established or re-established, and that there had previously been a native landlock run of sockeye; isn't it true that originally the outlet to Lake Washington was through the southern end of the lake and out what is now the Black River?

A That is true. There was no - -

Q In the early days, didn't the sockeye then come in from the Sound?

A I said it was probably the case, but I have never heard of anyone - -

Q From the Sound, and into Lake Washington?

A I have never seen any record that that actually existed. I am not much interested in eight-five or ninety year old people remembering this or that. I have tried to use those people as evidence, and they tell you what they think you want to hear, mainly, whether they be Indians

or not Indians.

Q What does the land-lock run, how recent was this land-lock run about which you spoke?

A I think it's probably always been there, there are three lakes in the State of Washington where there are native self reproducing land-lock sockeye; Lake Crescent, Whatcom Lake, and Lake Washington. I believe that is all.

Q Now, is the land-lock variety apt to develop if there is, in fact, an exit from the lake to the sea?

A There is an exit from all these lakes, there always has been. Lyre River comes out of Lake Crescent, the Whatcom Creek comes out of Lake Whatcom plus there is an obstruction on each of these, there was on Lake Washington but is not now.

Q There is the obstruction on the river exit from Lake Washington, but you have the Ballard Locks which for a long time was not good fish passage? I am talking about the original.

A No, there was no original obstruction, through the southern end of the lake. I forget what year they diverted White River into the duct for the Puyallup, and locked it out of Green River and diverted the Black River out of Green River through the locks, and dug the Lake Union canal. There was a period there when they probably didn't even have a fishway on the Ballard Locks.

Q It was the lowering of Lake Washington as a result of the Ballard Locks construction that caused the southern end to no longer be the exit for the lake, is that correct?

A I don't know the elevation details on that, but Black River is dry anyway, it was shut off. Whether the reduced level was maintained or not, I don't know.

Q There has been frequent reference in this case to a situation on the Frazier River, and an example cited of nets taking ninety per cent of a given run on the Frazier River. Are you familiar with the example where the nets have taken ninety per cent of the run?

A I certainly am; I had to put up with it for years.

Q What species?

A Sockeye, I think it applies to all species.

Q Was there any instance of that kind of percentage of Steelhead on the Frazier being taken by the nets?

A I don't think there is any question but what it happens, let me define the situation a little more realistically.

There are from four hundred to a thousand nets, normally extending from Point Roberts in the Gulf of Georgia, along the bar and inland close to the mouth of the Frazier, and up the Frazier for fifty miles, and on big sockeye runs, such as the Adams River, you can have up to four thousand nets. It would appear that four hundred nets will do the same thing as four thousand.

Q What size nets are we talking about?
A Nine hundred feet, nine to twelve hundred feet.
Q These are drift nets or set nets?
A Drift nets.

Now then, on Monday morning you open the fishery on the Frazier River, on the Gulf of Georgia, I suppose half these boats or roughly half, are off the mouth and extending away from the mouth of the Frazier which has two or three mouths, like the Skagit, then the other half extend upstream fifty miles to the town of Mission. By the afternoon of the day that you open, the fish start to completely disappear above New Westminster which is thirty miles from the deadline. By the end of a twenty-four hour period, there are practically no fish caught.

Fishing continues off the mouth and up the river to the Old Ferry landing at Woodard, just a few miles and it will continue, but the Monday catch is always twice that which, in spite of the successful fishery at the mouth, the catch drops at least fifty per cent between Monday and Tuesday, and by the third day, fishing is from a numerical standpoint, anywhere in the Frazier River, is practically useless, but there is recording of the escapement, which follows chronological pattern, recording the daily escapement at Hells Gate, there are, for all practical purposes, none, when the fishing period progresses

upstream to the Gate.

Q Now, are you talking about current conditions or a historical condition, before the International Commission Regulation?

A Current conditions, with modern gill nets extending back with gill nets, it was not that bad in the old days when they had sailing boats and course linen nets, there was no question but there was escapement, because the fishing extended six and seven days a week and they still got escapement.

Q Now, how does the International Commission control this as far as assuring adequate escapement, then?

A I mentioned this morning, fishing time is down to as low as twelve hours, or nothing, each week. It's taken a long time to endoctrinate the gill netter to fishing those kind of hours, but the Canadian Government has insisted upon having a major commercial fishery at the entrance of Juan de Fuca, and also a major gill net fishery, and since Canada is only entitled to fifty per cent of the allowable catch, they have to keep the river closed six days a week in order to get that escapement.

Q So, you are saying that when the nets are permitted to be in, and no restriction on the number of nets, other than physical restrictions of geography involved - -?

A I have said, you can get by with ten per cent of the

maximum, and do the same thing. Four hundred is the same as four thousand, all you do with four thousand nets is divide the catch ten times more.

Q You are saying when the nets are in, they are capable of taking ninety per cent of the run?

A Probably closer to a hundred. But, I don't think we need to spend time and money on that.

Q Are we talking about just the portion inside the river, or are you talking about all the way to Point Roberts?

A Yes.

Q You have mentioned earlier about the so called million dollar trap off Lummi Point, prior to Initiative 77, what effect did that trap have on reef net fishing in that area?

A I don't think there was any at that time; if there was, it was very minor.

Q (By Mr. McGimpsey) So the reef nets - -

A I don't think there was any reef nets.

Q (By Mr. Dysart) The reef net has grown up since Initiative 77?

A Yes. To my knowledge, or memory, which is not infallible, which is what you observe and hear in this case, there were no reef nets ever, at Lummi Island until they developed it after Initiative 77.

Q All those reef nets, where they are now, you had fish

traps?

A There was more than one fish trap on Lummi Island.

Q The traps precluded any effective reef net fishing in that area?

A Fishing in that area - - and it pretty well effectively prevented purse seine fishing. Purse seine fishing and reef net fishing is an adjustment from the removal of the traps, although there was major purse seine fishery, they spent most of the time fishing off - - the purse seine leads those that caught fish.

Q Do you have any knowledge when traps were first established on Lummi Island?

A No, it goes back into the late 1880's. The traps are what supplied the first canneries in Puget Sound, I should remember, but it was around 1872, in the Frazier and it was pretty close to that in Puget Sound when canneries were first established.

I might say, too, there was practically no gill net fishery in Puget Sound until after nylon net came in, in 1855, or synthetic nets.

Q You mean 1955?

A Yes, 1955.

Q I didn't mean to correct you, or cut you off.

A Thank you for correcting me.

Q Now, you made this study in 1971 that has already been

introduced in connection with the earlier affidavits on the Indian fishery. In your research, in connection with that study, or the current one, and in response to the request to study all aspects of anadromous trout, do you know any other studies that the Game Department made themselves, or caused to be made that they had access, of the Indian fisheries?

A Oh, I know they have attempted to get catch statistics and with partial success, of the number of caught fish.

Q Were any other written studies reported to the Game Department library?

A I don't know of any. I didn't run across them, I do not mean that there wasn't any.

One thing I want to clear up on the gill nets, I meant in salt water, away from the estuary, at the mouth of the river where the phosphorescent plankton were present, there was gill net fishery in the Skagit River, the Nooksack River and, of course, the Frazier River and there was no large gill net fishery, or any gill net fishery of any kind in the Straits of Juan de Fuca on the Canadian side until synthetic nets came in, in 1955. They tried them but real efficient ones grew up after that time.

Q The strands of the synthetic net is less visible to the fish?

A Yes, and by the smaller size it creates less phosphorescence in the water.

Q This is from contact with the plankton?

A Yes.

Q Were you given any instruction or directions in connection with the Indian studies that you did?

A No.

Q Any guide lines or critera?

A No, I was only given the information I requested from them, in the way of catch statistics.

Q The report, the recommendation which you have here made, by here, I am talking about this twelve page document which is Exhibit #2, contains no recommendation relating to the Indian fishery, is that correct?

A No.

Q Did you make recommendations pertaining to Indian fishery or the Department relationship to it?

A Only what I have here. I don't remember.

Q As far as - - there is an Indian report, just that, and I think it recommended closer consultation and liaison with the Indian tribes?

A Yes, that and there didn't appear to be any place for net fishing for Steelhead off the reservation as far as Steelhead.

Incidentally, that Commission meeting you referred to

on October 2, this morning, you referred to the Game Commission meeting?

Q (By Mr. Getches) That's right.

A My answer is right then.

Q (By Mr. Dysart) One other question, Mr. Royal, going back, or turning now for a moment to that aspect of your report which you were talking about the punch cards, would it be a fair statement to say that the conclusion of your study was the catch statistics derived from punch card data are more reliable in showing the trend and comparative relationship from year to year or month to month than they are in showing the actual amount of catch?

A No. I said that the total catch, while probably subject to a possible bias, or as found in the State of Oregon as well, that the variations in that were real, but the total for each year might be biased on the positive side by some figure which Oregon ended up with calculating at seventeen, or sixteen per cent. In other words, if the total catch statistic is one hundred thousand, or hundred sixteen thousand steelhead, Oregon would get the catch as a hundred thousand, but if it were a hundred thirty-two thousand, the difference between the hundred and the hundred sixteen, and the hundred thirty-two would be real. The bias would be proportional each year.

Q You are suggesting that fisherman report more fish caught

than they actually catch?

A What they call bias and non response. In other words, you assume that people that don't call in the cards, caught the same number as those who did, and that is not true. So, your figure has been found generally, your figure tends to be high.

Q So, when you say the figure, to use your example, of a hundred and sixteen thousand, you are not saying that a hundred and sixteen thousand holes were punched on the punch cards that came in, you are saying that some number was reported on that, and that the Commission added a figure?

A The figure for non response, yes.

Q What you are saying, you feel they added too much for the non response?

A That's right, it's not the same as the cards that were sent in on the catch.

MR. DYSART: That's all I have.

CROSS EXAMINATION BY MR. McGIMPSEY:

Q Mr. Royal, you talk about escapement enumeration for Steelhead, and indicated, I believe, that it was impractical for several reasons. That is, in determining the total number for escapement?

A Yes, and it's a very erroneous thing to even get an index, but better than nothing.

Q Up on the Frazier River when you had charge of managing that river's fishery of sockeye, did you use escapement enumeration as a method?

A Yes. As far as dealing with large numbers of fish in restricted spaces, when you tag, you either have to tag an exact proportion of the incoming fish so you have the same percentage tagged on the first day's fishing that the middle day's fishing will have, and the last day's fishing. If you can't do that, then you have to recover dead fish and the Steelhead don't die, at least a lot of them don't die, they are not available for counting. With sockeye, they all die, they don't drift very far, it's clear water, you have no flood at that time of year, so you pitch the dead fish out - - you select one bank first, you have proved how much area and where you have to do it in order to get an adequate sample. You pitch that every day; and the first day you may have one dead fish, at the height of the die you may have thirty thousand. If you get the tagged and untagged ratio, you cannot tag a long distance from the spawning ground because there is loss due to tagging. When you lose a tag, that runs your population estimate up.

If you lose that tag on or near the spawning ground, that dead fish drifts ashore in the same area along with the rest of them and you get your tag back, but if you

tag forty or fifty miles from spawning ground, your population is going to be way high, considerably above the actual due to the tag loss, and you lose a tag too, if you are tagging a long ways, they are migrating and swimming in, with so much activity, over fifty miles you are going to lose some tags.

Where they are dormant in the spawning area, or more or less dormant, you lose very few.

Q Do you have an opinion whether escapement enumeration is possible in the Salmon species?

A Enumeration is possible in the Salmon species in Puget Sound, I think it's on pink Salmon, I do not think it is - I think coho is very much like Steelhead, it would be impractical to enumerate coho. I don't think you can set up a system, statistically, that would stand the economic test - - the test of necessity for accuracy. All chinook runs, you reasonably could, because they spawn in a limited area. I will put it that way, you have got a lot more money to spend than you can justify, lots more money to spend on physical stoppage of coho and chinook for enumeration purposes than you have to spend on Steelhead, you could probably justify one such structure on a major stream for enumeration in the State of Washington.

Maybe I should not be so specific as on one, but you have dozens of streams and you could have one on all of

them, but it would be more than the resource is worth. The catch is known to be about a hundred and thirty to a hundred and seventy-five thousand, cohos are in the millions.

Except for biological purposes of specific areas, I see no purpose as long as you have a surplus escapement in sufficient amounts to preserve the resource.

Q Okay. In the case of the Steelhead you said that the actual escapement probably tends to run ten to twenty per cent more than what is actually necessary for escapement, perhaps even a higher percentage?

A I think I used a larger figure than that.

Q Okay, but that you felt that the surplus escapement, at least from an economic standpoint, was necessary in order to protect the necessary escapement?

A Or to manage the fishery within economic limits of the value of the resource.

Q As far as managing Salmon - -

A Plus the fact that there is no other known way, to my knowledge, of allowing an entire public to utilize the resource by any other method than hook and line.

Q Now, we are talking about Steelhead?

A Steelhead, yes.

Q As far as Salmon escapement, do you think Salmon can be more accurately regulated so as you cut down the surplus

of escapement on Salmon?

A You have a large commercial fishery extending out the coastal area of both chinook and coho, and that sequence the commercial fishery, because of the larger number of fish involved, greatly expedites a better understanding or a better approach for calculating escapement without actually knowing the number of fish that end up in the spawning grounds.

Q Then, as a commercial fishery progresses on a given run of Salmon, that is sufficient in determining the size of the run and making your restrictions?

A It does when you have years of data in various locations.

Q Would you say that type data is essential to accurate management to a salmon run as far as restricting it?

A If you want to avoid large surpluses in the escapement.

Q That type fishery is necessary?

A Yes. I don't justify commercial fishery or special privilege, except on the grounds that public utilization doesn't harvest the number of fish.

Q There has been some discussion as to traps being the most efficient means of taking fish?

A In some locations.

Q In some locations, okay.

(Mr. Dysart excused himself from further participation in the deposition; Mr. Getches continued to participate in behalf of the plaintiffs.)

Q (By Mr. McGimpsey) If you so set up a fish trap that would completely block a stream so that all fish that would migrate to that stream would be caught in the trap, would it be necessary to handle the fish to release them?

A I would say it's impossible to install a fish trap on large flowing streams to shut off one hundred per cent of the fish. The Commission tried that in the Thompson River, and got a hole in the darn thing about twelve inches square and about a million and a half fish went through it without them knowing it until they saw them up above.

Q This would be the International Salmon Commission?

A That was in 1942 - - I think, the fall of '38 or ' 42 - -

Q Are there any other attemps to establish traps by the International Salmon Commission?

A That was enough. We hired engineers, after that, to realize the hydraulic problems involved in trying to measure large rivers through trap webs of any kind.

Q Was it the determination of the Commission that traps were impractical or impossible?

A On the Frazier River, yes.

Q On the Thompson?

A Anyplace on the Frazier River except where escapement, where you have more numerically, that is why they went to tagging a hundred per cent locations, although in some

of the small streams which there are very few of, they did use live count and they developed a live count index factor of multiplication.

You make daily counts through the run and if you find out when the peak is - -

Q Does that entail handling the fish?

A You have a number of fish seen on the peak, sometimes you multiply by two and a half, or 1.8, 1.6, every time you change the live count counter, you have to reconfirm your index because he might not see as many fish as another.

Q In a stream where a trap could be built across, physically built across the stream, in order to release the escapement, would it be necessary to physically handle the fish?

A Not necessarily. If the fish were handled, well, there are lots of things, you have a rack in the Samish River, it's gone out once or twice, but I think - - and you lose fish over it on high water, everytime you get a major flood, but fish go over it and you don't know what you lose, that's a problem.

Q That is a problem?

A It is, and it's a damned expensive operation, but you need it to collect eggs.

On the other hand, if you want to go to the Indian

traps, and the aboriginal system, I obtained Hudson Bay records relating to fisheries. Hudson Bay Company and Northwest Company direct abstracts from the abstracts written at the time dating back to 1811 for the Northwest Company and Hudson Bay Company came in around 1820 or thereabouts, '25. It's quite clear in there, that the old accustomed fishing methods involved spear, dip net, the fish trap which was nothing but a brush weir called varvoes.

According to any reasonable calculations of the run of fish in the Stewart River at the outlet of the Stewart Lake at Fort St. James, there had to be one - - from one to several million sockeye in the dominant year and the Stewart River is certainly no larger than the Skagit and probably smaller. The run arrived up in there after the spring freshets and they put this varvo across the outlet of Stewart Lake which theoretically, apparently stopped the run, but in every year you have dominance up there where you have one large run, one second moderate run, and two very small runs. They caught no fish at all on the small runs, which must have involved tens of thousands of fish. They harvested, just merely harvested what they needed, which did not exceed fifty thousand.

If I remember correctly, the Hudson Bay records, the rest of the fish escaped through the weir. At no place

was there any record of any gill net, probably the most effective gear in the aboriginal gear was the dip net where it was usable in the Frazier Canyon. They used that for miles up and down the river where the turbulent water forced the fish closer to shore.

Q If handling were required of the fish, would that be harmful to the fish?

A Fish should never be handled unless it has to be for biological purposes. The trouble is, the fish at the racks and dams, they jump and injure themselves. If you have a fishway, and a counter, then the fishway is probably designed, they did design the fishways so the fish wouldn't jump, they will go up the fishways like the one at Bonneville Dam.

Q Take a river, the tributaries on a river, and if you were to establish a trap across the complete mouth of the river.

A Where is this going to be.

Q I am just giving a hypothetical, without a specific illustration, of what we are talking about.

A I will again reiterate, you can't do it.

Q I appreciate that, but there has been some discussion of traps, I would like to explore a little bit some of the problems with traps.

A It's hydraulic problem, an engineer will give you a far better answer than a fish man, you simply can't pass

a large volume of water through a stationery rack; it cannot be done.

Q I appreciate that. What I would like to do is explore a couple points with you regarding traps. One, if a trap at the mouth of a river were to catch all the fish, and then the person operating the trap were to release a certain number of fish for escapement, if there were several tributaries on the river, would there be any way that a person or an agency releasing those fish for escapement could determine which fish he was releasing as to which tributory those fish would spawn in?

A That would probably be easier to approximate than how many fish to release each day. You don't know what the size of the run is, there's no way to figure it out.

Are you going to have forty thousand fish come to that river, or twenty thousand, and your escapement requirement, say fifteen - - you are going to release, how are you going to decide the first Monday afternoon how many fish to release? You don't know what the run size is until it is well along its way. Then, you still have the problem of - - first place, your planting policy determines where the fish are going to come back, as far as the hatchery is concerned, and your wild fish, you don't know anything about it.

So, starting out, I will have to treat you like I

treated this gentlemen in some of his questions, I won't consider a trap because it's not practical to construct in lots of rivers, so why worry about the biology or usefulness of it, and in the second place, if you did have it, it's not practical anyway.

Q I appreciate all that, but I do want - -

A (continuing) What I have told you, is, it's better to restrict fishery by gear, have a surplus escapement with the built in escapement protection factor which is what you got in the State of Washington and the State of Oregon; everybody has found that out, and Canada applies it and accepted it, so to argue against it, you are arguing about the experience of the Government Legislative an Executive branches of two states.

Q Okay; assume for a moment that I am not arguing either for or against traps, but trying to establish certain facts about traps, is there any way of determining for wild stock fish caught in a trap, which tributary they would be from?

A No, you can't tell. Furthermore, you have to put these traps in at the period of the worst flood of the year when you have got debris, trees, snags three feet in diameter, coming down the river piling up against this thing. It wouldn't last any length of time, it is silly to talk about it.

Q Okay, just a couple other facts that I would like to discuss; do fish delay in front of an obstruction, such as traps?
A Yes.
Q Is that harmful to the salmonid fish?
A Probably not so much the steelhead as salmon.
Q More harmful to the salmon?
A Yes, because the Steelhead has to - - it lays its eggs anyway.
Q It would be harmful to the Steelhead if they jumped across them?
A The delay would be more harmful to its - - the delay for a period of time, at various places in the river before spawning.
Q And would any such trap that could catch all the fish in the mouth of the river, that would necessarily have to obstruct navigation, would it not?
Q (By Mr. Cufley) What kind of navigation?
Q (By Mr. McGimpsey) It would probably obstruct any navigation that might be there as long as the trap was in?
A Yes, which wouldn't be very long.
Q If you were to put a trap in that could stand the force of the water freshets - -

A To be a permanent type structure, you would have to build a dam, changing the heighth of the water level, and create a dam. You would have to stop the fish and pass them through a fishway and let them go over the top.

You can build a dam, but you can't build a fish trap which infers the water will pass through the trap and not create a dam. This does not apply to tributary spawning streams in the spring of the year when you do not have major flood, you can probably do what the Indians do, do what the Indians probably did, and create a brush wier, and catch them below the spawning grounds.

I don't doubt they used brush weirs extensively in regard to the water within the territorial jurisdiction of the State of Washington.

Q Some of those waters are under the control of the International Salmon Commission?

A During certain periods of the year, yes.

Q Do the regulations promulgated by the International Salmon Commission pre-empt the State?

A Only in regard to the species involved. I mean, within the terms of reference of the Commission. Essentially, they do pre-empt them, because the species involved in the Commission terms of reference are by far the most

dominant species, and there has never been any question about the State or Canadian Government, with minor exceptions, with the coho against the Commission regulation.

Q Okay. When, basically, are the Commission regulations in effect, what month?

A Oh, essentially from June 20 into September in the United States waters, and from June 20 into early October on the Frazier River.

Q Although the regulations are primarily aimed at regulating the Frazier River fish, they would also indirectly, at least, effect the fisheries or fish runs that go into Puget Sound, that would come in?

A Yes, that's right. It's the outer Puget Sound; Puget Sound itself is not in convention water.

Q But the regulation in the outer Puget Sound area controlled by the Commission would effect the runs going into Puget Sound water shed?

A Yes. The question has been raised by fisherman in Canada that too much coho escapement was being allowed in order to get an adequate escapement on sockeye in the Frazier River and no doubt there was an element of truth in it, but once the thing was considered, the increased coho escapement was the lesser of the two evils, so there has never been any real problem on it.

Q Could you explain briefly, this may be difficult, but explain just briefly the mechanics of the International Pacific Salmon Commission regulation of the Frazier River sockeye runs based on the fifty per cent sharing principal, how do you go about regulating it so you determine each side, American and Canadians are getting their fifty per cent share?

A I think the Commission met thirty some times last year, practically all of which was done during the six week period of the fishing season, and as I said, everyone stands by.

You have critical days, Tuesday is one, Thursday is another, and they recognize that, and they tend to stand by and be available on the driving time notice to Bellingham upon call from the Director.

The Director is on short wave telephone staff communication, and sampling cuts out on a twenty-four hour basis. If, by nine o'clock or nine-thirty, each day you have a total catch for the preceding day, and an indication of the catch of the night before preceding nine o'clock, and if things do not appear to be fitting the formula, you jump on the phone and get at least four commissioners, two from each country, there has to be a quorum, to Bellingham. By ten thirty in the morning you announce regulatory changes which have been known to

go into effect that night, and not later than the next morning.

That is how you do it. But, it's a series of experienced samplings, scale analysis, catch analysis, escapement analysis, and whether or not what is happening is fitting the established formula for accomplishing a specific end point. If they are not, you call a commission meeting and make such changes as you think are necessary to do it.

I might say, the escapement division of catch, of course, you can do that by a judgment, you close the one country down for a day and give the other country a day's fishing, you make up the large differences, pretty fast, but out of a catch of two or three million, you are never off, usually not over more than twenty five, fifty thousand, at the most, fifty thousand is considered a major difference.

Q This would be in part, these formula you are using would be partly based on predictions of returning runs?

A I will call it a formula based on - -

Q Would this be based on a prediction of returning runs?

A Various predictions are very complicated things. The tides differ, and when the tides differ, the migration speed changes; fish can be more vulnerable. The tides are not the same every year, they are the same every four

years, and when you are dealing with catches of a couple hundred - - up to a couple hundred thousand, I can remember in 1958, we were dealing with catches of over a million fish for each country, a day, on the peak of the run.

Mind you, it is not a desirable position during that period of time for anybody, but there is a certain element of fun in it after it's all over.

Q Okay. Do you think that the principle of shared harvest based on percentage of harvest is a workable principle for Salmon; has it been a workable principle on the Frazier River sockeye run?

A It was either that or else Canada owns the fish, and the United States had the fish in water. Canada is not happy now, and they are having a grand old fight over whether the fifty per cent share is correct and whether or not the Canadians are catching too many Washington hatchery coho. It's quite a mess, but nothing is settled. For twenty some years, things were pretty happy and I might say that the Commission contributed a great deal of it to the Canadian Government.

They developed their pollution policy for them, and demonstrated an air of good will; the fisherman had a regular international fraternity where Canadian or American was never mentioned, but if you are inferring

you share Steelhead that way - -

Q No, I am not speaking of Steelhead at all, I am asking you if it is your opinion based on your experience with the International Pacific Salmon Commission with regard to Salmon - -

A Regard to sockeye and pink under the geographical conditions of fact it worked. It started to get in a hell of a mess at the start of this, but I don't know, I don't know that this has anything to do with the status quo.

Q Okay. You indicated that there were traps near Lummi Island going back to 1880 - -

A This was all over Puget Sound.

Q Specifically, you were talking about these traps, and when the traps were there, there was no reef net fishing?

A As far as I am aware, there never was, I am pretty sure.

Q Do you know who operated that trap?

A The Fisheries Department office - - it's a matter of record.

Q Would this have been Indian?

A There were one or two Indians operated some traps, Henry owned some, owned a trap, and he operated them just the same as the white man, not through the Indian treaty rights, but through a license to the State of Washington.

Q Do you know of any Indian fish nets, reef net fishing

around Lummi Island?

A There was supposedly some and apparently there were four Canadian Indian reef nets over around Pender Island, over toward Victoria and that area, in that general area.

(Discussion off the record.)

MR. McGIMPSEY: No further questions.

RE-DIRECT BY MR. GETCHES:

Q I have a couple questions, you testified that there was a period of time in which there were no reef nets around Lummi Island. What was that period of time?

A During the fish trap days, I don't think there is any question but what the Indians had reef nets in the early days.

Q What were those fish trap days? What period of time was that, roughly?

A They started with the development of the Puget Sound Commercial Fishery which could not have been later than 1880, and lasted until 1934, or until 1935, they were put out of existence by Initiative 77, which came into effect at the end of 1934, or effective in 1935.

Q There was a period in the 1880's, running about fifty years?

A There was - - I don't think there were reef nets in Puget Sound.

Q Excluding Lummi Island?
A Yes. Now, I may not be a hundred per cent correct, but it was not recognized as amounting to anything and I don't remember anything except fish traps, purse seines and very few gill nets in that area.
Q All right. You answered one of Mr. McGimpsey's questions that related to gathering information on run size and escapement, I believe that you have more money to spend on coho than there is to spend on Steelhead?
A You are justified in spending more because of the value of the larger, much larger value of the resource.
Q Now, what is the basis of that value?
A It's established and accepted value of the resource by the public.
Q Commercial?
A Well, it could be sport value too, as far as that goes. I know the Game Department has a sports value on Steelhead resources, I think it's just been accepted as justifiable by leading economists, etc., something like $50.00 a fish caught, or $55.00.
Q When I was asking about statistical data that was available on Steelhead, you replied a number of times that it would not be practical or economic to pursue information to that extent. Did you have in mind this economic value of the Steelhead?

A Yes. As far as commercial fishery or fisheries which harvest fish and sell them, the only value of those fish is what they get for them, less the cost of catching.

Q So, that was your judgment about the practicality of this?

A Yes.

Q You testified about the means of fishing known as varvoes, used by the Indians?

A Yes.

Q And I think your - -

A Yes, it's a brush weir, or a brush trap.

Q Your point there was, even using this fairly efficient means, it was not - -

A I pointed out it was highly inefficient even though it was clear across the stream.

Q So, using something that was ostensibly efficient there was a great deal of error and loss of fish through escapement?

A That's right. I don't think - - the varvo has to be used where you do not have, due to the inefficiency of it, it can't be used at all where you have major fluctations of water in a large stream.

Q Now Mr. McGimpsey asked you about fish traps, hypothetical fish traps and real ones, he asked you a question about whether or not you could tell when you release a fish from

a trap for escapement purposes, where it was going?
A A steelhead, and I said no, you cannot.
Q You said no, you cannot? Wouldn't it - -
A Not on any information that is available to date.
Q But, would it be reasonable to assume, if you impounded fifty thousand fish and released ten thousand, the same proportion of that ten thousand would go to various tributories of that river?
A Not necessarily. If you released all Steelhead from a specific point at a specific point, they would all tend to go back to that point.
Q I'm sorry, I didn't make myself clear. I said, if you impounded a number of fish in a short period of time, and you released some of those fish, now, is it reasonable to assume that the same proportion of fish released up stream would go to each of the tributary streams as would have gone if all of them went?
A They would. You have a time factor here, and a differential time of arrival in migration, different fish, your wild fish, for instance, you get fifty thousand fish in the weir in December and January, you turn them all lose, you may not get any fish in the tributaries which may be where your wild fish are originating.
Q Assuming a constant trap with frequent releases?
A I would have to say you would tend to get a homogenius

distribution over the season, if you are releasing this way, but you go along today and you get a flood and out goes the trap, you get one hundred per cent escapement and zero catch.

Q So, what you do is put a trap above them and catch them before they spawn? That could control some of the circumstances by timing and by frequent releases?

A You could try, I don't think anybody would ever try a trap in a stream, even as large as - - certainly not the size of the Chehalis, between November and March when you can get floods that cover the entire valley out here. And the same thing applies, generally, and approximately, to all major river systems, nobody will build a fish trap.

Q Well, can't you correct a lot of problems with the river mouth fish traps such as debris accumulation, navigation interference, and the like with traps?

A Oh, if you want to give the Indians the fisheries and ignore the constitution and special privileges, gill netting at the mouth of the river is the proper way to do it. Gill netting. The snag comes down, you pull it out, and pull the net in, and then go back.

Q Couldn't you solve a lot of problems with large river mouth fish traps, many of which you have enumerated, by moving to the mouth of the tributary, putting in several

small fish traps?

A You would have to go out in the tide water and probably intercept in so doing - - you would intercept Steelhead from other streams, the mouth of the Duwamish, Coho would interfere there, in the fall I know of personal knowledge, clear up to Spokane Street Bridge at least, which is above what you call the tide flat area. There are many fish of several races (sic) that go in there, but don't go upstream, they turn around and go out. So, you don't know, you can't identify your fish, so you don't know what you are doing.

Q But, once they reach the tributary stream - -

A They will stay there.

Q They will stay there, and if you put a trap at the tributary - -

A In the tributary is where the Indians probably caught their fish in the first place, the spawning tributaries, and not down at the mouth of the river. You are dealing with a volume of water which can be reasonably and physically handled.

Q At that time, at that point, a fish trap is more practical and manageable?

A Yes.

Q The International Pacific Salmon Commission, according to the testimony you gave, sounds as if it has some fairly

sophisticated technology that it utilizes?
A It definitely did have.
Q And they have a great deal of rather complicated information gathering facilities?
A And we had enough fish that we could use these techniques which would not be justifiable in the case of Steelhead, for instance. We used test fishing and we actually caught thousands of sockeye, more sockeye than you would dare risk even in the Steelhead of the Frazier River.
Q Is there any information gathering statistical compilation or technology to the extent, and sophistication that it exists with International Pacific Salmon Commission?
A Definitely not. Although, the methods developed by the International Pacific Salmon Commission for management of similar species have certainly been used by other parties, other agencies.
Q But at this point, the Department of Fisheries and the Department of Game have not approached that level of technology?
A They either can't do it due to physical circumstances or can't justify it economically.
Q There are a number of the - -
A If they can do either one, they will do it.
Q There are a number of aspects of the methods developed by the Commission that could be adopted by those two

departments are there?

A They are there, as I said, you have a unique situation on the Frazier, you have vast numbers of fish, and very limited spawning ground. They are large, but they are few in number.

Q So the Department couldn't benefit from the technology?

A No, it's too hetrogenous, the whole thing, too many streams, too many species, too many this and that, and not a large enough population in each, or any case to justify the expenditures and all, of applying all these things.

Even, mind you, I think they have an excellent system, they use test fishing a good deal, even to the point of catching a fish and releasing him, unharmed, in purse seines, but they do and have done an excellent job, in my opinion, in recent years.

Q Who is primarily responsible; well, for how long has that technology existed in the Commission?

A It's like everything else in the fish business, it's grown very rapidly since 1950. We knew very little up to the late '40's, and really efficient scientific management has been developed, including hatcheries - - the first fifty years of fish culture probably did more harm than good, and millions of dollars were spent, but the principle is correct, the operating procedures were wrong, is all.

Q Have the results justified the expenditures of time and money on technology?

A I think it definitely has. Going from unknown losses to quite a considerable sum each year, I think that the Department of Fisheries has justifiably calculated they get about $3.00 back for every dollar on coho, in the fish culture, so you got two dollars left to apply to repay for the research that brought it about.

Q You are talking about Washington fisheries?

A Yes.

Q I am referring to the Commission.

A Oh, the Commission, yes. No question there, they don't spend any money on fish culture, everything is spent on management or research. But, mind you, it was the Commission policy and mine, and it's been holding together pretty well, that there was no increase in personnel -- over a ten year period - - it's a conservative organization where they limit the research primarily to the development of ideas and application and stimulation of other organizations to carry part of the load, because they have the same problems as the Commission has, so it's - - I spent a good deal of my time discussing, arguing over certain scientific ideas, stimulating maybe the State Fishery Department, maybe the Fish and Wild Life Service, down at Portland or at Seattle.

Q Based upon your experience - -
A I say developed the ideas, talked them over and let's get off the dime and do something. I can't do everything.
Q Do you have any disagreement with either of those departments?
A Let's put it this way, twenty-five years ago you could go to three doctors and get a different diagnosis from each of them as to what was the matter with you. Now days, they go to the book and order fifteen tests, and the book tells you what the tests results will show, and they all agree you've got fallen arches, and they are probably right once in a blue moon. So, you don't have the variation of ideas, but we are still in the variation of ideas to a considerable degree in fisheries, science and one biologist gets up and says it's not necessarily what one says, it's not necessarily the same thing as another biologist is going to say or that another biologist is going to agree, but we are getting closer together all the time.

MR. GETCHES: I have nothing further.

RE-CROSS EXAMINATION BY MR. McGIMPSEY:

Q As far as what Mr. Getches mentioned, and that you indicated it might be feasible to put traps in tributaries as it would not be feasible to put them in the mouths of rivers, if traps are in the tributaries, would they still

not be subject to the same problems of freshets, allowing too many fish to escape?

A It would be difficult in that you wouldn't have, in the upper streams, where you have higher banks, in most cases, better protection, you would still have problems, you probably could put in a trap later, and avoid the major floods because of the known delay in migration upstream, the tributary represents a spawning time more than migration.

In this report you will find that the fish are not caught in December, they will be caught in January. You have a lot of floods in December, and the river goes out of shape for hook and line fishing. You still catch the same fish in January, and do, but when you get in the tributary, your time is much later and the danger of flood is much less.

Q In the tributary, you have the engineering capability of stopping the fish and avoiding the danger of floods and so forth?

A I think that really, this is what you are talking about, from a practical standpoint, it's not a fish trap, but a dam with a trap in it.

Q Okay, do you have any idea, for example, on a river like the Skagit, how many tributaries there possibly could be where Salmon spawn?

A Well, number one, since you mention a specific stream, it's physically impossible to put a fish trap above tide water in the Skagit River, so you would have to build a dam to encompass that volume of water through screens. You would have to pass it over an obstruction by creating a dam.

Q Even on the tributaries?

A On the tributaries there are a number you could.

Q How many tributaries? If you put traps on some of the tributaries and the traps were the only place you were taking fish, would that create a problem as to those tributaries where there were no traps as far as over escapement, as far as those tributaries go?

A I am assuming you are not catching any fish at all, right? The only fish you are catching are in the traps?

Q You're not having any public utilization of sport fishery.

A I hate that word sport fishery, assuming all the fish are caught in the traps?

Q You put traps on some tributaries, and not all, would that pose a problem from management point of view to the Salmon resource of that river or water shed?

A I can't answer that, but inferring with you, in the same manner that I did with Mr. Getches, that situation will never occur, because the people of the State of Washington

will not let you do it.

Q Okay.

A You are creating an impractical, hypothetical situation that is not going to occur under any circumstances. So, why the question?

Q I appreciate that, and I guess maybe sometimes lawyers dwell in the absurd, but would it not present a problem of management?

A You are trying to find answers which you are not obligated to find out, and diverting from the legal problems involved.

Q What I am trying to do is to explore the ramification of a particular policy in this case, the traps. Would there not be over escapement on those tributaries that did not have traps if you put traps on only some of the tributaries and if all fish were taken in the traps?

A If over escapement is defined as allowing more fish to escape than is required to reproduce the maximum of fish in that tributary, the answer is yes, providing you do not harvest a single fish before it gets there.

Q And is over escapement a damage, or as detrimental as under escapement would be?

A There is no evidence, I said this morning, no evidence that an excessive number of coho, Steelhead, or any stream rearing salmonid is detrimental, it's wasted, failure,

wasted fish, but not detrimental to reproduction. With the pink salmon I think it has been, which is not a stream rearing salmonid, it's been demonstrated you can have too many fish and it's detrimental to reproduction but that is not demonstrated in the case of the stream rearing salmonids.

Q From a management standpoint of view, which would be more practical as far as Salmon and Steelhead, having net fisheries in the river, or traps on the tributaries of the river?

A Not having any fishery at all in the rivers and doing what you are doing now, and catching the bulk of fish in salt water where they are top quality and caught in a good condition by the public at large. In other words, the Legislative and Executive government branches doing what the people want and what has been found to be the most practical.

Q Okay. There is net fishery - -

A That applies to Steelhead.

Q There is an Indian net fishery in the Puyallup water shed?

A Some of them, yes.

Q In the rivers?

A Yes.

Q Would it be more desirable to regulate Indian net

fisheries in the rivers than to regulate Indian trap fisheries on all the tributaries?

A Up to now, the State of Washington says you can't do those things off the reservation, and on the reservation it's none of our concern. So, until that is changed, I can't answer your question.

Q Okay. Then, as far as releasing fish proportionally from a trap in order to do that, with accuracy, to get your right escapement, wouldn't you have to know in advance of the fish getting into that trap the size that the run is going to be?

A That's correct, I said that before. The difficulty with turning so many fish loose, you never know how many fish to turn loose until the run was well along and the end of the migration period you might be turning fish loose that didn't have any relationship to the fish that came on when you didn't release them. You just wouldn't know how many to turn loose.

Q As I recall, you were last employed by the Department of Fisheries in 1949?

A No, December 31, 1948. Now, wait a minute, I did work a month as a consultant, maybe two months, over the twenty-two year period, but as a permanent employee, yes.

Q So, would it be fair to say that you have not had real intimate contact with the fisheries management science

and practical development since?

A Absolutely not; I have been in constant contact with the Department for two years, the Department of Fisheries. I am personal friends of practically everybody up there, both professionally and personally. I am going to get rougher, I am tired, and I think we have gone far enough. I am entitled to leave.

Q You indicated to Mr. Getches that you thought the Department of Fisheries did not have the technology or ability to regulate the streams in Puget Sound water shed in a similar fashion to the regulation of the Pacific Salmon Commission, is that a fair statement of what you said?

A Insofar as I didn't say they didn't have the knowledge, I said they didn't have the capabilities or economic justification for doing so.

Q Okay, do they have the knowledge to do it?

A Yes. You have men who fully understand the workings of the International Pacific Commission and several of them as a matter of fact, very capable individuals, but they are inhibited by physical limitations, economic limitations, and the characteristics of the particular species involved.

MR. McGIMPSEY: Okay, that's all the questions I have.

MR. CUFLEY: No questions.

(Witness excused at 3:30 p.m.)

Loyd A. Royal

CERTIFICATE OF SIGNATURE

STATE OF WASHINGTON)
: ss
COUNTY OF L E W I S)

I, the undersigned duly commissioned and qualified notary public do hereby certify:

That the witness in the foregoing deposition appeared before me on the 15th day of August, 1973, and that said deposition was submitted to the witness for reading, examination and signing and being by said witness subscribed to in my presence.

Helen I. Lane
Notary Public in and for the State of Washington, residing at Centralia

Deposition Exhibit 1

Terms of Reference During Period of Employment with Department of Game

STATE OF WASHINGTON
DEPARTMENT OF PERSONNEL
CLASSIFICATION QUESTIONNAIRE

1. ASSIGNED CLASSIFICATION	2. POSITION 0625			
3. REVIEWED BY	4. DATE	5. AUDITED BY	6. DATE	7. PAY RANGE

SECTION I — GENERAL (DO NOT WRITE IN ABOVE SPACES)

8. NAME (MR. / MRS. / MISS) — LAST / FIRST / MIDDLE INITIAL: NEW POSITION

9. CLASSIFICATION TITLE:

10. Monthly Salary	11. PAY RANGE	12. PAY STEP	13. OFFICIAL WORK WEEK NUMBER OF HOURS	14. WORKING TITLE

15. DEPARTMENT OR INSTITUTION	16. DIVISION AND/OR SECTION	17. IMMEDIATE SUPERVISOR NAME	TITLE
Game	Fish Management	Carl N. Crouse	Director

18. DURATION OF EMPLOYMENT WITH DEPARTMENT YEARS / MONTHS	WITH PRESENT DUTIES YEARS / MONTHS	19. LOCATION OF EMPLOYMENT ADDRESS	CITY
		600 North Capitol Way	Olympia

SECTION II — DESCRIPTION OF DUTIES

20. % TIME ☐ Day ☐ Wk. ☐ Mo. ☐ Yr

21. DUTIES
READ INSTRUCTIONS CAREFULLY BEFORE COMPLETING THIS SECTION.
LIST THOSE DUTIES FIRST WHICH OCCUPY MOST OF YOUR TIME.
NOTE—UNDERLINE OR BRACKET YOUR MOST RESPONSIBLE DUTY.

DO NOT WRITE IN THIS SPACE

100%

Under the general direction of the Director of the Department of Game performs a variety of responsibilities involving a total review of the anadromous fish programs of the Department.

Reviews, analyzes and re-structures existing research programs and develops additional research programs as necessary utilizing the most modern techniques of fishery management in order to improve and produce a more efficient overall statewide management program for the sportsmen of the State of Washington.

Development and revision of existing programs requiring an analysis of planting records, rate of return, oceanographic trends, historical management information practices, both fresh water and marine, including a review and analysis of steelhead release programs.

Coordination and consultation with other fishery agencies, both state and federal, on anadromous fish management techniques, practices and research methods.

Develops, recommends and implements short- and long-range goals and objectives for the total management program, including the development and implementation of long-range comprehensive research plans for the total management of the steelhead fishery in the State of Washington.

Directs work of biologists and technicians as assigned in accomplishing the goals and objectives of this program.

Performs other work as required.

Exhibit 1
Witness: Mr Royal
May 25, 1973
Helen L Lane, M.P.

(Attach Additional Sheets If Necessary)

DISTRIBUTION: WHITE (TYPED ORIGINAL) PERSONNEL DEPARTMENT BLUE (TYPED CARBON) AGENCY; BUFF (ROUGH DRAFT) EMPLOYEE.

FORM 15-D—Rev. 1-62

SECTION III — RELATED INFORMATION

22. LIST THOSE EMPLOYEES WHO PERFORM SUBSTANTIALLY THE SAME DUTIES AS THOSE YOU HAVE SET FORTH IN ITEM NO. 21.

NAME OF EMPLOYEE (3 ARE SUFFICIENT)	CLASSIFICATION TITLE	WORKING TITLE
A. NONE		

23. IF YOU ARE IN A SUPERVISORY POSITION LIST THE UNITS YOU SUPERVISE AND NUMBER OF EMPLOYEES IN EACH. IF AN ORGANIZATION CHART HELPS CLARIFY THIS ITEM PLEASE ATTACH (8½ x 11) AND SO INDICATE BELOW.

DO NOT WRITE IN THIS SPACE

24. LIST EMPLOYEES, IF ANY, UNDER YOUR DIRECT SUPERVISION. IF MORE THAN FIVE LIST THE NUMBER OF EMPLOYEES BY CLASSIFICATION.

	NAME OR NUMBER	CLASSIFICATION TITLE	WORKING TITLE
A.	*Assigned depending upon need	*Biologist I - Aquatic	
B.		*Biologist II - Aquatic	
C.		*Biologist III - Aquatic	
D.		*Fish & Game Technical Aide	
E.			

25. LIST ANY OFFICE MACHINES, EQUIPMENT, TOOLS, MOTOR VEHICLES, ETC. OPERATED ON JOB; GIVE PER CENT OF TIME.

26. LIST ANY MAINTENANCE (ROOM, BOARD, LAUNDRY, CLOTHING, ETC.) YOU RECEIVE IN ADDITION TO YOUR CASH SALARY.

27. I CERTIFY THAT THE STATEMENTS CONTAINED HEREIN ARE MY OWN AND ARE ACCURATE AND COMPLETE.	28. SIGNATURE OF EMPLOYEE	29. DATE

SECTION IV — STATEMENT OF IMMEDIATE SUPERVISOR

(Attach Additional Sheets If Necessary)

30. THE ABOVE STATEMENTS ARE ACCURATE AND COMPLETE EXCEPT:

31. DO YOU AGREE WITH EMPLOYEE'S STATEMENT AS TO MOST RESPONSIBLE DUTY? (ITEM 21)

☐ Yes ☒ No EXPLAIN—

32. SUPERVISION REQUIRED BY POSITION

☐ CLOSE DETAILED; ☐ ON A SPOT CHECK BASIS ONLY; ☒ LITTLE—EMPLOYEE RESPONSIBLE FOR DEVISING OWN WORK METHODS; ☐ OTHER

EXPLANATION OF ITEM CHECKED:

33. EDUCATION

☐ LESS THAN HIGH SCHOOL
☐ HIGH SCHOOL GRADUATION
☐ SOME COLLEGE
☒ COLLEGE GRADUATION
☐ GRADUATE STUDY

NO. OF YEARS
DEGREE (KIND) BS or MS

MAJOR Fisheries

34. EXPERIENCE (INDICATE KIND AND LENGTH OF TIME)

Five years' experience in fisheries management or research.

35. SPECIAL KNOWLEDGE, SKILLS, LICENSE, CERTIFICATE, ETC. REQUIRED

36. SIGNATURE OF IMMEDIATE SUPERVISOR	37. TITLE	38. DATE
Carl N. Crouse	Director	1-29-71

SECTION V — STATEMENT OF DEPARTMENT HEAD

(Attach Additional Sheets If Necessary)

39. DEPARTMENT HEAD'S COMMENTS AS TO ACCURACY AND COMPLETENESS OF STATEMENTS OF EMPLOYEE AND IMMEDIATE SUPERVISOR.

40. DO YOU AGREE WITH THE STATEMENTS IN ITEMS 33, 34 AND 35?

☐ Yes ☒ No COMMENT

41. SIGNATURE OF DEPARTMENT HEAD OR AUTHORIZED REPRESENTATIVE	42. TITLE	43. DATE
Douglas L. Lozier	Personnel Officer	1-29-71

Deposition Exhibit 2

"Recommendations"

USJ Wash - Reports - Dept of Game

RECOMMENDATIONS

Administrative

1. The present organization of the Fishery Management Division is such that gathering information for use in improving management policies and operating procedure is difficult. It is strongly recommended that the division, under the division chief, be divided into three units, headed by (a) an assistant chief in charge of administration, including finance, budget, purchasing, federal aid, records, and personnel, (b) an assistant chief in charge of operations, which would include all hatcheries and management programs, and (c) a research director. Under (b), a field supervisor of hatcheries would be in personal contact with all hatcheries on a periodic basis and would have a full-time pathologist directly available to him. He would advise on diets, operating procedures, needed improvements in hatchery design and, in general, provide experienced advice to the superintendent in regard to his problems and the needed improvements in the quality of his product. All record keeping, which currently absorbs most of the hatchery supervisor's time, should be transferred to a knowledgeable clerk. Also under (b), a field supervisor of management programs would provide the necessary field liaison with the regions and arrange for specific management investigations to be conconducted by each regional biologist as an essential part of his continuing duties. Each project would represent type waters and be directed toward providing maximum yield of resident fish for a minimum cost. At present, all knowledge is retained by the individual biologist, with no records to be passed on to succeeding employees. Each project should be programmed in such a manner that adequate data is obtained for supporting

Exhibit 2
Witness: Mr Royal
May 25, 1973
Helen L Lane, N.P.

definite conclusions. Each project should be reported in detail in a manner suitable for publication in an annual report for the region. These reports should be exchanged within staff and summarized in the annual report of the division chief. Reports considered to be of value to the literature on fish management should be published by duplicating and released to those involved directly in applicable game fish management. Personality and dynamic leadership are essential qualities of both field supervisors that the guidance from the main office is respected and sought after by the regional organizations. Field work is the essential basis of activity on the part of both supervisors.

It is strongly recommended that a central fisheries research unit of limited size be created under the leadership of a capable, personable, and practical individual, with complete freedom of action, unaffected by the general operation of the division but working under specific terms of reference prepared by the division chief. Research should be dedicated primarily to providing new knowledge on methods for increasing the adult survival rate and the total available population of anadromous trout at minimum cost.

The report on the anadromous trout program submitted under separate cover should provide a detailed guide to the direction of the research. The director of the research unit should create a suitable liaison with other research agencies to stimulate their research toward a desirable end point and consolidate current findings of others into the design of the division effort. All information should be collected in an organized manner, leading to early publication of the data and related findings in the most economical manner. Publication of facts is a major

responsibility and only the analyses of data for publication can lead to substantive conclusions. All research relating to anadromous trout initiated by the regional staff should be eliminated and any activities of the region on this subject should be confined to cooperation in the collection of data. The region, because of the pressure of miscellaneous and widespread responsibilities, is no longer capable of carrying out the research required to eliminate those stresses being created on anadromous trout by present management practices and to measure the result. (See recommended research program.) Close liaison between the research unit and the region is necessary, however, to provide justification for the effort being expended and the distribution of the results. Only in this way can the morale of the regional staff be maintained and the proper education of the licenseholder carried out.

2. The primary responsibility for investigation and other actions in respect to water use, including pollution, which might impair game fish populations, should be removed from the regional biologist and transferred to the Environmental Management Division, acting through its staff and the regional supervisor. At present, the activities of the regional biologist related to water use and water-connected problems impairs his capability to carry out his primary functions of regional fisheries management. In addition, one senior employee in the division works full time in the water protection activity which, basically, is the responsibility of the Environmental Management Division. The time represented by this employee is badly needed for liaison with the field staff to improve fish management. This recommendation appears consistent with the terms of reference of the Environmental Management Division.

3. There is a need for an annual divisional report to the Director of the Department, including not just the hatchery operational report but a summary progress report on all activities of the division, including research. Such a report would tend to provide more coherent direction and consolidate needed improvement in operating and management policies. Such a report would serve also as an educational and factual record for the region and, if desired, for representative licenseholders.

4. Major improvements should be made in record keeping by the division, which is now inadequate for practical use, and the responsibility for keeping the required records should be clearly delineated. In association with improved record keeping is a need for a complete reorganization of the filing system. Currently, a general belief exists that the best way to lose something is to send it to the division office. The writer has experienced considerable difficulty in obtaining file information and, frequently, reports and information either couldn't be found or had disappeared. A central library of documents related to the activities of the division should be developed. Currently, no reference is kept of available information and no one is able to keep up with current published information to facilitate an improvement in the division operation. Such a reference library for fisheries probably could best be developed under the direction of the research unit but available for use by the region and other divisions of activity within the department. Perhaps the library could best serve not only the fisheries division but all interests of the department and thus eliminate the general lack of required information, the disappearance of documents, and provide for collection and exchange of all applicable documents under a responsible and knowledgeable person in library procedures.

5. The Department should consider the desirability of establishing permanent facilities on a control stream suitable as a base for survival studies related to hatchery practices, interspecific competition between stream-rearing salmonids, and the effect of fish cultural operations on the maintenance of natural reproduction. This proposal should be of mutual interest to this department and the Department of Fisheries and should be financed in equal moieties. Perhaps such a project might be entered into in behalf of all Northwest agencies involved in rearing salmonids and financed by federal funds. Further, the department should participate more realistically in the programming of research on the Columbia River and elsewhere, as carried out by other agencies. Desirable data on anadromous trout could have been collected in past research projects carried out in this area by the National Marine Fisheries Service. Such data would be of major value toward understanding some of the existing problems faced by those charged with the management of anadromous trout. (See recommended research program.)

6. In view of the negative results accruing from the recently increased planting program of anadromous trout, further expansion of this program should be discontinued until facts obtained from prototype experiments carried out by the research unit justify such expansion. In fact, some retrenchment in the number of fish planted appears justified subject to periodic reconsideration on the basis of new data. Care should be taken in the execution of all prototype experiments that the public recognize that research only is involved and that each experiment may not necessarily result in a new operating policy. (See Operational Recommendations.)

7. There is a serious need for establishing close and continuing administrative liaison with all other agencies involved in raising stream-rearing salmonids, particularly the Washington Department of Fisheries, to eliminate those practices which tend to create either undesirable interspecific competition or which tend to reduce or eliminate natural reproduction. A unified policy should be established which would phase out all plantings of anadromous stream-rearing salmonids which do not fall within the classification of a true smolt. Further, there appears to be a need for transferring responsibility regarding so-called "barren areas", landlocked areas, and the administration of regulating authority over nonmigratory salmon to the Game Department. Nonmigratory salmon should logically be considered game fish, the same as silver trout, Oncorhynchus nerka (kennerli), to eliminate, or at least reduce, the present conflict in the utilization of the aforementioned waters.

8. An administrative recommendation regarding any future requirements for fish cultural operations, while desirable, is difficult to define. On the basis of information available, we have developed rearing facilities for anadromous trout to the full survival capacity of existing stream conditions. Unless adverse hatchery practices, particularly those related to coho and chinook salmon, can be eliminated and the possible adverse effects of "Density Barriers" are understood, modified, or eliminated, any future expansion of rearing facilities for anadromous trout appears unnecessary. However, the statement above indicates that such a decision is tentative subject to new information and certainly the demand for catchable trout will require new rearing facilities proportional at least to the population increase. The potential perfection of

8. continued

the recirculation system, which can guarantee desirable thermal units and disease control, not available in all existing spring and gravity water supplies, could drastically change the planning of future hatchery rearing developments. However, the acquisition of rather scarce land and related water supplies consistent with expected population growth should be a sound real estate investment and provide insurance against the possible inability to perfect the biological and economic practicability of the water recirculation system. Such land and water supply acquisition might best be incorporated into multi-purpose projects, including recreational use.

Operational

It was strongly suggested in item 1 of the Administrative recommendations that the proposed research unit be restricted, at least initially, to activities related to improving the anadromous trout program. A suggestion was made also that each regional biologist conduct specific management investigations of resident trout in type waters on a continuing basis to improve the yield to the sportsmen at a minimum cost. There are a number of management problems in the resident fish program, the solution of which can best be detailed to the operational units. A limited amount of this type of investigation will aid in developing a more progressive attitude in the field staff and a better understanding of the problems still inherent in the present-day planting programs. Adequate design and execution, including the preparation of a detailed report suitable for publication, is essential to the success of such a program. The past failure in completing and reporting on each investigation after its initial start has produced little information, usually none, and has not contributed to the dignity, morale, or education of the departmental organization.

Operational, continued

1. Diet studies in relation to adult survival or survival to catch can best be carried out under the general guidance of the field hatchery supervisor and the specific supervision of selected hatchery superintendents at carefully considered locations. Proposed research programs related to diet will be detailed in the recommended research program. The findings from these special projects can then be incorporated into all hatcheries for confirmation or possible adaptation to each station. With different water supplies and rearing environment, favorable findings at one station may not always be duplicated at another.
2. The field supervisor of hatcheries, working with his pathologist, should attempt to isolate all existing stress factors brought about by the rather complicated rearing environment of each station. The relationship of each stress to the existence of virulent pathogens and the inevitable mortality, either at the time or later after the fish has been released, should be determined. Once isolated, each stress factor should be eliminated, if possible, either through redesign of the diet, water system, or the physical features of the station. The hatchery superintendent should be closely associated with this activity and the regional staff informed of the summary findings to the end that everyone gains in stature from the additional knowledge.
3. The regional biologist should keep the field supervisor of hatcheries and the regional supervisor sufficiently informed on each of his investigational projects for improving the catch of resident fish, to the end that all people directly involved in any required changes in procedure understand the need for such changes and, therefore, are in willing accord. Changes in the time, size of fish, species, and size of planting allotments may result from such investigational activity.

4. Special effort should be initiated in developing a new brood stock of summer-run steelhead and sea-run cutthroat for release in the Puget Sound area to determine if the present source of stock is involved in the relative failure of these two programs to date.

5. The number of steelhead smolts planted should be increased in those streams which have not revealed a "density barrier" to the number of adults produced. The number of fish planted should be reduced, in those streams indicating a "density barrier", to the number planted before this limitation was created. The execution of this suggestion requires a carefully planned educational program with sports groups so that they understand, first, why the number of smolts planted is being changed and, second, the possibility that the factor, or factors, controlling the adult steelhead population may be modified, or even eliminated, through the development of a suitable uniform policy governing the salmonid planting program or by the acquisition of additional information as to what these factors are and how they function.

6. All marking of steelhead and sea-run cutthroat fingerlings or smolts by the field staff should be eliminated except under the guidance and responsibility of the head of the research unit.

7. Special effort should be expended in obtaining steelhead escapement figures, by sex, on a daily basis, reported weekly, at selected locations. All escapement data should be summarized in a standardized form in the annual report of each regional biologist. Total recorded escapement for each stream selected should be presented, with pertinent remarks as to relative size, in the annual report of the division chief.

8. The capabilities of each regional biologist should be measured to some extent on the quality of his annual report. These reports should always be distributed to the supervisor and biologist of other regions and made available in the regional offices for reading by all wildlife agents. The failure to prepare and distribute information of import has been a major weakness of the fisheries division in past years.

9. All plants of pre-smolt anadromous trout in migratory areas should be eliminated at once. These fish produce few, if any, adults, yet they create both inter- and intraspecific competition which will reduce the natural reproductive capacity of the stream for all stream-rearing salmonids. Undersized fish can be retained for planting as catchable trout in areas remote from the anadromous trout habitat, for planting in rehabilitated lakes, or they should be destroyed.

10. It appears desirable, in a year having a cold spring, to release steelhead smolts a week or more later than the average time for the peak of wild smolt emigration and, if possible, at a time of relatively high flow. Under no circumstances should fish be starved prior to release to create artificially the reactions of smolting fish in order to justify an early release.

Regulatory

1. It is suggested that the ten-inch minimum size limit in lower sections of steelhead streams be abandoned and reduced to six inches, applicable generally, during an open season starting June 1 or the last Saturday in May, whichever is considered to be more practical. Most smolts have left the streams by the above suggested opening date and the major share of the

1. continued

remaining fish are late smolts, smaller than normal in size, with a poor survival potential, and residual hatchery smolts (both steelhead and sea-run cutthroat), which cause inter- and intraspecific competition and produce few, if any, adults. Residuals apparently die during the following winter carry-over period. An unknown number of aged 2-plus wild steelhead will be caught, but there is no evidence to indicate that those streams having a six-inch limit, such as the Samish, Puyallup, and Green Rivers, have suffered a reduced production of steelhead. Likewise, there is no evidence that the production of steelhead has benefited in those streams having a ten-inch minimum size limit. The removal of all larger fish immediately after normal smolt migration, including hatchery residuals, favors the survival of the incoming and the previous year class of naturally produced steelhead by permitting a relatively virgin habitat as far as steelhead are directly concerned. It is true that the one-plus aged wild steelhead will start to approach the six-inch size limit in late August but in most streams, including those with a ten-inch size limit, these fish have migrated upstream to escape the higher water temperatures in the lower river and are available to fishermen where the six-inch limit is usually applicable. The one-plus fish apparently do not return to the main lower rivers until late fall, apparently after mid-October. While taking some of these one-plus aged fish does not appear to harm the adult survival rate, presumably because of the limit in winter carrying capacity, it is the headwater streams that provide the major habitat during the summer months, where the six-inch limit currently applies, not the lower river, where the ten-inch limit is applicable.

1. continued

The removal of the ten-inch limit, which has provided no obvious benefits, would greatly simplify the fishing regulations and would open up a large stream area for recreational use. An opening date on or about June 1 appears completely justified for all streams unless it can be demonstrated that a major smolt migration occurs after that date in the highly glacial streams, such as reported by Larson and Ward (1955). Until further information is available on the fall timing of the downstream movement of yearling and one-plus steelhead fingerlings and on the winter carrying capacity of the lower rivers, which obviously can be increased by improved salmonid planting practices, the closing date of the fishing season remains speculative because of the interest in fishing for adult sea-run cutthroat However, there is no evidence at present to indicate that a late-summer closure would benefit the natural production of adult steelhead because of current hatchery practices, particularly those related to salmon, reduced fishing intensity, and because of the limited carry-over capacity of the stream. It would appear that range capacity has been ignored in the desire to prevent the taking of <u>any</u> young steelhead at the expense of the recreational use of the lower streams during the late spring and summer months. Furthermore, it is illogical to expect other agencies involved in rearing coho and chinook salmon to eliminate planting policies which contribute to temporary residualism while the department's regulations prohibit the taking of residual anadromous trout that produce few, if any, returning adults. The regulation recommended above currently applies to Oregon winter steelhead streams, except that the minimum size limit is eight inches instead of ten inches. The fishing season opens the last weekend in May. Survival rates of adult steelhead in Oregon streams appear to be as high as those indicated for Washington streams.

CERTIFICATE OF REPORTER

STATE OF WASHINGTON)
: ss
COUNTY OF L E W I S)

I, HELEN I. LANE, a notary public duly commissioned and qualified in and for the State of Washington, United States of America, do hereby certify that, pursuant to agreement, there came before me on the 25th day of May, 1975, at 8:30 a.m., the following named person, to-wit: Loyd A. Royal, who was by me duly sworn to testify the truth and nothing but the truth, of his knowledge touching and concerning the matters in controversy in this cause;

That he was thereupon carefully examined upon his oath and his examination was reduced to typewriting under my supervision;

That the deposition is a true record of the testimony given by the witness; and that the said witness read the same and subscribed his name thereto.

I further certify that I am neither attorney or counsel for, or related to, or employed by, any of the parties to the action in which this deposition is taken, and further, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, or financially interested in the action.

HELEN I. LANE
OFFICIAL COURT REPORTER
COURT HOUSE
CHEHALIS, WASHINGTON 98532

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal this 15th day of ~~July~~ August, 1973.

Helen I Lane

Helen I. Lane, Notary Public in and for the State of Washington, residing at Centralia, Washington.

My commission expires June 1, 1976.

HELEN I. LANE
OFFICIAL COURT REPORTER
COURT HOUSE
CHEHALIS, WASHINGTON 98532