

SCOMM

74:39

CHAPTER XI. SECTION C.
ENVIRONMENTAL REGULATIONS RELATED TO HATCHERIES

There are a number of environmental considerations involved in the siting, construction, and operation of hatcheries. In addition to the biological and genetics matters associated with the fish and eggs themselves, other environmental protection issues include the siting of hatcheries, their water usage requirements, the effluent they produce, and the disposal of fish carcasses (of broodstock or fish which are excess or diseased).

While Alaska law does not contain many environmental statutes and regulations which are specific to hatcheries, it does have a number of general provisions regarding protection of the environment which come into play during the planning, development, and operation of hatcheries. These include the Anadromous Fish Act which controls and requires approval for any construction projects or other action which might affect "rivers, lakes or streams or parts of them that are important for the spawning, rearing or migration of anadromous fish"; the Fishways Act which requires the construction of a fishway or hatchery construction if a dam or other obstruction will impact the passage of fish (see section on environmental mitigation); plus many laws and regulations about water quality and pollution, protection of genetic purity of fish stocks (see chapter on biology and genetics), fish health inspections (AS 16.05.868), siting of hatcheries (see chapter on planning), and so on.

A significant environmental protection issue associated with hatcheries is the discharge of waste into public waters. The procedures and permits required of hatchery operators in this matter have been confusing and in a state of flux for the last several years, but now seem to be headed for some resolution and streamlining. Part of the confusion stems from the fact that both the Federal Environmental Protection Agency (EPA) and the Alaska Department of Environmental Conservation (DEC) have some jurisdiction in this matter.

It appears that both EPA and DEC have been fairly lenient about requiring the various waste disposal permits that have technically been called for. Even so, there have been very few complaints or problems regarding hatchery impacts on water. Hatcheries do discharge effluent which may contain organic fish waste as well as some disinfectants or other chemicals used to prevent or control disease, but generally they discharge only very small amounts of pollutants. However, developments during the last few years which have necessitated the disposal of large numbers of fish carcasses have brought the subject of waste disposal monitoring to the forefront. These developments include a joint decision by the Federal Food and Drug Administration and the Alaska DEC in 1990 that the carcasses of hatchery broodstock (mature fish used for the taking of eggs and milt) should no longer be sold for canning for human consumption, and the recent huge returns of fish, particularly in Prince William Sound, which have resulted in the

inability of hatcheries sell large numbers of their "cost-recovery fish." Both of these developments demonstrated the need to establish procedures for hatcheries to dispose of large numbers of fish carcasses.

The federal Clean Water Act prohibits the point source discharge of pollutants by any person into water of the United States, except in compliance with the terms and conditions of a National Pollutant Discharge Elimination System (NPDES) permit issued by EPA. Under federal regulations, discharges of concentrated aquatic animal production facilities require NPDES permits. The regulations spell out the level of production and feeding a facility would need to do on an annual basis to require an NPDES permit, but also leaves to the EPA the discretion to require the permit of any facility it deems to be a significant contributor of pollutants into water.

In a January 1991 letter to all hatchery operators in Alaska, the EPA explained these requirements and noted that even if the regular operations of a hatchery did not fall under the NPDES permit guidelines, the permit would be required if the operator planned to dispose of fish carcasses in the water. It further explained that fish processors who dispose of greater than 1000 pounds of waste per day may be covered by the "Authorization to Discharge Under the National Pollutant Discharge Elimination System for Alaska Seafood Processors" general permit (the GP), and that for the purposes of carcass disposal, the EPA was willing to cover hatcheries under the same GP. The letter explained that this "greatly simplifies the administrative process and reduces the time frame in which a NPDES permit is obtained." The letter ended by asking that hatchery operators notify the EPA of their plans for fish waste disposal prior to the 1991 season.

In April 1991, the Anchorage EPA office sent another letter to all hatchery operators stating that many of the responses they had received to the January letter had raised a number of issues which were being considered. Since resolving these issues is likely to take some time, they established an interim policy to allow the hatcheries to operate and to provide for environmental protection in the interim period. The letter goes on to lay out three conditions under which the disposal of whole fish carcasses would be permissible. The criteria include the depth of water where discharge may occur, a requirement of pre-approval of the discharge site by EPA, and a requirement that the skipper of the discharge vessel maintain records of each discharge occurrence, its location, and the date.

Alaska is currently operating under the interim criteria spelled out in the EPA's April 1991 letter. Many hatcheries, particular state-run hatcheries, have submitted their applications for the NPDES permits to EPA. However, the EPA considers these hatcheries to be minor dischargers and has agreed to turn over to the state the authority for permitting and monitoring of their waste discharge. EPA has forwarded copies to DEC of all the NPDES permit applications they have received from hatchery operators, and has

asked that the state implement a hatchery waste permitting process.

Under current state law, hatchery effluent is covered under the DEC waste disposal permit statute (AS 46.03.100). The Department reports that few hatcheries apply for this permit but DEC has been comfortable with the situation, and has made permitting hatcheries a low priority, since hatcheries generally handle effluent in a manner that maintains acceptable water quality standards.

DEC has drafted a "General Waste Disposal Permit for Fish Hatchery Discharges," to be issued to hatcheries to fulfill the waste permit requirement in state law. Once the state has officially adopted this permit, hatchery operators will obtain waste permits only from DEC. Under the operating agreement between DEC and EPA, this permit would in effect fulfill both state and federal waste permit requirements. This centralization and consolidation should simplify the permitting and reporting processes for hatchery operators, ensure more compliance, and improve uniformity in the monitoring and information available.

The state's draft permit contains a provision stating that the permit is effective until a specified date, "unless superseded before that time by a state certified EPA permit." This statement is included in order to provide for any potential future situation in which EPA might require an NPDES permit, which would then supercede the state permit. The draft permit contains specific language regarding discharges, carcass disposal, drugs, chemicals and medications, operational, monitoring and reporting requirements, and so on. (It lacks specific language to address disposal of diseased fish or eggs but other general provisions in the permit, or language in the hatchery operational permits from Fish and Game may sufficiently provide for that circumstance).

Despite the lack of clear regulations and enforcement, and the confusion over federal and state requirements, there have been very few problems reported regarding such things as hatchery waste disposal in Alaska. Even during the situation that developed in Prince William Sound during the 1991 season when processors would not buy many of the hatchery fish and they had to be dumped, both DEC and EPA report that their agencies worked very closely with the hatcheries to devise and carry out plans for large-scale carcass disposals, and things went quite smoothly. The Alaska Departments of Fish and Game and Environmental Conservation, and the federal Environmental Protection Agency, generally believe that for this aspect of environmental protection, current laws are adequate.

Other environmental issues related to hatcheries are covered in this report in the chapters on Biology and Genetics, Planning and Permitting, and Environmental Mitigation. The topics covered in those chapters appear to raise more serious and complex environmental concerns and questions, and need more extensive review, than the more direct environmental protection regulations discussed here.

Chapter XI.

C. Environmental Regulations

Options to consider:

- * Encouraging DEC and EPA to coordinate waste disposal permitting requirements to the extent possible.
- * Ensuring that adequate direction is provided in regulation regarding the disposal of any diseased hatchery fish.

STATE OF ALASKA

ROUTE SLIP

TO: Mail Station 3100	Department Legislature	Division Senate
Attention Mary McDowell (Sen. Eliason)		
☐ Approval ☐ Signature ☐ Comment ☐ Contact Me ☐ Prepare Reply ☐ For Your File ☐ Note & Return ☐ Initial & Return ☐ Return as Requested ☐ Return for Approval ☐ Necessary Action ☐ For Your Information		
Remarks: <i>your FAX no. was busy so I thought this might be just as fast.</i>		
FROM: Mail Station 1800	Department AD&EC	Division EQ
By Dena Jenkins		Date 2/4/92

02-002 (REV 3-81)

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

DIVISION OF ENVIRONMENTAL QUALITY
410 WILLOUGHBY AVENUE
JUNEAU, AK 99801

Phone: (907) 465-5260
FAX: (907) 465-5274

Date: 2/4/92 Time: 10:05 am Total Pages: 5
(Including Transmittal Sheet)

To: Mary McDowell

Fax #: 465-5274

From: Deena Henkins

Subject: Hatchery permitting

Comments: Dischargers need both a state permit (AS 46.03.100) and
AND an NPDES permit. If the state certifies an NPDES permit
it becomes the state permit under AS 46.03.100 and the
discharger is legal under both state & federal law.
EPA frequently chooses not to issue NPDES permits to
"minor" dischargers. When they send a so called "minor
letter" to a discharger (such as the hatcheries), DEC
tries to issue a state waste disposal permit. EPA has
no review or approval authority over state permits.
If a discharger has a state permit but not
a federal permit, the discharger is legal
under state law but not federal law. This
isn't usually a problem but the discharger
& EPA are vulnerable to citizen lawsuits
for failure to have the NPDES permit. This
situation is not uncommon and is not
(i.e. no NPDES permit)
confined to the hatcheries.

h:\home\bettyt\faxform.eq

Deena

DRAFT *****DRAFT*****DRAFT*****DRAFT

HATCHERY REVIEW PROJECT -- CHAPTER ON ENVIRONMENTAL PROTECTION REGULATIONS RELATED TO HATCHERIES

There are a number of environmental considerations involved in the siting, construction, and operation of hatcheries. Besides the biological and genetics matters associated with the fish and eggs themselves, other environmental protection issues include the siting of hatcheries, their water useage requirements, the effluents they produce, and the disposal of fish carcasses (of broodstock or fish which are excess or diseased).

While Alaska law does not contain many environmental statutes and regulations which are specific to hatcheries, it does have a number of general provisions regarding protection of the environment which come into play during the planning, development, and operation of hatcheries. These include the Anadromous Fish Act (AS16.05.870) which controls and requires approval for any construction projects or other action which might affect "rivers, lakes or streams or parts of them that are important for the spawning, rearing or migration of anadromous fish"; The Fishways Act which requires the construction of a fishway or hatchery construction if a dam or other obstruction will impact the passage of fish; plus many laws and regulations about water quality and pollution, protection of genetic purity of fish stocks (see chapter on biology and genetics), fish health inspections (AS16.05.868), siting of hatcheries (see chapter on planning), and so on.

A main environmental issue associated with hatcheries is the discharge of waste into public waters. The procedures and permits required of hatchery operators in this matter have been confusing and in a state of flux for the last several years, and now seem to be headed for resolution. Part of the confusion stems from the fact that both the Federal Environmental Protection Agency (EPA) and the Alaska Department of Environmental Conservation (DEC) have a role to play, and have passed the authority back and forth between the two agencies several times.

It appears that for a number of years, both EPA and DEC were fairly lenient about requiring the various waste disposal permits that might have technically been called for, and evidently ran into very few complaints and problems. Hatcheries do discharge effluents which may contain organic fish waste as well as some disinfectants or other chemicals used to prevent or control disease, but generally discharge only very small amounts of pollutants. However, developments within the last few years which have necessitated the disposal of large numbers of fish carcasses~~x~~ have brought the subject of waste disposal monitoring to the forefront. These developments include a decision by the Federal Food and Drug

DRAFT ***** DRAFT ***** DRAFT

Administration in 1990 that the carcasses of hatchery broodstock (mature fish used for the taking of eggs and milt) should no longer be sold for human consumption, and the recent inability to sell and process huge returns of fish, particularly ~~in~~ Prince William Sound. Both of these developments demonstrated the need to establish procedures for the disposal of large numbers of fish carcasses.

Under current state law, hatchery ^{statute} effluents are covered under ~~general~~ DEC waste disposal permits (AS46.03.100). The Department reports that few hatcheries apply for this permit but the Department has been comfortable with the situation as hatcheries have also been subject to monitoring by the EPA, and generally hatcheries handle effluents in a manner that maintains acceptable water quality standards. In a similar situation regarding seafood processors, the state has operated under a policy whereby the State certified the EPA's ^{general} permit process so that ^{most} applicants could meet both the State and Federal wastewater disposal requirements by submitting a copy of the DEC Seafood Processors Permit Application to the EPA. Although this ~~rule~~ ^{permit} pertained specifically to seafood processors and did not include hatcheries, there seems to have been an informal arrangement by which the State assumed that hatcheries would get whatever permits the EPA required and any additional permitting by the state would not be pursued.

The federal Clean Water Act prohibits the point source discharge of pollutants by any person into water of the United States, except in compliance with the terms and conditions of a National Pollutant Discharge Elimination System (NPDES) permit issued by EPA. Under federal regulations, discharges of concentrated aquatic animal production facilities require NPDES permits. The regulations spell out the level of production and feeding a facility would need to do on an annual basis to require an NPDES permit, but also leaves the discretion ~~to the EPA~~ to require the permit of any facility it deems to be a significant contributor of pollution into water.

In a January, 1991 letter to all hatchery operators in Alaska, the EPA explained these requirements and noted that even if the regular operations of a hatchery did not fall under the NPDES permit guidelines, the permit would be required if the operator planned to dispose of fish carcasses in the water. ~~But~~ It further explained that fish processors who dispose of greater than 1000 pounds of waste per day may be covered by the "Authorization to Discharge Under the National Pollutant Discharge Elimination System for Alaska Seafood Processors" general permit (the GP), and that for the purposes of carcass disposal, the EPA was willing to cover hatcheries under the same GP. The letter explained that this "greatly simplifies the administrative process and reduces the time frame in which a NPDES permit is obtained." The letter ended by asking that hatchery operators notify the EPA of their plans for fish waste disposal prior to the 1991 season.

In April ~~of~~ 1991, the Anchorage EPA office sent another letter to

not really

OK

not really
Permitting
is a low
priority to
DEC. We
didn't assume
they would
apply for EPA
permits.

to the EPA

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all hatchery operators stating that ~~the~~ ^{of the} many responses they had received to the January letter had raised a number of issues which were being considered. Since resolving these issues was likely to take some time, they established an interim policy to allow the hatcheries to operate and to provide for environmental protection in the interim period. The letter goes on to lay out three conditions under which the disposal of whole fish carcasses would be permissible. The criteria included the depth of water where discharge ~~could~~ ^{can} occur, a requirement of pre-approval of the discharge site by EPA, and a requirement that the skipper of the discharge vessel maintain records of each discharge occurrence, its location, and date.

The interim criteria spelled out in the EPA's April ¹⁹⁹¹ letter are what the hatcheries in Alaska are currently operating under. Many hatcheries, particular state-run hatcheries, have submitted their applications for the NPDES permits to EPA. However, the EPA considers hatcheries to be minor dischargers and has agreed to turn the authority for permitting and monitoring waste discharge of hatcheries over to the State. They have forwarded copies to DEC of all the NPDES permit applications they have received from hatchery operators, and have asked that the State implement a permitting process.

~~In preparation for assuming this permitting responsibility,~~ DEC has drafted a "General Waste Disposal Permit for Fish Hatchery Discharges." ~~This permit would be used by hatcheries in lieu of the state general waste disposal permit, and would become the only waste disposal permit a hatchery operator would need to fulfill both state and federal requirements. Once the state has officially adopted the fish hatchery waste disposal permit, (assuming the final version meets with EPA approval) DEC, rather than EPA, will handle all of the permitting and monitoring of carcass disposal. This centralization and consolidation should simplify the permitting and reporting processes for hatchery operators, ensure more compliance, and improve uniformity in the monitoring and information available.~~

The draft permit contains a provision stating that the permit is effective until a specified date, "unless superseded before that time by state certifi. EPA permit." ~~It appears that DEC anticipates the possibility that the permitting responsibility may again bounce back to the EPA, or that the EPA may provide the direction but leave certification and authority with the State. The draft permit contains specific language regarding discharges, carcass disposal, drugs, chemicals and medications, operational, monitoring and reporting requirements, and so on. (It lacks specific language to address disposal of diseased fish or eggs but other general provisions in the permit, or language in the hatchery operational permits from Fish and Game may sufficiently provide for that circumstance).~~

No. Legally they still need an NPDES permit.

This provides for the possibility that the EPA may choose to require an NPDES permit in the future.

DRAFT ***** DRAFT ***** DRAFT

Despite the lack of clear regulations, permit requirements, and enforcement, there have been very few environmental problems reported regarding hatchery operations in Alaska. Even during the situation that developed in Prince William Sound during the 1991 season when processors would not buy many of the hatchery fish and they had to be dumped, both DEC and EPA report that their agencies worked very closely with the hatcheries to develop and carry out plans for large-scale carcass disposals, and that they went quite smoothly.

guck!
Other environmental issues related to hatcheries are covered in this report in the chapters on Biology and Genetics, Planning and Permitting, and Environmental Mitigation, appear to pose more concerns and questions than these more direct questions of environmental protections such as integrity of anadromous fish streams, water quality, and waste disposal. The Alaska Departments of Fish and Game and Environmental Conservation, and the federal Environmental Protection Agency, generally believe that for these types of environmental protections, current laws are adequate.

Thank you very much for
sending me the draft.

ALASKA STATE LEGISLATURE SENATE

SENATOR RICHARD I. ELIASON

PRESIDENT OF THE SENATE
LABOR & COMMERCE COMMITTEE
RESOURCES COMMITTEE
RULES COMMITTEE
CHAIRMAN, SPECIAL COMMITTEE ON
DOMESTIC & INTERNATIONAL
COMMERCIAL FISHERIES



P.O. BOX 143
SITKA, ALASKA 99835

P.O. BOX V
JUNEAU, ALASKA 99811
(907) 465-4916

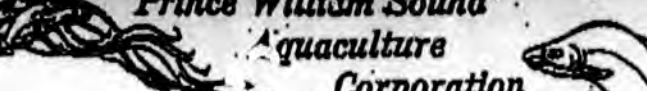
FAX (907) 465-4928

FAX TRANSMITTAL SHEETNUMBER OF PAGES (Including transmittal sheet): 5DATE: 2-3-92TO: Denna HenkinsDECTO FAX: 465-5274FROM: Mary McDowellSen. Eliason's OfficeFROM FAX: 465-4928COMMENTS: Thanks for lookin ver.

If you have any problems receiving this message, please call

Mary in Senator Dick Eliason's office, 465-4916.

P. 177



Prince William Sound
Aquaculture
Corporation

Anchorage
907/274-6066
907-274-1959

A regional not-for-profit organization for the enhancement of salmon.

Anchorage
Phone: 907/274-6066
FAX: 907-274-1959

DATE: 1/30/92
TIME: 2:25pm

RE: _____

Total pages including cover 7. For transmission error, please call sender.

MESSAGE:

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION

STEVE COWPER, GOVERNOR

DIVISION OF ENVIRONMENTAL HEALTH
3601 C STREET, SUITE 1324, ANCHORAGE, ALASKA 99503

(907)563-0318

Dear Seafood Processors:

Wastewater Disposal Permits

During 1984, the Environmental Protection Agency (EPA) implemented its general permit for the National Pollutant Discharge Elimination System (NPDES) program. This program was certified by the State of Alaska, thereby eliminating the requirement of applying for both a State and Federal wastewater disposal permit. Both requirements may be met by submitting a copy of the ADEC Seafood Processors Permit Application to:

Chief of Water Permits
Environmental Protection Agency
Region X
1200 6th Avenue
Seattle, WA 98101

Change of Operation

Changes made to water supplies, waste systems, or other changes which may affect your coastal zone determination must be reported to this office, and may require completion of a Coastal Project Questionnaire.

If you have questions on these or other matters, please feel free to contact me.

Sincerely,



Manuel J. Soares
Environmental Conservation Manager

MJS:k11

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10ALASKA OPERATIONS OFFICE
ROOM 537, FEDERAL BUILDING
222 W. 7TH AVENUE, #19
ANCHORAGE, ALASKA 99513

January 8, 1991

REPLY TO
ATTN OF: AOO/APrince William Sound
Aquaculture Corporation
P.O. Box 1110
Cordova, AK 99574

RE: THE NPDES PERMIT AND DISPOSAL OF FISH WASTE AND CARCASSES

Dear Mr. Suzumoto:

It has come to our attention that there may be confusion regarding the regulations for disposal of fish waste and carcasses. The Clean Water Act (CWA), specifically Section 301(a) of the CWA, 33 U.S.C. Section 1311(a), prohibits the point source discharge of pollutants by any person into waters of the United States, except in compliance with the terms and conditions of a National Pollutant Discharge Elimination System (NPDES) permit issued pursuant to Section 402 of the Act, 33 U.S.C. Section 1342.

The Code of Federal Regulations (CFR) Section 122.3(e) says that discharges from concentrated aquatic animal production facilities as defined in Section 122.24 require NPDES permits. A concentrated aquatic animal production facility produces 9,090 kilograms (about 20,000 pounds) harvest weight per year; and feeds 2,272 kilograms (about 5,000 pounds) of food per month. However, the EPA may designate any production facility as a concentrated aquatic animal facility upon determining that it is a significant contributor of pollution to the waters of the U.S.

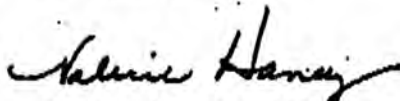
Even if you do not need a NPDES permit based on the guidelines above, you will need one if you plan to dispose of fish carcasses in the water. Fish processors who dispose of greater than 1000 pounds of waste per day may be covered by the "Authorization to Discharge Under the National Pollutant Discharge Elimination System for Alaskan Seafood Processors" general permit (the GP). For the purposes of carcass disposal, the EPA is willing to cover the hatcheries under the GP. This greatly simplifies the administrative process and reduces the timeframe in which a NPDES permit is obtained.

PRINCE WILLIAM
SOUND AQUACULTURE

JAN 11 1990

Most of the hatcheries in Alaska were briefed on NPDES requirements at the 1990 Salmon Hatchery Operators Seminar held in Anchorage last May. Please inform the EPA Alaska Operations Office of your plans for fish waste disposal prior to the 1991 operating season. If you have any questions about your responsibilities contact me in Anchorage at (907) 271-5083.

Sincerely,



Valerie Haney, P.E.
Environmental Engineer

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10ALASKA OPERATIONS OFFICE
ROOM 537, FEDERAL BUILDING
222 W. 7TH AVENUE, #19
ANCHORAGE, ALASKA 99513

April 8, 1991

Copy To:

Jeff Olsen
Eric Prestegard
Phyllis DayREPLY TO
ATTN OF: AOO/ABruce Suzumoto, President
Prince William Sound
Aquaculture Corporation
P.O. Box 1110
Cordova, AK 99574

RE: DUMPING FISH CARCASSES

Dear Mr. Suzumoto:

We have received many responses to our January 8, 1991, letter concerning regulatory requirements for your facility and other similar facilities. These responses have raised a number of issues which we are considering. As resolution of these issues may take some time, we are establishing an interim policy that will allow you to operate and provide adequate environmental protection in this interim period.

Under the interim policy it will be permissible to dispose of whole fish carcasses under the following conditions:

1. The discharge must take place in water at least 50 fathoms deep and which is suitable for dispersing the carcasses.
2. Approval of the discharge site must be obtained from the EPA before the carcasses are dumped.
3. The skipper of the discharge vessel must maintain a log of each discharge occurrence, approximate location and the date of the discharge. An attachment of National Oceanic and Atmospheric Administration (NOAA) chart may be used to identify each dump site.

If you have any questions concerning the foregoing, please call Valerie Haney (271-3651) or Martha Barber (271-5079).

Sincerely,

C. D. Robison, Jr., P.E., Chief
Field Operations SectionPRINCE WILLIAM
SOUND AQUACULTURE

APR 15 1991

Post-It™ brand fax transmittal memo 7671

of pages > (1)

To	Bill Salpe	From	Phyllis
Co.		Co.	PWSAC
Dept.		Phone #	
Fax #	277-8235	Fax #	8-19-91

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10

P.6/7



ALASKA OPERATIONS OFFICE
ROOM 337, FEDERAL BUILDING
222 W. 7TH AVENUE, #19
ANCHORAGE, ALASKA 99513

August 23, 1991

REPLY TO
ATTN OF: AOO/A

Howard Ferren
Planner
Prince William Sound
Aquaculture Corporation
PO Box 1110
Cordova, AK 99574

RE: SALMON CARCASS DISPOSAL PROPOSAL

Dear Mr. Ferren:

We have reviewed your proposed salmon carcass disposal plan for Esther and Cannery Creek Hatcheries, and AFK Hatchery as outlined in your letter of August 23, 1991, and find it to be in accordance with our interim guidance as stated in our letter of April 8, 1991. [Given the unusually high volume of carcasses to be dumped this year we recommend that the dumping occur while the vessel is underway to maximize dispersion.]

This constitutes approval of the disposal sites you indicated. Please maintain the completed Salmon Disposal Logs on-site for at least three years.

If you have questions, please contact Valerie Haney (271-3651) or Martha Barber (271-5079).

Sincerely,

C. D. Robison, Jr., P.E., Chief
Field Operations Section

Post-It [®] brand fax transmittal memo 7671		# of pages > 1
To	Howard Ferren	From
Co.	PWSAC	Co.
Dept.		Phone #
Fax #	424-7514	Fax #
		271-3651
		271-3424

Prince William Sound Aquaculture Corporation

P.O. Box 1110 Cordova, Alaska 99574-1110 Phone (907) 424-7511 FAX (907) 424-7514
821 N St. #101B Anchorage, Alaska 99501-3285 Phone (907) 274-6066 FAX (907) 274-1959



October 1, 1991

Florence Carroll
Environmental Protection Agency
Region 10
1200 Sixth Avenue
Seattle, WA 98101

Dear Ms. Carroll:

At the direction of Valery Haney in Anchorage, enclosed are the daily pink salmon disposal logs for our three hatcheries, a map of the area, and a summary sheet of the daily logs.

21 pages	Wally Noerenberg Hatchery at Esther 8/23/91 through 9/15/91
9 pages	Cannery Creek Hatchery at Unakwik 8/23/91 through 8/26/91
3 pages	Armin Koernig Hatchery at Port San Juan 8/22/91 through 8/23/91

If there are questions on this, please contact our Operations Manager, Jeff Olsen, here in Cordova at 907/424-7511 or fax 424-7514. Thank you.

Sincerely,

Phyllis M. Day
Executive Secretary

pmd

Mary McDowell

Keith Pratt, FRBD Division,
ADF&G Juneau is the
Permit coordinator for
hatcheries in the state.

1-30-92



**U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10**

ALASKA OPERATIONS OFFICE
ROOM 537, FEDERAL BUILDING
222 W. 7TH AVENUE, #19
ANCHORAGE, ALASKA 99513

January 8, 1991

REPLY TO
ATTN OF: AOO/A

Jim Cochran, Manager
Hidden Falls Hatchery
304 Lake Street, Room #103
Sitka, AK 99835-7563

RE: THE NPDES PERMIT AND DISPOSAL OF FISH WASTE AND CARCASSES

Dear Mr. Cochran:

It has come to our attention that there may be confusion regarding the regulations for disposal of fish waste and carcasses. The Clean Water Act (CWA), specifically Section 301(a) of the CWA, 33 U.S.C. Section 1311(a), prohibits the point source discharge of pollutants by any person into waters of the United States, except in compliance with the terms and conditions of a National Pollutant Discharge Elimination System (NPDES) permit issued pursuant to Section 402 of the Act, 33 U.S.C. Section 1342.

The Code of Federal Regulations (CFR) Section 122.3(e) says that discharges from concentrated aquatic animal production facilities as defined in Section 122.24 require NPDES permits. A concentrated aquatic animal production facility produces 9,090 kilograms (about 20,000 pounds) harvest weight per year, and feeds 2,272 kilograms (about 5,000 pounds) of food per month. However, the EPA may designate any production facility as a concentrated aquatic animal facility upon determining that it is a significant contributor of pollution to the waters of the U.S. *calendar month off max feed*

Even if you do not need a NPDES permit based on the guidelines above, you will need one if you plan to dispose of fish carcasses in the water. Fish processors who dispose of greater than 1000 pounds of waste per day may be covered by the "Authorization to Discharge Under the National Pollutant Discharge Elimination System for Alaskan Seafood Processors" general permit (the GP). For the purposes of carcass disposal, the EPA is willing to cover the hatcheries under the GP. This greatly simplifies the administrative process and reduces the time frame in which a NPDES permit is obtained.

OPTIONAL FORM 10 (7-82)

FAX TRANSMITTAL

of pages = 3

To: Mary McDowell	From: Valerie Hancy
Dist. Agency: Senator Eliason's Office	Phone # 465-4916
Fax # 465-4928	Fax #

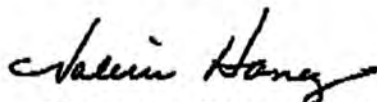
NSN 7540-01-317-7368

5010-107

GENERAL SERVICES ADMINISTRATION

Most of the hatcheries in Alaska were briefed on NPDES requirements at the 1990 Salmon Hatchery Operators Seminar held in Anchorage last May. Please inform the EPA Alaska Operations Office of your plans for fish waste disposal prior to the 1991 operating season. If you have any questions about your responsibilities contact me in Anchorage at (907) 271-5083.

Sincerely,



Valerie Haney, P.E.
Environmental Engineer



U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10

ALASKA OPERATIONS OFFICE
ROOM 537, FEDERAL BUILDING
222 W. 7TH AVENUE, #19
ANCHORAGE, ALASKA 99513

April 8, 1991

REPLY TO: A00/A
ATTN OF:

Darrell Keifer, Manager
Elmendorf Hatchery
716 Steel Street
Anchorage, AK 99501

RE: DUMPING FISH CARCASSES

Dear Mr. Keifer:

We have received many responses to our January 8, 1991, letter concerning regulatory requirements for your facility and other similar facilities. These responses have raised a number of issues which we are considering. As resolution of these issues may take some time, we are establishing an interim policy that will allow you to operate and provide adequate environmental protection in this interim period.

Under the interim policy it will be permissible to dispose of whole fish carcasses under the following conditions:

1. The discharge must take place in water at least 50 fathoms deep and which is suitable for dispersing the carcasses.
2. Approval of the discharge site must be obtained from the EPA before the carcasses are dumped.
3. The skipper of the discharge vessel must maintain a log of each discharge occurrence, approximate location and the date of the discharge. An attachment of National Oceanic and Atmospheric Administration (NOAA) chart may be used to identify each dump site.

If you have any questions concerning the foregoing, please call Valerie Haney (271-3651) or Martha Barber (271-5079).

Sincerely,

A handwritten signature in dark ink, appearing to read "C. D. Robison, Jr.".

C. D. Robison, Jr., P.E., Chief
Field Operations Section

*Identical
letter sent
to all on
attached
addressees
listing.*



DEENA J. HENKINS

CHIEF

WASTEWATER & WATER TREATMENT SECTION

STATE OF ALASKA

DEPARTMENT OF

ENVIRONMENTAL CONSERVATION

PHONE: (907) 465-2853

3220 HOSPITAL DRIVE

MAIL: P.O. BOX 0

JUNEAU, ALASKA 99811-1800

465-5312

413 N. 10th St. DY

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

General Waste Disposal Permit
Fish Hatchery Discharges

PERMIT NO. 9240-DB004

Date: December 18, 1991

This General Waste Disposal permit is issued to persons responsible for the disposal of wastewater from fish hatcheries. This permit covers fish hatcheries that discharge domestic and non-domestic wastewaters to waters of the State.

To be eligible for this permit, the wastewater must be treated in accordance with the requirements in Appendices A, B, and C of this permit prior to the discharge.

The Department will require a person to obtain an individual permit where notification of intent to conduct activities under this general permit is not made; when the disposal does not meet the conditions of this general permit, contributes to pollution, causes an adverse impact on public health or water quality, or a change occurs in the availability of technology or practices for the control or abatement of pollutants contained in the disposal.

This permit is issued under provisions of Alaska Statutes 46.03, the Alaska Administrative Code as amended or revised, and other applicable State laws and regulations.

This permit is effective on issuance and expires January 1, 1997 unless superseded before that time by state certified EPA permit. It may be terminated or modified in accordance with AS 46.03.120.

DRAFT

Date Issued

Michael Menge, Director
Environmental Quality

APPENDIX A - OPERATION

I. NOTICE OF DISPOSAL

- A. Applicants wishing to conduct disposal activities under this permit must submit a Notice of Disposal to the appropriate Regional Office at least thirty (30) days prior to the disposal activity. This notification must be a written notice of intent to operate under this permit. This notification must include the following information:
1. applicant's name, position, company, address, and phone number;
 2. name and address of the owner of the facility, and name and address of the operator of the facility;
 3. topographic map showing the exact location of the facility and the discharge point(s), and the direction and ultimate termination of the flow after discharge;
 4. average and maximum daily flow rates of all discharges;
 5. description of the treatment process of the domestic and non-domestic wastewater that includes a flow schematic;
 6. characteristics of the domestic and non-domestic wastewater;
 7. list of any medications, drugs, disease control chemicals and disinfectants used within the hatchery and discharge to the waters of the State along with the Manufactures Material Data Sheets(MSDSs);
 8. stamped engineering plans for all wastewater discharges.
- B. Applicants must have written approval from the Regional Supervisor of the appropriate Regional Office before conducting disposal activities under this permit. The Department will, in it's discretion, deny use of the permit, or attach conditions to the approval as necessary.

II. SITE OPERATION

- A. Discharging untreated cleaning wastes (e.g., obtained from a vacuum or standpipe bottom drain system) to waters of the State is prohibited.
- B. Sweeping accumulated solids from raceways or ponds to waters of the State is prohibited.

APPENDIX A - OPERATION

- C. Practices, such as removing or raising dam boards in raceways or ponds, which allow accumulated solids to discharge to waters of the State is prohibited.
- D. Cleaning of raceways and/or ponds shall occur on a frequent basis such that accumulation of solids is minimized. Raceways and/or ponds shall be inspected for excessive buildup of solids on a regular basis. Washing or eroding of solids up and over the top of dam boards into water of the State is prohibited.
- E. All operating activities in raceways and/or ponds shall be performed to minimize the disturbance of accumulated solids.
- F. The methods used to remove accumulated solids from a cleaning waste treatment pond (or settling pond) shall be implemented to prevent the unnecessary release of accumulated settled material. The following measures shall be implemented to the extent possible:
 - 1. The water level in the ponds shall be lowered slowly to prevent the escapement of accumulated settled material into waters of the State in amounts or concentrations exceeding applicable limitations.
 - 2. During the removal of material there will be no discharge from the pond into waters of the State in amounts or concentrations exceeding applicable permit limitations.
- G. Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the State.
- H. The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by the permittee only when the operation is necessary to achieve compliance with the conditions of this permit.
- I. There shall be no discharge of floating solids, garbage, grease, foam, oily

APPENDIX A - OPERATION

waste or wastewater containing a visible sheen or which may produce a film, sheen or coloration on surface waters.

- J. The discharge shall not cause contamination of surface or groundwaters, and shall not cause a violation of the Alaska Water Quality Standards (18 AAC 70).
- K. The disposal shall not cause adverse effects on aquatic or terrestrial plant or animal life, their reproduction, or habitat.

III. LIMITATIONS AND MONITORING

- A. Unless otherwise specified in this permit, during the period beginning on the effective date to the expiration date, the Permittee is authorized to discharge in accordance with the following limitations and monitoring requirements below:

APPENDIX A - OPERATION

1. HATCHERY WASTES

Effluent Characteristics	Effluent Limitation		Monitoring Requirements	
			Frequency	Sample Type
	Monthly ave.	Daily max.		
Flow (gpd)			monthly	estimate or meter
Total Suspended Solids (mg/l)	5.0	15.0	monthly worst-case ¹	grab composite
Settleable Solids (ml/l)		0.2	monthly worst-case ¹	grab composite
Turbidity (NTU)				
Ambient			quarterly ²	grab
Marine water		25	monthly worst-case ¹	grab composite
Fresh water	See Footnote ³		monthly worst-case ¹	grab composite
pH (range)	6.5 - 8.5		monthly	grab

¹Samples shall be taken during the "worst-case" times. For discharges from raceways, sampling shall occur during raceway cleaning. For discharges from farm ponds, samples shall be taken during the harvesting (removal) of fish. The TSS and turbidity samples shall consist of at least four grab samples taken at such times which will result in a composite sample representative of the discharge during the cleaning/harvesting. Two (2) settleable solids samples shall be collected during cleaning/harvesting, at least one (1) hour apart.

²Quarterly sampling of ambient receiving water shall be conducted during the first year of coverage under this permit. Samples shall be collected at areas that serve as control stations (ie. unaffected by the discharge). Sample shall be taken at least 2 months apart, and shall be representative of seasonal ambient conditions.

³Shall not exceed 5 NTU above natural conditions when the natural turbidity is 50 NTU or less, and shall not have more than 10% increase in turbidity when the natural condition is more than 50 NTU, not to exceed a maximum increase of 15 NTU. Shall not exceed 5 NTU over natural conditions for all lake waters.

APPENDIX A - OPERATION

2. DOMESTIC WASTES⁴

Effluent Characteristic	Effluent Limitation		Monitoring Requirements	
	Monthly ave.	Daily max.	Frequency	Sample Type
Flow(gpd)	Shall not exceed design capacity		monthly	estimate/ meter
BOD ₅ (mg/l)	30	60	quarterly	grab
Total Suspended Solids(mg/l)	30	60	quarterly	grab
Fecal Coliform(FC/100ml)			monthly	grab
marine water	14	43		
fresh water	20	40		
Chlorine Residual ⁵ (µg/l)	non-detectable ⁶		monthly	grab
pH(range)	6.5 - 8.5		monthly	grab

3. FISH CARCASS DISPOSAL

- a. The discharge must take place in water at least 50 fathoms deep and which is suitable for dispersing the carcasses, waiver of the depth requirement for specific sites may be granted upon written approval of the Regional Supervisor if dispersal is demonstrated to be adequate.

⁴For discharges to surface waters.

⁵For those facilities that disinfect with chlorine.

⁶Based upon amperometric or DPD methods.

APPENDIX A - OPERATION

- b. Approval of the discharge site must be obtained from ADEC before the carcasses are dumped.
 - c. The skipper of the discharge vessel must maintain a log of each discharge occurrence, approximate location and the date of the discharge. An attachment of a National Oceanic and Atmospheric Administration (NOAA) chart may be used to identify each dump site.
- 4. DRUGS, CHEMICALS, MEDICATIONS and Other Products
 - a. The discharge of tri-n-butyl tin is not authorized.
 - b. The discharge of any drugs, chemicals or medications in toxic amounts to waters of the State is prohibited.
 - c. Only drugs, medications and disease control chemicals which are approved for hatchery use by the United States Food and Drug Administration (USFDA) or the United States Environmental Protection Agency (EPA) shall be used. Their use shall comply with the permitted uses and application practices given on the product labels.
 - d. Reporting of usage of such products shall be in accordance with Part IV.B. below.
 - e. Should it be determined that such products are being discharged in toxic amounts, or are having a significant negative impact upon the receiving environment, this permit shall be modified to include appropriate limitations or other requirements.
- B. If the Permittee monitors any effluent characteristic identified in this permit more frequently than required, the results of such monitoring shall be included in the calculation and reporting of the values required in the monitoring report (Part IV.). Such increased frequency shall also be indicated.
- C. Test procedures for the analysis of pollutants shall conform to methods cited in 18 AAC 70.020. The Permittee may substitute alternative methods of monitoring or analysis upon receipt of written approval from the Department.

APPENDIX A - OPERATION

- D. All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, calibration and maintenance of instrumentation, recordings from continuous monitoring instrumentation, and any addition or modification of the facility, shall be retained at the facility for observation by the Department for three years. Upon request from the Department, the Permittee shall submit certified copies of such records.

IV. REPORTING

- A. Monitoring results as required in Part III. shall be summarized each month on the form in Appendix C and submitted to the appropriate regional office no later than the 15th day of the following month. (Refer to Appendix D for the map of the Regional offices.)

Alaska Department of
Environmental Conservation
Northern Regional Office
1001 Noble Street, Suite 350
Fairbanks, Alaska 99701
(907) 452-1714
FAX: 451-2187

Alaska Department of
Environmental Conservation
Southcentral Regional Office
3601 C Street, Suite 1334
Anchorage, Alaska 99503
(907) 563-6529
FAX: 562-4026

Alaska Department of
Environmental Conservation
Southeastern Regional Office
410 Willoughby Ave., Ste #105
Juneau, Alaska 99801
(907) 465-5351
FAX: 465-5362

- B. The permittee shall report any use of medications, drugs, disease control chemicals, and disinfectants. The report shall be summarized each month and submitted with the monthly monitoring reports required in Part IV.A. above, and shall include the following:
1. Person responsible for the administration of the chemicals.
 2. The trade name and purpose of the applied chemical.
 3. Date, time, and pond or raceway being treated or disinfected.
 4. Pond or raceway treatment concentration of the active ingredient, duration of treatment, and amount in gallons or pounds of the chemical used.
 5. Estimate of concentration of active ingredient at the point of discharge to receiving waters.
- C. The permittee shall record and report on the respective monthly report the date(s) of fish harvesting (as appropriate).
- D. The permittee shall record and report on the respective monthly report the date(s) the raceway/settling pond(s) were cleaned (as appropriate).

APPENDIX A - OPERATION

- E. The permittee shall record and report on the respective monthly report the date(s), location(s) and approximate weight of fish carcasses disposed of (as appropriate).
- F. If for any reason the Permittee does not comply with or will be unable to comply with any effluent limitations specified in this permit, the Permittee shall report the noncompliance to the Department within 24 hours of becoming aware of such condition by telephone, telegraph, or in the absence of both, by mail. A written follow-up report shall be submitted to the Department within 10 days of the non-compliance. The report shall contain,
but not be limited to:
 - 1. Times and dates on which the event occurred and, if not corrected, the anticipated time the non-compliance is expected to continue;
 - 2. a detailed description of the event including quantities and types of materials involved;
 - 3. details of any damage to the receiving environment;
 - 4. details of actions taken or to be taken to correct the causes of the event; and
 - 5. details of actions taken or to be taken to correct any damage resulting from the event.
- G. For purposes of this permit, a violation of this permit, or contamination of surface or groundwaters shall be defined as any of the following:
 - 1. Discharging waste other than authorized.
 - 2. Discharging waste to an area other than authorized.
 - 3. Surface or groundwater levels exceeding levels specified in 18 AAC 70 (Water Quality Standards).
- H. Termination of activities under this general permit. The Department will, in its discretion, require a person with a general permit to apply for an individual permit when situations including, but not limited to, the following occur:

APPENDIX A - OPERATION

1. the disposal does not meet the conditions of the general permit;
2. the disposal contributes to pollution or causes an adverse impact on public health or water quality; or
3. a change occurs in the availability of technology or practices for the control or abatement of pollution contained in the disposal.

APPENDIX B - GENERAL CONDITIONS

I. Access and Inspection

The department's representatives shall be allowed access to the permittee's facilities to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit and State laws and regulations.

II. Availability of Records

Except for information related to confidential processes or methods of manufacture, all application materials and records and reports submitted in accordance with the terms of this permit shall be available for public inspection at the department's Southcentral Regional Office.

III. Location of Permit and Application

The permittee shall maintain a copy of this permit and facility plans at the disposal facility or, if that is not feasible, at there permittee's or operator's place of business.

IV. Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance, whether or not such noncompliance is due to factors beyond his control, including but not limited to accidents, equipment breakdowns, or labor dispute.

V. Adverse Impacts

The permittee shall take all necessary means to minimize any adverse impact to the receiving waters or lands resulting from a violation or noncompliance with any limitations specified in this permit, including any additional monitoring needed to determine the nature and impact of the activity in noncompliance. The permittee shall clean-up and restore all areas adversely impacted by the noncompliance.

VI. Cultural or Paleontological Resources

Should cultural or paleontological resources be discovered as a result of this activity, work which would disturb such resources are to be stopped, and the Office of History and Archaeology, Division of Parks and Outdoor Recreation, Department of Natural Resources, is to be notified immediately (907)561-2020.

VII. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, nor does it authorize any damage to private property.

APPENDIX B - GENERAL CONDITIONS

VIII. Modifications or Changes

Any alteration, installation, expansion or modification to the facility must have written approval of the plans by the Department prior to construction. Proposed plans must be submitted for review at least 30 days prior to implementation of such changes.

IX. Applications for Permit Renewal, Amendment or Plan Approval

Application for a renewal of or amendment to a permit will be treated in the same manner as the initial application, except that public notice or hearing will not be required for applications for renewal or amendment. Application for renewal or amendment or plan approval must be made no later than 30 days before the expiration of the permit or the planned effective date of the amendment or change.

X. Transfers

Should operation of the facility be contracted or a change in contractors be made, the new contractor shall be notified of the existence of the permit and its conditions. A copy of the request shall be forwarded to the Regional Supervisor of the appropriate Regional Office listed below.

XI. Termination

This permit terminates upon the expiration date. The department has the authority to terminate a permit upon 30 days written notice if the department finds that there has been a violation of the conditions of the permit.

DISCHARGE MONITORING REPORT - HATCHERY WASTES

Permittee Name/Address

Monitoring Period

Name: _____
 Address: _____

From: ____/____/____
 Yr. Mo. Day
 To: ____/____/____
 Yr. Mo. Day

Location: _____

PARAMETER		CONCENTRATION			UNITS	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		MINIMUM	AVERAGE	MAXIMUM			
Flow	Sample Measurement				gpd	monthly	estimate or meter
	Permit Requirement						
Total Suspended Solids	Sample Measurement				mg/l	monthly	grab
	Permit Requirement		5.0	15.0			
Settleable Solids	Sample Measurement				ml/l	monthly	grab
	Permit Requirement			0.2			
Turbidity Ambient	Sample Measurement				NTU	quarterly	grab
	Permit Requirement						
Turbidity Marine Water	Sample Measurement				NTU	monthly	grab
	Permit Requirement			25			
Turbidity Fresh Water	Sample Measurement				NTU	monthly	grab
	Permit Requirement	See Appendix A	See Appendix A	5 above			
pH	Sample Measurement				std.	monthly	grab
	Permit Requirement	6.5		8.5			
	Sample Measurement						
	Permit Requirement						

Comment and Explanation of any violation:

Type or Print Name and Title of Principal Executive or Authorized Agent:

DATE:

SIGNATURE:

DISCHARGE MONITORING REPORT - HATCHERY WASTES
WORST CASE MONITORING

PARAMETER		CONCENTRATION			UNITS	FREQUENCY OF ANALYSIS	SAMPLE TYPE			
		MINIMUM	AVERAGE	MAXIMUM						
Total Suspended Solids	Sample Measurement				mg/l	worst-case	composite			
	Permit Requirement		5.0	15.0						
Settleable Solids	Sample Measurement				ml/l	worst-case	composite			
	Permit Requirement			0.2						
Turbidity Marine Water	Sample Measurement				NTU	worst-case	composite			
	Permit Requirement			25						
Turbidity Fresh Water	Sample Measurement				NTU	worst-case	composite			
	Permit Requirement	See Appendix A	See Appendix A	5 above						
	Sample Measurement									
	Permit Requirement									
	Sample Measurement									
	Permit Requirement									
	Sample Measurement									
	Permit Requirement									
	Sample Measurement									
	Permit Requirement									
Comment and Explanation of any violation:										
Type or Print Name and Title of Principal Executive or Authorized Agent:										
DATE:				SIGNATURE:						

DISCHARGE MONITORING REPORT - DOMESTIC WASTES

PARAMETER		CONCENTRATION			UNITS	FREQUENCY OF ANALYSIS	SAMPLE TYPE
		MINIMUM	AVERAGE	MAXIMUM			
Flow	Sample Measurement				gpd	monthly	estimate or meter
	Permit Requirement			Design			
BOD ₅	Sample Measurement				mg/l	monthly	grab
	Permit Requirement		30	60			
Total Suspended Solids	Sample Measurement				mg/l	monthly	grab
	Permit Requirement		30	60			
Fecal Coliforms Marine Water	Sample Measurement				FC/ 100ml	monthly	grab
	Permit Requirement		14	43			
Fecal Coliforms Fresh Water	Sample Measurement				FC/ 100ml	monthly	grab
	Permit Requirement		20	40			
pH	Sample Measurement				std.	monthly	grab
	Permit Requirement	6.5		8.5			
Chlorine Residual	Sample Measurement				µg/l	monthly	grab
	Permit Requirement	non-detect	See Appendix A	non-detect			
	Sample Measurement						
	Permit Requirement						

Comment and Explanation of any violation:

Type or Print Name and Title of Principal Executive or Authorized Agent:

DATE:

SIGNATURE:

DEC

Manny Soares
349-7343

Ruling

Broodstock cannot
be canned



Alaska State Senate
Office of the President
Senator Richard I. Eliason, President

~~DEC~~
~~DEC~~
Whether hatchery broodstock
is "wholesome" & should
be sold as human food
2696 DEC

Canned Salmon
Control Plan
1990

FDA & DEC

S.E. Reg. Office

DEC - Water Quality Management Section 2653
Wastewater & Water Treatment " 2656

How do water quality standards come
in to play in hatcheries?

Siting
Operation

Deena
Hankins
5312

Effluents

- hatchery discharges
waste disposal permit
required

AS 46.03.100

Need permit for water effluents

& carcass dumping

Water quality standards

mixing zones may be ~~required~~
allowed

Occasionally use chemicals for disease
prevention

DEC doesn't

General Wastewater permit for hatcheries
being considered

Hatcheries ~~usually~~ may need Fed EPA permits but
so DEC being contacted

Few if any under permit now

Only at Elmendorf -

Coastal ones not a problem

but if done easily w/ gen. permit
may do that

Also 5AAC 41.080 Reporting & Control of Fish Diseases at
Egg-take sites, hatcheries & nearby facilities - refers to dangers to
fish in hatchery effluent areas p. 508 in AAC

Carcus dumping -
DEC wants w/hatcheries to find acceptable
a place to dump 19 carcasses

Solid waste permits - but one permit
can cover solid & water

Robert Dolen -
DEC Anch. office

Diseased carcasses
Crystal Lake hatch. in Petersburg.

AS 16.10.010 A person may not
(1) obstruct, divert or pollute waters of the
state, either fresh or salt, utilized
by salmon in the propagation of the species
be felling trees or timber in those waters,
casting, passing, throwing or dumping any
tree limbs or foliage, underline....

p. 73

THE DAY OF THE

TRIPLLOIDS

by LAINE WELCH



JUST WHEN YOU THOUGHT IT WAS SAFE TO DRAG A HERRING BEHIND YOUR BOAT, GENETIC ENGINEERS GET A HOLD OF A FEW KING SALMON EGGS, SCRAMBLE THEIR CODING AND CREATE A RACE OF STERILE SUPER FISH.

NOW YOU'RE ALONE ON THE OCEAN, SURROUNDED BY GIANT KING SALMON WITH ONLY ONE THING ON THEIR MINDS. THAT'S RIGHT, AN ENTIRE RACE OF NO-NOOKIE CHINOOKIE WITH NOTHING BETTER TO NIBBLE ON THAN YOUR BAIT, YOUR ARM, OR MAYBE YOUR TRANSOM.

READ ON IF YOU DARE...

CONTINUED ON PAGE 50



Triploid King Salmon

Genetic Engineers Seek Huge Sexless Chinook

The one that got away may be getting bigger

Molecular biologists in Alaska are in the process of creating king salmon that could top the scales at more than 100 pounds. The end

product of a genetic research project underway in Ketchikan is expected to be "steers of the sea"—sterile fish that put their growth into meat rather than egg or milk production.

Since 1989, fish culturists at Ketchikan's Deer Mountain Hatchery have been genetically altering king salmon using a remarkably simple heat-shock method, immersing normally fertilized eggs in warm water for about 10 minutes. The result is a "triploid fish"—one with three sets of chromosomes, rather than the normal two sets (diploids). These sterile salmon will not become sexually mature and then die, as with the diploid fish. ADF&G geneticist Jim Seeb said the genetic altering doesn't trigger some abnormal growth mechanism that makes the fish grow larger. They simply live longer.

About 15 years ago, British scientists discovered that some fish are naturally triploid. Different groups then began trying to find out how to control the process for use in a burgeoning rainbow trout net-pen industry, and the simple

heat shock method worked best. The technology is now applied primarily in private fish farms. The experimentation in Alaska is the only state-sponsored program in the world, and is regarded as "very innovative" by genetic scientists.

When the research started in Alaska three years ago, the initial interest was in producing triploidized rainbow trout for sportfisheries in landlocked lakes, primarily around Anchorage. "Fish culturists were finding that when they produced normal diploid fish, they would sexually mature and drop out of the fishery often before they were caught," said Seeb. "That resulted in them creating more fish than seemed necessary. So they decided to try and make sterile triploids to see if it improved the return to the creel."

The hypothesis being tested at Deer Mountain Hatchery is that the sterilized king salmon won't home in to Ketchikan Creek, but will mill around and contribute to Southeast troll fisheries for five to seven years. That's what happened around Vancouver Island, where sterilized coho were released along with normal fertile fish. The normal ones migrated out to sea before homing in on the hatchery, but the sterile silvers simply swam around the island. They were taken by trollers for six to seven years. The "normal" fish died at three to four years. The triploids also weighed

five to ten pounds more than the fertile coho.

Seeb said the Canadian government is now considering a requirement that net-pen farmers sterilize their Atlantic and chinook salmon, so they won't genetically disrupt wild stocks if they escape. "People are concerned about Atlantic salmon becoming reproductively active up and down the coast," Seeb explained, noting as many as five Atlantics were caught in troll fisheries in Southeast Alaska this year.

It may turn out that Ketchikan kings will return to their native streams, but they won't spawn when they get there. "In that case the hatchery could harvest and sell the fish," said Carol Denton, ADF&G biologist in charge of the Deer Mountain project. "And they'd be very valuable because they won't darken like salmon preparing to spawn," she added.

Since it's likely the triploids will grow to above-average sizes, economies of coastal communities could get a boost from increased numbers of sportfishermen looking to catch trophy kings. Commercial trollers would benefit financially as well, bringing aboard colossal chinook salmon.

Does this mean we're headed for the brave new world of Dr. Frankenfish? Not yet. Jim Seeb stressed that Alaska fishermen needn't fear that genetic engineering is being embraced by ADF&G

for widespread use. And though the technology appears promising, he said biologists are very aware of some potential disadvantages arising from genetically altered fish.

"When it comes to releasing triploids into the wild, we're concerned that the sterile fish—especially the males—might accidentally return to streams and try to spawn with females, and the progeny of such a mating wouldn't live. The sterile males might disrupt wild spawning that way. So we're very concerned and very much aware of that potential pitfall. That's why the work at Deer Mountain is being done under such controlled conditions," Seeb said.

Carol Denton agreed. "If a triploid fish returns to its native stream and exhibits mating behavior that disrupts natural stocks, that's a detriment and we'll be watching for that very carefully," she added. "That would mean the technology won't be used in Alaska." The biologists said they'll need at least two more years of data before they draw any conclusions.

As many as 75 of the 15,000 kings released from the Deer Mountain hatchery in 1989 might have returned in 1991. Although data were still being analyzed, Denton said five fish with the triploid wire tag code had been identified by late December. The majority of the genetically altered fish are expected to return this summer. □

Future Bright for Sitka Urchins

But don't tell the sea otters

by Laine Welch

Fishermen, processors and ADF&G biologists in Sitka are prospecting on an urchin fishery and it's already paying off. Sitka ADF&G received funding in 1991 to develop



Sitka's urchin fishery begins this spring. (Photo by Kris Freeman.)

an urchin fishery management plan for Southeast Alaska. The money—\$18,000 per year for four years—was

awarded by the Pacific States Marine Fisheries Commission.

Sitka was chosen for the funds because the viability of a red urchin fishery was shown there last year when divers took 220,000 good quality sea urchins through the fall and winter. "The market is there and the divers are there," said ADF&G biologist and diver Bill Davidson.

Assessment of urchin populations was underway to help fishery managers determine harvest levels in Sitka Sound. Unlike most other areas where seasons start in the fall and continue into the winter, Sitka's urchin fishery will begin in the spring. "We noticed last year that although the roe quality was good in the winter, it appeared to improve in late March and early April," Davidson explained.

But once the fishery is underway, biologists believe it won't be effort by fishermen that poses the man-

agement problem; it'll be the appetites of otters.

"The predators in this case don't observe things like size limits or seasons or any kind of restriction on their harvest," he added with a wry laugh. "As a result, they do change the entire environmental community structure."

Biologists agree that developing a sea urchin fishery will provide a unique opportunity to observe otter behavior. But they say long-term prognosis for urchins and abalone on outer coastal areas of Southeast Alaska is not good.

Otters are called a "keystone predator" and eat 25 percent of their body weight each day. "When they come into an area, they target first on urchins, abalone and crab," said Davidson. "Then they eat the clams. As food supplies dwindle, the otters move on and set up housekeeping elsewhere."

However, ADF&G biologists

remain undaunted in their efforts to develop plans for annual sea urchin harvests throughout Southeast Alaska. "If funding becomes available, we believe we can expand the fisheries and have some good, sustained harvests before the otters take over," Davidson said.

"It's got the potential to be a fairly sizable fishery in Southeast and elsewhere in Alaska," he added. "People would like to harvest and market this resource and make a living from it whenever it's available."

Sea urchins of all colors—red, green and purple—make up an industry that's become increasingly important to many other areas. Urchins are now California's largest inshore fishery, worth more than \$25 million two years ago. Smaller fisheries are bringing \$2 million to British Columbia and \$3 million to Washington. State harvests in Maine are now worth nearly \$7 million. □



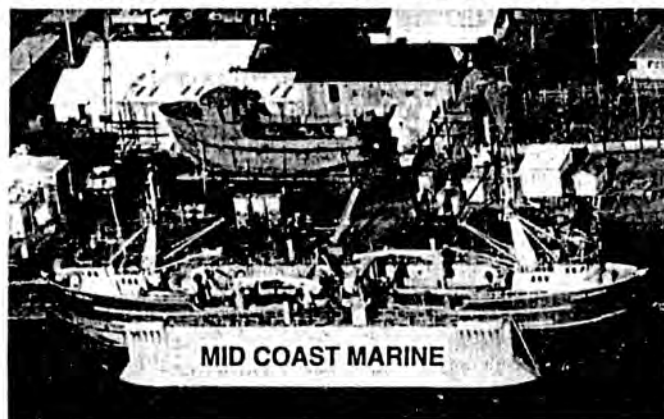
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Hagfish

A slimy nightmare or a dream come true?

by Kerry Beebe

The hagfish is one of the most primitive creatures on earth today. It also touches the most primitive sense of fear and loathing in most humans who come into contact with it. For those people who can stomach catching and processing the eel-like rasp-toothed bottom dweller, just about all the parts are usable, although a few glitches have yet to be worked out in holding them and marketing everything from their skin to their slime.

A hagfish is a jawless fish without bone. Cartilage gives it a structure somewhat like a snake. And

ington Sea Grant in Bellingham, the buyers are located in Korea and mainland China. Melvin says, "The product was frozen and then it disappeared. We'd get feedback from mysterious sources or sources they could not verify that the product was not very good. And the pricing structure came from these distant folks who you couldn't communicate with."

Since then, one Korean tanner/processor has established itself in Washington state with ties to mainland China. But Melvin says that, too, is having its start-up problems as O-

Yang International tries to get some consistent suppliers. Unlike the booming hagfish industry in California—where fishermen are expected to land three million pounds this year—Washington and Alaska are slow to get going. But that may benefit fishermen and processors in the end. Alaska marine advisory agent Brian Paust says it's more likely to be a stable industry if it grows incrementally. But the eel and hagfish skin markets appear to be maintaining their strength in the yuppie markets. However, he says, people have reported seeing them on "seconds" shelves at recent clothing shows, and wholesale prices continue to fluctuate.

In trying to get the best quality skin, however, the meat of the hagfish is mostly being wasted. In harvesting, it's taken several years to come up with what for now is the best way to kill hagfish and keep them from ruining each other's skin. When the fish become agitated they bite each other. Cutting off the heads has proved unsuccessful.

Dick Bishop with Silver Lining Seafoods in Ketchikan says fishermen that deliver to them usually have the creatures in slush ice, which slows them down. When they used to cut the heads off, the hags produced large quantities of slime, making a huge mess for everyone concerned. Bishop says boat crews and people on the dock get sick and quit on the spot.

The key, he says, is dumping the hagfish into the slush ice with their heads on... but adding a sedative to the slush. One drug that is widely used is MS-222, under the trade name Finquel. Unfortunately, the drug taints the meat, making it inedible, and at least for the Pacific hagfish, the MD-222 had little effect.

There is one other method that is just beginning to be used instead of the drugs. Marine advisory agent Brian Paust says CO₂ is proving effective. The gas is pumped into the

slush ice, killing the hagfish without any negative effect on the meat.

But there is still one glitch. Paust says a couple of years ago, when the processors attempted to market hagfish meat in Korea, they were told the meat was barred from importation. Paust says, "The American Embassy looked into the problem and found there in fact were no laws in place that addressed the banning, although there were quotas for importation established. It was never quite figured out."

Ed Melvin says the motivation for the restriction remains a mystery. "It's unclear if these laws are protectionistic or a manifestation of health concerns from anesthetic-tainted meat."

Melvin says processors in the U.S. are working to establish domestic markets in urban centers where large ethnic populations are found. And the U.S. government continues to work on the Koreans.

Silver Lining's Dick Bishop had his own thoughts about the snake-like meat. He says, "I tried cooking it, but it smelled so bad I just threw it away."

And then there is the essence of the hagfish: its slime. Melvin says a few agitated slime eels in a five-gallon bucket can fill it with the slime that exudes from the 30 or so pores along each side of its abdomen. Even the slime, he says, has its benefits. Researchers written up in *Science and Technology* magazine have been studying the ooze of hagfish. Melvin says, "They have determined that hagfish slime contains a number of biopolymers... materials you can use for a whole bunch of applications, such as emulsifiers, moisturizers, thickeners, lubricants and even fabrics. Purified components can modulate the release of drugs in the human circulatory system."

While the hagfish is disgusting, no doubt, it obviously has many uses. But like many other emerging fisheries, little is documented about the species. What researchers do know is the reproductive cycle appears to be very slow, and no one seems to know what role they play in the ecosystem of the ocean bottom.

Melvin says the females lay up to 30 eggs, probably just once a year. But so far it's unclear where they go once hatched. He says they can't find them.

For now the hagfish is not being overly exploited along the Northwest coast, but that may be just a temporary circumstance of market instability. Hagfish populations in the eastern Pacific have been heavily harvested. Hence, the interest in West Coast fisheries. And for now, California is the major supplier. Nevertheless, a lot more research needs to be done on the hagfish before biologists can get a handle on the new fishery. □

It Starts With a Bang

by Ron Rau

Yawn

Is it 1992 already? Don't let me kid you, I know it is. 1992 descended with a bang on Sitka. Six of them; the last came about midnight; I counted them. I saw one. I had gone out on the porch for more firewood just after dark and was treated to a powerful flash of lightning which illuminated the house trailer next to ours bright enough that I could see the inch-wide gap in the plywood cover I always wonder why he doesn't fix. And shadows. I have a vivid image in my mind of white light and shadows. It lasted a long time, too long enough that I remember thinking: *this is like the springtime Michigan lightning I grew up with.*

With a bunch of wood cradled in my arm I stood and waited for the report. It was quite something. It started a long ways away, came closer, got louder, and like a bowling ball crashing into the headpin, broke all around me and then kept going, farther away, finally echoing with another crash off the mountains above town. It was very satisfying.

To be form, it was not three minutes later that the hail started. I have seen enough winter lightning in Sitka now that I can tell you it is always followed by hail. You can count on it. I went out on the porch again after piling the firewood inside and enjoyed the hailstones.

Our two cats didn't, but perhaps they know something I don't.

But this is logical, isn't it? Hail following winter thunder in a place as far north as Sitka? What's happening is a mass of cold air moving onshore across a warmer ocean and then when it hits land you get all kinds of convective movement with warm vs. cold and then BOOOOM! It's too cold to rain so it hails.

There were six long thunderclaps the night of January 1 in Sitka; I tallied and enjoyed every one. Longer and louder than any I have heard in nearly 10 years. Six hail storms, too. Was it humpies already massing for next summer's run? Don't laugh, it's an election year. But then, what are humpies worth these days? The last laugh is on us.

That night on the TV they had footage of snow in Israel, six inches of it. Jordan got 18 inches. I mean, are we messing with the ozone or what? Old timers tell me they never heard thunder in Sitka in the old days.

They never had IFQs either. □



Hagfish bikini? (Washington Sea Grant photo.)

while not much is known about the hag, there are some 32 species known to exist, most between 18 and 28 inches long. Only two of those are targeted along the West Coast. The Pacific hagfish is brown to gray and is found from California up into British Columbia. The black hagfish dwells in deeper water and farther north into Alaska.

Initially the hagfish was harvested for its skin, which is similar enough to eel that it is often marketed as eel. Right now there seems to be more of a market for the Pacific hagfish because of its lighter color, which can be dyed and made into anything from wallets to bikinis. But harvesters continue to have some trouble with markets because of communication problems with distant buyers. According to Ed Melvin of Wash-

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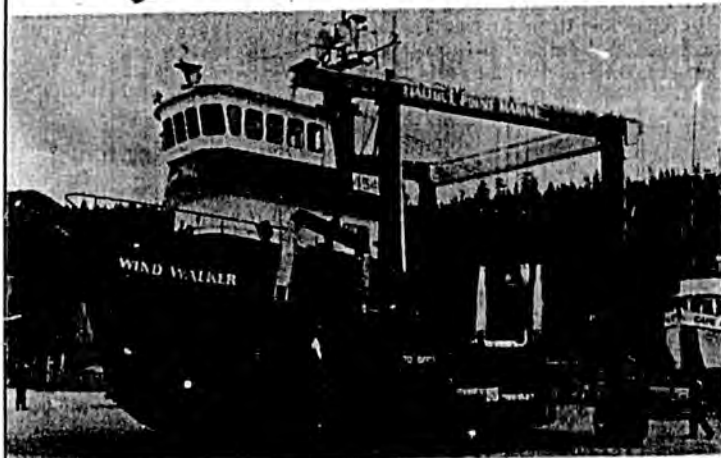
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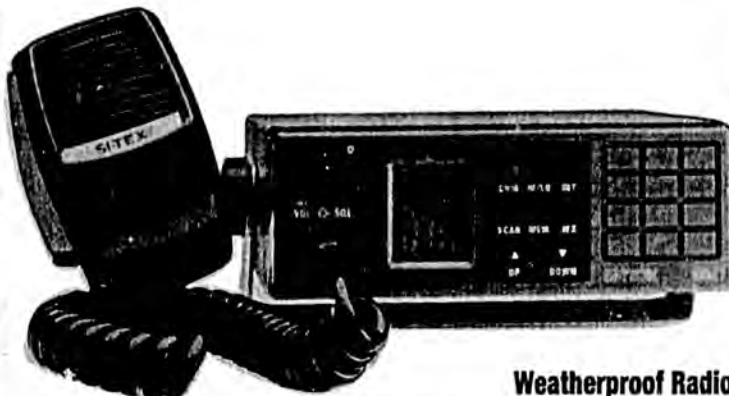


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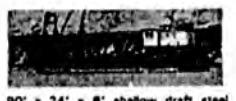
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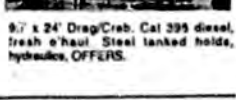
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F/V "Lenor," 45' wood troller/longliner. 671 GMC. Furuno electronics. Large deck and hold. 4 bunks. Good seaworthy workboat. \$30,000. (907) 747-6234, P.O. Box 1536, Sitka, AK 99835.

02-01-1992 BS GLTS34-1



F/V Northern Star 32'x12' alum. bowpicker built 1990 J&H boat. Powered by twin Mercs 636d diesel w/Bravo outdrives. Cruise 23 knots. Exceptional electric package & interior layout, custom. Too many features to list. Changing fisheries, priced to sell. Call (503) 325-3943.

04-01-1992 BS GDRP77-1



32' Wegley gillnetter 1974 F/G, 32'x11'x4', 4-53 GM diesel, alum. gn/ll drum, levelwind, twister drum drive, VHF, CB, paper recorder, digital fathometer, Wood Freeman w/remote, hyd. anchor winch, misc. gear. \$38,000. (206) 468-3170.

02-01-1992 BS GNN093-1



F/V "I Gotta," 37'x11'x6' custom fiberglass troller. 453 GMC, hydraulic steering, tanked, top of the line troll rigging & electronics, hot & cold shower. Priced below survey at \$90,000. Power troll permit available. (907) 747-6743.

03-01-1992 BS GNN008-1



"Donna Lea" 32'x13' fiberglass, 1980 Nordic, 671, complete electronics, hydraulics, Kvichak drum, bridge, good packer, extras, ready to go, at Naknek. \$85,000. (206) 252-6449 or write Dept. 292-AFJ-1, 1115 NW 46th St., Seattle, WA 98107.

02-01-1992 BS GNN061-1



1989 37' Roberts gillnet/halibut combination. 375hp Cat, 3,700 hrs, 16 knot cruise. 2kW Inverter microwave, toaster, full rigging and electronics, 3 tanked insulated hatches, 14,000# cap. Lead thrower, levelwind. Yacht-like condition. (907) 886-6966.

04-01-1992 BS GNNF13-1



31' Roberts gillnet and long line. 6354 Perkins diesel, 3 well insulated slush tanks, cap. 7,000 lbs. Flasher, color sounder, VHF, autopilot, Furuno radar. Longline puller, roller, 12 large tubs of halibut gear. Spare prop, starter etc. Dependable workhorse in very good shape. Located Ketchikan. \$37,500. (206) 592-5573.

03-01-1992 BS GNN002-1



F/V "Linda Lee," 1985 32' fiberglass gillnet. Insulated tanked hold. 130hp 6-354 Perkins. New alum. fuel tanks, deck, batteries, and starter. (206) 789-5101.

04-01-1992 BS GOAM05-1



F/V "Bessie B." 54'x14' seiner/longliner. Great condition. \$85,000. (206) 672-7969.

02-01-1992 BS GNTM05-1

BELLHAVEN

83' Excursion Ship
1948, fir/oak/brnz, Boston Mfyd. Lic
110 Psg, twin GM 871 \$165,000

75' Steel Tug
1949, 600 HP Enterprise, 2100 GHP,
tire pumps, Lister aux \$150,000

67' Seiner/Dragger/Tender
1949, Breskovich bit, Cat D353, 4:1,
2 gen, electronics, False Pass/PS
gear, Skiff w/ 6-71 \$425,000

50' Seiner/Combination
1941, Tacoma bit, fir/oak/galv,
aluminum bulwarks, house, GM 671
30,000# glassed hold \$12,500

41' Troller
1963 Peterson Bit, cedar/oak/moel,
GM 471, electronics \$50,000

40' Modutech Gillnet/Herring
1977, FG, 2 Volvo TAMO 71A's,
electronics, 10,000# hold \$94,500

35' LeClerq Gillnetter
1971, fir/oak/galv, GM 6V-J3N, nets,
electronics, Permit \$47,500

32' Bryant Gillnet/Combination
1961 cedar/oak/galv, 350 Chrysler,
PWC, packs 16,000# \$10,900

28' Hudson Bowpicker
1966, FG, 2 190's Merc 10, 4 nets,
electronics, PS permit \$49,950

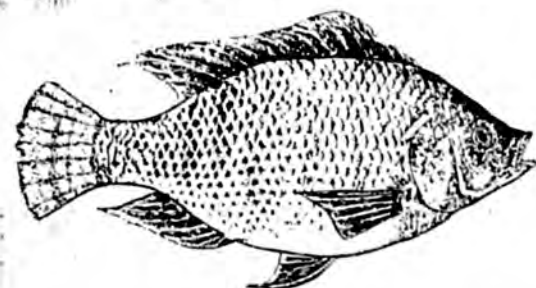
27' Neptune
Bowpicker/Combination
1991, Volvo 270 HP w/ 60 hrs, good
diver, utility, fish, etc. \$39,500

24' Sleek Craft BowPicker
1980, Fiberglass/Aluminum, 350
Chev, trailer, drum, nets, etc. \$18,000

19' Bombard Inflatable
1980, C-20, floorboards, 140 HP
Evinrude (\$3,500 w/out engine) \$6,000

32' Gillnetter
1970, Anacortes bit, phy/g, Isuzu,
electronics, 3 nets, PS Permit \$55,000

#9 Squalicum Mall
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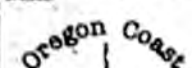


50'x14' built by Seattle Shipyard in 1952. This vessel is extremely well-built with 1-58" AK cedar planking. 6-71 Gray diesel (rebuild 1985). Mercedes 4 cyl. aux., 1,200 gal. fuel, 450 gal. water. 10-ton welded hold w/hold freeze. Great electronics, full galley, head w/shower, sleeps 8. Cat/Dex. troll permits. Has all crab equipment & much more! \$85,000, or \$100,000 w/hold gear and 300 pots. A great buy. This boat is in wonderful shape.



54'x13.8' plank dragger. V8-92 TA GMC, full elect., all hyd. & electronics replaced or rebuilt since 1986. All deliveries for "A Class" permits. 1,200 gal. fuel, 10 tons, head/shower. Cash/Trade/Fin? Call for full details.

Fish and/or pleasure boat. 34' fiberglass troller w/lybridge. Excellent liveaboard Spectra trailer with all amenities. Cat. troll permit, rigged for salmon, hyd. anchor winch. A definite "must see" \$75,000.



Charleston (503) 888-3686



44'x13.1' plank troller w/lybridge. Rigged for salmon & tuna. 220 Cummins, full electronics, roller, coil, 3-station console. Cat. troll permit. A definite turn-key operation. \$47,500.



48' Carvel plank troller/lybridge/longliner. 6-71 Gray when new 2.95:1 gears. Price includes all tuna, longline, blackhead and salmon gear, and a crab block. Ore., Wa. and Cal. halibut permits. Qualifies for both Oregon groundfish permits and Alaska halibut permits. Full elect. Two month to test-call for full details. \$91,500.

40'x12' 8' plank troller w/lybridge, built 1940 by Genoa Shipyard. V8-53 GM (rebuild), RSW, full galv, w/c electronics. New hyd. steering. Salmon gear, tuna pulley. Cat. troll permit. This boat is immaculate! \$39,500.

Special! 55' 10'x17' stern dragger. Mark design hull w/lybridge, built 1979 by Van Fleet. 4,500 gal. fuel, 800 gal. water. RT 1150 Cummins, 16 knots. Riser, full elect., John Deere 300W generator. This boat is in top-notch condition, except clean inside and out, see inside more to test. Call for survey.

52'x13' Carvel plank troller/lybridge w/lybridge. 6-71 GMC diesel w/10:1:1 gear. 1,200 gal. fuel, 300 gal. water. 18 tons product. Full elect. & Ore./Cal. and permits. New fished Alaska. \$80,000.

Alaska

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- Vessel Sales
- Loan Assistance

Bristol Bay Drift	\$175,000
Cook Inlet Drift	\$92,000
False Pass Drift	\$335,000
Kodiak Salmon Seine	\$80,000
Kodiak Herring Gillnet	\$31,000
P.W.S. Salmon Drift	\$92,000
P.W.S. Salmon Seine	\$115,000
32' 1965 Matumato Gill/Longline 454 Chev	\$39,500
37' 1976 Russian Marine Gill/Longline Lugger 6144L	\$60,000
40' 1981 Modutech Seiner Volvo TAMO-700	\$124,000
53' 1979 Little Hoquiam Charter Twin Detroit	\$193,500

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42' LeClerq w/Top House \$210,000

48' Delta w/RSW

50' Westport 1990 \$215,000

50' Troller w/RSW \$350,000

52' w/RSW \$350,000

62' Lander \$450,000

Many other vessels available

PERMITS	
Kodiak Salmon Seine	\$75,000
Cook Inlet Drift	\$92,000
Bristol Bay Drift Packages	\$165-\$280,000
Kodiak Herring Gillnet	\$30,000
Kodiak Herring Seine	\$75,000
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S.E. Power Troll	\$40,000
S.E. Salmon Seine	\$75,000

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BOATS FOR SALE



43'x13'5" FG gillnetter or combination. Rawson hull. 3160 Cat. 25,000# tanked hold. Complete electronics. Sleeps 3 or 4. \$115,000. (907) 874-3168.

02-01-1992 BS FCKK38-3

Marco 19' seine skiff with GMC 653 engine. Keith, (206) 545-8485.

03-01-1992 BS FCSK12-4



Be versatile, fast. Dive/gillnet/troll, 1987 32' Radon. Twin Mercs. Rock bottom winter price. \$29,995. Send for video. (206) 757-2854.

02-01-1992 BS FEOL35-3

36' troller/longliner, blt '37. Port Orford cedar, GM 3-71, glassed hold, longline drum, Kolstrand gurdies. Vessel qualifies for Limited Entry permit under present plan. Must sell. (206) 692-5776.

03-01-1992 BS FBOJ46-2



55' wood longline/troller. Super live aboard. A must see. \$69,000. Located Sitka. (907) 747-4090 or (503) 928-9856.

03-01-1992 BS FGJ42-1

FV "Sylvia B." 32' x 12' alum bowpicker built Dec 1989. Fast and efficient 350 Chev (Mercruiser) stern power outdrive. 20" wheel, 35 mph, packs 24 tons, reel, herring shaker, power bow roller, Silex fishmeter, VHF. \$50,000 obo. Call (415) 345-9019.

03-01-1992 BS GAXN56-1



62' tender "Chilkat" - 68,000 lb. slush tank with 3-inch circulating pump, 3 booms and complete deck gear for tendering. 8V71 main, 9-1/2 to 10 Kmts. 20KW genset; large deck for fish, totes, pump, crab pots etc. Fish hold enlargement to 80,000+ lbs. Presently tendering Puget Sound. For sale at any time. \$175,000. Home phone (206) 659-8240. Message phone, ask for Butch (206) 734-8384.

04-01-1992 BS FGK67-3



58'x 18'x 8.5' Jul-e, Monk design, steel GM 892TA, twin disk 514-461, 20KW Isuzu, sodium wick lights. Hydraulic steering. Plumbed for insert tank, 3000 fuel, 500 water, two radars, sonar, plotter, paper and color sounders. SSB, two VHF, SCB, 7-91 survey. \$210,000. Crab tank included. (503) 265-6065.

05-01-1992 BS FIDL24-1



Must sell 30'x11.3' f/g bow picker blt. 1985 by Beck. Full electronics, new in '91, GMC 8.2 liter diesel turbocharged twin disc 1.5-1 gear. Stainless steel shaft, good condition, survey \$70,000, asking \$50,000. Will consider any offer. (907) 789-0670.

03-01-1992 BS FJPP06-2

CALL OR WRITE FOR OUR FREE CATALOG!

20 SE DRIFT PACKAGES FOR SALE. CALL DARRIN FOR DETAILS.



32'x16' alum. gillnetter blt. 1983 by Randy Sandvick, Twin Cummins VT 555, hydraulic controls, fly bridge, reel w/LW, anchor winch, microwave, spacious cabin, H/C water, shower, large work deck (Alaska). \$100,000/offer. File # BB1-027.



32'x13' BB gillnetter blt. 1991 by Wegley, 3208 TA Cat 425hp, articulating reel w/LW, anchor winch, hydraulic controls, VHF, CB (2) DS, (2) lorans. Make offer, financing available. (Alaska) \$155,000, \$145,000 without reel. File # BB1-032.



50'x16' Delta charter blt. 1976, complete rebuild stem to stern in 1991. New twin Cummins 300hp 5.9 liter mains, low hrs., extended warranty avail., cruise 19 knots. C.D.I. for 20x2, easy upgrade to 40x oceans. Full electronics, most new (Alaska) Asking \$180,000. File # CH1-009.



78'x26' steel combi. Twin 8V71 mains w/sercet shaft, 30KW 371 GMC & 20KW Perkins. SSB, autopilot, 36-mile radar, paper recorder, video sounder. Good cond. (Seattle) Asking \$360,000. File # C02-028.

OVER 20 BBAY PACKAGES AVAILABLE. CALL DARRIN AT DOCK STREET FOR DRIFT OR SET NET PERMITS & BOATS.



75'x20'x10' steel longliner blt. 1973 by Rysco. Cat 343 main, deluxe electronics all new in 1991. New Marcomatic longline sys. w/100 tubs gear. Drag and longline history in Alaska. Hull in good condition. (Seattle) Try \$250,000 w/gear. File # LL1-002.



58'x15.7'x7.3' wood seiner/longliner blt. by Peterson Boat Yard in 1950. Recent alum. tophouse. 8V71 Detroit Diesel main, 20KW Isuzu aux., Thermo Tec RSW, packs approx. 60,000 lbs. Continuous upgrades and maintenance make this a very desirable vessel. (Alaska) \$240,000. File # SE1-024.



56'x17'x6.5' FG seiner/drag/crab blt. 1980 by Sunniford. 3408T Cat, J.D. 30KW aux. runs RSW, 2 station Wagner sining and AP. All hydraulics new, Ma co PTO. Pullmaster winches, valves, A.M. Services main & picking booms. Top electronics pack includes new Sat/Nav with plotter. Just hauled, painted, serviced and is ready to go. Much new gear avail. (Seattle) Boat only \$415,000. File # SE1-029.



52'x16'x8' FG Hoquiam Seamount seiner/longliner/crabber blt. 1979. 8V71T GM main w/3,500 hours, Susie 40KW aux., packs 75,000 lbs. in tanked hold. Vessel had recent conversion to seine, many upgrades, full electronics, complete longline set-up & gear, Dungle pots available. (Alaska) Boat only \$375,000. File # SE1-050.

EIGHT STEEL TOPHOUSE SEINERS FOR SALE -- OVER 70 SEINERS TO CHOOSE FROM. SKIFFS & GEAR FOR ALL AREAS. CALL STEVE FOR DETAILS



47'x15'x6' Sunniford RSW seiner/blt. 1979. GM 671N, Suzi 21KW aux., both rebilt. 1991, 3-sta. steering, alum. mast & "A" frame. Vessel has had continuous upgrades, most systems rebilt. 1991 including reduction gear & PTO, engines & wiring. (Washington) Asking \$210,000. File # SE1-052.



36' FG sternpicker blt. 1975 by Mal Martin. Volvo TAMD70, 10,000 lb. hold. Aluminum mast, reel with LW. Furuno radar, VHF, CB, DS, dsl. stove. A "must see." (Washington) Clean vessel - a good buy at \$45,000. File # SP2-048.



42'x14' FG sternpicker blt. 1988 by Sunniford. Cat 3406 BTA, 540hp cruise 15 knots. Radar, VHF, Ioran, AP, mast boom w/winch. Good combi boat. (Alaska) \$195,000. File # SP2-049.



42'x12'FG Lindell gillnetter blt. 1981. GMC 671 main, fly bridge, 20,000 lb. hold, 4-sta. steering, crab block, alum. drum. Full electronics incl. Stevens sideband. Good cond. (Seattle) \$97,000/obo. File # SP257-40.

10 PWS PACKAGES AVAILABLE. EXCELLENT SELECTION OF BOWPICKERS. PERMITS AT \$96K. CALL STEVE.

PERMITS FOR SALE

The following prices are as of Jan. 10. Call for latest quotes:

PWS Salmon Seine	\$105,000	Kodiak Set Net	SOLD
PWS Salmon Drift	96,000	Kodiak Salmon Seine	67,500
PWS Herring Seine	190,000	Norton Sound Herring	35,000
PWS Herring Pound	58,000	Chignik Salmon Seine	395,000
False Pass Salmon Drift	315,000	Cook Inlet Salmon Drift	87,500
False Pass Set Net	115,000	Bristol Bay Set Net	45,000
False Pass Salmon Seine	180,000	Bristol Bay Drift	180,000
SE Power Troll	37,000	SE Salmon Seine	65,000
SE Hand Troll	9,000	SE Salmon Drift	65,000
SE Herring Seine	200,000	SE Tanner Crab	92,000
SE Herring Drift	35,000		
Kodiak Herring Seine	60,000		

BRISTOL BAY PERMITS ARE IN HIGH DEMAND. WE HAVE BUYERS AT \$177,000.

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SERVING NW FISHERMEN SINCE 1976

Aluminum gillnetter. 32' Marco, low hours 454, power roller, reel, good electronics. Great packer, fast, great workboat. \$45,000 or offer. Call Frank (907) 262-5477.

02-01-1992 BS FBNJ44-4

1982 Shore. Diesel, fly-bridge, reel, levelwind, radar. Engine and transmission new '91. \$75,000. (208) 935-2196 or (207) 522-5284, evenings.

02-01-1992 BS FCKK12-8

BOATS FOR SALE



F/V 36' FG Delta gillnet LL troll 3160 CAT 3 kw aux. electronics, auto pilot, am/fm radio, live aboard, diesel stove, insul. fish hold, alum. LL reel, LW gear, 12" hydro slave, boom, stabilizers, shelter deck, troll gurdies, misc gear. \$84,000 obo. Call Karl (907) 696-2552.

05-01-1992 BS FLOM45-1



65'x18.2' steel schooner-longline-tender. 1973 Lodi built. V871 40kW Deutz, 45 ton capacity, RSW, main overhauled, bottom sandblasted, audiogauged, \$200,000. Joe (206) 857-6861.

02-01-1992 BS GAEM71-3

For sale: 56' Middleton longliner/seiner, tanked for crab. Also seine permit, aluminum skiff and longline gear. (907) 772-3242.

03-01-1992 BS GMLR50-1



50' Delta "Emerald Fjord." TAM70Bs, 500 hrs. 4kw Kabota. Lic. 40, seats 32. \$325,000. Box 7814, Ketchikan, AK 99901. (907) 225-3498.

02-01-1992 BS GLLQ20-1

18'x10' alum. seine skiff with turbo charged 453, 4:1 reduction. Btl. June '91. \$40,000. (206) 463-2156.

02-01-1992 BS HAG28-1



"Silver Fox." 40' Snowball, excellent condition. Cat 3208NA, rigged for troll/longline. Complete electronics. All aluminum/stainless rigging, levelwind reel, 20 skates snap-on gear. Fiberglassed hold, 400 gal. fuel, comfortable deck house. Vessel ready to fish. Priced to sell below survey. \$65,000. (907) 586-3451.

03-01-1992 BS GKN050-1



34' fiberglass gillnetter. 1979 Ohima/Turbojet. New 320hp 3208T Cat diesel (only 640 hours) 16+ knots, reinforced net reel for longlining, radar, autopilot, color video sounder, fathometer, VHF and CB radios, Loran, aluminum skiff rack. Very well maintained. One owner. F/V "Fairlead." \$70,000. (907) 235-5596.

04-01-1992 BS GHL54-1



42' steel troller/ F/V Shearwater, heavy offshore construction with ballast keel, large insulated hold, rebuilt hydraulics, 3300 watt sounder plus cockpit monitor, Furuno electronics, wood Freeman, dealer rebuilt 4-71, 0 hrs, capitol gear, new prevailers. \$57,500. (206) 232-7236.

04-01-1992 BS FAL502-1

F/V Dryas 36'x 12'x 5 1/2' fiberglass sailboat-troller. Built by Cecil Lange, Port Townsend, WA. Wheelhouse-trunk cabin 6'4" headroom. Dependable diesel, recent overhaul, slush tanks, 3 spool Kolstrand windlass, hydraulic anchor windlass, full electronics, Dickenson Pacific range, sails. Good fisher, seaworthy, comfortable, perfect NW cruiser. \$65,000. Write Fred Howe, Port Townsend, WA 98368. (206) 385-4469.

03-01-1992 BS FLRR29-1

1980 Modutech 32'x14' Volvo TAM70D w/4700 hrs. Reel, AW, roller, spare SS prop & shaft. Must sell. (907) 376-0658 or (907) 837-2237.

02-01-1992 BS FFWP62-2

1978 32' Wegley BB gill- netter, F/V "Snowflake." 3208 Cat, flying bridge, 2 lorans, Polaris VHF, Bruce anchor, 9 shackles gear. Well-maintained workboat. \$50,000. Call Grant at (907) 522-5284 or (206) 935-2196.

02-01-1992 BS FFWT02-2

F/V "Kalan," 39' troller/long- liner. All salmon and halibut gear, WA/OR/AK troll permits. Consider trade for north-end Seattle property only. Make reasonable offer. \$115,000. (206) 788-7988.

05-01-1992 BS FOR437-2

GSI

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LONGLINERS

80' x 22' steel longliner, btl 1985, Cat 3412TA main, Cat 3304 and JD aux. 80kw each, two blast freezers, asking \$495,000. Has fished the South Pacific, call for more info on (LONG080004).

90' x 23.8' steel longliner/trawler, btl 1973, 2x 12V71 mains, 2 x 731 aux, Carrier reeler system, all trawl gear, call for more info (LONG090009).

93' x 25' steel longliner, btl 1972, twin Cat D353 mains, lead fish hold, surface longline gear. Asking \$350,000/offers. (LONG093002)

98' x 24' steel longliner/crabber, btl 1979, 12V149 main, 2 Cat 3306T aux., Carlisle reeler system, watermaker, blackcod gear. Asking \$695,000 (LONG098005)

98' x 24' steel longliner, btl 1978, Cat D398 main, 2 Cat 3306T aux., Carlisle reeler system, watermaker, blackcod gear. Asking \$695,000 (LONG098005)

123' x 32' factory longliner, 2x Cat 3408 mains, 2x Cat 3306 aux, Sabroe reeler system, processing equipment, Marco longline system, lots of extras. Call on LONG123001.

CRABBERS

82' x 22' steel crabber/longliner/tender, btl 1969, Cat D343 main, two 4-71 aux, 50 lone fish hold, tanked, champagne system, 500 dungeness pots, longline gear. Call for more info on (CRBR082001).

84' x 24.4' steel crabber/longliner, btl 1974, Alaska fishing history, needs some work. Asking \$300,000. (CRBR084002)

92' x 23' steel crabber/longliner, 2x 12V71 mains, 371, 671, 471 aux, packs 50k, halibut gear, some crab pots, good fishing history. (CRBR092003)

98' x 24' steel crabber/tender, btl 1978, Detroit 16V149 main, 2 Cat 3306, packs 100k. PSER RSW system, flow crane, hydraulics for towing (TRWL098001)

CRAB CATCHER/ PROCESSORS



180' x 40' crab catcher/processor, btl 1977, converted 1987, 2 EMD12-643E mains, 2x12V71, Cummins KYA36 & NT355 aux, constant high production record. Major overhaul 1987. Increased frozen hold cap, plate freezer, installed in 1987 (CRBR180002)

TRAWLERS

83' x 22' steel trawler, btl 1978, Cat D379 main, Cat 3304 and Isuzu aux, 75th fish bld, Marco trawl winches, all trawl gear. Ready to go! Asking \$700,000 (TRWL083004).

90' x 24.5' steel trawler, btl 1973, Detroit 12V149 main, kof nozzle, 8V92 and 2-40kw aux, 60th fish hold, all trawl gear, LOTS of electronics, watermaker, more. Asking \$750,000. (TRWL090009)



160' x 36' trawler, btl 1974, converted 1987, 2 EMD 16567VC mains D/H in 1988, 2 GM 8V92 aux, RSW, crane, elect & safety gear. REDUCED. (TRWL160002)

165' x 36' steel trawler, btl 1972, two Cat D399 mains, two Cat 3304 aux, good conversion prospect. (TRWL165001)



180' x 36' trawler, btl in 1970, converted 1987, 2 EMD 12845E mains, 2 GM 8V71 aux, winches, fuel, crane, electronics/safety equip. (TRWL180001)

CATCHER/ PROCESSORS

134' x 31.6' factory trawler, btl 1973, rebt 1988, 2 Detroit 12V149 mains, 1800 hp, 4-871 aux, Sabroe reeler equip, 80000lb freezer holds, HAG proc. line, Rapco band gear, watermaker. Asking \$5,000,000. (TRWL134001)

PROCESSING BARGE

110' x 34' steel processing barge, complete salmon line, good condition. Call for more details (PFOC110001)

195'x40' ST processing barge, 200,000/day process cap, 1,750,000lb hold cap. @ -40deg. Autocool. for 80, 48 30TN Mycom Comp. (PFOC195001)

TENDERS

61' x 17' steel LL tender btl 53, 8V-71 main, JD 30KW & Isuzu 200W aux., 50K # fish hold w/130w RSW, alum. LL, chute, 50 lbs gear, tuna gear, accom for 8. \$185,000. (LONG061002)

67' x 18' 5.5' steel tender, schooner style, btl 1967, two GMC 6-71 mains, two aux, 57.5 lone fish hold, RSW, two cranes, deck fuel tanks, satellite electronics. Asking \$367,500. (TRF060701)



76' x 19' x 3.5' ST tender/cod pot longliner, Jensen Design, btl 90', 160,000 lb hold, 30tn RSW, 2 @ 8V71 mains, 6-71 @ 2-71 aux, accom for 7. (TRDR076004)

BRISTOL BAY STERNPICKERS/ PACKAGES

PERMITS WANTED/ WE HAVE BUYERS
5 WEGLEY'S + 6 MARCOS
2 ROBERTS
2 AMERICAN COMMERCIALS
6 SHORES
ALL OFFERS INVITED!

1980 Ohima glass, 3208T Cat. Good deck gear, good electronics, lots of recent work, all the gear, trailers, lines, buoys, etc., and a container van. Bristol Bay drift permit included. \$248,000. (GILS032067)

1979 Shore, Chrysler 440 and gearbox rebuilt 1991. Sliding reel, Wagner/Hydraulic controls, reeler, loran, VHF. \$55,000. (GILS032256)

1991 Wegley w/300hp Cummins. Finished by Vlahovich. One season of shakedown, good gear, finish and equipment. East 17+ knot cruise. Some extras. \$175,000. (GILS032260)

1983 Jumbo Wegley. Twin 8.2 Detroit diesels. Narrow reel, autopilot, lots of custom work. Beautifully cared for. Bristol Bay drift permit included. \$310,000 (GILS032263).

1982 Roberts w/ Perkins turbo diesel. Container, gear, jeep and Bristol Bay drift permit included. \$257,500 (GILS032271).

1980 Marco w/Cummins 903 installed 1988. Kvichak speed modifications, 24V starting, Marco deck gear and herring shaker. Complete some package available by offer. Boat: \$136,000 (GILS032268).

1975 Shore w/Volvo diesel. Good equipment, good condition. Bristol Bay drift permit included. \$250,000 (GILS032184).

1987 Saratoga Aluminum. 440 Lugger in All Points design. Big strong shallow boat in GREAT condition. PRICE REDUCED! \$130,000 (GILS032142).

1980 Bryant with 1990 GMC 8.2L diesel. Articulating reel, windless, gear, stored inside and Bristol Bay drift permit included. \$205,000 (GILS032275).

PERMITS AVAILABLE AS OF 1/10/91.

S.E. (C) Trawler	\$95,000	PWS (S) Seine	\$106,000
S.E. (H) Seine	\$195,000	PWS (S) Drift	\$90,000
S.E. (DC) Chatham	OFFERS	PWS (H) Gillnet	\$100,000
S.E. (S) Seine	\$61,000	PWS (H) Pound	\$62,000
S.E. (S) Drift	\$63,000	Kodak (S) Seine	\$75,000
C.I. (H) Seine	OFFERS	Kodak (H) Seine	\$52,000
C.I. (S) Drift	\$90,000	Kodak (H) Gillnet	\$31,000
C.I. (S) Seine	\$80,000	Paini Sai Net	\$130,000
C.I. (S) Seiner Pkg.	OFFERS	Paini (S) Seine	\$195,000
B.B. (S) Drift	\$175,000	Paini (S) Drift	\$337,500
PWS (H) Seine	\$180,000		

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02-01-1992 BS GNFM87-2

F/V "Peggy J." 42' x 14'6" F/G gillnetter-longliner-seiner. (2) 3208 Cats low time. Some halibut gear. Surveyed \$154,000, sell \$120,000 or trade for faster boat. Call (907) 243-1157.

05-01-1992 BS GJEL36-1

Bristol Bay gillnetter. Diesel engine, fiberglass hull, full flying bridge, hydraulic anchor winch, articulating gillnet reel, power stern roller, electronics, new Ioran & VHF. Good packer, recent upgrades. Picture and surveys available. \$48,500. (509) 493-1954.

03-01-1992 BS GLLQ69-1



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50' "Patriot", LeClercq built '88, raised focle w/pilot house, reconditioned '91, MAN D2842LXE 940HP newly rebuilt, new 20KW Isuzu gen-set & RSW system. Price was \$550,000.

46' "Lora Mae", LeClercq built '84, twin 6-71TI rebuilt in June '91, free standing mast. Price was \$350,000.

46' "Aleut Kid", LeClercq built '85, twin Cummins VT903M, 5KW Yanmar, free standing mast. Price was \$350,000.

46' "Autumn Gale", LeClercq built '79, rebuilt in '91, 8V-92, 3 KW Onan gen-set, insulated hold & refrigeration. Price was \$315,000.

42' "Miss Shannon", LeClercq built '79, new Lugger 6125. Price was \$250,000.

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50' x 15' conventional, twin Lugger L6125 460HP, loaded, optional RSW.

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02-01-1992 BS GLRN38-1



F/V "Carlanna." 33' Roberts, custom finished. V-8 Cat, all electronics, levelwind, electric head, shower, hot water, oil stove, alcohol stove, refrigerator, anchor winch, stereo, propeller access. Top condition. (206) 935-0681.

03-01-1992 BS GASM87-2

F/V "Sea Foam" 58'x16.5' seiner. Hansen design, heavy-built by Tacoma Boat in 1958. Newly rebuilt 12V71 main with twin disc 5-14. Packs 60,000+ lbs. in 2 tanked fish holds. Fast and a great sea boat. \$275,000. (206) 933-0455.

03-01-1992 BS GKPM48-1

F/V "Shirley M" - aluminum BB gillnetter, 8.2 Detroit, flybridge, drum with levelwind, new reduction gear, good electronics. \$85,000. (907) 333-0493.

04-01-1992 BS GMER56-1



56' x 17' combi steel with alum. house. Cummins 855 main, Isuzu 25kw aux. full electronics and safety equip. Boat completely gone through, new alum. house, totally relined and wired. Complete sandblast and paint 2/90. Alum. bait shed, longline and crab haulers. Some gear. Boat in excellent condition. \$285,000. (907) 486-2034.

02-01-1992 BS GLLQ68-1



36' Roberts troller, TMD 70B diesel, 6 spool gurdies, full electronics, new pilot, 3 station controls, insulated hold; light, spacious cabin, gear and spares included. Clean, solid, efficient. Ready to fish. \$75,000. Permit available. (206) 435-4553, or write Dept. 192-AFJ-2, 1115 NW 46th St., Seattle, WA 98107.

02-01-1992 BS GMYM44-1

F/V "Mayme" 40' crabber/troller. 671 main, Isuzu aux. 19kW crab lights. Tanks 7,800 lbs. Oregon troll permit. Most electronics. \$70,000 cash. (907) 784-3290.

05-01-1992 BS GMRL21-1



Good salmon boat for sale. 33' round stern (Monterey). 271 Jimmy, radar, VHF and California salmon permit. Looks good! \$16,000 OBO. (408) 899-7254.

02-01-1992 BS GNFM24-1



F/V "Seal," 36'x11'x5.5' heavily built Monk wooden troller, 1957. 371 GMC, twin disc gear, packs 10,000 lbs. Heavy anchor gear, full electronics, 420 gallons fuel, 50 gallons water. Excellent condition, seaboard & producer. Includes Washington & Oregon permits with Alaska option. Turnkey, \$45,000. (206) 385-6246.

02-01-1992 BS GNFM53-1

F/V "True North." 34'x11' Airex FG double-ended troller. Alum. rigging, 353 GMC/Borg Warner, 5-ton hold, hydraulic gurdies/anchor/longline hauler, good electronics, 200 water, 300 fuel. \$60,000. (907) 239-2222.

02-01-1992 BS GNFM47-1



58'x18'x9'2" steel seiner/ crabber/longliner built 1977, major work '89. GM 8V71 twin disc 509, 3-71, 30kw aux. Tanked 85,000 lbs. RSW, insulated and glassed fwd. hold, aft hold 20,000 lbs. New deck winches, hyds., 2 VHF, SSB, 2 sounders, 2 radars, Ioran, AP-45 auto. 4,000 fuel, 700 water. Bunks 8, just hauled, blasted, painted. Also available: Alfab GM 6V53 powerskill, 2 seines, 2 blocks, 50 tubs halibut gear & hauler, flags & buoys. Complete package, asking \$375,000. Boat only, asking \$345,000/ offers. (907) 262-4418, (907) 776-8863 after 6:00 p.m.

02-01-1992 BS GLT557-1

F/V "Sova," price slashed, \$34,000. 33' Roberts, 140hp Isuzu, tanked, full electronics, 'ridge, large stove, shower, excellent live-aboard. (206) 945-9709.

02-01-1992 BS GLZJ78-1

1980 47' Beck seiner. Excellent condition, Volvo TAMD 120B, heavy hydraulics with vang and topping winches. 24" power block, 72-mi. radar, color sounder-plotter, paper machine, flasher, CB, 2 VHF's, Mark IV autopilot, 406 EPIRB, 6-man liferaft. \$285,000/obo, consider trades. (907) 346-1372.

05-01-1992 BS GLZJ83-1



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03-01-1992 BS GASN49-1



28'x11' aluminum bow reel, new fall 1989. Volvo duo-prop, 9,600 lb. locker. \$62,500/offer. (503) 458-6973.

02-01-1992 BS GBZM29-3



50' wood selner. 671 GMC, glassed fish hold, alum. drum and stern roller, electronics and more. Boat in excellent condition. \$65,000. (206) 734-0627.

03-01-1992 BS GBDM79-2



50 ft Hoquiam Seamaster F/G schooner troller - 1979. Full electronics, GMC, 671 main, Bedford 4 cyl aux., 10 kw gen., dual eye hydraulics off main & aux. 23 ton spray brine hold, fuel 5000 G, water 800 G, fished crab, salmon, albacore. Excellent condition, recently surveyed at \$225,000. Reasonable offers will be considered. Call Crescent City (707) 464-8414 after 7 pm.

05-01-1992 BS GBSX25-1



1990 32'x12' alum. Set up for diving & crabbing, could be easily converted for other fisheries. Hyd. anchor winch, 12 U lift gear, built-in compressor system, s.s. shaft/wheel/rudder, diesel heater, full electronics, approx. 100 hrs. on new 454/Borg Warner. Top speed 22 kts, price \$85,000 as is or \$90,000 with diesel engine installed. Will consider offers/trades, possible owner contract. Phone (206) 647-6470.

03-01-1992 BS GCLJ62-2

32' aluminum BB gillnetter built by Shore. New Cummins 6BTA diesel and 5061 twin disk, new 20 gal. hydraulics, narrow drum, VHF, loran, radar, \$65,000. Message phone (512) 729-9652 or (206) 647-7806 or (907) 235-2411, or Box 564, Homer, AK 99603.

02-01-1992 BS GCLX17-3



F/V Mistasea, 61' steel trawler, 12V71 GMC main, 4-71 GMC hyd. aux., Isuzu 20kw gen, good electronics, Marco winches, double net reel, equipped for bottom and mid-water trawling. \$360,000. (206) 642-3727.

05-01-1992 BS GDGJ04-1



'74 Modutec F/G stern gillnetter with flying bridge. Total rebuild since 1988. Spencer hyd., MMC electronic controls, new 8.2L Turbo Diesel, new electronics and antennas, L/W reel, P/R, Bruce anchor (44#), hyd. anchor winch, ref/freezer, windows, SS shaft, bronze prop., etc. Injury forces sale. New survey 65K, reduced for quick sale to 50K. (206) 789-5101.

04-01-1992 BS GDTP57-1



32'x11'x2' Aluminum bow-picker. Westrom design, built 1984. 1987 TAMD 41 200hp Volvo diesel, 290 O/D. 25 knots, 14 ton capacity. Herring drum/shaker, salmon drum, L.W., power roller. Complete electronics. Great cabin, sleeps 3. Entered SE halibut fishery 1986. Priced to sell - \$49,500. Trailer available. (206) 221-3616.

02-01-1992 BS GGHK17-1

36' fiberglass combination charter, gillnetter or crab boat. Like new, completely overhauled, "0" hours 671 GM 509 gear PTO. 30 gal. pumps, new 400 gal fuel tank, 60 water, Capilano steering. Gillnet reel, 2700 radar Raytheon. Boat is in excellent condition. \$70,000 or best offer. (206) 268-0137.

04-01-1992 BS GHUK13-1



F/V Ambition, 95x25 ft. trawler, built 1980, 16V-149 main 900 H.P. 8V-92 hyd. engine, 60KW gen., 12KW gen., full mid-water electronics, 3 mid-water nets, 5 roller nets. Make offer (206) 642-3727.

05-01-1992 BS GDCJ04-2

32' Bristol Bay aluminum gill netter. 1980 Shore model. 454 engine, raised bulwarks, narrow reel with levelwind. CB, VHF, loran, depth finder. Boat in good condition. Located in Naknek, AK. \$50,000. (206) 425-6255.

05-01-1992 BS GDNJ85-2

F/V "Webbslinger" - aluminum 32'x12' BB gillnetter, 6V53 Detroit Diesel 200hp, Kolstrand anchor winch, Maritime Fab roller, wide gillnet reel, Cessna 4.21 hyd. pump. Heavy duty built. \$80,000 obo. (503) 325-4549 or (503) 325-3140 evenings.

04-01-1992 BS GKCK75-1

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40' Freeman aluminum. TMD 708 Volvo diesel, 506 TD gear, hyd. steering. 900 gal fuel. Tanked. Exc. galley, berths, head/shower. This boat is ideal for Alaska fishing. \$149,500.

68' Jensen design, 3412 Cat, 60kW & 33kW gensets. This boat is first class throughout—too much to list. Comes with 700 Dungeness crab pots, shrimp gear, shrimp permit, West Coast drag history, Alaska longline, king crab & Kodiak Dungeness history. \$765,000.

68' Desco Cherglass, built 1979. Shrimp, drag, midwater. KT 1150M Cummins, 20kW genset, full electronics & sonar. Too much more to list. Call for survey! \$325,000 or reasonable offer.

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44' steel Ross Troller design. 6V-71 Detroit Diesel w/ 2.5:1 TD 509 gear, 10kW Isuzu gen., 16 ton hold, 1,400 gal. fuel, 550 gal. water. Complete galley, loaded with electronics. Crab block, tank, tune pullers & longline reel. \$125,000.



40' fiberglass troller. 3180 Cat, TD gear, full galley & electronics. Good buy at \$60,000.

48' plank troller/crabber, built 1941. 6-71N Detroit (rebuild) w/ twin disc 509 hyd. 2.48:1 gear. Coil ref., brine tank on deck. Restored, remodeled interior. New steel mast, crab block, Ore., Wa. and Cal. troll permits. Reduced to \$65,000.

58' x 16.5' steel Skallenut, built 1971. 220 Cummins, new genset, 5,000 gal. fuel, 40T fish hold. South Pacific albacore, spray brine reel, top house. First class elect., living quarters and throughout the entire boat. Owner retiring and must sell. Beautiful boat—as seen in many television shows. \$275,000.

Five boat for price of permit—48'x11' 5'x7' halibut schooner, built 1929, forward house design, remodeled '74, recaulked '89. 4-71 GM, new hyd. Capitol 4:1 gear, 38 tube blackbird gear. Good electronics. Needs cosmetic work, Alaska longline history. West Coast longline history. All for only \$35,000 (not a negotiable).

52'x13'x7' steel inter-labrador built 1986. 6-71 GM, twin disc 509 hyd. gear w/PTO. 2,000 gal fuel, genset, ref., and Alaska troll permit. Good shape & good electronics. \$117,000.

BOATS FOR SALE



For sale: F/V "Cuatro Vidas," steel longline/troller combination, 43'x14'x7'. 671 main, recent rebuild. 271-20KW generator. Blast freezer. Crab lights. 30,000 lb. hold. Yacht-like interior. Very seaworthy. Asking \$120,000. (907) 225-4869.

06-01-1992 BS GJFM84-1



You finish and save \$\$\$ 58'x22' steel hull. 2300 cu. ft. in two tanked holds. Ready to outfit for your fishery now. Construction began August 1990. Call (206) 437-0427 or (206) 385-5574.

04-01-1992 BS GUQ52-1

Power skiff, Munson, aluminum, built 1984, 20x10, steerable nozzle, Perkins engine reel with fairlead for lead, fathometer, CB. \$32,000. (206) 378-5260.

03-01-1992 BS GKNN29-1

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05-01-1992 BS GJMH89-1



40' troller, "Joellanne," Blt 1974 Humbert, Volvo TMD 70B, new 14kw Isuzu aux., holding plates, full electronics, W.F. 500 pilot, new stove, shower, 800 fuel. \$75,000. AK power troll for sale. (206) 452-3073 or write, 1040 W Lauridsen, Port Angeles, WA 98362.

02-01-1992 BS GJAP57-1

F/V Vitus 32'x12'6" Aluminum Bristol Bay gillnetter, built 1978, rebuilt 1986, TAMD 60 Volvo, 1830hrs, flybridge, drum with levelwind, 20,000lbs capacity, excellent electronics, stored Naknek Marine Center. \$85,000. (206) 385-4442.

02-01-1992 BS GJAO5-1



M/V "Odyssey," 40' Beck/ custom finished F/G. All electronics, 20" power block, 6V92 with low hours. Well maintained. Terms at \$165,000. Call (206) 784-8391 or 285-6110, or write Rod Olsen, 9515 19th Ave. NW, Seattle, WA 98117.

05-01-1992 BS GJUM97-2



67'x19'9", steel, blt. 1981, 60-ton albacore, 2 holds. 6,800 gal. fuel, 1,000 gal. water, new Cummins 855TA, 2 new Isuzu Lima 40kw gensets, 2 new 5F60 Carrier compressors, 2 new Stone chillers, 2 autopilots, 2 radars, 2 plotters, GPS, sidebands, etc. Swordfish reel, Calif. & Oregon salmon permits. Very well maintained, oak interior, plus enormous inventory of spare parts. \$425,000. (805) 238-5064.

02-01-1992 BS GKCK89-2

M/V Lara Lee 52' Hansen, built 1989, shallow draft, top house, 600hp Luggar, 15 ton hydraulic chill, bow thruster, sonar tube, freezer, microwave, full electronics, halibut gear including: 60 full skates, tub gear, tub racks, puller, roller, cleaning table. \$650,000. Jan Messersmith. (503) 568-4305.

02-01-1992 BS GJAP82-1

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47' FG Skookum troller. 3-71 GMC, well equipped and efficient. Very comfortable quarters and large fishhold. For complete details (206) 371-3683.

02-01-1992 BS GJEL03-1



52'x16'x7' Little Hoquiam Seamaster t/g seine, crab, LL. Detroit 8V71T, twin disc 509, 40kw Isuzu. Price reduced \$348,000. (907) 424-3174.

05-01-1992 BS GKCK99-1

F/V "Joint Venture." 36' FG troller. V653, radar, loran, CB, VHF, autopilot, two fathometers, paper machine, totally equipped, ready to fish. Turn key. \$65,000 obo. Permit available. (303) 856-7336.

05-01-1992 BS GKHL45-2

28-ft. fiberglass herring skiff with reel, shaker, Volvo V-8 200hp I/O. Located in Unalakleet. Includes all gear. \$10,000 or best offer. Call (218) 387-2565.

04-01-1992 BS GLEM16-1

F/V "Argo" 35' Bruno Stillman. 1978 F/G gillnetter. Flying bridge, 3 station controls, electronics. 454 GMC. Fast, great sea boat. Excellent condition. Stored in Cook Inlet. \$37,500 obo. (907) 285-9540 eves.

02-01-1992 BS GLLP21-1



New 1991 Mel Martin 30'x12' diesel duo-prop bowpicker. Only 375 hrs. Kolstrand aluminum drum with automatic levelwind, power roller, MMC controls. Total state of the art fishing vessel. Immaculate, must see. \$75,000. (206) 466-4644.

02-01-1992 BS GNFM87-3



72' classic wood halibut schooner, excellently maintained and ready to operate. RSW, full electronics, rigged for tendering, longline and crab. Vessel only, \$220,000. Package negotiable for vessel with longline and crab gear. Phone (907) 486-3729.

03-01-1992 BS GCLJ03-1

Power skiff — 19' Alfab with new 165hp Perkins. New power block and prop. Rebuilt reduction gear, steering and hydraulics. \$30,000 or possible lease option. (206) 672-7969 or (206) 774-1226.

02-01-1992 BS GNTM05-2

F/V "Alberta." 52' selner, 671 GMC, misc. spare engine parts. Glassed fish hold. Hyd. steering, radar, VHF, CB. \$65,000. (206) 423-0092 or (206) 577-8877.

02-01-1992 BS GOAL70-2

50'x15.5' or 17.5' Ledford seiner molds. Complete with hull, house, tophouse deck, etc. For sale, \$5,000 or offer, or possible lease. (206) 321-6042.

03-01-1992 BS HAKQ98-1

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32' Bristol Bay package for Feb. '91. 320BT 320HP diesel. Full hyd. and w/d system. 5 fish holds, 40" power roller, 2 station controls, fully galley, bunks, dinette.

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03-01-1992 BE FCA025-5



Cook Inlet drift permit package for sale, F/V "Donna B." 35', fiberglass, 3208 Cat, electronics. Moored at Wards Cove Packing, Kenai, AK. \$55,000 boat only. Permit at market. Call (206) 742-1190.

03-01-1992 BE GLT532-1



42' Delta. Full electronics, A-frame w/ winches. Refurbished inside & out in 1990 incl. new engine & hydraulics. Surveyed \$195,000, asking \$180,000. Also Kodiak salmon seine permit \$80,000 or package including Brown 16'x8' self bail skiff, 150hp & 90hp outboards, 2 seines. All misc. tools & gear, 90 stacking cone pots, 45 skates halibut, cod tub gear, \$295,000 for all, will consider offers. (208) 466-1827.

02-01-1992 BE GML06-1



Reduced—"Saint Rocco," 50' seiner. 671 GMC, 509 twin disc. Aluminum fuel/water tanks. Glassed fish hold, aluminum stern bulwarks, Marco block. \$55,000. Southeast seine permit \$85,000. (206) 652-9238.

02-01-1992 BE FMZ030-3

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04-01-1992 BE GNGM63-1

F/V "Mary T." Hand troller, 26'x8.5'x2', Northsea Clipper Craft. Built 1980. 120B gas Volvo, 270 outdrive. Video depth, VHF, CB, charts & gear. Dickerson stove, 2 station steering. Boat in Craig, AK. Boat and hand troll permit, \$19,000. (503) 357-7462.

02-01-1992 BE HAKR26-1

Kodiak salmon seine permit, 32' Roberts seiner, 13' aluminum skiff, seine. Package or separately. (907) 486-9494.

02-01-1992 BE GMLF45-1

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DRIFT PACKAGE

1979 32' fiberglass American commercial with flying bridge. 3208 CAT diesel with low hours. Full deck hardware and electronic pkg. Complete with trailer and gear. Vessel's sale price is \$75,000. Package price with drift permit \$175,000.

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F/V "Abby," 36'x12' wood troller, 453 GMC, 10,000 lb. hold, EPIRB, loran, color machine, alternator, hydraulic lines, deck, hay rack new '91. Boat \$25,000. AK troll permit \$42,000. Write Box 2976, Sitka, AK 99835 or call (907) 747-8144.

04-01-1992 BE GNTM32-1

PSW drift gillnet package. Permit, 1990 30'x12' Martin bowpicker, 200hp Volvo diesel, levelwind reel, power bow roller, loran, radar, VHF, CB, 3-axle trailer, 6 strings gear, many extras. \$205,000. (206) 398-7451.

04-01-1992 BE HAKR02-1

"Valeta H." 40' double-ender. 371 GMC, rebuilt gurdies. Complete electronics, rail, EPIRB, halibut drum, new troll prop. Heavy built, extremely seaworthy. With AK power troll permit, \$90,000. Will sell either separately. (206) 793-1965.

04-01-1992 BE GNFMT71-1

33' Uniflite gillnetter, Cook Inlet drift salmon permit and gear, package only, \$200,000. F/V "Veronica K," 1010 Minke Dr., Kenai, AK 90611. (907) 283-5316.

04-01-1992 BE HAG005-1



Bristol Bay permit and boat. 1979 Shore boat, "Cindy," 440 Chrysler engine, loran, radar, depth finder, articulating reel, hyd. roller and anchor winch. Wash down pump, 3-station steering. (218) 387-1534.

04-01-1992 BE HAKR17-1

26'x10' aluminum bowpicker w/ two new 70hp outboards, power reel and shaker. \$20K. Nunivak herring permit, \$25K. Package offer good until 3/30/92, \$40K. (907) 224-3910.

03-01-1992 BE HAG020-1



Price reduced. Kodiak seine package. Salmon permit, skiff, seine, boat. \$155,000. Also, 5-strip herring seine and Wesmar 460-8 sonar, \$15,000. Call (907) 486-2905 for details.

02-01-1992 BE FLQK36-2

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03-01-1992 PS FLJ04-3

SF herring odd gillnet permit, \$45,000. SE Alaska herring gillnet permit, \$30,000. (206) 733-5028.

02-01-1992 PS GLEM51-1

PWS salmon purse seine permit and gear. (907) 486-3448.

03-01-1992 PS GLZJ98-1

For Sale: (Sitka) S.E. sac roe purse seine permit, Kodiak salmon purse seine permit. Offers. (808) 325-6937.

03-01-1992 PS GMER46-1

S.E. handtroll permit. \$8,300. (206) 293-6181 after 6:00 p.m.

02-01-1992 PS GNNR96-1

PERMITS WANTED

Wanted: Bristol Bay permit or package deal. Serious buyer. Call (509) 962-5789 or (406) 756-1330. Or write: Permit, c/o 983 Rose Crossing, Kalispell, MT 59901. Will pay cash or trade income property in Flathead Valley.

03-01-1992 PW FGUL54-2

Cook Inlet drift permit. Will pay cash. Write or call: Vince Arbucci, PO Box 531, Sitka, AK 99835 or (907) 747-8381.

02-01-1992 PW FKEK34-1

Wanted: Bristol Bay drift permit. \$150,000 cash. (206) 259-1873.

02-01-1992 PW GHHO13-1

Wanted: Bristol Bay setnet permit. Cash or possible trade for Norton Sound herring permit. Call (907) 949-1912 evenings.

03-01-1992 PW G08031-1

Lease: BB drift for '92 season. Cash now or percentage. Call (206) 782-4017.

02-01-1992 PW HAG006-1

Wanted: BB setnet permit transfer for '92 season. Would consider site also - Coffee Pt. (Egegik). Please send descriptions and terms to: Permit, 4227 Dorothy Dr., Anchorage, AK 99504. (907) 333-5613.

03-01-1992 PW HAG071-1

Will trade P.S. package. 30' alum. bowpicker, twin Mercruisers, electronics, 2 nets, sockeye and king P.S. license for good Bristol Bay sternpicker. (206) 758-2229 or (206) 491-6537.

02-01-1992 T GCSR10-2

Want to trade Citabria 7GCBG 160hp, or Piper PA12 150hp, plus cash for Norton Sound herring permit. Aircraft include skis, wheels and many extras. (907) 235-2485, or write Box 1971, Homer, AK 99603.

02-01-1992 T GFR18-2

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Permit - Shore fisheries lease containing two 25fm. sites located 1/2 mile northeast of Coffee Point. 22' aluminum skiff, motor, pickup, 2 weatherports, and much more. Turn-key. Purchase options.

① \$112,500

Permit - Two 25fm. sites under lease application located approx. 2.5 miles N.E. of Coffee Pt. 22' alum. skiff, 2 motors, trailer, 4wd truck, 6x20 container, complete inventory of nets, hdw. & tackle. 35,000lb. average. Terms

② \$119,500

Permit - Shore fisheries lease containing two 25fm. sites located approx. 2.5 miles N.E. of Coffee Pt. Fully furnished cabin, 22' alum. skiff, 3 motors, 6 nets, misc. inventory, 4x4 vehicle, 35,000 lb. average. Terms available.

③ \$132,500

Permit - Shore fisheries lease containing one site located 1/2 mile north of Clarks Slough. 22' skiff, motor, nets and tackle. Furnished cabin. Good production.

④ \$135,000

Permit - Shore fisheries lease containing one site located on combine 1 1/2 miles north of Clarks Slough. 24' alum. skiff, 60 h.p. motor, nets, tackle & cabin.

⑤ \$135,000

Site only - Shore fisheries lease containing one site located on combine approx. 1 1/2 miles North of Clark's Slough. Strong production with 40,000 lb. average.

⑥ \$43,000

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Nushagak



Ugashik



Kvichak

Permit - Shore fisheries lease containing two 25fm. sites located 1/4 mile west of Dago Creek. 2 aluminum skiffs, 2 motors, and total inventory package. Very nice furnished cabin. Turn-key.

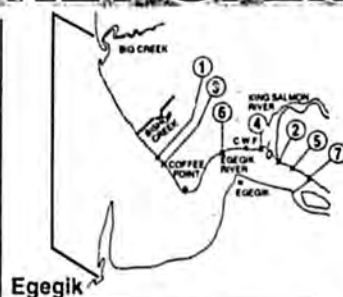
① \$115,000

Two Permits - Four 25fm. shore fisheries lease sites located at Smokey Pt. Large camp includes: 5 structures, extensive inventory, documented production. Possible purchase options.

② \$225,000

Permit - Shore fisheries lease containing two 25fm. sites located near Pilot Point Cannery. 23' alum. skiff, motor, nets & tackle. Storage and camping use privileges.

③ \$110,000



Egegik



Naknek / Kvichak

Permit - One site under lease application located on cutbank. 22' alum. custom skiff 70 h.p. motor, Ranger, large inventory of nets and tackle. 16'x20' cabin, property privileges. Strong production.

① \$165,000

Permit - Shore fisheries lease containing two sites located approx. 1 1/2 miles northeast of Pederson Pt. near Happy Creek. Alum. skiff, 40 h.p. motor, nets, & tackle. Priced to sell!

② \$65,000

Permit - Shore fisheries lease containing one site located 1.5 miles south of Graveyard. Alum. skiff-2 motors, 4 nets & inventory. Cabin privileges. Good production average.

③ \$105,000

EGEGIK

Permit - Shore fisheries lease containing one site located approx. 1 1/4 miles northwest of Coffee Pt. halfway to Bishop Creek on the outside beach. Seller's assistance in set-up.

① \$80,000

Permit - Shore fisheries lease containing two 25fm. sites located east side of King Salmon River confluence. 50,000 lb. production in past years. 21' skiff, 2 motors, major inventory and furnished cabin. Turn key operation.

② \$165,000

2 Permits - Shore fisheries leases containing two sites located on outside beach near Red Bluff. Large furnished cabin, shop, with gen. set. 2 trucks, Honda, rafts, motors, nets & tackle. Major turn-key package. Purchase options.

③ \$222,500

Permit - Shore fisheries lease containing one site located 1,500 ft. west of King Salmon River. 22' alum. skiff, 60 h.p. motor, 3 spare motors, 2 Hondas w/trailers, large inventory of nets, tackle & hardware. New 18'x18' cabin. Turn-key.

④ \$107,500

Permit - Shore fisheries lease containing two 25fm. sites on cutbank. Furnished cabin, 600w gen. set, 23' skiff, 2-motors, 6-nets, complete inventory. Turn-key operation. Good production average.

⑤ \$139,500

Sites only - Shore fisheries lease containing two 25fm. sites located approx. 1.25 miles downstream from C.W.F. at Alexander Creek. Each site can be purchased separately for...

⑥ \$27,500

Sites only - Shore fisheries lease containing two 25fm. sites located on cutbank. 2nd & 3rd sites from north side in river marker. Combined price...

⑦ \$62,000

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BOATS WANTED

Permit holder seeks maintained boat for '92 B.B. salmon season. Prefer lease with option to buy, have good references. Contact Gary at (206) 525-4230, 10017 Ravenna Ave. N.E., Seattle, WA 98125.

03-01-1992 BW FHJ22-2

Wanted: Boat for 1992 Cook Inlet drift and longline. Prefer lease or lease with option. Have C.I.D. permit and lined up for IFQs. Boat well maintained. Call (907) 747-8381 evenings.

02-01-1992 BW FKE94-3

Wanted: Brown crab longliner, 98-120', lease purchase or owner finance. Call Reggie, (907) 243-6495.

03-01-1992 BW 3LEM30-1

Charter boat, certified, fast. 43' Modutech twin engines or similar. Phone 1-800-640-MAKO or fax (714) 673-2819.

02-01-1992 BW GMLR07-1

Wanted: Lease option/owner finance for vessel capable of longlining and tendering. Prefer seaworthy, economical operation in the 45-60 ft. range. Blast freeze RSW a plus. 15+ years experience in all Alaskan waters. 100T masters, (907) 745-3669.

02-01-1992 BW GMLR07-1

WANTED TO LEASE

RSW seine vessel for SE salmon season. Have seven years experience as skipper, five as boat owner. Have excellent crew and markets. (206) 647-2014.

03-01-1992 WL GCNO93-1

PARTNER WANTED

F/V "Blueberry" looking for a partner with a driftnet permit or a medical transfer for PWS. Or, cash money for one year salmon season, Cook Inlet or False Pass. Please call (503) 634-2306, evenings.

04-01-1992 PA F0BM54-2

Have Kodiak salmon seine permit. Will travel with experienced skipper and good boat. (907) 345-0158.

04-01-1992 PA GASM93-2

Wanted: Partner with PWS salmon seine operation. I have C.I. salmon seine operation, but no liveaboard. Partnership would fish both PWS and C.I. salmon seasons. Call (907) 224-8613.

02-01-1992 PA GNIN86-1

Bristol Bay fisherman, aggressive, legal, experienced, with twin engine diesel vessel, gear, and excellent market, seeks permit holder or medical transfer for 1992 season. Contact Dan York, 10203 47th Ave. SW, #A-101, Seattle, WA 98146. (206) 935-2085, fax (206) 938-4060.

04-01-1992 PA HAKR51-1

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Pot puller & hyd. power pack. Alum. davit, Suzuki: 5hp 2:1 reduction, hoses, coupled to a 7-1/2 gal. Viker's pump. Excellent for small boat. Complete system, \$1,400 obo. (206) 652-9324.

02-01-1992 G GCLJ21-6

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New Cat 3516 DI TA marine engine with new Cat warranty. S/N 91MB5006. \$127,000. Call (907) 520-5451 or (303) 565-3908.

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For sale: Toglak herring skiff w/ 70hp Merc and 50 fathoms herring seine. \$8,000. (907) 783-2601.

02-01-1992 G HAG002-1

Herring seine, 100 fth., 800 mesh. Deep built by Redden. Excellent condition. (503) 867-4694.

03-01-1992 G HAG024-1

Blast freezer - made by Sea Breeze. Vanmar 2QM20 auxiliary, hydraulic driven compressor and fan. Cooper cooling unit. Run off mail or auxiliary. Make offer. Call Steve Keller, (907) 874-3168.

02-01-1992 G HAG032-1

Maritime Fabrication herring reel and shaker, \$1,500. (907) 586-8342 or (206) 932-2704.

03-01-1992 G HANK15-2

Three shackles 2-1/4" herring gillnet. Breast line, shaker panels, never used. Make offer. Call Mike, (206) 284-8618.

02-01-1992 G HANK26-1

Fish Hog autobalter/hauler longline system with 25 tubs of gear. \$12,500. (907) 735-2249.

02-01-1992 G FLOM39-2

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02-01-1992 G GJMK87-2

Herring seine, 4 strips with ribline, 100 fathom lead, located in Kodiak. Call (206) 568-5006.

03-01-1992 G GLLQ51-1

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02-01-1992 G GCLJ21-7

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02-01-1992 G FDEK24-4

Halibut haulers & siderollers. Warren Huff, 15717 Crescent Valley Dr. NW, Gig Harbor, WA 98335. (206) 857-2005.

05-01-1992 G FKHQ32-1

Transvac fish pump model 3510- 30hp. Complete with hoses, dewatering box, 12' sorting table, weigh box. Complete package \$33,000. (403) 758-3603.

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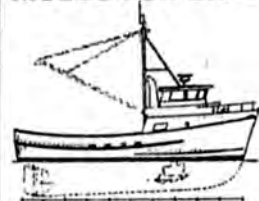
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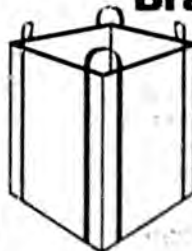
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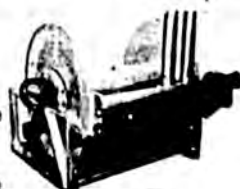
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JOYRIDE, 32' x 10.6' F/G. 1979 Rawson seiner, holds 13,500#. Cat 3208 w/twin disc, 4,180 hrs. (T:12/C:8). \$60,000.



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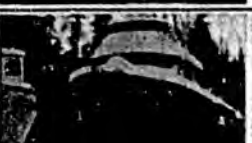
KEY MAID, 34' x 12' F/G. 1979 Crusader seiner, holds 15,000#. Single Cat 3208. \$30,000.



GATOR, 34' x 12' F/G. 1979 Crusader seiner. 3208 Cat. \$50,000.



LISA DENISE, 34' x 11' F/G. 1979 Uniflite gill/long. Volvo Penta 60-D, 9,000+ hrs., 9-11 kts. \$54,000.



MOROZ, 36' x 11.2' F/G. 1981 Russian Marine combo/gillnet, holds 14,000#. 6BTA Cummins, 4,500 hrs. \$49,000.



GLADIATOR, 38' x 12.6' wood. 1971 LeClercq/Comm Marine seiner. 3160 Cat. \$50,000.

CHAPTER XI. OTHER ISSUES
SECTION A. USE OF HATCHERIES AS ENVIRONMENTAL MITIGATION

Hatcheries are sometimes built with the goal of mitigating environmental damage caused by such things as construction of dams and other projects, and water pollution. The goal of environmental mitigation has been a driving force in salmon hatchery development in the Pacific Northwest, particularly in association with dams on the Columbia River.

In contrast, Alaska's hatchery system has been developed for fisheries enhancement, mitigation of the effects of over-fishing, and the offsetting of reductions in fishing quotas for Alaskan fishermen negotiated as part of the U.S./Canada Salmon Treaty. However, Alaska law does contain several provisions regarding use of fisheries enhancement projects as a means of mitigating environmental damage. The primary one is the "Fishways Act."

Alaska Statutes 16.05.840 through 860, referred to as the "Fishways Act," gives the Commissioner of Fish and Game the authority to require the builder of a dam or other obstruction across a stream containing fish to provide and maintain a fishway or other device for fish passage. Where a fishway is not practical because of cost, the builder of the obstruction can choose among several other mitigation options with the approval of the commissioner. The options include:

1. Paying a lump sum to the state Fish and Game Fund;

2. Conveying land and funding the building, maintenance and operation of a fish hatchery, rearing ponds, buildings and other facilities; or
3. Agreeing to provide money (both initially and in annual payments) to expand, maintain, and operate additional facilities at existing hatcheries within a reasonable distance of the dam or obstruction.

The Fishways Act was passed in 1959. Since that time, other environmental protection laws and regulations have been enacted setting water quality standards and regulating the types, locations, designs, and allowability of development projects. The Anadromous Fish Act (AS 16.05.870) is especially important as it spells out requirements for pre-approval of any projects which could potentially impact fish or fish habitat. This Act and other environmental protection requirements work in conjunction with the mitigation requirements in the Fishways Act.

According to the Department of Fish and Game, the requirement to provide a fishway, either as a permanent structure or as a temporary one during construction, logging, or other work, is used frequently. The State often requires construction of spawning channels in streams that are being disturbed by such things as highway projects. Although the other provisions of the Fishways Act which require construction of hatcheries or monetary compensation are rarely imposed, state officials believe their existence in statute encourages modifications in project plans that

will avoid the actual stream obstruction and serious risk to fish that would activate these very expensive mitigation measures.

Obviously, preventing damage to fish and fish habitat in the first place is the simplest and most practical means of ensuring the health and ongoing availability of fish. State and Federal officials are charged with making every effort to ensure that the siting, planning and construction of any development project is done in a way that avoids or minimizes potential damage. Realistically, however, development will occur which will damage fish and fish habitat. In those cases where environmental protection methods, even fishways, cannot prevent that damage, mitigation of some sort is usually required by law. In other states and countries, hatchery production has indeed provided enough fish to keep some commercial and sport fisheries alive, at least for a time, that would otherwise have been restricted or curtailed due to a lack of fish. This is particularly true in areas where major dam projects or pollution have completely changed or destroyed salmon habitat and spawning patterns. To fishermen in an affected area, hatcheries seem better, at least initially, than no mitigation at all.

While salmon and steelhead hatcheries do produce fish to offset declines in natural runs, there is increasing concern among some scientists in the Pacific Northwest that hatcheries may actually be causing the further depletion of the already suffering natural stocks, some to the point of extinction. These concerns are

further addressed in Chapter VII of this report, regarding biological and genetic issues.

It is important to note how the federal Endangered Species Act (ESA) relates to the matter of using hatcheries as a means of mitigating environmental damage. In the state of Washington, where hatcheries have been used extensively with mitigation as a goal, scientists and fishermen are concerned that regardless of how productive hatcheries might be, they cannot prevent the federal government from invoking the provisions of the ESA if particular stocks are declared endangered. Indeed, the National Marine Fisheries Service (NMFS), which has jurisdiction over endangered species, proposed in 1991 that one stock of Snake River sockeye be listed as endangered under the ESA, and that two stocks of Snake River chinooks be listed as threatened. Decisions on two more salmon stocks (in the Snake and Columbia Rivers) are expected soon.

The Washington Legislature is considering legislation to address issues which have arisen from the application of the ESA to Washington's salmon. These issues include salmon habitat, wild stock protection, tagging of hatchery stocks, and how to define "species" or "stocks" of fish. (See Attached information).

Declaration of a salmon stock as "endangered" can have enormous impacts on fisheries and local and state economies. Since salmon are migratory, any restrictions placed on fisheries to protect a

particular stock could affect fishing hundreds or even thousands of miles from the spawning area of that stock.

The Endangered Species Act in effect sets the parameters within which hatcheries can be used to mitigate environmental damage. The Act does not recognize the creation of strong runs of one stock of salmon, through hatcheries or other enhancement efforts, as adequate compensation for the destruction of another stock. If a natural stock is at risk of becoming "endangered," the ESA will not allow for hatcheries to serve as a substitute for damaged habitat. The end result is that efforts to mitigate damage through hatcheries can backfire, closing down fisheries rather than enhancing them, if the hatcheries contribute to the further depletion of a stock. Thus, to avoid the impacts of the strict protective measures which can be imposed under the ESA, primary concern must be focused on preservation of wild stocks.

It should be noted however, that in some instances, such as where dams have irretrievably destroyed the ancestral habitat of a particular salmon stock, a carefully designed hatchery or other enhancement project may represent the only hope for survival of that stock. For the purposes of ESA, federal law defines "conservation" as including "propagation" if it is necessary to help an endangered or threatened species recover. Thus, while the ESA serves as a warning against hatchery development that could deplete natural stocks, it also recognizes the potential usefulness of hatcheries in the ultimate survival of an endangered stock.

Judgement about how effective hatcheries can be for "mitigating environmental damage" must be made on a case by case basis and with a recognition that mitigation is just that, a means of minimizing or offsetting some of the change or damage. Hatcheries can produce new harvestable salmon, but they do not generally repair or duplicate a damaged resource. Hatchery production of fish is an expensive ongoing commitment. The use of hatcheries to mitigate damage must be employed with the understanding that salmon which have been provided "free" and perpetually by nature, are being replaced by salmon that will initially and continuously cost money to produce. This cost, along with the possibility that hatcheries may harm remaining natural stocks, must be realistically considered and weighed in each case, against what is to be gained through the project that will cause the damage and set the mitigation effort into motion.

TAGGING AND MARKING SALMON

INTRODUCTION

The Magnuson (Fisheries Conservation and Management) Act of 1976 provided for United States jurisdiction over fisheries with 200 miles of the U.S. shore line as an effort to end foreign exploitation of our fisheries and aid in rebuilding stocks. A cooperative management effort was called for involving regional fishery management councils and the federal government. One of the most important factors of the act toward providing more data is the observer program. This requires foreign vessels, if requested to do so, to carry a U.S. observer on board when operating within the 200 mile limit. While the catch levels and biological data provided by the observers is very valuable it is only a piece of what is necessary to responsibly manage our fisheries. For example, where do the fish come from which are caught in the north Pacific no mans land "doughnut hole"? Are these of U.S. (lower 48) Alaskan, Russian, or Japanese origin and if we don't know where they come how can we ever expect to protect and or allocate "our own" fish (Gordon 1990).

High Seas Tagging

The International Convention for the High Seas Fisheries of the North Pacific Ocean signed by the United States, Canada, and Japan in 1952 requires research to determine the continental origins of Pacific salmon. This agreement known as the North Pacific Treaty established the International North Pacific Fisheries Commission to act as a guide to recommend and review research on salmon in the area of the Japanese high-seas fisheries. The Commission has supported the high-seas salmon research efforts of the Fisheries Research Institute at the University of Washington since 1955. The Institute has based its research on the use of a Peterson disk tag and a scale sample and other data gathered at the time of tagging. This process is initiated using two types of capture floating

longlines and purse seines. The Japanese use the longline technique exclusively and tag salmon caught in the western and central north Pacific, Bering Sea, and the Gulf of Alaska. The Canadians also use the longline technique and concentrate their efforts in the Gulf of Alaska and the eastern north Pacific. The United States through the Fisheries Research Institute and in cooperation with the U.S.S.R.'s Pacific Scientific Research Institute of Fisheries and Oceanography have used a combination of longline and purse seine over the years have tagged salmon in the central north Pacific and the Bering Sea.

This research has provided valuable information since high-seas salmon research started with the Fisheries Research Institute in 1955; however, the information is neither easy nor inexpensive to gather. As with any tag and recovery program several factors influence the quality of the research.

Weather is often a controlling factor in high-seas salmon research when tagging is as part of the program. While the longline technique can be used successfully in moderately rough seas and in areas of low concentration of fish the salmon are more likely to be injured than when captured with a purse seine. In light seas and with the use of an outrigger to hold the net away from the research vessel a purse seine may be used to capture large numbers of fish for tagging which are less size specific and less likely to be injured than those captured with the longline technique.

Major factors limiting the success of high seas tagging operations are magnitude of the area where the fish may be captured and the distribution of fish in such a large area. Beyond the difficulties encountered in capturing and tagging fish there is the possibility that these tagged fish will be caught while in the high-seas of the north Pacific before beginning their migration to spawning areas. A tagged fish may survive the predators of the open sea, be caught by fishermen not participating in the tagging program, or just avoid interception by the inshore fisheries causing a loss of data. Some fish find their way into remote spawning areas where tag recovery is very unlikely and thus

limiting the amount of data available from the tagging operation (Davis et al. 1990).

The Mark and the Salmon

When it comes to creating a way to give fish a unique identification there is little left to the imagination as a form of mark or tag that has not been tried, tested, revised, retried, retested and in some cases continues to be used. In addition to the variety of external tags or marks applied to fish for identification there are a number of internal tags or marking techniques that have been used with varying degrees of success. Some of techniques used for internal tags or marking are the use of implants, parasites, physiological, or genetic changes to create an identifiable tag or mark in the fish.

Implants

The least intrusive implant is the utilization of a tattoo using red, blue, green or yellow tattoo artist's ink injected with a Syrijet Mark II dental inoculator. The mark should be readily visible to the naked eye (Laufle et al. 1990). The next least intrusive may be fluorescent grit pigments in blue, red, yellow, light green, or a combination of red and blue implanted into the fish using a sand blaster operating with the nozzle at a distance of 40 cm and nozzle pressures ranging from 300 to 400 g/cm². These marks are detected by using an ultraviolet light to look at the blasted area of the fish in a darkened room or area (Nielson 1990).

Coded-wire-tag (CWT) is another popular tagging or marking system. The CWT is typically a 1.0 mm long by 0.25 mm diameter type 302 stainless steel wire which has been etched to provide notches representing binary code which are readily discernable using a microscope set at 400 power magnification. The CWT can be injected, using a 24 gauge hypodermic system, directly into the nasal cartilage in salmon (Buckley and Blankenship 1990).

Another implant technique involving additional technology is the use of a Passive Integrated Transponder (PIT). The PIT is a glass tube 12.0

mm long by 2.1 mm in diameter which contains an integrated circuit with antenna. This is a small radio transmitter which can be activated from an external energy source usually at a return site. This induced signal is then decoded to provide a unique factory set identification for the fish. Implantation is accomplished by using a 12 gauge hypodermic syringe system (Prentice et al. 1990).

The most invasive implant system is the application of fully powered radio transmitters measuring 6.5 cm long by 2.0 cm in diameter and weighing about 20 grams with an antenna about 30.0 cm long. This system is typically placed in the stomach of an adult salmon and basically used to track salmon movements in turbid glacial systems (Eiler 1990).

Parasites

The use of parasites as a tag or method to mark fish is an area where there may be a need for further research. Since parasites are common and present throughout most of the developmental stages of a fish they may provide a very acceptable tagging or marking technique. Some parasites naturally occurring in fish offer some very desirable qualities for tagging or marking fish.

At least seven types of endoparasitic tags or marks have been used in fisheries research. They can be identified as acanthocephala, cestoda, digenea, nematoda, plerocercoids, protoza, and sporozoan but these are only seven of possibly 180 species of parasites known to infect Pacific salmon. Parasites can be very specialized surviving in a single species of fish or a close relative or very unspecialized and occur in a variety of different fish. Much of this is dependent not only on the host fish but the environmental factors affecting the contact between the parasite and host as well as the evolutionary factors related to the stage of growth or development of both. Mark or tag recovery requires that the suspect fish be dissected to find some presents of the parasite or an indication that it had been infected by the parasite used as a mark. Recovery is simplified if the parasite used is of the variety that infects or can be found in a specific tissue or organ of the host (Buckley and Blankenship 1990).

Analysis of plerocercoids and nematode parasites have been used to identify sockeye Salmon from Alaska and Asia respectfully. Parasites which can be identified in the brain of sockeye salmon have been used to identify stocks originating from southeast Alaskan or northern British Columbia. Precision has been added to this analysis of the sporozoan brain parasite myxobolus neurobius by comparing scale characteristics also commonly used to distinguish fish from different continents (Moles et al. 1990).

Physiological

There are two basic physiological structure changes used as a mark or tag, these are scale circuli and otolith bone structure. These are both basic physical structures of fish and both have identifiable characteristics which are changed either by naturally occurrence or have changes in structure which are induced. These and other calcified structures offer a powerful technique for identifying stocks by looking at their chemical composition. Certain elements and other environmental factors such as temperature affect their crystalline density or chemical composition of these structures and can be considered a chemical mark or tag (Brothers 1990).

Scale analysis has been used for years to reliably identify the country of origin for salmon in the north Pacific. However, the use of scale analysis may not be capable of providing the information necessary to identify salmon beyond specific hatchery stocks or wild stocks, geographic region, or spawning time.

Otolith bone development provides a daily record of the internal and external forces affecting fish growth beginning at the eyed stage. This growth occurs in rings somewhat similar to the circuli of a fish scale or the rings of a tree. Growth of the otolith is in alternating rings of high and low concentrations of protein calcium carbonate. The ability to easily manipulate the optical density of these rings to make an obvious visible change in structure is what makes the manipulation of the otolith structure attractive as a marking or tagging technique.

Other changes affecting the chemical composition in the otolith have been to expose the fish to a specific trace element or isotope from a wide variety of chemicals with a specific atomic structure which can be chemically identified in the bone structure. The problem with the technique is that it can require some very sophisticated and sensitive equipment such as tube excited X ray fluorescence or atomic absorption spectroscopy, neutron activation analysis, inductively coupled argon plasma atomic emission spectrometry, or other mass spectrometry methods to detect what can be minute concentrations of the marking or tagging element (Brothers 1990).

The most common otolith mark technique may be to simply make a change in water temperature or to change the feeding pattern. Thermal marking is achieved by causing a rapid drop in water temperature. This technique has been successfully used in the hatchery environment to mark approximately 33 million pink salmon eyed eggs. This was achieved with no mortality or stress loss when water temperature was increased by 3.5°C to 3.7°C from an ambient temperature of 1.3°C to 1.5°C . Temperature control was maintained to $\pm 0.1^{\circ}\text{C}$ with 48 hour periods of heated water followed by 24 hours of water at ambient temperature to create one distinct ring in the otolith. This cycle was repeated to create a unique series of distinct rings in the otolith (Munk et al. unpublished).

Another technique used to lay down distinct rings is a simple matter of alternating periods of feeding and starvation of juvenile fish. Each day of starvation creates a ring of low optical density material. Subjecting fish an alternating series of days of starvation followed by and days of feeding creates areas of high and low density in the otolith which correspond directly to the periods of starvation and feeding.

Recovery and reading of the otolith mark or tag is very similar to the process used for coded wire tag recovery and reading. However there are some specific and note worthy differences. The coding process for the coded wire tag is a manufacturing process occurring some time before tagging and generally not considered a part of the tagging, recovery or reading operation. While the coding process for the otolith is the tagging operating. It is the preparation of the otolith for reading that may be

considered a production process not unlike manufacturing coded wire tags but occurring between the recovery and reading steps in the process.

The current standard procedure for preparation of otoliths for reading involved removing the bone from the fish, properly arranged in a mold and set in a polyester resin. The resin block with the enclosed otolith bone is then ground and polished on a Buehler Ecomet 3 lapping machine with a Texmet cloth and 1.0 μm alumina abrasive to a point that provides a clear view of the primordia of the otolith. The polished end of these block of plastic is then mounted with epoxy on glass slides and cut on a Buehler Isomet diamond saw to remove all but 0.5 mm of the otolith resin block. This is then polished on a Logitech LP-30 precision lapping and polishing machine to a thickness of between 50 and 150 μm depending on the specimens being prepared (Volk et al. 1990). The rings can then easily be read with a common microscope at 400 power.

Draft

Proposed Section for the Hatchery Research Study on: The Scope, Importance and Economic Value of the Fishery Enhancement Program to the Recreational Fishery in Alaska

Introduction.

The importance of enhancement program to the recreational fishery.

Many projects in the statewide enhancement program produce fish that are highly valued by sports fishermen, primarily chinook, coho, pink, sockeye, and chum salmon, steelhead, rainbow trout, grayling, and arctic char. Fish targeted for sport fisheries are released in over 350 locations around the state. Many of the projects in the state operated portion of the program (FRED Division) are entirely dedicated to improving recreational fishing opportunities.

This chapter summarizes the size and distribution of enhanced harvests, type of economic effects that result from the harvests, other non-market values associated with tourism, and to the extent possible, magnitude of these effects on Alaska's economy. Additionally, a discussion of some of the issues and conflicts relevant to the enhancement of recreational fisheries are presented.

Sport fishing has been growing in Alaska since Statehood. This is evidenced by the increase in the growth in the number of licensed anglers fishing in Alaska from 1977 (200,000 total license sales) to 1990 (425,000 total license sales) (Mills 1991).

The explosive growth in sport fishing participation in Alaska can be attributed to many factors, including changes in Alaskan population, real per capita income of resident and non-resident visitors, and the opportunity to have a good quality fishing experience. A major component of a high quality fishing experience, particularly for resident anglers is the probability of catching a fish during an angling experience (called the harvest per angler day) (Jones and Stokes 1991). The economic value of fishing experiences are directly related to higher harvests per angler day. The statewide enhancement program has been a key factor in maintaining and augmenting these catches in the presence of increasing fishing effort.

Magnitude of recreational fishing from the Enhancement Program.

The statewide salmon enhancement program has grown in recent years to the point of supporting a significant portion of the total Alaska fin fish harvest. Total finfish harvests in 1990 in the Alaska Recreational fishery were 1,995,360 (Mills 1991)¹. Total finfish harvest of trout, salmon, grayling, and arctic char and steelhead was 1,341,741. The enhancement program contributed over 28 percent of the harvest of salmon, trout, grayling, arctic char, and steelhead (Table 1.)(Fig. 1)(McKean 1991 and Mills 1991).

The state operated enhancement program produced 270,983 salmon, trout, grayling, char and steelhead in 1990, while PNP operators contributed 98,910 salmon to the recreational harvests for a Total of 369,893 fish (Table 1) (Fig. 2). The total recreational harvest from enhancement in 1991 is estimated to be 357,370 (Holland and McKean 1992).

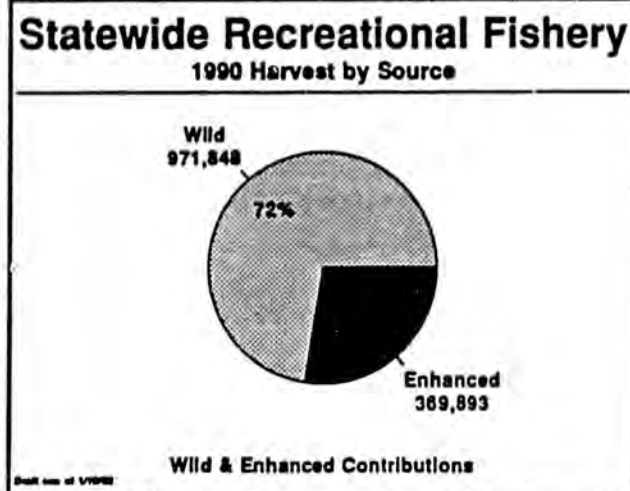


Figure 1

Table 1. Number and Percent of Enhanced Salmon, Trout, and other enhanced species harvested in 1990 in comparison with total harvest in the recreational fishery.

Species	king	searun coho	sockeye	pink	chum	landlocked coho/chin	rainbow	other	total
FRED harvest	16,100	33,447	3,550	3,900	0	37,831	170,283	5,872	270,983
PNP harvest	1,517	34,754	0	54,867	7,772	0	0	0	98,910
Enhance total	17,617	68,201	3,550	58,767	7,772	37,831	170,283	5,872	369,893
Wild totals	106,291	257,735	235,568	146,835	6,753	0	21,526	197,140	971,848
Grand Total	123,908	325,936	239,118	205,602	14,525	37,831	191,809	203,012	1,341,741
% harvest enhance	14.22%	20.92%	1.48%	28.58%	53.51%	100.00%	88.78%	2.89%	27.57%

¹ Over 1 million razor clams were also harvested in 1990 in non-fisheries.

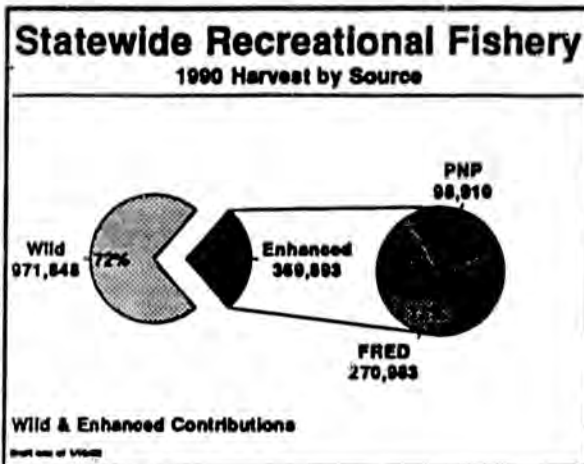


Figure 2

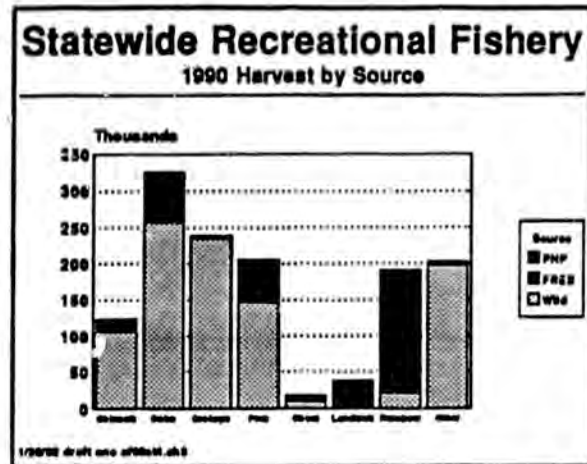


Figure 3

List of selected enhancement projects that have dramatically increased recreational catches.

- o Eighty nine percent of the 192,000 rainbow trout harvested by sport fishermen in Alaska in 1990 originated from state operated hatcheries (Fig. 3)(McKean 1991, and Mills 1991)².
- o Of 37,831 coho and chinook landlocked sport harvests, 100% were produced by state hatcheries in 1990 (McKean 1991, and Mills 1991).
- o Between 1987 and 1990, 47% of the coho salmon harvested in the popular Resurrection Bay sport fishery originated from enhancement projects at Elmendorf Hatchery, Trail Lakes Hatchery, and Bear Lake rearing Facility. The average sport harvest of enhanced fish was 9,910 (McKean 1991).
- o Harvests of coho salmon from enhancement projects in the Juneau area increased by 21 fold (2,166%) between 1990 and 1991 from 1,174 to 21,664 fish (McKean 1991). Most of the increased harvests in 1991 were estimated to originate from Gastineau Hatchery operated by Douglas Island Pink and Chum (Holland and McKean 1992).
- o In 1991 the Homer Spit recreational fishery produced 10,000 coho salmon, 3,500 chinook salmon, and 500 pink salmon entirely from enhancement releases from Crooked Creek Hatchery.

² While enhanced harvest statistics are available for recreational fisheries in 1991, statewide harvest statistics for wild and enhanced fish are produced on a one year lag, so 1990 is the most recent year that total and enhanced harvests may be contrasted.

- o Southeast chinook salmon production in 1991 totaled almost 38 thousand adult fish returning with another 5 thousand pan-sized fish harvested in stocked lake fisheries. Over six thousand adults and 5 thousand sub-adults were harvested in marine and freshwater sport fisheries.
- o The Elmendorf and Crooked Creek Hatchery increased the harvests of king salmon by 4,800 and coho salmon by 1,655 in the 1990 Kasilof River Recreational Fishery.

Contribution of enhancement program to community fishing derbies.

Dozens of fishing derbies are conducted each year in Alaska. Fishing interest groups and vendors, and municipalities are the major organizers of these events. Approximately one dozen of these derbies produce large harvests of fish into the recreational fishery (Table 2). The major reason that communities hold derbies is to increase the amount of economic activity in an area or to collect revenue for charity.

Retail businesses in some communities depend upon the angler related spending that occurs during a derby to sustain a large portion of their annual gross receipts. The ability of a derby to attract the angling public depends largely on the ability of the fishery to supply a good fishing experience with acceptable catch levels.³ The enhancement program augments catch opportunities and in some cases is the primary source of fish harvested during the derby. In Alaska some derbies would not be able to exist without fishery enhancement (i.e. Valdez coho derby pers. comm. Paul McCollum) others would not attract nearly as many participants without the acceptable catch rates offered by fishery enhancement. Approximately 82% of the salmon harvested in Alaska's major fishing derbies have originated from the statewide enhancement program (Fig. 4).

List of major fishing derbies in Alaska, augmented by enhancement

1. Juneau sport fish Derby
2. Ketchikan sport fish Derby
3. Wrangell/Petersburg
4. Sitka Derby
5. Seward Coho derby.
6. Valdez Derby
7. Big Lake Derby
8. Seldovia
9. Community of Houston

³ Weather conditions, income, and substitute recreational activities, and the opportunity to compete for prizes, are also known to affect participation in fishing derbies.

10. Assorted Kodiak derbies

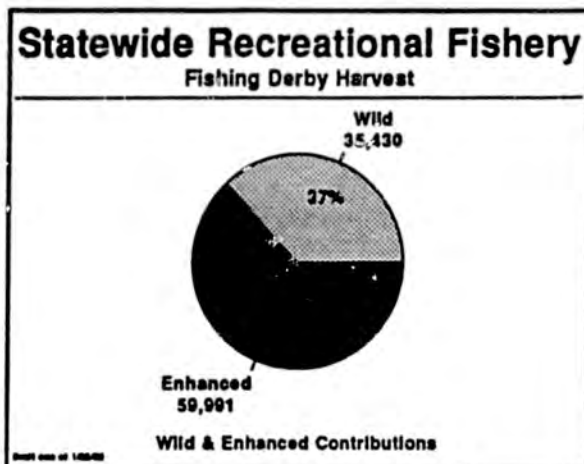


Figure 4

Table 2. Fishing Derby Harvests, including numbers of enhanced fish by species, percent of enhanced fish by species for 1991 and other selected years.

Derby Name	Species	Location	Enhanced Harvest	Wild Harvest	% Enhanced
Golden North(1991) ^a	Chinook	Juneau	136	522	26.0%
^b	Coho	Juneau	173	2,567	15.8%
Petersburg(1991) ^a	Chinook	Petersburg	228	422	35.1%
Wrangell(1991) ^a	Chinook	Wrangell	48	173	21.7%
Sitka(1991) ^a	Chinook	Sitka	270	980	21.6%
Seward(1989) ^c	Coho	Seward	9,280	5,581	62.4%
Valdez(1991) ^d	Coho	Valdez	10,000	500	95.2%
Valdez(1991) ^d	Pink	Valdez	30,000	500	98.4%
Total			50,135	11,655	81.7%

^a Memo from Paul Suchanek to Fred Gaffney 12, 5/91

^b Karen Crandall, Pers Comm. 1-15-91

^c Doug Vincent-Lang Sport Fish Division Anchorage, pers comm. 1-91

^d Paul McCollum, Valdez Fisheries Development Corporation, pers comm 1-91

Valuation and economic impacts of the recreational fishing that result from the statewide enhancement.

What is a recreational benefit, and how does it differ from an expenditure and an economic impact?

The salmon, steelhead, trout, grayling, and Dolly Varden resource in Alaska provides at least two distinct forms of recreation. It provides an extensive saltwater and freshwater sport fishery, as well as non-consumptive recreation such as watching a run of salmon migrate and spawn. The same basic economic principles apply to determining the value of both forms of recreation in terms of how benefits are generated. However, the data bases differ for each kind of recreation and the methodologies developed for the sport fish evaluations will not be suitable for evaluating the non-consumptive forms of recreation.

Consumptive values from harvests and catches of fish could be likened to property values, in that they vary from location to location. Also, they vary in quality, just as a piece of property with a beautiful view or superior amenities may have a higher market value than an equal sized piece of property with a view of a city dump, and poor amenities.

In the context of a salmon or trout fishery, enhancement changes these consumptive values by increasing the abundance of fish available to anglers. This results in a larger catch which increases the harvest expectations of both current and prospective anglers. This will either cause a greater number of fishermen to go fishing, the current number of fishermen to spend more time fishing, or cause fishermen to receive a higher valued experience for the current amount of fishing effort. Since these angler decisions can occur simultaneously, economic models that estimate the value of these experiences may be quite complex. This chapter includes a short discussion of the methods used for valuing sport fishing benefits from enhancement projects and some analytical results of economic studies on enhancement.

When anglers expend more effort catching fish from an enhancement project they may spend a greater portion of their income in harvesting. For policy makers and fishing interest groups, expenditure data reported by anglers is frequently mistaken for the "value" of recreational fishing. The net economic value of a recreational fishing experience is what fisher's are willing to pay over and above their costs. These expenditures, however, are a "cost" to the consumer and must be subtracted from the total consumer surplus. While these expenditures are an unambiguous cost, they do produce economic activity in communities. This economic activity is referred to as "indirect effects" ⁴ in economics, and is further discussed in the impact section of this chapter.

Consumptive Values and economists use of the term "value".

Given the virtual free and open access to fisheries that are augmented by enhanced fish, the largest part of the incremental recreational benefits generated by FRED Division and the PNP program will accrue directly to recreationists in the form of consumer surplus. Consumer surplus is a measure of the satisfaction people enjoy from their consumption of a commodity. It is defined by what they would be willing to pay for it.

If charges could be levied for the rights to harvest enhanced fish, each individual would be willing to pay some maximum fee for the opportunity to participate in any particular type of fishing or other recreational opportunity. Further, the angler would choose to buy a certain number of units of that recreation at each unit price below that maximum. Of course recreationists do not buy angler days or days of salmon viewing as they do other commodities. None-the-less, this price quantity relationship does exist for each individual and forms his or her demand curve for fishing, viewing etc. The sum of all the individual demand curves forms the aggregate demand curve over all those willing to pay to participate in the recreation (Fig. 5).

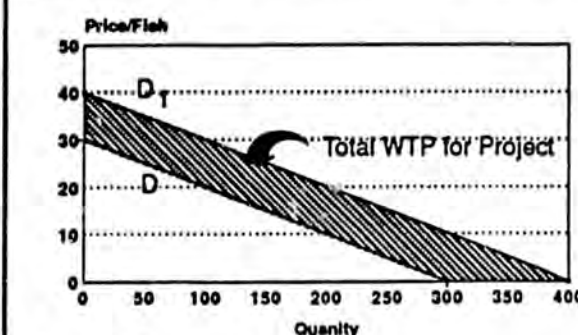
⁴ Also, they are referred to as secondary effects, secondary impacts, and regional economic impacts.

In Fig. 5, the line D represents the aggregate demand curve for some particular recreational activity associated with the salmon, trout or other resource. The area under the curve is the total willingness to pay of all recreationists. It is a measure of the total satisfaction gained from consumption of the recreation if it is offered at no charge. This demand curve is influenced by many factors such as the price of complementary goods, by incomes and by the expectations and perceptions of those who participate. The availability of more fish as a result of the enhancement program causes the quality of the product to change, thus, shifting the demand for salmon and steelhead recreation from D to D1. The expectations of fishermen are raised over the prospect of improved catch success and this, in turn, improves what they are willing to pay for the experience. This increase in willingness to pay results in the consumption of more fish at each price. The shaded area between D and D1 is the increase in consumer surplus that results from an enhancement project.

The total willingness to pay differs from the net willingness to pay in that net WTP considers the additional cost of catching fish. In (Fig. 6), the net willingness to pay for a recreational experience is demonstrated by the difference between the total willingness to pay and the cost of fishing at a given price per fish. The consumer surplus is the shaded area above the price line and below the demand curve. This graph represents the net willingness to pay for a project that creates a new fishery, and does not represent an increment in catch for an existing fishery.

In addition to generating consumer surplus by increasing the abundance of fish in existing fisheries, the statewide enhancement program can generate consumer surplus by opening new sport fisheries. Enhancement projects which rehabilitate a diminished stock have been credited with re-opening sport fishing areas, and with expanding bag limits in a recreational fishery. The reopening of a sport fishing statistical area, or relaxing of

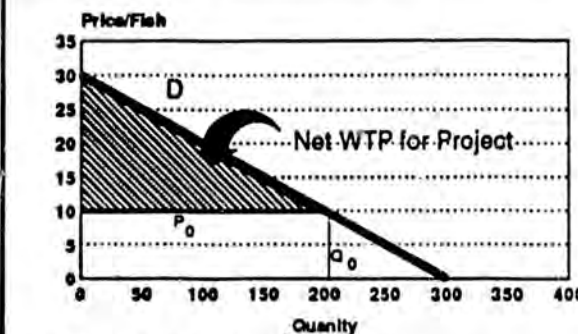
Total Willingness To Pay (WTP) For An Enhancement Project



Draft of 1/22/92 SF90ln1.ch3

Figure 5

Net Willingness To Pay (WTP) For An Enhancement Project



Draft of 1/22/92 SF90ln2.ch3

Figure 6

bag limits will often produce greater consumer surplus values than simply increasing catch rates during an existing opening.

Finally, there may be non-consumptive and nonuse values associated with the fishery. These values include existence, option or bequest values. People may gain satisfaction from the fishery not because they make use of it, but for other reasons. Viewing and education associated with fishery enhancement projects motivate tens of thousands of visits to state and PNP facilities each year. A discussion of some of the tourist visitation statistics are included in this chapter. Persons who never fish may still place a value on the continued existence of the fishery. Fishery rehabilitation projects have been applied to several streams with salmon populations that would be otherwise too small to sustain themselves in the future. Although nonuse values associated with fisheries in Alaska may be significant, they are not treated here.

Valuation Statistics on Enhancement of Recreational Fisheries

The State of Alaska is fortunate to have some of the finest economic models in the North America for valuation of recreational fishing. Three studies by the consulting firm of Jones and Stokes, have been carried out since 1986 (Jones and Stokes 1987, 1989, and 1991). The work, which clearly represent the state of the art in recreational demand modeling cover the regions of South Central Alaska, Juneau, and Southeast Alaska. Areas not covered by the analysis include the Arctic, Yukon, Kuskokwim regions, Alaska Peninsula, Kodiak, and Bristol Bay. The State of Alaska has expended over \$600,000 in the development of the current models with Wallop-Breaux funds. The two valuation techniques applied in these studies are (1) a modified travel cost model approach and (2) contingent valuation procedures. While the methods for these two techniques cannot be described in detail here, some of the major findings of the studies, as well as difficulties with the models are summarized.

While enough cannot be said about the analytical quality of the three Jones and Stokes studies, several obstacles exist in actually applying some of the models to policy questions related to the Statewide fishery Enhancement Program.

1. The report for the South Central studies, and Juneau area studies do not include an analysis of current enhancement projects. Some net willingness to pay values are cited in the reports that are unfortunately, not relevant to evaluation of enhancement projects. The economic models created for the studies must actually be operated on a computer program to precisely estimate sport fishing values for policy analysis (unless a relevant policy analysis simulation was carried out under the contract). In fact, the estimates of average value for a day of fishing effort will be overestimates of the marginal value of an enhanced fish by a few percent to more than an order of magnitude. This is demonstrated in the Southeast economic study where average angler willingness to pay per king salmon harvested of \$616 was nearly three times the marginal angler willingness to pay

per fish of \$210 from a king salmon enhancement project (Jones and Stokes 1991). Thus, use of the average willingness to pay figures from the reports, could produce grossly distorted and spurious results when applied to policy questions requiring marginal or incremental values.

2. The South Central Economic Study (Jones and Stokes 1987) is extremely complex, and the models created in this study required initial calibration on a Cray super computer, during their formulation. The cost of carrying out simulations on the mainframe computer is prohibitive for day to day policy analysis. Furthermore, only the staff at Jones and Stokes and a few other economists in the U.S. are capable of operating the South Central Region discrete choice models.

3. Even if the computer simulation models were operated in their current state, many of the site/species statistical areas, that are sampled in the studies are not the sites in which enhanced fish are produced. Enhanced sites must be matched with similar site/species combinations in the surveys to approximate the value of a project. This would require some ADF&G Sport Fish Division staff time to carry out the site/species matches.

4. Applied cost benefit analysis with the Jones and Stokes models require the projection of some fairly detailed catch and effort information from the Department of Fish and Game. The logit Travel Cost models and Contingent Valuation models require detailed information on probable harvests and fishing effort (angler days) for each proposed project. This information must be projected by specific statistical area and by week of harvest.

5. The Jones and Stokes models produce valuation estimates for years between 1986 and 1988. To run simulations on present day policy questions requires some updating of the models. These updates would require some ADF&G staff time and some contractual resources for economic analysis.

For the proceeding reasons (1-5), a comprehensive study of the net benefits of the statewide fishery enhancement program to the recreational fishery has not been carried out. Such a study would be of critical importance for investment and allocation purposes and would complement the economic modeling that the Legislature is now undertaking on the value of enhancement to the commercial fishery. The costs of creating the necessary software to evaluate all projects in South Central region, would require approximately \$20,000. Additional running of simulations would require approximately 1 full year of work in a cooperative effort with FRED Division and the Division of Sport Fish. The simulation of the net benefits for projects in Southeast Alaska could be undertaken with fewer resources, since the computer software was produced as part of the contract. Both the South Central and Southeast Region fishery enhancement could be evaluated with an additional \$30,000 in contractual services, and with the better part of

a year of staff time from the FRED Division economist and 1/3 year of staff time from the Biometrics section of the Division of Sport Fish.

Selected statistics for the enhancement produced Southeast Alaska king salmon fishery.

The Southeast Alaska Sport Fishing Economic Study (Jones and Stokes, 1991) does produce some analytical results that are applicable to estimating the value of proposed king salmon enhancement actions.

- They are:
- (1) An estimate of the net willingness to pay estimates for a proposed increase in hatchery operations for king salmon enhancement of 20%, and
 - (2) A policy analysis question involving the estimation of an increasing in the opening for the Juneau Statistical Area for Chinook salmon fishing.

In brief, the first analysis applies direct survey questions about what amount anglers would be willing to pay for a fishing stamp to charge for improved chinook salmon fishing from the hatcheries in Southeast Alaska. The survey relates these proposed access fees to a 20 increase in production costs from the enhancement facilities. This in turn, was estimated to yield approximately a 30% increase in the average sport harvest of Chinook salmon in Southeast Alaska. While the production costs are not exact estimates, a special simulation of the models revealed that the increase of 8,900 harvests would result in an annual net willingness to pay of approximately 1.9 million dollars annually (1988 dollars) (Table 3). The average value for a chinook salmon in this scenario is approximately \$210 per harvested adult.

Table (3) Total Annual Willingness to Pay of Resident Angler Households in Southeast Alaska for a 20% increase in the King Salmon Harvest from Hatcheries

Harvest Area	Hatchery Operations
Ketchikan	\$380,688
Prince of Wales	340,958
Kake/Petersburg/Wrangell/Stikine	352,287
Sitka	362,983
Juneau-Haines/Skagway	<u>439,104</u>
Total	\$1,876,020

The second economic statistic results from a proposed opening of the Juneau statistical area for King salmon fishing during the months of April, May, and June. This policy question focuses on a recent decision to open a portion of the Juneau Statistical area to early season king salmon fishing (from April 24 to June 18). During a previous opening of this statistical area over 1,130 king salmon were harvested, and a large increase in the number of days of effort were recorded. Angler net willingness to pay for this alteration was estimated using the travel cost, and contingent valuation methodologies. The change in the willingness to pay for the increased catch for this management action was between \$303,500 (from the results of the logit model) and \$398,000 (from results of the CV model) annually and from \$268 to \$352 per harvested fish respectively.

This simulation is similar to the approach that would be applied to computing the value of a Chinook enhancement project that increased the abundance of fish sufficiently to extend the length of the opening in a prime fishing area. For several reasons, the net willingness to pay for an identical increment in chinook harvests from a typical enhanced chinook fishery may be less than the WTP amounts cited in this example⁵, but they are probably within a similar magnitude.

While these valuation results must be offered with a note of caution, they probably provide an upper bracket for the marginal value of a Chinook salmon, produced by enhancement, and caught by recreational fishers in Southeast Alaska. The lack of updated computer software, designed to apply the Jones and Stokes models, is the major restraint to a comprehensive economic assessment of recreational net benefits for the statewide enhancement program.

Visitation Statistics for Hatcheries.

In aggregate, State and PNP hatcheries generate nearly one half million visitor days from resident and non residents per year. Visitation statistics have been compiled for the following hatcheries.

Table (4) Public and PNP facilities with visitor facilities and visitation records.

	Visits
Deer Mountain	150,000
Elmendorf	65,000
Ft. Richardson	1,200

⁵a. Most enhancement projects increase the catch per unit of effort in an established fishery opening, but do not result in outright extensions of area/time openings.

b. Harvests in this example consist of both enhanced and non-enhanced salmon. The Jones and Stokes models have demonstrated a small WTP premium for wild fish in the Southeast marine chinook salmon fishery.

Gastineau Hatchery (DIPAC)	100,000
Trail Lakes Hatchery (CIAA)	25,000 (20,000 to 30,000)
Bear Lake Rearing Facility (CIAA)	12,500 (10,000 to 15,000)
Crooked Creek Hatchery	80,000
Valdez Hatchery (VFDA)	8,541
Total	442,241

The tourism generated by hatchery visitation is one example of a non-consumptive value that is created by the statewide enhancement program. Non-consumptive recreational benefits generated by the enhancement program are in many ways more difficult to estimate than the benefits of sport fishing itself. Baseline information on the demand for such forms of recreation is scarce, but visitation itself is an indicator that people derive consumer surplus from these experiences. The value of a visit to a salmon enhancement facility can be compared with the value of visits to attractions such as Aquaria or a private zoo. The willingness to pay for entrance to the facility is a proxy for the minimum consumer surplus derived.

The visits vary in quality and time from facility to facility. Some facilities have extensive visitor amenities and visitation may consist of an hour or more in length. Other facilities have minimal visitor amenities and visitation may consist of a few minutes of viewing of migrating and rearing of salmon. The states largest and most extensive hatchery visitor center is at Gastineau Hatchery, in Juneau. In 1991 the facility charged \$2.25/visit (walk in fee) and recorded nearly 100,000 visits.

While a total value cannot be computed from the existing visitor information available from these facilities, total visitation suggests that benefits to Alaska are on the order of hundreds of thousands of dollars annually.

Indirect economic effects of the statewide enhancement program (employment and income effects from tourism and resident expenditures)

As previously explained, an enhancement project that increases non-market benefits of a fishery will often compel anglers to spend additional fishing effort and make additional expenditures to compete for improved fishing. Thus, fishery enhancement can compel anglers pay more for boats, moorage, lodging, transportation, food and beverages, guiding, and other fishing related items. It is these out of pocket expenditures that lead to "economic impacts" and result in increased employment and income in the Alaska economy. Businesses that provide goods and services to anglers hire and pay employees and buy inventory from other businesses, which in turn hire and pay employees and buy from still other businesses. Multiplier effects turn these expenditures into gross business revenues in Alaska. The magnitude of these revenues can be projected with economic impact models.

DRAFT

Two economic impact models exist in Alaska that are suitable for computing changes in changes in expenditures and employment resulting from fishery enhancement of recreation. One is input-output model developed for Jones and Stokes 1987,1989, and 1991). The second is a model called SALMOD, developed by the Institute of Social and Economic Research. In the Jones and Stokes, I-O models angling expenditures are computed for anticipated change in fishing effort (angler days), and in turn, the direct, indirect, and induced economic income for a fishery may be estimated. A major advantage of this model is that short run expenditures for a given project are empirically estimated in the behavioral models. Thus, the expenditure estimates conform more closely to the amount of additional spending resulting from a management, or enhancement action. Many impact models must use average expenditure data which can produce greatly overstated estimates of marginal expenditures.

As in the case of the Jones and Stokes non-market models, economic impacts for the statewide enhancement program could not be estimated without the creation of practical computer software, and additional fishery effort projections for enhanced sites (for South Central Alaska). Impact assessments would be possible for enhancement projects in Southeast Alaska with the soon to be completed impact models, and with additional work on fishing effort estimates for all enhancement projects. An example of an employment and personal income estimate is provided in Jones and Stokes (1991) for an expansion of recreational fishing opportunities for chinook salmon fishing in the Juneau area. An additional catch of 1,130 harvested adults is estimated to produce approximately \$13,000 in personal income and less than 1 full time job (Jones and Stokes 1991).

Results of Economic impact Assessment of Statewide Enhancement program with ISER Model.

Estimates of employment in the Alaska economy can also be made with SALMOD, an economic impact model created by the Institute of Social and Economic Research (ISER). This model was created specifically for the evaluation of the state wide enhancement program. Several revisions of the economic base model have been completed between 1986 and 1990. The model produces estimates of the expenditures of recreational fishing created by the enhancement program. Employment is expressed in full and part time jobs. The documentation for this model is in progress through a contract with Scott Goldsmith of ISER (pers comm Jeff Hartman FRED Division 1991).

The preliminary results of the FRED recreational impacts, from SALMOD, project personal income to Alaska residents of \$2.0 million to \$7.0 million annually, with a point estimate of \$4.3 million⁶. The full time employment that would result from this

⁶ Income and employment impacts vary greatly depending on what assumptions are used in this model for the expenditures that would occur in the absence of the recreational fishing opportunity. Net expenditures in this simulation are equal to 1/2 of the average expenditures for

increased personal income is approximately 150 jobs. The PNP hatchery personal income impacts from recreational fishing are estimated to be approximately \$400,000. These impacts result from the eggs taken in broodyear 1988, that were projected to return between the years 1990 and 1997 (Hartman, 1988) Memo of July, 20, 1988, to Distribution. These employment and income impacts occur primarily in the Cook Inlet region, Southeast, and Kodiak regions (Table 5) (Fig. 7).

Table 5 Personal Income and Employment Impacts from 1988 simulation of SALMOD impact model for FRED Division enhancement projects by region of impact.

	Total Statewide Impacts	South east	Prince Willia Sound	Cook Inlet Mat/Su	Kodiak AK. Pen.	Interior
Personal Income (\$ 1,000'S)	\$4,309	\$731	\$59	\$2,786	\$37	\$696
Employment	148	25	2	96	1	24

Issues and Conflicts relating to Enhancement of Salmon, Trout, and other species.

1. Allocation between competing users.

Intense competition between users exists for most of the salmon fishery in Alaska as is the case in most of North America. This competition is observed by the Alaska Board of Fisheries, and ADF&G fisheries managers who are under constant pressure to deliver more fish to each of the various interest groups in the state. Within the commercial fishery, sport fishery, personal use and subsistence fisheries of Alaska, there are a multitude of insistent claims to enhanced fish, all asserting equal validity but in total, exceeding the available supply.

The source of the conflict and divisiveness over allocation of enhanced fish is often misunderstood. The primary reason for the competition lies in the large economic value of the



Figure 7

an angler day, as approximated from Jones and Stokes (1987) and Mike Mills pers comm 1988.

salmon resource that has been created in Alaska. If the resource created by enhancement were of little economic value, fishers would not spend so much of their time trying to seek out larger shares of the available harvest.

Since enhanced fish are often harvested along with wild stocks, allocation conflicts involving recreational fish are complex and intertwined. In Southeast Alaska, the allocation conflicts are additionally complicated by U.S./Canada treaty constraints. This treaty sets strict limits on harvests of non-enhanced chinook salmon in the region. Reduced quota's have generated a recent Board of Fish decision to hold special hearings that consider a range of restraints on the sport harvest of chinook salmon.

The economic costs of further restraints on the recreational fishery may be greater than the economic costs of producing additional chinook salmon to targeted commercial or recreational fisheries. Thus, the fishery enhancement program may be a tool to help reduce conflict in this dispute.

2. Funding of enhancement for recreational fisheries.

While anglers in Alaska have clearly become dependent on the statewide fishery enhancement program for sustaining a valuable fishing experience, the prognosis for sustained financing of fishery enhancement in the state is much less certain.

The existing funding for statewide fishery enhancement program is highly dependent on the continuation of Federal funding through an excise tax and distribution program called Wallop-Breaux. This amendment in the federal Register, represents somewhat of a windfall for Alaska. While Alaska fisher's contribute a trivial amount the tax receipts to the total fund, the current funding formula provides an amount to the state which is not commensurate with population or licensed fishermen in Alaska. Should the funding formula for distributing tax receipts to Alaska change, most of the states enhancement production would be affected.

Additionally, in the FY 93 Governors Budget, two state owned hatcheries that produce important recreational fisheries, are not funded. They are Deer Mountain Hatchery in Ketchikan, and Big Lake Hatchery in Wasilla. Deer Mountain Hatchery produces several hundred chinook salmon harvests in the recreational fishery, and over 1,000 chinook harvests annually in the commercial fishery. It also produces a significant harvest of coho salmon in the recreational fishery. While the economic value of the permanent loss of the production from this hatchery has not been computed, it would be possible to produce an estimate by creating a simulation from the newly completed Southeast Economic Study.

3. Genetic and Management Conflicts and Issues.

To be inserted by Jeff Koenings and Sport Fish Division

For 1991 Juneau DJ coho 1,445; Gastineau 20,219

Juneau Derby from tag lab Coho 1991 Juneau 173 fish catch 2567
Coho 1990 Juneau 18 fish catch 1914.

Table (X) Public and PNP facilities with visitor facilities and visitation.

	Visits	
Deer Mountain	195,000	
Elmendorf	65,000	('91-47,000; '90-65,000;
Ft. Richardson	1,200	'89-60,000)
Gastineau Hatchery (DIPAC)	100,000	
Trail Lakes Hatchery (CIAA)	25,000	(20,000 to 30,000)
Bear Lake Rearing Facility (CIAA)	12,500	(10,000 to 15,000)
Kasilof Hatchery	80,000	
<u>Valdez Hatchery (VFDA)</u>	<u>8,541</u>	
Total	478,200	

Furthermore, the two policy questions produce WTP results that are comparable in units of harvest. The CV hatchery simulation produces an incremental value of ____ per harvested salmon, the

Notes:

For Gastineau Hatchery, in 1991 84,000 cruise ship, 10,000 travelers, 5,000 school students. Salt water aquaria, 5,000 gallons, several small aquaria 100 species, museum like display of bear and eagle habitat, mocked wheel house of fishing vessel, viewing window in the fish ladder, displays outside. In full swing, 6 full time and 6 part time positions. Facility used for conferences, meetings and receptions, research. Fee for independent i.e., 2.25 educational commentary cruise ship contract with operators. Reecia Wilson DIPAC. Tourism Manager. Visitor Fishing Pier.

D. Impact Statistics.

LEGISLATIVE RESEARCH AGENCY
130 Seward Street, Suite 218
Juneau, Alaska 99801-2196
(907) 465-3991
(907) 463-3351 (FAX)

DATE

2/3/92

TO

FAX NUMBER:

4928

FROM:

Glenn Gray

Transmission of the following number of pages including this page 3

MESSAGE:

I called Bill Smoker and he reaffirmed
that this resolution is only proposed.
Mr. Smoker is chair of the resolutions
committee of the Alaska Chapter of the
American Fisheries Society. The committee
is still accepting comments on the proposal.

of "A Tongass Treasure: The Cave Resources of Southeast Alaska," by Jim Baichtal, a geologist with the U. S. Forest Service.

Immediately following the meeting, there were tours for interested members at the fish processing facilities of Silver Lining Seafoods, the FRED hatchery at Deer Mountain and the SSRAA hatchery at Beaver Falls.

Chapter Comments on Tongass Forest Management Plan

The Alaska Chapter has sent a letter to the U. S. Forest Service in response to the Forest Service's request for public comment on the Supplement to the Draft Environmental Impact Statement (DEIS) for the Tongass National Forest Land Management Plan (TLMP). The letter was reviewed by the Environmental Concerns Committee and approved by the Executive Committee. The Chapter had previously gone on record supporting regulations requiring 100 foot wide buffer

strips along fish-producing streams in areas of the Tongass that are to be logged. The Supplement to the DEIS does now include those requirements, as mandated by the Tongass Timber Reform Act. In our comments on the Supplement, the Chapter emphasized that such buffers should be considered minimums, and that habitat biologists should be granted wide discretion to extend the width of the buffer as needed to protect particularly sensitive riparian habitats and valuable fish populations. The Chapter recommended the Forest Service reject the Plan Alternative that did not use the most conservative riparian habitat management prescription.

The Chapter also commented on the inadequacy of the DEIS and the Supplement in addressing the impacts of upland uses, such as roading and logging, on spawning populations of salmon, especially pink salmon. The DEIS and Supplement acknowledge "greater risk" to populations in impacted watersheds, but assume no effect on productivity of these fish in comparing alternative forest management strategies.

Proposed Resolution on Yukon River Wild Stock Management Zone

The following draft resolution was identified at the Annual Meeting, and the membership present voted to have it publicized for informational purposes in the next issue [this one] of *Oncorhynchus*. **IT HAS NOT BEEN APPROVED BY THE MEMBERSHIP**; it does not represent an official position of the Chapter. Background material that was provided by the author of the resolution follows the resolution itself.

The Chapter also received a draft of the "United States Proposal for Establishing a Cooperative Yukon River Salmon Wild Stock Restoration Program." This draft was prepared by the U.S. delegates, including members of both Alaska and National agencies, to the Joint Technical Committee considering Yukon River salmon policy with respect to the U.S./Canada Salmon Treaty. The draft proposal provides insight into the current planning process to establish cooperative management policy for the Yukon. This current process anticipates two outcomes: 1) the establishment of a Regional Planning Team for RPT's in Alaska are representative public bodies for salmon enhancement and management and which have been given responsibility for designating game refuge areas; and 2) participation in a joint US/Canada plan for the Yukon River watershed.

The proposed resolution **WAS NOT** offered in the meeting document, the proposed resolution would be subject to comment by the Chapter on the policy prior to the planners.

A Resolutions Committee has been formed to consider this resolution and to recommend to the Executive Committee 1) whether the resolution should be presented to the membership as it is written for approval or disapproval, 2) whether an alternate resolution should be offered, or 3) whether the proposed resolution should be tabled. The following material is being presented to inform the membership about the resolution and to solicit comments on the resolution.

Particularly useful would be comments on the scope of the Chapter's recommendation.

The Yukon is home to a unique group of Pacific salmon, subarctic animals adapted to near arctic conditions. They deserve special care. Should, therefore, resource users of the Yukon be denied any enhancement of salmon production beyond the capacity of wild spawning habitat? There is of course widespread current debate of whether artificial enhancement ever can increase production over that supported by wild

spawning habitat, and perhaps that is the core of the proposed resolution's author's concern.

Alaska has a long established mechanism (RPT's) for public participation in the controlled development of salmon enhancement and Alaska has strong genetic and disease policies that are applied in all salmon enhancement projects. Does the Chapter anticipate that this process will be inadequate to the difficult task of protecting the Yukon's stock diversity? Perhaps that anticipation is also at the core of the proposed resolution.

The Chapter in 1988 in a similar resolution supported establishment of genetic sanctuaries (or refuges) in which harvests but not enhancement could occur and this proposed resolution seeks establishment of a large sanctuary in the Yukon. Is the present protection offered by national parks and refuges inadequate? Will the entire Yukon have to be set aside in order to provide adequate protection?

Please send your comments to W. W. Smoker, Resolutions Committee Chair, University of Alaska Fairbanks, Juneau Center for Fisheries and Ocean Sciences, 11120 Glacier Highway, Juneau, AK 99801 (789-4441) (FFWWS@Alaska). To encourage frank discussion the Committee promises to keep confidential the identities of comment authors.

Proposed Resolution Yukon River Wild Stock Management Zone

WHEREAS, the Yukon River is one of the largest producers of wild chum and chinook salmon in North America; and

WHEREAS, supplemental hatchery production is being considered as a means to increase harvest levels of Yukon River salmon; and

WHEREAS, increased harvest levels have a potential to severely impact the many small wild stocks included in the mixed stock and mixed species fishery; and

WHEREAS, available scientific literature suggests that hatchery produced salmon can stray and interbreed with wild stocks altering the wild gene pool, reducing stock fitness and threatening the survival of wild populations;

BE IT RESOLVED, the American Fisheries Society, Alaska Chapter, urges the governments of Canada, United States and Alaska to manage the Yukon River as a Wild Stock Management Zone and to implement the following resolutions:

1. Rebuilding of depressed wild salmon stocks should be accomplished with proper management of the resources and not

accomplished through increased hatchery production;

2. Management of the mixed stock fisheries should be governed by the least productive stock with regulations set to insure that these small stocks do not become extinct;

3. In no instance should hatcheries be used as a means to increase harvest levels;

4. As a last resort, aquaculture techniques may be necessary if a specific stock would become extinct without direct intervention.

BACKGROUND

(Statement prepared by author of the proposed resolution)

The Yukon River is one of the largest producers of wild "unenanced" chum and chinook salmon in North America. Nearly all salmon spawning and rearing habitat remain intact. The fishery is mixed stock and mixed species in nature with commercial and subsistence harvest of salmon taking place from its mouth upstream almost 1,400 miles. The 1978-1986 average annual drainage-wide harvest was 185,000 chinook, 1,161,000 summer chum, 442,000 fall chum and 61,000 coho salmon (Alaska Department of Fish and Game, 1986). The demand placed on Yukon River chinook and fall chum salmon exceeds the capacity of wild stocks to satisfy all user groups and, consequently, several stocks have become depressed.

Supplemental hatchery production is seriously being considered by many managers, fishermen and politicians as a quick-fix means of alleviating the ever-growing demand placed upon the Yukon River salmon resource. Proposals include expansion of the Clear Hatchery near Fairbanks (Tanana River), increasing funding for artificially enhanced Canadian stocks through treaty stipulations, and developing small-scale aquaculture 4-H projects throughout U.S. waters. The necessary public involvement process has not been initiated for Yukon River enhancement projects, even though the effects may be substantial.

Available scientific literature suggests hatchery produced salmon can negatively impact wild populations by decreasing genetic diversity, reducing stock fitness and reducing effective population size. Foreign diseases can also be introduced from hatchery salmon. The salmon stocks of the Pacific Northwest should exemplify what happens when hatcheries are used to "mitigate" for declining wild salmon stocks. Some salmon stocks

are currently being considered for listing under the Endangered Species Act largely due to the ineffectiveness and misuse of salmon hatcheries.

Nehlsen et al. (1991) identified the status of Pacific salmon, steelhead and cutthroat stocks in the Pacific Northwest which included 214 naturally spawning depleted stocks, 101 of which were at a high risk of extinction. A review of 18 quantitatively evaluated supplementation projects in the Pacific Northwest, British Columbia, Alaska and New England found that none had rebuilt wild runs to self-sustaining levels (Miller et al. 1990). In a comprehensive review of supplementation programs, Smith et al. (1985) concluded that supplementation should not be initiated in wild fish only streams and that populations in these streams are best enhanced by habitat protection and harvest control.

Supplemental hatchery production will only further complicate mixed stock fisheries management. Many wild stocks are relatively small which make them extremely vulnerable to overharvest in an intensive fishery. Consequently, should mainstream harvest levels increase in response to hatchery production of salmon, then small stocks risk reduction or elimination. The status of many of these stocks have never been assessed. Management of a mixed stock fishery requires protection of the weak stocks.

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22550 A
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1990

CHAIRMAN'S REPORT: THE SALMON STRATEGY TASK FORCE

By Commissioner Glenn A. Olds

Salmon is Alaska's showcase fishery resource. It is the common denominator among the sportsman, tourist, commercial fisherman, subsistence villager, and fish processor in Alaska. When the salmon industry is in trouble, all Alaska suffers. When it prospers, everyone wins. The salmon industry is in trouble. New players have entered the world market with abundant supply, new technologies, and rival market strategies. Alaska's striking success in fishery renewal, hatcheries, habitat management, production, and harvest have contributed to a dramatic increase in the world supply. However, world demand, marketing sophistication, and new products have not kept pace. This disparity between supply and demand has driven prices down, leaving heavily mortgaged boats and equipment at risk, and resulted in outmigration of Alaskan control of its own resources and industry. This is the salmon crisis, which the Chinese describe as "dangerous opportunity." Governor Hickel, recognizing the urgency of this crisis, established a statewide, representative task force, to discover the sources of the crisis and to recommend solutions. Some things could be done at once, others require more time. The committee set to work in September, exploring popular "myths" that surround the industry—discussing simplistic solutions, quick fix, and the oldest game in the world, "passing the buck." Their analysis was incisive and inclusive. The Task Force report includes specific recommendations in certain areas. In other areas, the task force indicated a range of options for consideration by policy makers.

RECOMMENDATIONS

Immediate Steps

1. Marketing and product development are the most urgent requirements. Production and processing on the supply side have prospered through state and private initiative. Alaska Seafood Marketing Institute (ASMI) must

- concentrate on a focused and sustained effort, with renewed state and industry support on current inventory and the 1992 catch. Commitment of new and hard dollars are required.
2. The Department of Commerce and Economic Development (DCED), Division of Investments, and the Commercial Fishing and Agriculture Bank should initiate and accelerate accommodation of loan extensions and other measures to ease the financial crisis on fishermen.
3. The Limited Entry Commission should be urged to increase efforts to protect and accelerate Alaska-based permits to authentic Alaskans.
4. Processor and fishermen groups should initiate early market commitments to introduce dependable planning and early preparation for next season.
5. The University of Alaska, State Department of Fish and Game, DCED, and appropriate organizations and agencies should mount an early and sustained information/education service to the fishermen and industry on world market conditions, product change and opportunity, and all elements essential to realistic planning.
6. The salmon processing capacity situation analysis in Prince William Sound, in light of the 1991 season, should be undertaken early by the DCED for early action concerning next season.
7. The Governor should encourage and promote early and sustained collaboration and trust between all segments of the fishing industry. Important consideration should be given to appropriate organization and tools to effect this.
8. The Alaska Science and Technology Foundation, the University of Alaska's Fisheries Industrial Technology Center, and the Marine Advisory Board should concentrate on expanding their efforts in salmon product diversification and market development, coordinated with the Alaska Fisheries Development Foundation.

9. Special attention should be given by every appropriate agency to the domestic U.S. market, especially for high volume, lower-cost salmon.
10. Quality standards and controls for Alaska salmon must be developed and maintained. Department of Fish and Game should reexamine management policy and practices to guarantee quality:
 - A) Southeast Alaska and Prince William Sound fishermen, processors, and Department of Fish and Game should develop a plan for timing to optimize quality.
 - B) Fishermen, managers, and industry operators should cooperate to devise a program of training in "management for quality" at every level of the

(Continued on page 11)

DED SUPPORTS YUKON RIVER FISHERIES INITIATIVE

Governor Hickel's Rural Development Sub-Cabinet unanimously endorsed a resolution presented by the Alaska Department of Commerce and Economic Development supporting the Clear Hatchery Expansion/Yukon River Drainage Fisheries Initiative. The Rural Development Sub-Cabinet is also recommending, to the governor, that he approve the planning and design phase through a commitment of financial resources in the FY93 capital budget.

The poor fish runs of the past few years have had devastating impacts on both the cash and subsistence economies of the area. Through this initiative, the expansion at Clear Hatchery would allow incubation and rearing of up to 20 million chum fry and 3.3 million chinook smolts which would be placed at various Yukon River sites. The expected annual adult return would be 200,000 chums and 100,000 chinook salmon.

The Division of Economic Development is working with the Yukon River Drainage Fisherman's Association to help set up an aquaculture association in support of this project.

FOREST PRODUCTS

SOCIOECONOMICS DRIVES STATE'S RESPONSE TO TONGASS PLAN

By F. A. Seymour

Governor Hickel has called for a total "restudy and rewrite" of the Environmental Impact Statement for the Draft Tongass National Forest Plan because it had "been prepared without adequate regard for either the social or economic impacts of its provisions and conclusions on the people of Southeast Alaska." In his December 6 letter to Michael Barton, Regional Forester for the U.S. Forest Service in Alaska, the governor rejected the Forest Service analysis of the Tongass Management Plan alternatives pointing to the deficiencies in the socioeconomic evaluation and in the underlying philosophy of the plan.

Congressional land allocations on the Tongass have whittled the nation's largest national forest to a land base where subtle shifts in management allocations can now dictate major changes in the regional economy. Over 5 million acres of the 17 million acre Tongass are permanently dedicated to wilderness and the recent Tongass Timber Reform Act placed an additional .7 million acres in a LUD II (wild land) status.

The Forest Service's preferred alternative (Alternative "P") included allocation of an additional 4+ million acres to primitive and semi-primitive management. The plan would further reduce an economically limiting timber

supply base; "dramatically impede the growth of the emerging mining industry; and threaten transportation and utility corridors, as well as roaded recreation opportunities." The governor boldly called for "effective multiple-use management of the Tongass National Forest which is crucial to the future of the Southeast Alaska region and the very survival of the people and communities dependent upon the region's resources."

This position marks an important shift in the state's Tongass posture. Supporting information produced by the the Division of Economic Development and the Alaska Department of Natural Resources, Division of Forestry, provided the basis for the strong socioeconomic stance taken by the governor. Agency staff investigations into the forest products markets, timber supply and demand, the plans implications for mining in southeast, the region's timber industry and dependent communities were pivotal in developing the governor's response.

"While maintaining a strong commitment to caring for the wildlife values, the beauty and the recreation opportunities enjoyed by our people and those who visit the region," the state's Tongass position demands: evaluation of an additional alternative with an annual allowable net sawlog volume of 520 million board feet; analysis and display of the effect of permanent closure of



Tongass plan threatens jobs.

existing mill(s) that may result from any existing alternatives; expansion of the area covered by a favorable minerals prescription; increased emphasis on back-country, roaded, and destination oriented recreation; reconciliation of management standards with operational expectations; and preservation of opportunities for regional transportation corridors into Canada and cost effective electrical corridors between communities.

Tok Timber Fire Disposal

Major timber fires in the Tok area during the summer of 1990 have generated a large volume of wood fiber that needs to be harvested soon - very soon! Preliminary inventory information suggests that as much as 250 million board feet of timber is dead or dying as a result of the fires. Part of the damaged timber is

owned by three Native village corporations and part is owned by the state and other government agencies.

A conference on this subject was held in Tok on December 19. DED forest products specialist Frank Seymour, along with several representatives from the Departments of Natural Resources and Community and Regional Affairs, attended the meeting. About thirty persons in total participated in the all day session, including land owner representatives and local wood processors.

Seymour and U of A forestry researcher and instructor Ed Packey provided technical information on market mechanics, wood fiber values, and the need and methods for clearing the land and causing regeneration to occur. Transportation cost factors and the recommendation to put all their timber into one collective pot were also discussed. Seymour, Packey, and others present stressed to the land owners that immediate harvest of the fire-killed timber is essential to maintain any existing value that may be recovered.

INFO TO SAVE FOR USE IN CHAPTER ON BIOLOGICAL ISSUES:

Successful hatchery development may actually cause further depletion of already suffering natural stocks, some to the point of extinction. This ironic effect is due to several factors:

1. The extent of habitat and other environmental damage can be camouflaged by hatchery production so it may go unrecognized and unchecked, impeding survival of natural runs.
2. A large influx of hatchery fish may compete with natural stocks for food and other survival necessities. There has been considerable debate about the question of "ocean carrying capacity." While it is not too difficult to determine how many fish can survive or spawn in a stream or hatchery tank, data is not yet available to show just how many salmon can be adequately sustained in the ocean environment. For example, when the average body weight of pink salmon throughout Alaska was significantly lower in 1991 than normal, there was speculation that massive hatchery production of pink salmon may have pushed populations beyond what the ocean can adequately sustain. If indeed there is such a threshold, over-production of hatchery fish could potentially harm natural stocks.
3. Fisheries management decisions and allowed harvest levels are based on total amounts of fish available. If only a small percentage of total fish population in an area is natural fish, the percentage mandated to be left for escapement may be high enough to sustain hatchery stocks but insufficient to sustain the declining natural runs.

Ironically, the success of hatcheries, and the associated decline of natural runs, may eventually even spell trouble for the future of **hatchery** stocks. This is because the genetic diversity found in natural runs, and introduced into hatchery stocks through broodstock from wild fish stocks, is important to the long-term health and adaptability of all stocks including hatchery fish. After a number of generations, hatchery fish can lose their genetic diversity and thus lose their ability to adapt to changes and survive.

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Seattle P.I.
1-22-92

Saving state's salmon

Bills seek to protect dwindling fish runs

P-I Staff and News Services

Warning that "Washington without salmon would be like Hawaii without beaches," a state panel yesterday proposed broad legislation designed to save Washington's declining salmon, steelhead and trout stocks.

Rep. Dick King, D-Everett, chairman of the House Task Force on Salmon and Steelhead Survival, told a news conference that the Legislature has "an obligation to be ahead of the curve" in stemming the depletion of wild fish stocks.

House leaders created the panel last summer to study the dwindling of salmon stocks. Yesterday, the task force introduced bills to develop recovery plans for troubled wild fish runs, study hatchery impacts on them, regulate farm practices on state lands, promote water conservation, screen irrigation ditches and set up a new education program.

King said he wasn't aware of any concerted opposition to the bills.

"Salmon are very important to the state of Washington," said King, who chairs the Fisheries and Wildlife Committee. "Salmon impacts everybody in the state in one way or another."

The task force was formed after the National Marine Fisheries Service proposed that three salmon runs on the Columbia and Snake rivers be listed as threatened or endangered under the U.S. Endangered Species Act. One run, the Snake River sockeye, has since been listed as endangered. Federal officials are beginning to plan for recovery of several Columbia-Snake Basin runs.

The primary goal of King's bills is to help avert a similar crisis in scores of other Washington stocks of wild salmon, steelhead and trout that are said to be in trouble. These are among 214 stocks of salmon, steelhead and trout that an American Fisheries Society panel found to be in trouble along the U.S. Pacific Coast.

"If we waited five years we would be facing the same problems we see on the Columbia River," King said.

The package's core proposal would direct the Fisheries and Wildlife departments to set up a panel of experts to study wild fish runs outside the Columbia River

Salmon: Bills seek to protect state fish runs

From Page B1

Basin. The panel would be charged to produce a recovery plan and to determine whether hatchery-bred fish are depressing wild-fish stocks, which are considered stronger and more genetically diverse than hatchery fish.

The bills also would:

- Allow Columbia River fishermen who refrain from fishing under a Northwest Power Planning Council program — designed to reduce fishing pressure on troubled stocks — to resume fishing after four years. Current state law requires commercial fishermen to fish every year or lose their licenses.

- Regulate farm practices on state lands to ensure that fish runs aren't harmed by silt and other farm runoff.

- Require that water pipelines and other agricultural irrigation channels meter their water withdrawals from the Columbia system and install fish screens within four years. About 6,000 are exempt from current screening mandates. The screens keep migrating fish out of irrigation canals, where they cannot successfully spawn.

- Encourage water suppliers to set rates rewarding water conservation by users.

- Set minimum stream flows for fish migration on the Tahuya, Dewatto, Dungeness, Cowlitz, Wenatchee, Okanogan, Methow and Entiat rivers.

- Establish a privately funded state program to teach elementary and high school students about fish and wildlife preservation.

See SALMON, Page B2

Other Issues

Do. A: Use of hatcheries as Enviro. Mitigation

E. Enviro. Regs - are there some?

enuf?
effective?

D. Use of water as tool for
local economic devel.

Enviro. Regs:

And. Fish Act

Fishways Act

Gen. Policy

Siting Regs

Clean Water Regs

Checks on carcass dumping

Hatchery Statutes

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day it becomes law without approval.



LAWS OF ALASKA

1974

Source

CSHB 830 am S

Chapter No.

111

AN ACT

Authorizing the operation of private nonprofit salmon hatcheries.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

* Section 1. INTENT. It is the intent of this Act to authorize the private ownership of salmon hatcheries by qualified nonprofit corporations for the purpose of contributing, by artificial means, to the rehabilitation of the state's depleted and depressed salmon fishery. The program shall be operated without adversely affecting natural stocks of fish in the state and under a policy of management which allows reasonable segregation of returning hatchery-reared salmon from naturally occurring stocks.

* Sec. 2. AS 16.10 is amended by adding new sections to read:

ARTICLE 8. SALMON HATCHERIES.

Sec. 16.10.400. PERMITS FOR SALMON HATCHERIES. (a) The commissioner or his designee may issue a permit, subject to the restrictions he considers desirable or that are imposed by statute or regulation under secs. 400 - 470 of this chapter, to a nonprofit corporation organized under AS 10.20, for the construction and operation of a salmon hatchery.

(b) The application for a permit under this section shall be on a form prescribed by the department and be accompanied by an application fee of \$100.

(c) A hatchery permit is nontransferable. If a permit holder sells or leases a hatchery for which a permit is issued under this section, the new operator shall apply for a new permit under this section.

(d) Permits are renewable on terms prescribed by the

Sec. 16.05.827. Sale of subsistence salmon roe. [Repealed, § 4 ch 99 SLA 1975.]

Sec. 16.05.830. Wanton waste. [Repealed, § 1 ch 73 SLA 1968.]

Sec. 16.05.831. Waste of salmon. (a) A person may not waste salmon intentionally, knowingly, or with reckless disregard for the consequences. In this section, "waste" means the failure to utilize the majority of the carcass, excluding viscera and sex parts, of a salmon intended for

- (1) sale to a commercial buyer or processor;
- (2) consumption by humans or domesticated animals; or
- (3) scientific, educational, or display purposes.

(b) The commissioner, upon request, may authorize other uses of salmon that would be consistent with maximum and wise use of the resource.

(c) A person who violates this section or a regulation adopted under it is punishable by a fine of not more than \$10,000, or by imprisonment for not more than six months, or by both. In addition, a person who violates this section is subject to a civil action by the state for the cost of replacing the salmon wasted. (§ 3 ch 99 SLA 1975; am § 18 ch 132 SLA 1984)

Revisor's notes. — This section was enacted in section 3 of both ch. 89 and ch. 99, SLA 1975. Chapter 99 had an immediate effective date (May 30, 1975), so the section was already in effect when ch. 89, enacting identical language, took effect on August 20, 1975.

Effect of amendments. — The 1984 amendment substituted "a salmon in-

tended for" for "salmon which are to be" at the end of the introductory paragraph, substituted "sale" for "sold" at the beginning of paragraph (1), and deleted "utilized for" from the beginning of paragraphs (2) and (3).

Collateral references. — 35 Am. Jur. 2d, Fish and Game, § 51.

Sec. 16.05.835. Maximum length of salmon seine vessels. A salmon seine vessel may not be longer than 50 feet, official Coast Guard register length, and 58 feet overall length except vessels that have fished for salmon with seines in waters of the state before January 1, 1962, as 50-foot, official Coast Guard register length vessels. (§ 1 ch 252 SLA 1970)

Sec. 16.05.840. Fishway required. If the commissioner considers it necessary, every dam or other obstruction built by any person across a stream frequented by salmon or other fish shall be provided by that person with a durable and efficient fishway and a device for efficient passage for downstream migrants. The fishway or device or both shall be maintained in a practical and effective manner in the place, form and capacity the commissioner approves, for which plans and specifications shall be approved by the department upon application to it.

Fishways
Act

§ 16.05.840

[Repealed, § 4 ch 99

ch 73 SLA 1968.]

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§ 16.05.850

FISH AND GAME

§ 16.05.860

The fishway or device shall be kept open, unobstructed, and supplied with a sufficient quantity of water to admit freely the passage of fish through it. (§ 30 art I ch 94 SLA 1959)

NOTES TO DECISIONS

Stated in Southeast Alaska Conserva- No. 2662 (File No. 5855), 665 P.2d 544
tion Council, Inc. v. State, Sup. Ct. Op. (1983).

Sec. 16.05.850. Hatchery required. If a fishway over a dam or obstruction is considered impracticable by the commissioner because of cost, the owner of the dam or obstruction, in order to compensate for the loss resulting from the dam or obstruction shall, at the owner's option

(1) pay a lump sum acceptable to the commissioner to the state fish and game fund;

(2) convey to the state a site of a size satisfactory to the commissioner at a place mutually satisfactory to both parties, and erect on it a fish hatchery, rearing ponds, necessary buildings and other facilities according to plans and specifications furnished by the commissioner, and give a good and sufficient bond to furnish water, lights and necessary money to operate and maintain the hatchery and rearing ponds; or

(3) enter into an agreement with the commissioner, secured by good and sufficient bond, to pay to the fish and game fund such an initial amount of money and annual payments thereafter as the commissioner considers necessary to expand, maintain, and operate additional facilities at existing hatcheries within a reasonable distance of the dam or obstruction. (§ 30 art I ch 94 SLA 1959)

Sec. 16.05.860. Penalty for violating fishway and hatchery requirements. (a) The owner of a dam or obstruction who fails to comply with AS 16.05.840 or 16.05.850 or a regulation adopted under AS 16.05.840 or 16.05.850 within a reasonable time specified by written notice from the commissioner is guilty of a misdemeanor, and is punishable by a fine of not more than \$1,000. Each day the owner fails to comply constitutes a separate offense.

(b) In addition to the fine, the dam or other obstruction managed, controlled, or owned by a person violating AS 16.05.840 or 16.05.850 or a regulation adopted under AS 16.05.840 or 16.05.850 is a public nuisance and is subject to abatement. (§ 30 art I ch 94 SLA 1959; am § 29 ch 14 SLA 1987)

Effect of amendments. — The 1987 amendment in subsection (a) inserted "or a regulation adopted under AS 16.05.840 or 16.05.850" in the first sentence and in

subsection (b) inserted "or a regulation adopted under AS 16.05.840 or 16.05.850" and made minor punctuation changes.

unable to agree upon the terms and conditions of such interconnection, including compensation therefor, the District Court for Alaska, or its successor in jurisdiction under the laws of this State, shall, upon petition of the parties, or either of them, establish such terms and conditions, which shall be reasonable and non-discriminatory.

Sec. 35. Construction of Act. This Act is complete in itself and shall be controlling. The provisions of any other law of this State relating to the organization of a corporation, except as provided in this Act, shall not apply to a cooperative organized under this Act. The enumeration of any object, purpose, power, manner, method or thing shall not be deemed to exclude like or similar objects, purposes, powers, manners, methods or things.

Sec. 36. Act Extended to Existing Cooperatives. The provisions of this Act shall apply to all non-profit cooperatives organized under any other law of Alaska for the purpose of supplying electric energy and power, or telephone service, to its members, or for the purpose of promoting and extending the use thereof, and such cooperatives shall become subject to this Act with the same effect as originally organized under this Act.

Sec. 37. Defectively Organized Cooperatives. In the event any cooperative has filed defective articles of incorporation, or has failed to do all things necessary to perfect its corporate organization, it may, nevertheless, file corrected articles of incorporation, or amend the original articles, and do and perform all acts and things necessary in the premises for the correction of such defects. Any action so taken shall be valid and binding upon all persons concerned, and the capacity of such cooperative to file corrected articles of incorporation or amendments to the original articles, or to do and perform all acts and things necessary in the premises, shall not be affected.

Sec. 38. Separability of Provisions. If any provision of this Act, or the application of such provision to any person or circumstances is held invalid, the remainder of the Act and the application of such provision to other persons or

circumstances shall not be affected thereby.

Sec. 39. Repealer. Chap. 38, SLA 1955, is hereby repealed.

Sec. 40. Effective Date. This Act shall take effect immediately upon its passage and approval, or upon its becoming law without such approval.

Approved April 16, 1959

CHAPTER 94

AN ACT

Relating to the fish and game resources of Alaska; providing for a Department of Fish and Game and its organizational structure; providing a code of laws relating to fish and game; providing for licensing and prescribing fees thereof; providing penalties for violations; repealing certain laws relating to the fish and game resources of the State; and providing for an effective date.

(H.B. 201)

Be it enacted by the Legislature of the State of Alaska:

Article I

The Department of Fish and Game

Section 1. Title of the Act. This Act shall be known and may be cited as the "Fish and Game Code of Alaska".

Sec. 2. Definitions. For the purposes of this Act, the following shall be construed respectively to mean:

- (a) "State": the State of Alaska.
- (b) "Department": the Alaska Department of Fish and Game.
- (c) "Board": the Alaska Board of Fish and Game.
- (d) "Commissioner": the Commissioner of the Alaska Department of Fish and Game.
- (e) "Person": the singular or the plural, including individuals, associations, partnerships, or corporations unless the context otherwise requires.
- (f) "Fish": all species of marine, anadromous, and fresh-water fish; amphibians, shellfish, and other invertebrates; or any of the foregoing that may be found or that may be introduced in the State of Alaska.
- (g) "Game": all species of birds and mammals, including feral domestic animals, found or that may be introduced in Alaska, except domestic birds and mammals; provided, however, that

"game" as herein defined may be classified by regulation as big game, small game, fur bearers or such other categories as may be deemed essential for carrying out the intention and purposes of this Act.

(h) "Take": taking, pursuing, hunting, fishing, trapping, or in any manner disturbing, capturing, or killing or attempting to take, pursue, hunt, fish, trap, or in any manner capture or kill fish or game.

(i) "Sport fishing": the taking of or attempting to take for personal use, and not for sale or barter, any freshwater, marine, or anadromous fish by spear or underwater gun or by hook and line held in the hand, or by hook and line with the line attached to a pole or rod which is held in the hand or closely attended, or by other means defined by the Board.

(j) "Resident": a person who for the immediately preceding year has maintained a permanent place of abode within the State and who has continually maintained his legal residence in the State; and in the case of a partnership, association, joint stock company, trust, or corporation, "resident" shall mean one that has its main office or headquarters in the State of Alaska; provided, however, that any member of the military services stationed in the State for a period of twelve consecutive months shall be considered a resident for the purposes of this Act, and the dependents

Sec. 30. Fishways or Hatcheries Required. Every dam or other obstruction built by any person across any stream frequented by salmon or other fish shall be provided by such person with a durable and efficient fishway and a device for efficient passage for downstream migrants if deemed necessary by the Commissioner, which fishway or device or both shall be maintained in a practical and effective manner in such place, form and capacity as the Commissioner may approve, for which plans and specifications shall be approved by the Department upon application to it, and which shall be kept open, unobstructed, and supplied with a sufficient quantity of water to freely admit the passage of fish through same.

In the event that a fishway over any dam or obstruction is considered by the Commissioner to be impracticable because of cost, then the owner of such dam or obstruction, in order to compensate for the loss resulting from such dam or obstruction shall, at his option: (1) pay a lump sum acceptable to the Commissioner to the State Fish and Game Fund; (2) convey to the State a site of a size satisfactory to the Commissioner at such place as may be mutually satisfactory to both parties, and erect thereon a fish hatchery, rearing ponds, necessary buildings and other facilities according to plans and specifications to be furnished by the Commissioner, secured by good and sufficient bond, to furnish all water and lights and necessary sums of money to operate and maintain said hatchery and rearing ponds; or (3) enter into an agreement with the Commissioner, secured by good and sufficient bond, to pay to the Alaska Fish and Game Fund such initial money and make such annual payments of additional money as the Commissioner may determine are necessary to expand, maintain, and operate additional facilities at existing hatcheries within a reasonable distance of such dam or obstruction.

The owner of any dam or obstruction who shall fail to comply with the provisions of this section within a reasonable time as specified by written notice from the Commissioner shall be guilty of a misdemeanor, punishable by a fine

not to exceed \$1,000.00, and each day that the owner fails to comply shall constitute a separate offense.

In addition to the penalty above provided, if any such person be convicted of violating any of the provisions of this section, the dam or other obstruction managed, controlled or owned by such person is hereby declared a public nuisance and shall be subject to abatement as such.

Sec. 31. Protection of Fish and Game. In the event that any person or governmental agency desires to construct any form of hydraulic project or to use any equipment that will use, divert, obstruct, pollute or change the natural flow or bed of any river, lake or stream or that will utilize any of the waters of the State or materials from any river, lake or stream beds, such person or governmental agency shall notify the Commissioner of such intention prior to the commencement of construction, and the Commissioner shall acknowledge receipt of such notice by return mail. If the Commissioner so determines, he shall, in said letter of acknowledgment, require such person or governmental agency or submit to him full plans and specifications of the proposed construction or work, complete plans and specifications for the proper protection of fish and game in connection therewith, and the approximate date when such construction or work is to commence, and shall require such person or governmental agency to obtain the written approval of the Commissioner as to the sufficiency of such plans or specifications before construction is commenced. If any person or governmental agency commences construction on any such works or projects without first providing plans and specifications subject to the approval of the Commissioner for the proper protection of fish and game in connection therewith and without first having obtained written approval of the Commissioner as to the adequacy of such plans and specifications submitted for the protection of fish and game, he is guilty of a misdemeanor. If any such person or government agency be convicted of violating any of the provisions of this section and continues construction on any such work or projects without ful-

ly complying with the provisions hereof such works or projects are hereby declared a public nuisance and shall be subject to abatement as such. The cost of restoring any river, lake or stream to its original condition shall be borne by the violator and shall be in addition to any penalty imposed by the court.

Provided, that in case of an emergency arising from weather or stream flow conditions, the Department, through its authorized representatives, shall issue oral permits to a riparian owner for removing any obstructions or for repairing existing structures without the necessity of submitting prepared plans and specifications.

Sec. 32. Assumption of Administration and Management by Alaska. Upon assumption of administration and management of the fish and game resources of Alaska by the State, the Commissioner and Board shall assume their respective controls on behalf of the State of Alaska.

Sec. 33. Violations: Misdemeanor Penalty. Any person violating any of the provisions of this Act or any regulation promulgated thereunder shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be punished as provided in Article II of the Constitution of this State, or Article III of this Act, whichever is applicable as determined by the nature of the offense.

Sec. 34. Continuation of Regulations, Agreements, Employees, Etc. All regulations, procedures, policies; contracts, agreements; employees' positions, accounts, assets, liabilities, benefit conditions and amounts, whether vested or contingent, established in manner under any Act repealed by provisions of this Act are hereby continued except where inconsistent with the provisions of this Act. Divisions, together with all employees shall continue in their respective positions at the pleasure of and until removed by the Commissioner created herein, or designee.

Sec. 35. Intent and Application of Act. It is the purpose of this Act to further implement the provisions of the State Organization Act of 1959 relating to fish and game. However, in

Sec. 16.05.865. Transplanting of musk oxen. The board may transplant surplus musk oxen from Nunivak Island to appropriate areas on the mainland of the state, when good management practices dictate the action. The board shall determine which transplant sites are appropriate and whether a surplus of animals exists. (§ 1 ch 220 SLA 1975)

Sec. 16.05.868. Fish health inspections. Fish health inspections determined to be necessary by the department shall be performed by a professional fish health specialist certified by the fish health section of the American Fisheries Society. (§ 3 ch 110 SLA 1980)

*Anadromous
Fish
Act* → **Sec. 16.05.870. Protection of fish and game.** (a) The commissioner shall, in accordance with the Administrative Procedure Act (AS 44.62), specify the various rivers, lakes and streams or parts of them that are important for the spawning, rearing or migration of anadromous fish.

(b) If a person or governmental agency desires to construct a hydraulic project, or use, divert, obstruct, pollute, or change the natural flow or bed of a specified river, lake, or stream, or to use wheeled, tracked, or excavating equipment or log-dragging equipment in the bed of a specified river, lake, or stream, the person or governmental agency shall notify the commissioner of this intention before the beginning of the construction or use.

(c) The commissioner shall acknowledge receiving the notice by return first class mail. If the commissioner determines that the following information is required, the letter of acknowledgement shall require the person or governmental agency to submit to the commissioner:

(1) full plans and specifications of the proposed construction or work;

(2) complete plans and specifications for the proper protection of fish and game in connection with the construction or work, or in connection with the use; and

(3) the approximate date the construction, work, or use will begin.

(d) The commissioner shall approve the proposed construction, work, or use in writing unless the commissioner finds the plans and specifications insufficient for the proper protection of fish and game. Upon a finding that the plans and specifications are insufficient for the proper protection of fish and game, the commissioner shall notify the person or governmental agency which submitted the plans and specifications of that finding by first class mail. The person or governmental agency may, within 90 days of receiving the notice, initiate a hearing under AS 44.62.370. The hearing is subject to AS 44.62.330 — 44.62.630. (§ 31 art 1 ch 94 SLA 1959; am § 1 ch 180 SLA 1960; am

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Revisor's notes. — Former subsection (c) of this section was redrafted and reorganized into present subsections (c) and (d) in 1983.

Opinions of attorney general. — The purpose of this section is to protect and conserve fish and game and other natural resources. 1964 Op. Att'y Gen. No. 10.

Alaska has jurisdiction to enforce its fish and game laws in national forests. 1964 Op. Att'y Gen. No. 10.

Alaska's protective fish and game laws, especially this section, complement rather than conflict with federal government functions in national forests and should be enforced by both federal and state officials. 1964 Op. Att'y Gen. No. 10.

The Department of Fish and Game has permit jurisdiction over activities affecting anadromous streams, over activities in streams "frequented by fish" if those latter activities will result in the physical obstruction of that stream, and over all land use activities within the state refuge system. March 4, 1982 Op. Att'y Gen.

This section gives the Department of Fish and Game jurisdiction over nonpoint pollutant sources adjacent to classified anadromous streams or their tributaries which, absent sufficient mitigating measures, would create a direct and substantial threat to pollution of the anadromous stream itself. March 4, 1982 Op. Att'y Gen.

The commissioner of the department of fish and game has the power to adopt procedural rules to implement this section and to establish by regulation the standards under which permits will be issued under this section. March 4, 1982 Op. Att'y Gen.

When the Department of Fish and Game or Boards of Fisheries and Game have established a general policy of requiring plans and specifications in all instances involving specific types of activities, that policy can and perhaps must be codified by regulation. March 4, 1982 Op. Att'y Gen.

The Department of Natural Resources, under the authority of AS 41.17.900(d), cannot preempt the regulatory authority of the commissioner of fish and game under this section over nonpoint source pollution of anadromous streams caused by logging activities. March 4, 1982 Op. Att'y Gen.

There is no statutory basis in either AS 46.03 or AS 41.17 for implying that the Department of Fish and Game's authority over "non-point source pollution" under this section is limited by the § 208 program of the 1972 Federal Water Pollution Control Act (PL 92-500). March 4, 1982 Op. Att'y Gen.

This section would seem to allow that the applicant submit, essentially, two permit applications — the first to determine whether a more detailed inquiry will be made, and the second to obtain the needed authorization. March 4, 1982 Op. Att'y Gen.

The phrase "pollution" in subsection (b) should be viewed as a jurisdictional incident distinct from the other listed results or activities in that subsection and not as a specific enumeration which is to be construed to modify and limit the more general phrases. March 4, 1982 Op. Att'y Gen.

The fundamental question concerning when a permit is required is whether the nature of the construction or work is such as to constitute a "desire to pollute," and not what the individual hopes will or will not happen. March 4, 1982 Op. Att'y Gen.

When read together, this section and AS 16.05.880 are a licensing statute. March 4, 1982 Op. Att'y Gen.

There is no conflict between this section and AS 16.10.010. March 4, 1982 Op. Att'y Gen.

This section has not been impliedly repealed by anything in Title 46. AS 41.17 or AS 16.10.010. March 4, 1982 Op. Att'y Gen.

NOTES TO DECISIONS

Procedure for gaining permission to ford controlled river or stream. — A person seeking to ford a controlled river or stream must first give notice to the com-

missioner and include in his notice sufficient "plans and specifications" so that the commissioner will know what he intends to do, when he intends to do it, what risk

he foresees from his activities to fish in the vicinity, and what steps he intends to undertake for their protection. The commissioner will then review the notification and either grant the request, reject the application, or request "full" plans and specifications requiring the actor to go into greater detail and answer specific questions. *Schnabel v. State, Ct. App. Op. No. 250 (File No. 7273), 663 P.2d 960 (1983).*

Rejection of a request to ford need not be preceded by a request for full plans and specifications unless the commissioner lacks sufficient information to make a determination on the application. *Schnabel v. State, Ct. App. Op. No. 250 (File No. 7273), 663 P.2d 960 (1983).*

Stated in Southeast Alaska Conservation Council, Inc. v. State, Sup. Ct. Op. No. 2662 (File No. 5855), 665 P.2d 544 (1983).

Sec. 16.05.880. Construction without approval prohibited. If a person or governmental agency begins construction on a work or project or use for which notice is required by AS 16.05.870 without first providing plans and specifications subject to the approval of the commissioner for the proper protection of fish and game, and without first having obtained written approval of the commissioner as to the adequacy of the plans and specifications submitted for the protection of fish and game, the person or agency is guilty of a misdemeanor. If a person or governmental agency is convicted of violating AS 16.05.870 — 16.05.895 or continues a use, work or project without fully complying with AS 16.05.870 — 16.05.895, the use, work, or project is a public nuisance and is subject to abatement. The cost of restoring a specified river, lake, or stream to its original condition shall be borne by the violator and shall be in addition to the penalty imposed by the court. (§ 31 art I ch 94 SLA 1959; am § 1 ch 180 SLA 1960; am § 1 ch 132 SLA 1962; am § 2 ch 89 SLA 1966)

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MEMORANDUM

To: Molly McCammon
From: Doug Rickey
Date: January, 1992
Re: Hatchery legal issues

DELETED

You have asked me to provide a review of the legal questions that appear to be making it difficult for the Board of Fisheries to make decisions regarding the management of hatchery salmon, and to discuss potential statutory changes the legislature might consider during this session.

In preparing this response, I reviewed a letter from the chairmen of the board of fisheries, pertinent constitutional, statutory, and regulatory provisions, and four recent legal opinions concerning a number of issues relating to the requirements for the management of hatchery fish.

I have divided this memorandum into three sections. The first is a brief summary of the powers and duties of the Board of Fisheries ("board"), and regulations governing private nonprofit hatcheries. The second reviews the concerns of the board as expressed in a May 6, 1991, letter from Chairman Michael Martin to Senator Richard Eliason. The third summarizes several recent legal opinions concerning the state's duty, or lack thereof, to manage fisheries for broodstock and cost recovery by hatcheries.

I. Powers and duties of the board/PNP hatchery regulations.

The board was created "for purposes of the conservation and development of the fishery resources of the state . . .". AS 16.05.221 (a). In order to carry out that charge, the board may "adopt regulations it considers advisable in accordance with the Administrative Procedures Act (AS 44.62)." AS 16.05.251(a).¹

¹/AS 16.05.251 (b) lists the purposes for which the board may exercise this power, including

- . . . (2) establishing open and closed seasons and areas for the taking of fish;
- (3) setting quotas, bag limits, harvest levels, and sex and size limitations on the taking of fish;
- (4) establishing the means and methods employed in the pursuit, capture and transport of fish; . . .
- (6) classifying as commercial fish, sport fish, personal use fish, subsistence fish, or predators or other categories essential for regulatory purposes;

The statutes governing the private nonprofit hatchery system are found at AS 16.10.375 - AS 16.10.470. They provide for: regional salmon plans; regional associations; criteria for the issuance of hatchery permits; public hearings prior to permit issuance; permit conditions; criteria for permit alteration, suspension or revocation; board regulation authority; department assistance and cooperation for permit applicants and holders; salmon egg sources; salmon egg sales; hatchery inspection; and an annual report to the department by permittees.

The board has adopted a number of regulations relating to private nonprofit hatcheries. Codified at 05 AAC 40.005 - 05 AAC 40.900, they include: delegating to the commissioner the authority to specify gear type and fishing periods for hatchery cost recovery; requiring hatchery permit holders who harvest salmon to comply with fish purchaser reporting requirements; allowing hatchery permit holders who harvest salmon for broodstock exemptions from the salmon "waste" statute, regulations concerning "closed waters" and vessel area registration; designating special harvest areas; procedures for permit application, application review, public hearings, review and determination, and reconsideration; establishing regional comprehensive planning teams and procedures to be followed by them; prohibiting permit transfers; requiring hatchery management plans, inspections, and performance reviews; establishing criteria for the sale of surplus salmon eggs.

II. Board concerns.

In a May 6, 1991 letter to Senate President Richard Eliason, Fisheries Board Chairman Michael R. Martin stated the following:

In managing fisheries that involve hatchery raised salmon, the Board of Fisheries has encountered problems due to ambiguities in the current Alaska statutes. These problems commonly arise when the management of hatchery stocks conflicts with either the health of wild stocks or with the opportunity of fishermen to harvest wild stocks. Essentially,

(7) watershed and habitat improvement, and management, conservation, protection, use, disposal, propagation and stocking of fish;

(8) investigating and determine the extent and effect of disease, predation, and competition among fish in the state, exercising control measures considered necessary to the resources of the state;

(9) prohibiting and regulating live capture, possession, transport, or release of native or exotic fish or their eggs; . . .

(12) regulating commercial, sport, subsistence, and personal use fishing as needed for the conservation, development, and utilization of fisheries...

AS 16.05.251(b).

establishing open and closed seasons

the statutes are not clear on the status of wild stock management.

State statutes are also not clear about the state's duty to provide fish for hatchery broodstock and cost recovery, and about hatcheries' obligations to contribute to the common property fisheries. We perceive that the development of state policy toward hatcheries may create a conflict of interest. On the one hand, the state manages fisheries as a common property resource for the benefit of all user groups. On the other hand, the state loans money to hatcheries with the expectation that the hatcheries will receive enough fish to be able to repay these loans.

While Chairman Martin went on to note other concerns,² the overall problem for the board appeared to be the perceived statutory ambiguities which lead to conflict between wild stock protection and broodstock/cost recovery.

The only direct statutory reference to the protection of wild stocks from harm due to hatchery operations is found at AS 16.10.400(g):

During the development of a comprehensive plan for a region, no permit may be issued for a hatchery unless the commissioner determines that such an action would result in substantial public benefits and would not jeopardize natural stocks. (emphasis added)

The concern the board has is that the statute requires the department to make a judgment concerning the potential harm to wild stocks prior to the issuance of a hatchery permit; the inference being that once that judgment is made and a hatchery permit is issued, there is no statutory "protection" for wild stocks that are jeopardized by hatchery-related dangers that arise after a permit is issued.³ This raises the possibility that a protective wild stock management regime, unsupported in statute, would conflict with, and might be overridden by, existing statutes that indicate the state must manage hatchery fish for broodstock and cost recovery. These statutes will be more fully discussed in the following section.

III. Recent legal opinions.

A. Hatchery fish and "sustained yield".

Article VIII, section 4 of the Alaska Constitution states:

²/These included

³/See Martin letter, p. 2.

Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial users.

The general rule is clear that wild salmon, while they are in the natural waters of the State, "belong" to State and must be managed on the sustained yield principle. Metlakatla Indian Community, Annette Island Reserve v. Egan, 362 P.2d 901, 915-915 (Alaska 1961). Whether hatchery-reared salmon enjoy the same status is less clear, and has been the subject of disagreement among attorneys who have recently written on that issue. The issue is important in the context of Chairman Martin's concerns because if hatchery fish must be managed on the sustained yield principle, that implies the Board of Fish must provide hatcheries with broodstock, and possibly cost recover fish, even if that may cause some harm to the wild stocks.

In an August 1990 letter to Fish & Game Commissioner Don Collinsworth, Assistant Attorney General Steve White concluded that the Department of Fish & Game and the Board of Fish had the legal authority, and were in fact directed by law, to manage fisheries so that salmon hatcheries receive broodstock and cost recovery fish for their operations. He based these conclusions in part on the assumption that the above quoted section of the Alaska Constitution mandates that hatchery fish be managed in the same manner as wild stocks. Two other attorneys, George Utermohle of the Legislative Affairs Agency's Legal Services Division, and Juneau attorney Michael Stanley, later called that assumption into question. Sometime after that, Anchorage attorney A. William Saupe analyzed the three prior opinions and concluded that Mr. White's initial assumption was correct.⁴ What follows is a summary, extracted from the four opinions, of the arguments on both sides of the proposition that the sustained yield management requirement of art. VIII, sec. 4 applies to hatchery raised fish:

First is the issue of "ownership." On its face, sec. 4 of art. VIII applies only to resources "belonging" to the state. Are hatchery raised fish in that category? Stanley and Utermohle argue that they may not be.

Stanley points out that the framers of our constitution did make distinctions between resources "occurring in their natural state" and those that are "subject to intensive culture," at least for the purpose of exempting the latter from the requirements of art. VIII, sec. 3 (the "common use clause").⁵ Because humans play a substantial role in the growth and

⁴/Copies of the four legal opinions are attached to this memorandum.

⁵/art. VIII, sec. 3 provides

development of hatchery fish, Stanley reasons that they may not be the "natural resources" the drafters of article VIII had in mind.

George Utermohle points to the fact that the legislature, when it created the private nonprofit hatchery system, used the following language to provided for the common use of hatchery fish:

Fish released into the natural waters of the state by a hatchery operated under AS 16.10.400 - 16.10.470 are available to the people for common use and are subject to regulation under applicable law in the same way as fish occurring in their natural state until they return to the specific location designated by the department for harvest by the hatchery operator.

AS 16.10.440 (a).

Utermohle finds the above language significant in a number of respects: first, while the statute provides for the common use of hatchery fish, it is silent as to state ownership and makes no mention of sustained yield; second, the fact that hatchery fish are to be treated "in the same way" as fish occurring in their natural state "until they return to the specific location. . ." suggests that the legislature did not consider them a common property resource belonging to state, but merely felt they should be treated as if they were until they returned to the hatchery for harvest; finally, Utermohle suggests that the provision for harvest by the hatchery operator indicates "some lingering private property interest in the hatchery fish by the hatchery," another indicator that these fish may not "belong" to the state for purposes of the sustained yield section of art. VIII.

In his lengthy memorandum to PWSAC President John McMullen, attorney A. William Saupe disagreed with the arguments made by Stanley and Utermohle that the sustained yield clause may not apply to hatchery fish.

Initially, Saupe relies on legislative history to refute the "ownership" argument. He quotes this passage from Linda J. Snow July 31, 1991 memorandum to Senator Eliason:

Consensus is that the legislature had always intended that the fish from PNP hatcheries belong to the common property fishery until such time as they return to the hatchery, and then they belong to the hatchery for broodstock and cost recovery. Testimony by Senator Dick Eliason at a 1975 Senate Resources Committee hearing on SB 180 indicates that the initial concept of a private hatchery system considered profit-making corporate ownership. However, a profit-making corporation might advance a claim to exclusive ownership of everything it produced. Thus, it was felt that private, nonprofit ownership of hatcheries would be more consistent with with

the concept of publicly owned hatchery fish. This opinion is echoed by former Representative Terry Gardiner.

At a March 7, 1977 House Resources Committee hearing, Jack Milnes, Executive Director of Southern Southeast Regional Aquaculture Association testified: "I wish to recognize the fact that these are common property fish, that they belong to the state of Alaska and to the people of Alaska and therefore they should be protected by the representatives of the people of the state of Alaska." At a 1979 Senate Resources Committee hearing on HB 48, Don Clocksin, and attorney with Alaska Legal Services discussed the question of ownership of hatchery fish. In his testimony, he asked "When are fish no longer common property fish?" He felt that constitutionally, they were to be considered common property fish at all times. Consequently, it appears there was never any question that hatchery fish were common property of the people of the state while in Alaska waters, and they may or not be the property of the PNP hatchery operator at the hatchery, but that he allowed to harvest a sufficient number for broodstock and cost recovery.

(Emphasis his).

Saupe also relies on certain portions of the commentary of the Committee on Resources of the Alaska Constitutional Convention. The first concerns the common use clause:

Game fish, wildlife, fisheries, and water are recognized as belonging to the state so long as in a natural state. These resources are subject to a private right only when they have been acquired or utilized as provided by law. (emphasis his).

Saupe asserts that this passage indicates the framers' belief that fish reserved for common use "belonged" to the state. Because hatchery fish are reserved for common use by AS 16.10.440 (a), Saupe reasons that they must be owned by the state and be subject to the sustained yield principle.

The second commentary the sustained yield clause itself:

Sustained yield is recognized as a principle applicable to the administration of plant and animal life subject to the immediate authority of the state. (emphasis his).

Because hatchery fish are subject to the authority of the state by AS 16.10.440(a), Saupe reasons, they are subject to the sustained yield clause. This conclusion, he asserts, "also comports with common sense" because

[i]f they did not belong to the State, it could not reserve hatchery fish for use by others without paying for them. Moreover, if the

mere expectation that a hatchery will later be allowed to harvest some unidentified fraction of the returning fish constitutes an ownership interest in all of its fish, then every other limited entry permit holder could be said to have the same "lingering property interest," leading to the false conclusion that none of the fish in Alaska's waters ever belong to the State or are subject to the sustained yield principle of management.

A more reasonable interpretation of these related statutory and constitutional provisions is that, once released, hatchery fish become like wild stocks in every legal respect. They belong to the state, are reserved to the people for common use and must be managed for sustained yield. . .

Saupe, pp. 10-11.

Initially, I agree with Saupe on the "ownership" issue. When it created the hatchery system the legislature made a number of policy choices: first, the hatcheries would be operated by private nonprofit, rather than profit making, entities, apparently because it was feared that profit making entities would make ownership claims to their fish; second, the statutes governing hatchery operations place a tremendous amount of control in the hands of the Department of Fish & Game and the Board of Fish, including the power to revoke a hatchery permit, and to designate where and when hatchery operators may harvest; third, hatchery fish, until they reach a designated operator harvest area, are a "common property resource," a designation associated with state dominion and control. In my view, these are all persuasive indicators of state ownership.

However, even if the state "owns" the hatchery fish, it does not automatically follow that the state must manage those fish on a sustained yield basis. As George Utermohle notes, the sustained yield requirement is always subject to "beneficial uses". the Commentary on Article on State Lands and Natural Resources , at page 98, states:

This principle [sustained yield] is qualified in terms of "the highest beneficial public use" in recognition of its not being in the public interest to preserve certain parasitic or predatory organisms destructive of more beneficial plant and animal life

And, during the debate on the sustained yield clause, Delegate Riley explained

. . . we have in mind no narrow definition of "sustained yield," as is used for example, in forestry, but the broad premise that insofar as possible a principle of sustained yield shall be used with respect to administration of those resources which are susceptible of sustained yield, and where it is desirable. For

example, predators would not be maintained on a sustained yield basis.

Alaska Constitutional Convention Proceedings, p. 2451.

Utermohle argues that

the delegates understood that the concept of preferences among beneficial uses would allow the state to make reasoned decisions to prefer certain renewable resources over other renewable resources to achieve a more beneficial public purpose. The authority to establish preference among beneficial uses may permit the state to harvest hatchery fish without providing for a sustained yield from the hatchery, provided that those who have vested rights in hatchery fish are compensated for those rights that are taken by the state.

The ability of the state to establish preferences among beneficial user is reflected in AS 16.10.430(b) which allows the commissioner of fish and Game to terminate the operation of a hatchery in the best interests of the public, if the adverse effects of the operation of the hatchery are irreversible and cannot be mitigated.

Utermohle memo, pp. 3-4.

Saupe, on the other hand, argues that AS 16.10.430(b) is not merely a reflection of the state's ability to establish preferences among beneficial uses but is in fact the only basis upon which a hatchery permit may be terminated. He also argues that the contribution made by PWSAC to the growth of the commercial fishing industry in Alaska demonstrate its beneficial use to the state, and that "short of the extreme situation envisioned by AS 14.10.430(b) it is hard to conceive how denial of a reasonable hatchery harvest in favor of other beneficial uses could achieve a greater public purpose." Saupe memo, p. 14.

In my view, the arguments made and conclusions reached by Micheal Stanley, George Utermohle and A. William Saupe on this issue all have merit. It is unfortunate that our supreme court has never defined "sustained yield," much less taken up the question whether hatchery raised fish must be managed on that principle. Suffice to say that knowledgeable people disagree on this issue and it would probably take a constitutional amendment to guarantee an unassailable legal conclusion one way or the other.

My own view is that art. VIII, sec. 4 probably does require that hatchery reared fish, after they are released and until they are allowed to be harvested by the hatchery operator, be managed on a sustained yield basis unless the state finds that such management would cause significant

harm to the wild stocks. No one would seriously argue that the preservation of wild stocks is not a "beneficial use" of the fishery resource, and there apparently is a concern that managing hatchery fish for broodstock and cost recovery may, in some instances, be harmful to that beneficial use. The difficulty with such a conclusion is that it probably raises more questions than it answers. How significant must the harm be? Can it be clearly substantiated? Isn't the continued health and development of hatchery raised fish also a "beneficial use" of the resource?

I have included the above arguments, conclusions and question for the purpose of demonstrating that there is no clear answer to the question whether there is a constitutional mandate that hatchery fish be managed on a sustained yield basis. That is not to say, however, that the legislature should not exercise its constitutional law making authority in this area. As Chairman Martin's letter makes clear, the Board of Fisheries is struggling with statutory ambiguities, and the board is obviously looking for legislative action.

B. Statutory basis for broodstock and cost recovery.

As noted earlier, assistant attorney general Steve White concluded that the board and the department are authorized and directed by law to allocate fishery resources for broodstock. He also concluded that the board has the authority, but is not required, to manage for cost recovery. White memo., p. 7. Going a step further, Mr. Saupe reached the conclusion that the board and the department must manage for both broodstock and cost recovery. Saupe memo., p. 16. In reaching their conclusions, White and Saupe both rely on the notion that hatchery fish must be managed on the principle of sustained yield, discussed above, and on a number of statutes and court decisions which point to legislative approval for such activity.

(1) Broodstock.

As noted above, the board is to provide for "the conservation and development of the fishery resources of the state." AS 16.05.221(a). The supreme court, in Kenai Peninsula Fishermens Coop Ass'n v. State, 628 P. 2d 897, 903 (Alaska 1981), defined "conservation" as "controlled utilization of a resource to prevent its exploitation, destruction or neglect." Steven White argues that, since managing for broodstock helps to perpetuate the fishery resource (i.e., prevents its "exploitation, destruction or neglect"), managing for broodstock is analogous to managing for escapement of wild fish. Therefore, the board has the power to adopt regulations that will provide for hatchery broodstock. White memo., p. 2. I believe White is correct. The board does have the statutory authority⁶ to so provide, and has promulgated regulations to that end.⁷

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(2) Cost recovery.

Whether the board has the authority to manage for cost recovery is less clear than it is for broodstock. The board does have the authority to allocate fish to various user groups.⁸ However, private nonprofit hatcheries are not specifically designated in law as a user group. Nevertheless, Steve White has concluded that private nonprofit hatcheries could be considered a "subgroup" of commercial users. Because our supreme court has upheld the board's power to allocate among subgroups (e.g., drift gillnetters and set gillnetters),⁹

IV. Conclusions.

1. There is no statutory "priority" for wild stocks.
2. Article VIII, sec. 4 of the Alaska Constitution, and existing statutes, strongly indicate that hatchery fish are required to be managed on the sustained yield principle, unless the state finds that such management causes significant harm to the wild stocks (i.e., that the protection of the wild stocks is a more "beneficial use" of the fishery resource than managing for broodstock).
3. The board has the power to adopt regulations for hatchery broodstock management, and probably has the same for cost recovery.

V. Recommendations.

1. That the legislature make a policy choice as to the priority of wild stock fish and express that choice by statutory amendment.

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DRAFT

LEGAL ISSUES SUMMARY

The Board of Fisheries ("board") has expressed to the legislature its concern over perceived ambiguities in the Alaska statutes relating to wild stock and hatchery fish management. One problem is that there is no clear statutory policy for the board to follow when it must make decisions that would favor wild stocks over hatchery fish or vice-versa. An additional problem is that the statutes are unclear about the state's duty to provide for hatchery broodstock and cost recovery, and about the hatcheries' obligation to contribute to the common property fisheries.

The Alaska Statutes contain only two direct references to wild stock protection from hatchery-related dangers: AS 16.10.400(g), which requires the commissioner, during the development of a comprehensive regional plan and before a hatchery permit is issued, to determine that such an action would not jeopardize wild stocks; and AS 16.10.420(10), which directs the department to require, as condition of a permit, that the hatchery be located in an area where a "reasonable segregation" from wild stocks occurs.

The board is concerned that these statutes protect wild stocks only prior to the start of a hatchery operation. This raises the inference that, once a regional plan is completed and/or a hatchery permit is issued, wild stocks no longer enjoy a statutory protection from hatchery operations.

Article VIII, sec. 4 of the Alaska Constitution ("Sustained Yield") states:

Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses.

The board was created "for purposes of the conservation and development of the fishery resources of the state." AS 16.05.221. The Alaska Supreme Court has stated that "'conserving' implies controlled utilization of a resource to prevent its exploitation, destruction or neglect" and that "'development' connotes management of a resource to make it available for use." Kenai Peninsula Fishermen's Coop. Ass'n v. State, 628 P.2d 897, 903 (1981).

In August 1990 opinion letter to the commissioner of the Department of Fish & Game, assistant attorney general Stephen White concluded that the board had the authority, and was in fact directed by law, to manage for hatchery broodstock. He further concluded that the board had the power to manage for cost recovery, but that it was not required to do so. He based these conclusions in part on the unstated assumption that the constitutional "sustained yield" requirement applied to hatchery fish. This assumption, coupled with the board's statutory charge to "conserve" the

fishery resource, formed the basis for White's conclusion that the board was required to manage for broodstock.

White's conclusion that the board had the authority to manage for cost recovery was based on the board's statutory authority to "develop" the resource and to allocate among various user groups. Although hatchery operators are not specified on the list of user groups for which the board may allocate, AS 16.05.251(d), White concluded that the board had the power to make such an allocation by treating hatchery operators as a "subgroup" of commercial users. He noted that the Alaska Supreme Court, in Meier v. State, 739 P.2d 172, 174 (1987), has upheld a board allocation between two subgroups of commercial users.

The White opinion spawned two critical responses. The first was from Juneau attorney Michael A.D. Stanley, in a February 1991 letter to the Southeast Alaska Seiners. Stanley argued that the "sustained yield" clause may not apply to hatchery fish for a number of reasons. First, because humans play such a significant role in the development of hatchery fish, there is some question whether the framers of the constitution would have considered them "natural" resources "belonging to the state" as those terms is used in article VIII. Stanley then points to AS 16.10.440(a), which provides that hatchery fish are to be treated "in the same way as fish occurring in their natural state until they return for harvest by the hatchery operator." He argues that the "in the same way" language indicates the legislature did not view hatchery fish as already subject to article VIII.

Stanley also takes issue with White's conclusion that hatchery operators could receive an cost recovery allocation as a subgroup of commercial users. He asserts that the definition of "commercial fishing," AS 16.05.940(5), would have to be "strained" to include hatchery operators, and that such a broad reading would allow other inappropriate users (such as salmon derby operators) to be considered as a subgroup. He also notes that the definition of "commercial fisherman," AS 16.10.940(4), contemplates a "natural person," not a nonprofit corporation.

Finally, Stanley asserts that only the department, not the board, may make an allocation of fish for hatchery operators. He argues that AS 16.10.440(a), quoted above, allows for harvest only at an area designated by the department, and only after the hatchery fish have travelled through the common property fisheries. Stanley argues that for the board to decide otherwise would be a circumvention of the existing statute.

The second opinion that questioned ass't attorney general White's conclusions was from Legislative Counsel George Utermohle, in an April 8, 1991 letter to Sen. Dick Eliason. He argues that, if the legislature had intended for hatchery fish to be managed on a sustained yield basis, it would have used the phrase "belonging to the state" when it wrote AS 16.10.440(a), quoted above. Utermohle reasons that the legislature intended

hatchery fish to be treated as if they were a part of the common property resource, but only until they return to the designated harvest location; at that point the hatchery operator may harvest the fish. Utermohle asserts that this language "suggests some form of lingering private property interest in hatchery fish by the hatchery operator," and indicates that the fish do not "belong" to the state for purposes of sustained yield.

Utermohle also argues that if hatchery fish belong to the state, it does not mean they necessarily must be managed for sustained yield. He points out that the sustained yield principle is always "subject to preferences among beneficial uses." Citing commentary and minutes from the Alaska Constitutional Convention, Utermohle asserts that the delegates understood this qualification to mean that the state "could make reasoned decisions to prefer certain renewable resources over other renewable resources to achieve a more beneficial public purpose. He concludes that this "may permit the state to harvest hatchery fish without providing for sustained yield;" and points to AS 16.10.430(b), which allows the termination of a hatchery operation "in the best interest of the public, if the adverse effects of the operation are irreversible and cannot be mitigated."

The Stanley and Utermohle opinions generated a vigorous and lengthy response from Anchorage attorney A. William Saupe, contained in an October 17, 1991 opinion letter to the president of the Prince William Sound Aquaculture Corporation (PWSAC). Saupe concluded that any regulation significantly restricting PWSAC's broodstock and cost recovery practices would be inconsistent with existing statutes and with the Alaska Constitution. He further concluded that legislative history suggests the board was never intended to have the power to limit hatchery production.

Saupe points to the legislative history compiled by Linda J. Snow of the Legislative Research Division as evidence that the legislature intended to assert state ownership of hatchery fish, and relies on statements made by several legislators and lobbyists to that effect. He also cites commentary from the framers of the constitution which states that the sustained yield principle is applicable to "plant and animal life subject to the immediate control of the state." Saupe argues that hatchery fish are so subject and therefore must be managed for sustained yield.

He answers the "beneficial use" argument by asserting that article VII, sec. 15, which speaks to the "efficient development of aquaculture in the state," indicates the importance and value of hatchery operations to the state; he also argues that hatcheries, specifically PWSAC's, would be seriously harmed if broodstock harvest was curtailed.

Saupe also points to "an extensive web of statutory provisions that evidence an unwavering legislative intent to sustain and expand hatchery operations through hatchery harvest," as evidence of the legislature's belief that harvests are necessary and beneficial. Among these provisions: AS 16.10.443, which requires the department to assist permit holders in the

operation of their hatcheries; AS 16.10.450(a), which contains certain expenditure requirement for hatcheries that sells salmon or salmon eggs after harvest; AS 16.43.420, which allows for the sale of fish caught under the authority of a special harvest area entry permit; and AS 16.10.430(b), which allows sale, but not release, of fish during the period of time that a hatchery operation is being terminated; AS 16.05 020, which requires the commissioner to "improve and extend" the fisheries of state. Saupe concludes that the cited statutes, and legislative history, demonstrate the legislature's intention that cost recovery harvests be the primary method of funding private nonprofit hatchery operations.

Saupe also takes issue with Michael Stanley's questioning of the board's authority to allocate for cost recovery. Saupe argues that the language of AS 16.05.440(a), quoted above, applies only to the time and location of a special harvest and not to allocation. He points to legislative history indicating approval of board authority to regulate hatchery harvests, as well to provisions of the Limited Entry Act that subject entry permit holders to board regulations, to also support his conclusion.

On the question of board restrictions on local hatchery production, Saupe is less certain. He cites evidence to the effect that the legislature did not consider such restrictions during the time the private nonprofit hatchery system was put in place; and he takes the position that AS 16.10.440(b), which allows the board to amend hatchery permit terms relating to source and numbers of salmon eggs was intended by the legislature to relate only to harvests and not to limiting hatchery production. On the related question of the board's ability to limit hatchery production on a regional basis, Saupe acknowledges that the answer is unclear but he asserts that such a policy would conflict with many statutes already cited, and with the constitutional provisions relating to sustained yield and promotion of aquaculture.

Conclusions.

1. There is no specific statutory mandate directing the board to give wild stocks preferential management treatment relative to hatchery raised fish.

2. The Alaska Constitution may require that hatchery fish be managed to allow for broodstock and cost recovery by the hatcheries, but that requirement may be vitiated by a determination that the sustained yield of hatchery fish is not as "beneficial" a "use" of the fishery resource as that of protecting the health of the wild stocks.

3. Existing statutes appear to allow the board to allocate fish to hatcheries for broodstock, but are less clear as to the authority for cost recovery.

BACKGROUND: DECLINING SALMONIDS IN WASHINGTON

Columbia River Salmon and the Endangered Species Act (ESA)

In April and June of 1990 petitions were filed by the Shoshone-Bannock tribe in Idaho, Oregon Trout and five other organizations, under the federal Endangered Species Act (ESA) to list five wild stocks of Columbia River salmon as threatened or endangered. These stocks were: Snake River sockeye, Snake River spring, summer, and fall chinook, and lower Columbia River coho. The National Marine Fisheries Service (NMFS) is the federal agency with jurisdiction over endangered fish species. In April and June of 1991, NMFS proposed that three of the five stocks of salmon be listed under the Endangered Species Act. These stocks are the Snake River sockeye salmon (proposed as endangered), the Snake River fall chinook (proposed as threatened) and the Snake River spring/summer chinook (proposed as threatened). On November 14, 1991, NMFS officially listed the Snake River sockeye as endangered. Decisions on the other two stocks are expected shortly.

Wild Stocks Under the Endangered Species Act

An important part of the NMFS decision was their determination of what the definition of stock would be that would constitute a "species" for purposes of the ESA. The agency determined that an "ecologically significant unit", or ESU, would constitute a species for the purposes of the ESA. Another key point in application of the ESA to fish is that the wild stocks were recognized and being genetically and biologically important and merit protection, or stocks that have not been intermixed with hatchery stocks and that still spawn naturally, are considered.

Salmon in the Columbia River System and Reasons for Decline

Approximately one-third of the Columbia River drainage that historically supported salmon populations is not currently accessible to these fish because of dam construction without fish passage facilities. Alterations in river flow and velocity, adjacent habitat changes, irrigation diversions, commercial and recreational harvest, and hatchery practices have resulted in fewer "returns" of spawning adults from the ocean than historically. In the mid-19th century, anadromous fish runs in the Columbia River basin numbered up to 16 million adult fish. Anadromous fish include salmon, steelhead, and sea-run cutthroat trout. Juveniles migrate from freshwater to the ocean, where they take between one and five years to mature. They return as adults to their streams of origin to spawn. Salmon and steelhead numbers on the Columbia have been reduced to about 15 percent of historic run sizes.

Dams: The U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, and the state's public utility districts operate water projects in the Columbia and the lower Snake Rivers. The Bonneville Power Administration, part of the U.S. Department of Energy, markets the power generated by these hydroelectric facilities. There are hindrances to both upstream and downstream fish migration that can occur because of dams. The impoundments that are associated with dams alter natural water flow, sometimes preventing downstream migration of juvenile fish. Power turbines without adequate screening can cause fish mortality when fish do attempt to migrate downstream. Five of eight Army Corps of Engineers projects have juvenile fish bypass systems. Facilities at the Lower Monumental, Ice Harbor, and the Dalles dams are not yet in place. For successful upriver migration of adult salmon, dams are equipped with fish

ladders. There are no ladders at the Chief Joseph or Grand Coulee Dams, blocking upstream spawning in the Columbia River at Bridgeport.

Habitat Alteration Out of River: Activities such as timber harvest, mining, agricultural drainage, livestock grazing and point source pollution can alter fish habitat conditions. Increased sediment, increased water temperatures, loss of riparian (adjacent to the watercourse) habitat, and reduced oxygen can negatively affect fish.

Harvest: Both recreational and commercial salmon fishing occur on the Columbia River. Salmon fishing in Washington and Oregon state waters is regulated by the Washington Department of Fisheries and by the Oregon Department of Fish and Wildlife, respectively. The two states coordinate their commercial fishing regulation development through the Columbia River Compact. Recreational fishing is regulated by the Washington Department of Wildlife (steelhead trout and resident game fish), Washington Department of Fisheries (salmon and marine fish), and the Oregon Department of Fish and Wildlife (all species of fish).

Fish Production: 80-90% of salmon returning to the Columbia River from the ocean are produced in hatcheries. There is an ongoing debate over the role of hatchery practices in preservation of wild stocks of fish. Deterioration of wild stocks of salmon and steelhead can occur through poor hatchery management practices. Hatchery practices have begun to explore the use of wild stock in breeding programs, to avoid deterioration of hatchery stocks.

Water Use: There are several large users of water in Washington, including municipal, industrial, irrigation, hydroelectric generation, and instream. Municipal water use includes water supplied by public water systems for domestic, commercial, and fire protection. Industrial use includes process and cooling water. Irrigation accounts for the majority of water use in Washington. Water is diverted from water sources. Diversions must be screened to prevent fish from entering the irrigation system, unless the area of the diversion is under the management authority of the Department of Wildlife and the diversion existed prior to 1947. Water storage for irrigation, power production or flood control affects timing of peak flows that under natural conditions coincide with juvenile anadromous fish migration downstream.

The American Fisheries Society Endangered Species Committee Report

According to a report by the Endangered Species Committee of the American Fisheries Society, entitled Pacific Salmon at the Crossroads, 214 stocks of wild salmon, steelhead, and cutthroat trout are in decline in the Pacific Northwest. 52 of these are in the Columbia River basin. In the coastal and Puget Sound areas of Washington, outside of the Columbia River basin, 41 stocks are in jeopardy. There are currently no mandated recovery efforts for these stocks, other than for the Snake River sockeye salmon.

Other Efforts to Recover the Columbia River Salmon

Columbia River Salmon Flow Measures

The Army Corps of Engineers, Bureau of Reclamation, and the Bonneville Power Administration are conducting an Environmental Impact Statement (EIS) to examine water management actions to help both juvenile and adult salmon. These actions will be taken in 1992, for a one year period, on an experimental basis. The alternatives include various combinations of reservoir drawdown and flow augmentation to assist juvenile salmon migration.

The final EIS is expected to be released in March of 1992.

The Salmon Summit

The Salmon Summit was convened at the urging of Senator Mark Hatfield by agencies and organizations in the Pacific Northwest to develop a management and recovery program for the Columbia and Snake River salmon. This effort concluded in March 1991 and the participants failed to reach a consensus on major recovery methods. However, the task of continuing these efforts was subsequently undertaken by the Northwest Power Planning Council (NWPPC).

The Northwest Power Planning Council Amendments

In 1980, Congress passed the Northwest Power Act. The Act created the NWPPC and directed it to determine how much energy the region would require over the next twenty years and to develop an electric power plan to meet those needs; and to develop a program to protect, mitigate, and enhance fish and wildlife and related habitat in the Columbia River basin. The NWPPC develop a Fish and Wildlife Program (FWP) to accomplish this. In response to the declining salmon on the Columbia and Snake Rivers, the NWPPC is amending its FWP. The amendments are in four phases. Phase I identified immediate measures to assist in salmon recovery. Phase II, completed on December 12, 1991, recommends the following actions, as well as many others not listed below:

- mainstem passage improvements on the Snake and Columbia by increasing flows for juvenile salmon migrating downstream and by improving screens so that juveniles don't experience as much mortality in dam turbines;
- reductions in commercial harvest;
- implementation of a temporary commercial salmon license leaseback program;
- adoption of water conservation measures including the placement of instantaneous flow meters on all diversions from anadromous fish streams tributary to the Snake and Columbia;
- improvement of hatchery management practices;
- development of habitat management standards for salmon protection.

NMFS will use this Phase II Amendment as the basis for their recovery plan for the endangered sockeye salmon. Phase III and IV are watershed level planning, and resident fish and wildlife protection, respectively. The NWPPC has just begun to develop these phases.

HOUSE BILL ANALYSIS

HB 2626

AN ACT RELATING TO WILD STOCKS OF SALMONIDS

Brief Description: Conserving and enhancing wild stocks of salmonids.

Committee: Fisheries & Wildlife

Sponsor(s): Representatives R. King, May, Orr, Rust, Belcher, Fraser, Hochstatter, Horn, Morris, R. Meyers, Basich, Jones, Sheldon, Leonard, Franklin, Zellinsky, Valle, Pruitt, O'Brien, Nelson, Bowman, Brough, Jacobsen, Haugen, Rasmussen and J. Kohl

Background:

Recovery Planning

The Northwest Power Planning Council, in their Phase II Amendment process, developed a management plan for salmon on the Columbia and Snake Rivers, which will be used by the National Marine Fisheries Service as a basis for their recovery plan for sockeye salmon. The Snake River sockeye salmon was listed as endangered under the Endangered Species Act in November of 1991.

There is currently no mandatory or ongoing recovery effort for wild stocks of salmon, steelhead and cutthroat trout that have not been petitioned for listing under the Endangered Species Act. There are many other wild salmon, steelhead, and sea-run cutthroat trout stocks that have been identified as declining by the American Fisheries Society. Forty-one of these are in Washington, outside of the Columbia River Basin.

Management Techniques for Increasing Wild Fish Runs

The Department of Wildlife regulates the recreational harvest of resident fish including steelhead trout and sea-run cutthroat trout. The Department of Fisheries regulates the harvest of the commercial and recreational salmon fisheries for non-treaty fishers. Both agencies coordinate with the tribes in developing commercial harvest regulations. Regulations are designed to provide harvest opportunities and sustain fish runs.

The Northwest Power Planning Council, in their Phase II Amendment, proposed a reduction in harvest of fall chinook in the Columbia river. Part of the mechanism for accomplishing this will be by providing for a commercial license leaseback program. The federal government will assist in paying to temporarily lease back commercial fishing licenses. Current Washington law requires that a commercial fisher, in order to renew a salmon license, catch one fish. The director of the Department of Fisheries has the authority to waive this requirement if the fisher has not had the opportunity to catch fish, such as would occur if a fisher participated in the leaseback program.

Marking and Catch and Release

Where a distinction between wild and hatchery stocks needs to be made for the purpose of allowing wild fish, if caught, to be released, the hatchery fish may be marked by clipping the adipose fin, using a coded wire tag, or using a newer ocular marking technique. The Department of Wildlife has marked most of its hatchery raised steelhead and sea-run cutthroat trout and is therefore able to implement catch and release regulations for recreational fishers. For almost all of the steelhead and sea-run cutthroat stocks identified by the American Fisheries Society as stocks of concern, these regulations are already in place. The Department of Fisheries has not marked all hatchery fish. Even if all were marked, the utility in returning wild fish caught commercially with current techniques is low, since these fish, caught in nets are usually dead shortly after the nets are hauled in. The recreational fishery could be managed for catch and release if all hatchery raised salmon were marked.

Hatcheries

The Department of Fisheries operates 39 major hatcheries and 19 satellite facilities. The Department of Wildlife operates 32 hatcheries. The tribes and the U.S. Fish and Wildlife Services also operate hatcheries, and there are hundreds of cooperative production facilities operated by volunteers and coordinated by the state Departments of Fisheries and Wildlife.

Captive Broodstock and Wild Stock Supplementation:

Wild salmonids spawn in river gravel. Their progeny reside in freshwater until ready to go to the ocean, where they mature. As adults, they return to their natal streams to spawn. Fish produced in hatcheries are artificially spawned by removing eggs from the female and raising the young fish and releasing them to travel downstream as smolts. New technologies are being developed to use artificial production means to supplement wild populations of salmonids with fish that are genetically of the same wild stock. One technique, called captive broodstock rearing, raises the fish from egg to mature adult, rearing in saltwater if necessary by using saltwater net pens. That adult is spawned artificially. Wild stock supplementation is the process of using eggs from the wild stock that one wants to supplement, by taking the fish out of the wild, rearing the progeny, and releasing the progeny back into the natal stream from which the parents originated. The Department of Wildlife has sea-run cutthroat captive broodstock programs in Shelton and Aberdeen, which have been implemented in the last five years. Many stocks of sea-run cutthroat on coastal streams have been identified by the American Fisheries Society as being stocks of concern.

Summary of Bill:

The Departments of Fisheries and Wildlife are directed to establish a review and recovery team to recommend recovery methods for salmonid stocks outside of the Columbia River Basin. The review and recovery team is to develop a definition of the term "stock", determine the status of all wild salmonid stocks in Washington, set escapement objectives for these wild stocks, and where escapement objectives are not currently being met, develop a recovery plan for each subbasin containing the wild stock. Priorities for recovery are to be, in descending order, natural production, supplementation using hatcheries, and captive broodstock technology. The team shall evaluate the role of existing hatcheries in recovery, and shall evaluate methods of

harvest that have less impacts on wild stocks. The recovery plan shall be submitted to the appropriate legislative committees by June 30, 1993.

By January 1, 1993, the Department of Wildlife is directed to implement an experimental captive broodstock program on a coastal river to be selected by the Department for wild sea-run cutthroat trout.

The Department of Fisheries, by December 31, 1992, is to determine the cost of marking all hatchery fish at all Department operated hatchery facilities.

The director of the Department of Fisheries is directed to use authority granted under existing law to waive requirements for commercial fishing license renewal, in order to accomplish the goals of the license leaseback program of the Northwest Power Planning Council, described in the Council's Phase II Amendment.

*Prepared by Keithlyn Watson, Research Analyst (786-7310)
House Fisheries and Wildlife Committee
Office of Program Research
January 23, 1992*

SECTION BY SECTION SUMMARY: H-2626
Conserving and enhancing wild stocks of salmonids

Section 1. Legislative findings.

Section 2. The Departments of Fisheries and Wildlife are directed to establish a review and recovery team to recommend recovery methods for salmonid stocks outside of the Columbia River Basin. The review and recovery team is to develop a definition of the term "stock", determine the status of all wild salmonid stocks in Washington, set escapement objectives for these wild stocks, and where escapement objectives are not currently being met, develop a recovery plan for each subbasin containing the wild stock. Priorities for recovery are to be, in descending order, natural production, supplementation using hatcheries, and captive broodstock technology. The team shall evaluate the role of existing hatcheries in recovery, and shall evaluate methods of harvest that have less impacts on wild stocks. The recovery plan shall be submitted to the appropriate legislative committees by June 30, 1993.

Section 3. By January 1, 1993, the Department of Wildlife is directed to implement an experimental captive broodstock program on a coastal river to be selected by the Department for wild sea-run cutthroat trout, using existing facilities where possible.

Section 4. The Department of Fisheries, by December 31, 1992, is to determine the cost of marking all hatchery fish at all Department operated hatchery facilities.

Section 5. Amends existing law to require the director of the Department of Fisheries to use authority granted under existing law to waive requirements for commercial fishing license renewal, in order to accomplish the goals of the license leaseback program of the Northwest Power Planning Council, described in the Council's Phase II Amendment.

HOUSE BILL 2626

State of Washington

52nd Legislature

1992 Regular Session

By Representatives R. King, May, Orr, Rust, Belcher, Fraser, Hochstatter, Horn, Morris, R. Meyers, Basich, Jones, Sheldon, Leonard, Franklin, Zellinsky, Valle, Pruitt, O'Brien, Nelson, Bowman, Brough, Jacobsen, Haugen, Rasmussen and J. Kohl

Read first time 01/22/92. Referred to Committee on Fisheries & Wildlife.

1 AN ACT Relating to wild stocks of salmonids; amending RCW
2 75.30.120; and creating new sections.

3 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF WASHINGTON:

4 NEW SECTION. Sec. 1. The legislature finds that wild stocks
5 of salmonids in the state of Washington are in a state of decline.
6 Stocks of salmon on the Columbia river are proposed for listing as
7 threatened and endangered, the Snake river sockeye has been officially
8 listed as endangered, and the American fisheries society has indicated
9 that there are two hundred fourteen other stocks of salmonids in the
10 Pacific Northwest that are in decline or possibly extinct. Many of
11 these are within Puget Sound or the coast, and therefore are not within
12 the jurisdiction of the Northwest power planning council. The
13 legislature recognizes that to lose these wild stocks would be
14 detrimental to the genetic integrity of the fisheries resource and the

1 economy, and will represent the loss of a vital component of
2 Washington's aquatic ecosystems. The legislature further finds that
3 to postpone the recovery of stocks that are on the decline but that are
4 not yet listed as threatened or endangered is short-sighted, and that
5 it will be less costly to act now to save this important resource.

6 NEW SECTION. Sec. 2. (1) The departments of fisheries and
7 wildlife shall establish a wild salmonid review and recovery team
8 consisting of fisheries biologists and geneticists. The purpose of the
9 team shall be to review and recommend recovery methods for salmonid
10 stocks outside of the Columbia river basin. The departments shall
11 invite representatives of the Northwest Indian fisheries commission and
12 the national marine fisheries service to participate on the team.

13 (2) By June 30, 1993, the review and recovery team shall:

14 (a) Develop a meaningful definition of stock. The definition shall
15 be formulated to allow preservation of genetic integrity of the wild
16 fish resource and to avoid future federal listings under the endangered
17 species act. The team shall consider the national marine fisheries
18 service's species definition as well as the American fisheries society
19 definition of stock;

20 (b) Determine the status of all wild salmonid stocks in Washington;

21 (c) Set escapement objectives for all wild salmonid stocks in
22 Washington; and

23 (d) Where escapement objectives are not currently being met,
24 develop a recovery plan for each subbasin containing the wild stock,
25 attempting to achieve escapement objectives within two generations.
26 The recovery plan shall identify baseline conditions as well as
27 recommend actions. Priorities for recovery shall be, in descending
28 order, natural production, supplementation using hatcheries, and
29 captive broodstock technology. The recovery plan shall include an

1 evaluation of the role of existing hatcheries in wild salmonid
2 recovery, as well as of methods of harvest that have less impact on
3 wild stocks.

4 (3) By June 30, 1993, the review and recovery team shall provide
5 a recovery plan to the appropriate legislative committees. The plan
6 shall include:

7 (a) A definition of stock;

8 (b) A state-wide list of wild stocks, with status of and escapement
9 objectives for each;

10 (c) A summary of data management needs; and

11 (d) A range of recovery alternatives for wild stocks outside of the
12 Columbia river basin, with accompanying time frames for implementation,
13 time frames for expected recovery, costs, and risk assessments.
14 Alternatives shall consider actions in the areas of water quality and
15 quantity, flow management, hatchery management, captive broodstock
16 programs, harvest, and land management. Costs shall be developed in
17 consultation with an advisory committee of appropriate membership to
18 be appointed by the departments.

19 (4) This section shall expire January 1, 1994.

20 NEW SECTION. Sec. 3. By January 1, 1993, the department of
21 wildlife shall implement experimental captive broodstock programs on
22 a coastal river to be selected by the department, for wild sea-run
23 cutthroat trout. Existing facilities shall be used where possible.

24 NEW SECTION. Sec. 4. By December 31, 1992, the department of
25 fisheries shall determine the cost of marking all hatchery fish at all
26 department of fisheries operated hatchery facilities.

1 **Sec. 5.** RCW 75.30.120 and 1983 1st ex.s. c 46 s 146 are each
2 amended to read as follows:

3 (1) A commercial salmon fishing license issued under RCW 75.28.110
4 or salmon delivery permit issued under RCW 75.28.113 may be issued only
5 to a vessel:

6 (a) Which held a state commercial salmon fishing license or salmon
7 delivery permit during the previous year or had transferred to the
8 vessel such a license, and has not subsequently transferred the license
9 or permit to another vessel; and

10 (b) From which food fish were caught and landed in this state or
11 in another state during the previous year as documented by a valid fish
12 receiving document.

13 Where the failure to obtain the license or permit during the
14 previous year was the result of a license or permit suspension, the
15 vessel may qualify for a license or permit by establishing that the
16 vessel held such a license or permit during the last year in which the
17 license or permit was not suspended.

18 (2) The director may waive the landing requirement of subsection
19 (1)(b) of this section if:

20 (a) The vessel to which an otherwise valid license is transferred
21 has not had the opportunity to have caught and landed salmon; and

22 (b) The intent of the commercial salmon vessel limitation program
23 established under this section is not violated.

24 (3) The director shall exercise his or her authority under
25 subsection (2) of this section to accomplish the goals of the Northwest
26 power planning council's phase two amendment to its fish and wildlife
27 program, dated December 11, 1991, concerning a temporary commercial
28 salmon fishing license leasing program. The director may adopt rules
29 to accomplish the goals of the leasing program.

- 1 (4) Commercial salmon fishing licenses and salmon delivery permits
- 2 are transferable.