ALASKA LEGISLATURE COMMITTEE FILES 1991-1992 8672
7648 SENATE RESOURCES

SB

415

AACA
ALASKA AIR CARRIERS ASSOCIATION
4040 B Street • Anchorage, Alaska 99503 • (907) 562-1272

January 3, 1992

The Honorable Harold Heinze
Alaska Department of Natural Resources
400 Willoughby Avenue
Juneau, AK 99801

Dear Commissioner Heinze:

If recent radio news is accurate, we understand that the Wood River Tikchik Park Advisory Council has or will recommend to you that the regulation banning commercial helicopter access to the park, which was not approved by Lt. Governor Coghill, should be reinstated.

Should this be true, the Alaska Air Carriers Association (AACA) strongly urges you to continue to allow helicopter access to the park for sport fishing or other recreational pursuits. As previously indicated, our association feels that a regulation banning helicopter access is neither good public policy nor appropriate under the statute which created the park.

AACA is willing to work with the Division of Parks to avoid real conflicts which jeopardize park resources. We believe that this may be accomplished without a complete closure. If closures are deemed necessary, a statutory change should be sought by the Department.

We would be pleased to discuss this further with you if our concerns are well founded.

Sincerely,

Richard Stern

Richard Stern, President
Alaska Air Carriers Association

FISCAL NOTE

STATE OF ALASKA
1992 LEGISLATIVE SESSION

BILL NO. SB 415

Revision Date: 3/20/92 Department Affected: Fish and Game

Title: Ban Helicopters in State & Recreation Areas BRU: Habitat

Component: Habitat

Sponsor: Zharoff

Requestor: Senate Resources COMPONENT SERIAL NO. | | 4 | 8 | 6 |

Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	0	0	0	0	0	0
CAPITAL	0	0	0	0	0	0
REVENUE FUND SOURCE:	0	0	0	0	0	0

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER FUND SOURCE:						
TOTAL	0	0	0	0	0	0

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

Estimate of current year impact: No impact on current year.

ANALYSIS: (Attach a separate page if necessary.)

Prepared By: Frank Rue, Director Phone: 465-4105

Division: Habitat Date: March 20, 1992

Approved by Commissioner: Tom Somerville

Agency: Department of Fish and Game Date: 4/1/92

Distribution (by preparer): Leg. Fin., Legislative Sponsor, Requestor, OMB/DBR, Gov. Legis. OSC., & Impacted Agency(ies).

Rev 10/7/91

SB

417

SENATOR FRED F. ZHAROFF
ALASKA STATE LEGISLATURE
P. O. BOX 405, KODIAK, ALASKA 99615 (907) 486-5259
DURING SESSION:
P. O. BOX V, JUNEAU, ALASKA 99811 • (907) 465-3473 • 465-3474

DISTRICT N
ALASKA PENINSULA • ALEUTIAN CHAIN • BRISTOL BAY • KODIAK ISLAND • LAKE CLARK/LAKE ILIAMNA • PRIBILOF ISLANDS • SHUMAGIN ISLANDS

MEMORANDUM

TO: Senator Lloyd Jones
Chairman
Senate Resource Committee

FROM: Senator Fred F. Zharoff

DATE: March 30, 1992

RE: Senate Bill No. 417 - "An Act relating to the use of jet boats in anadromous fish streams."

BILL SUMMARY: SB 417 would prohibit the use of jet units to propel vessels in rivers, lakes, or streams or portions of rivers, lakes, or streams that are less that 12 inches in depth and have been identified as habitat for anadromous fish. Anadromous fish are the five species of salmon and steelhead.

The prohibition would not apply to anadromous waters that are a foot or more in depth.

AS 16.05.870 -- as referenced in the bill -- is the section of the Fish and Game statute that requires the commissioner of fish and game to specify the various rivers, lakes and streams, or parts of them, that are important for the spawning, rearing, or migration of anadromous fish.

FISCAL IMPACT: Fiscal notes requested from the Department of Fish and Game and the Department of Public Safety.

PREVIOUS ACTION: Introduced on Feb. 18. Referred to the Senate Resources and Judiciary committees.

BACKGROUND INFORMATION: Over the years, many people in the Bristol Bay Basin region have voiced concern about the impact of jet boats on salmon habitat in the upriver spawning streams and lakes. Jet boats -- because of their shallow draft -- have been able to venture into many areas that were previously inaccessible or could only be reached with great difficulty. The jet units have opened up many new fishing streams to recreational fishermen.

Unfortunately, many of these streams and lakes are prime salmon spawning habitat. When jet boats traverse shallow water, they churn up the substrate, resulting in an undetermined level of mortality for salmon eggs and fry.

Local people have been frustrated in their efforts to get action on this issue. The official response to their concerns is that nothing can be done because there's "no research" on the subject. While research has been requested, none has been funded or conducted.

Incorporating extensive public comment, the Nushagak & Mulchatna Rivers Recreation Management Plan (August, 1990) contains the recommendation (page 88) that, "ADF&G should conduct studies to evaluate the effects of jet boat use on fish habitats." To date, this recommendation has not been acted upon.

In an effort to prevent further damage to salmon habitat, SB 417 prohibits jet units in anadromous waters -- as identified by the Department of Fish and Game -- that are 12 inches or less in depth.

ATTACHED BACKUP INFORMATION:

1. Excerpt from the Nushagak & Mulchatna Rivers Recreation Management Plan "Response to Comments on the Public Review Draft Plan". The planning team took no regulatory action because it had no information available that indicated any damage.

2. Copy of AS 16.05.870.

1.

NUSHAGAK & MULCHATNA RIVERS

Recreation Management Plan

Response to COMMENTS on the PUBLIC REVIEW DRAFT PLAN

April 1990

ALASKA DEPARTMENT OF NATURAL RESOURCES

ALASKA DEPARTMENT OF FISH AND GAME

BRISTOL BAY COASTAL RESOURCE SERVICE AREA BOARD

The preparation of this document was financed in part from the Alaska Coastal Management Program, which is funded by the State of Alaska and the Office of Ocean and Coastal Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, administered by the Alaska Department of Community and Regional Affairs, Municipal and Regional Assistance Division.

ISSUE

LITTER

COMMENTS

People leave a lot of trash and excess gear. What can be done? This makes the wildlife stay away from the area.

We have run across some serious cases of trash dumping this summer.

Sport fishermen are leaving trash and gas.

Sport fishermen leave trash.

Airplanes, which are flying to the Mulchatna from a long distance, are more liable to leave trash behind because they are limited on the backhaul by weight, since they must carry a lot of fuel.

Sportsmen are leaving equipment and trash on my allotment.
The basic point is that you need to protect the land and its resources. I saw a leaking gas drum floating down the river. The state can do something about this even if it's from private land, right?

PLANNING TEAM RESPONSE No change.

This plan includes recommendations on enforcement, information, and education. See PRD p86. Enforcement will lead to better compliance by those who have DNR permits that include stipulations addressing litter. Information and education will provide information to the general public about litter. Active management involving litter barrels and outhouses would require considerable funds and a level of management that may occur sometime in the future, but are not a part of this plan at this time.

ISSUE

JET BOATS

COMMENTS

Ban all jet boats in fresh water spawning rivers because they kill fish eggs, especially in shallow water.

Want to restrict motorized boats on the Stuyahok River, especially when the water level drops. There is too much activity on this river. It can harm fish spawning habitat.

We depend on fishing. Jet boats are wiping out our salmon by going into creeks with 2-3 inches of water and harming the fish spawning beds.

Restrict use of jet boats in some sensitive spawning creeks.

PLANNING TEAM RESPONSE See following:

a. There is no information available which indicates that jet boat use causes significant impacts on fish habitats at this time.

b. Add a section after PRD p88pg4:

Assessing Impacts of Motorboat Use

ADF&G should conduct studies to evaluate effects of jet boat use on fish habitats.

March 19, 1992

The Honorable Lloyd Jones, Chairman
Senate Resources Committee
Alaska State Legislature Room 30-C, State Capital
Juneau, Alaska 99801-1182

RE: SENATE BILL #417

Dear Senator Jones:

As a property owner and member of the Chilkat Lake owners association I would like to go on record as objecting to Senate Bill #417.

SB 417 would adversely affect those living on a permanent and part time basis at Chilkat lake.

Access to the lake is strictly by jet boat on a tributary to the Chilkat River, May through November.

All supplies, medical attention, etc. must be obtained in the community of Haines. Travel across the lake out the river and by road of some 32 miles are necessary to accomplish this. A drop of water to "a depth of 12 inches or less" in the river would (if "identified by the department") create a personal and financial hardship for many of the residents.

I'm quite sure that there are other rural areas in our vast State that would be affected by such legislation if passed.

Thank you for your time and consideration.

Sincerely,

W.D. (Dave) Gross

CC: Senator Duncan
Senator Sturgulewski

Gross-Alaska, Inc.
Gross-Alaska Theatres - Video 144
"Pioneering Alaska Since 1897"
W.D. 'Dave' Gross II
222 Front St., Suite 600
Juneau, Alaska 99801

20 March 1992
Chilkat Lake

ATTN: SEN. JONES
RESOURCES

Re: Senate Bill 417

I would like to voice strong opposition to Senate Bill 417 the act relating to the use of jet boats in anadromous fish streams. My family and I live at Chilkat Lake year round and a jet boat is our means of transportation to and from the lake. I was about to start a commercial operation of transporting people and supplies to Chilkat Lake, but the threat of this actions has put this on hold.

If the reason for this bill is due to others misuse in urban areas, please deal with it on a case by case situation, not a blanket bill that has a negative impact for all the State. I also find that to single out jet boats sounds like knee jerk reaction to special intrest groups. Even canoes and river rafts impact fish streams. Are we to lock up our whole state to special intrest hysteria?

Is this bill the result of special intrest, emotional hysteria that is to serve a few and hurt many? Another tool to "lock up" our State, and regulate and change peoples lives and livelihood ?

Steve Brooks

STEVE BROOKS
P.O BOX 135
HAINES, ALASKA
99827

MARCH 26, 1992

DEAR LEGISLATOR,

Mr. Jones

REGARDING SENATE BILLS 274 AND 117, THE SALCHA RIVER PROPERTY OWNERS ASSOCIATION, FAIRBANKS, ALASKA, STRONGLY OPPOSES THE PASSAGE OF THESE BILLS.
OUR ORGANIZATION HAS A MEMBERSHIP OF 230 VOTERS.

SINCERELY,

Ellen DeWeese

ELLEN DEWEESE, SECRETARY

Alaska State Legislature

Please enter into the record my testimony to the SENATE Resources ~~House Finance~~ committee name committee on SB 417 bill/subject, dated 4/1/92.

I FEEL THIS BILL IS NOTHING MORE THAN HARASSMENT LEGISATION ~~SHOULD BE FILED~~. DON'T WASTE YOUR TIME ON THIS BILL, FILE 13. GET THE BUDGET OUT SO WE CAN SEE IT + MAKE COMMENTS BEFORE IT'S PASSED

Signed: Hugh T. Dougherty
Testifier

SSCB
Representing (Optional)

359 ~~STEVENS~~ WATER ST. JUNEAU
Address

~~586~~ 465-1869
Phone No.

Alaska State Legislature

Please enter into the record my testimony to the RESOURCES
committee name

committee on JET BOATS SB417 dated 4-1-92.
bill/subject

I STRENOUSLY OBJECT TO THE PROVISIONS OF SB417. I HAVE PROPERTY ON THE RICHARDSON CLEARWATER RIVER NEAR FT. DELTA. THE GRAYLING THAT POPULATE THE MAJORITY OF THE TANANA DRAINAGE CLEARWATER RIVERS SPAWN IN SHAW CREEK FLATS AS DETERMINED BY STUDIES CONDUCTED BY SPORTS FISHERIES IN CONJUCTION WITH TAGGING PROGRAMS OVER THE LAST SEVERAL YEARS. SALMON THAT SPAWN DO SO IN OCTOBER AFTER THE BOATING SEASON IS CONCLUDED. I BELIEVE THAT THERE IS NO CLEAR EVIDENCE TO SUPPORT THE BELIEF THAT JET BOATS PROPERLY OPERATED PRESENT A DETERIMENTAL EFFECT ON THE SPAWNING OF ANY SPECIES. I SUBMITT THE ATTAYCHED INFORMATION FOR YOUR CONSIDERATION. THIS INFO WAS ASSEMBLED IN CONJUNCTION WITH A STUDY CONDUCTED IN OREGON RE: THIS SUBJECT

Signed: BILL PRYOR
Tes.ifier

Representing (Optional)

924 KELLUM ST FAIRBANKS AK 99701
Address

907 452-4330
Phone No.

Alaska State Legislature

Please enter into the record my testimony to the Senate Resources
committee name

committee on Senate Bill 417 dated April 2, 1992
bill/subject

I OPPOSE Senate Bill 417.

Studies in the State of Oregon show that jet boats do not dredge out a river bottom or suck up eggs deposited by spawning fish.

Senate Bill 417 would prevent many people in our State from enjoying our recreational areas.

Eugene R. Rutland

Signed: EUGENE R. RUTLAND
Testifier

MECHANICAL CONTRACTORS OF FAIRBANKS
Representing (Optional)

P.O. BOX 74796 FAIRBANKS, AK. 99707
Address

(907) 456-8347
Phone No.

Alaska State Legislature

Please enter into the record my testimony to the Senate Resources
committee name

committee on Senate Bill 417 . dated 2/18/97 .
bill/subject

I don't believe jet boats have any effect on fish spawning and if it did it would have showed up 20 years ago when jet boats got started

Signed: Royce Miller
Testifier

Representing (Optional)

774 Spruce Rd Fbks AK 99709
Address

452-1132
Phone No.

Alaska State Legislature

Please enter into the record my testimony to the Senate Resources
committee name

committee on 417 , dated 2-18-92 .
bill/subject

I am opposed to any laws or Regulations that would restrict travel on any Rivers in Alaska Boy Boats Powered with Jet units or Prop.

Signed: [signature]
Testifier

Representing (Optional)

Box 815 Fbks. AK 99708
Address

479-5519
Phone No.

Alaska State Legislature

Please enter into the record my testimony to the Senate Resource Committee
committee name

committee on SB417--Jet Boats . dated 2/18/92 .
bill/subject

This bill shouldn't even be considered unless it's determined that a problem exists and that would require a study.

VOTE NO.

Signed: BILL SAGER
Testifier

Representing (Optional)

650 9th Avenue; Fairbanks, AK 99701
Address

456-4816
Phone No.

March 31, 1992

DEPARTMENT OF FISH AND GAME
POSITION PAPER

BILL NO: SB 417

SPONSOR: Zharoff

DIVISION: Habitat

DEPARTMENT POSITION:

The Department of Fish and Game opposes SB 417 at this time. If research currently in progress demonstrates that jet units create a significant adverse impact to anadromous fish or their habitat under field conditions, the department believes it could regulate the activity under current fish habitat permitting authorities (AS 16.05.870 -.895).

In conjunction with the 1990 Board of Fisheries consideration of three proposals to ban jet boats on Western Alaska rivers, the department prepared a staff analysis paper entitled, "Effects of jet boats on fish eggs and fry". This analysis involved an extensive review of available scientific literature including existing Federal regulations, other state statues, and New Zealand bylaws pertaining to jet boat usage. Our review indicated that jet boats are capable of causing mortality to salmon eggs in laboratory studies but that no studies have demonstrated significant mortality to salmon under field conditions. Further, the department concluded that the available scientific literature did not justify a ban on jet boats at this time. We recommended additional research be conducted to test laboratory assumptions in the field and that, in the interim, jet boat operators should be requested to voluntarily refrain from operating in known spawning areas in depths less than 18 inches during the period of spawning and early (sensitive) egg incubation. The University of Alaska, Cooperative Fisheries Unit has subsequently secured funding from the National Park Service and is conducting research to test these assumptions.

The department currently lists 13,849 river, lakes, streams and portions thereof in its Catalog of Waters Important to the Spawning, Rearing, or Migration of Anadromous Fish. A fish habitat permit is required for any activity in a cataloged water deemed by the department to adversely affect fish habitat. Because the department lacks substantive evidence linking jet boat usage with fish mortality in the field, permits are not required to operate jet units in cataloged waters. In addition, the department has no source of water depth data

to determine where a prohibition based on 12 inches or less would need to be applied.

The department is monitoring research underway by the University of Alaska to test the assumption that jet units cause mortality to salmon eggs. This research is expected to begin to yield results this year and is expected to be completed by 1994. The department is planning to review the results of this study and determine whether regulation of jet boat usage is necessary to protect fish habitat under AS 16.05.870.

If enacted, this bill would effectively eliminate jet boats from many streams used historically for recreational and subsistence hunting and fishing, guiding, access to cabins, lodges, and camping areas, and ADF&G management and research activities. Jet boats are the only practical means of access to many remote areas and this rule would create an unjustified hardship for rural residents, recreationists, commercial operators, enforcement personnel, and resource managers, alike. Stream depths are highly variable by reach, cross section, and seasonal flow regime. Field interpretation and enforcement of the 12 inch standard would be difficult and costly.

COMMISSIONER'S SIGNATURE Carl L Rosier DATE 4/1/92

FISCAL NOTE

STATE OF ALASKA
1992 LEGISLATIVE SESSION

BILL NO. SB 417

Revision Date: 3/20/92 Department Affected: Fish and Game

Title: Jet Boats in Anadromous Streams BRU: Habitat

Component: Habitat

Sponsor: Zharoff

Requestor: Senate Resources COMPONENT SERIAL NO. 4 8 6

Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98
PERSONAL SERVICES	122	122	122	122	122	122
TRAVEL	3	3	3	3	3	3
CONTRACTUAL	4	4	4	4	4	4
SUPPLIES	1	1	1	1	1	1
EQUIPMENT	7	1	1	1	1	1
LAND & STRUCTURES	0	0	0	0	0	0
GRANTS, CLAIMS	0	0	0	0	0	0
MISCELLANEOUS	0	0	0	0	0	0
TOTAL OPERATING	137.0	131.0	131.0	131.0	131.0	131.0
CAPITAL	0	0	0	0	0	0
REVENUE FUND SOURCE:						

FUNDING: (Thousands of Dollars)

GENERAL FUND	137.	131.	131.	131.	131.	131.
FEDERAL FUNDS						
OTHER FUND SOURCE:						
TOTAL	137.0	131.0	131.0	131.0	131.0	131.0

POSITIONS:

FULL-TIME	2	2	2	2	2	2
PART-TIME						
TEMPORARY						

Estimate of current year impact: No impact on current year.

ANALYSIS: One full time position plus support in both Fairbanks and Anchorage at the Habitat Biologist II level will be needed to implement and enforce jet boat prohibition in anadromous fish streams.

Prepared By: Frank Rue, Director Phone: 465-4105

Division: Habitat Date:

Approved by Commissioner:

Agency: Department of Fish and Game Date: 4/1/92

Distribution (by preparer): Leg. Fin., Legislative Sponsor, Requestor, OMB/D&R, Gov. Legis. OSC., & Impacted Agency(ies).

Rev 10/7/91

March 31, 1992

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POSITION PAPER

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DIVISION: Habitat

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COMMISSIONER'S SIGNATURE Carl L Rosier DATE 4/1/92

Ken and Lorane Owsichek's

FISHING UNLIMITED
LODGES

To: Resources Committee Senate
COTTON, ELIASON, FRANK,
HALFORD, JONES, MENARD
ZHAROFF.

Reference SB 417 - a jet boat in 12 inches or less of water causes less Damage in a prop or even a person walking in the river. Lets get Serious! Next we wont be able to walk up or down streams, while the commercial fishing industry is hauling in all our fish, and protecting the spawning beds for a non-common user. Our Fish and water resources are guaranteed to us under our constitution as well as access.

Kill this stupid bill.

Thanks,

Ken Owsichek

The Ultimate Alaskan Fishing Experience
Ken and Lorane Owsichek (O-say-chek)
Winter Phone (907) 243-5899 • Fax (907) 243-2479
Summer Phone (907) 781-2213 • Fax (907) 781-2244

NEW ZEALAND JET BOAT ASSOC. MAY 1980

PLEA BY FORMER PRESIDENT:

"End stupid war of words and arguments and unite to preserve our rivers"

By DICK FARRANT

THE old saying, "They can't see the wood for the trees", surely epitomises the current strife that is occurring in Southland, Nelson, and Hawkes Bay regarding attempts to have the speed restrictions uplifted.

All this kerfuffle is regrettable for surely we are all interested in the one ultimate goal: the preservation of our rivers for the enjoyment of future generations. Already too many rivers have been lost—the Waikato, Tekapo, Pukaki, Ohau, Waitaki, Waiau . . . and so the list goes on.

If only the people who have been creating all the fuss could see the number of rivers ear-marked for future hydro-electric and irrigation schemes they would then realise the seriousness of the whole situation.

The term 'uplifting of speed restriction' unfortunately conjures up in some minds, thoughts of high-speed jet boats, dangerously screaming around corners and constituting a danger to everyone. This is amply borne out by letters and newspaper articles in which "dangerous high speed" is mentioned time and time again.

In an article in the 'Nelson Evening Mail' an angler complained that he had been "chased around all day" by about 20 jet boats. On another occasion the 'Southland Times' referred to the "terrible enormous damage to fish life".

These statements are nothing short of inflammatory and are wrong in fact.

Ninetyfive per cent of our boats are not high-speed types, but are ordinary river boats that travel around 25 m.p.h. Anyone who did endanger other river users by dangerous speeds would be jumped on hard by our own Ministry of Transport launch wardens.

The man who complained about being "chased all day" by 20 jet boats did not say if he had been caught by them. And that is all that kind of statement deserves.

Dr Ogle's thesis on damage to ova by jet boats points out that boats can damage redds, but two situations must apply. The water must be 1.5 inches deep and the ova, nine days old. Most boats would be aground in 1.5 inches of water: the odds against both situations occurring together must be one in a million.

So please let us stop this stupid war of words and arguments. It has been proved in other areas of the country that boaters, canoeists, fishermen, swimmers, and picnickers can exist together—can enjoy our heritage of beautiful, clear, free rivers.

How much better it would be if all of these groups joined together to try and preserve what we have and not fight for sole rights to what rightly belongs to everyone to enjoy as they so desire. ■

banks and spawning grounds—even in instances where the Catchment Board has already approved proposals for relaxing the speed limit.

As refutation the Association has disseminated the findings of two scholarly reports. One is an investigation of the effect of speedboat activities on bank erosion, carried out on the Hawkesbury River, New South Wales, by E. J. Lesleighter. The other is a thesis on the effect of jet boats on salmon eggs, completed in 1972 by D. G. Ogle, a civil engineering post graduate at the University of Canterbury.

In fact, the Association has always demonstrated responsibility and initiative in its attitude to the environment.

Environmental effects

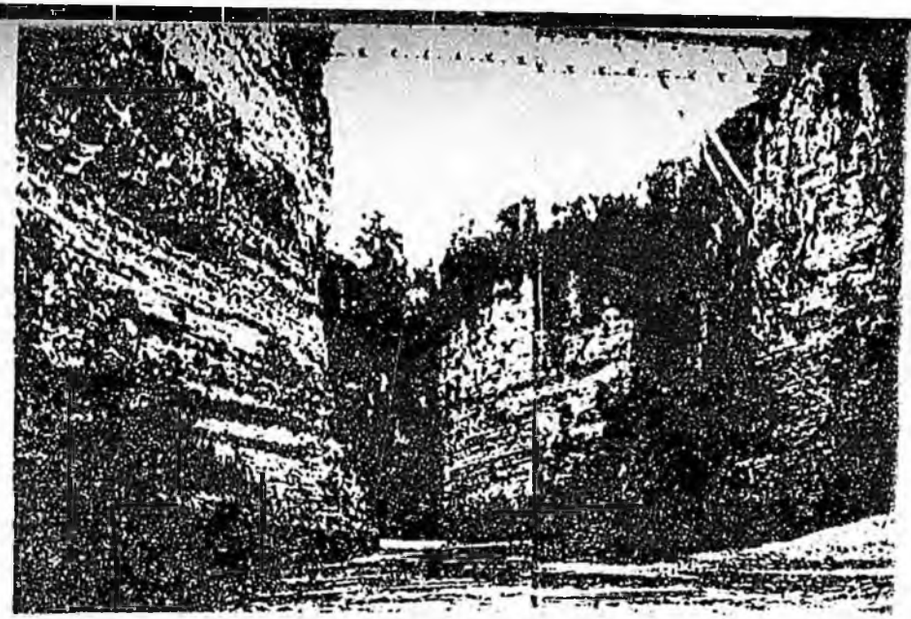
NEW ZEALAND JET BOAT ASSOC.

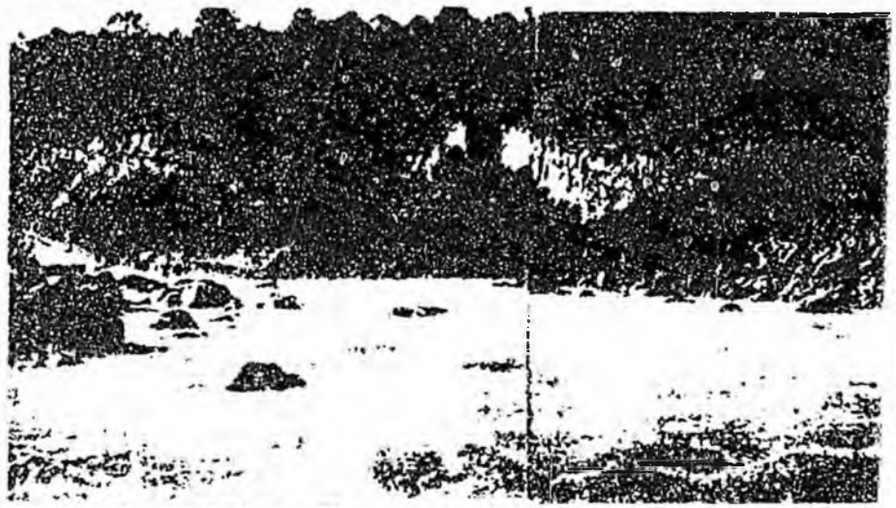
In 1969, the NZJB asked the University of Canterbury to study whatever effects jet boats were having on the environment and how those effects might vary with speed.

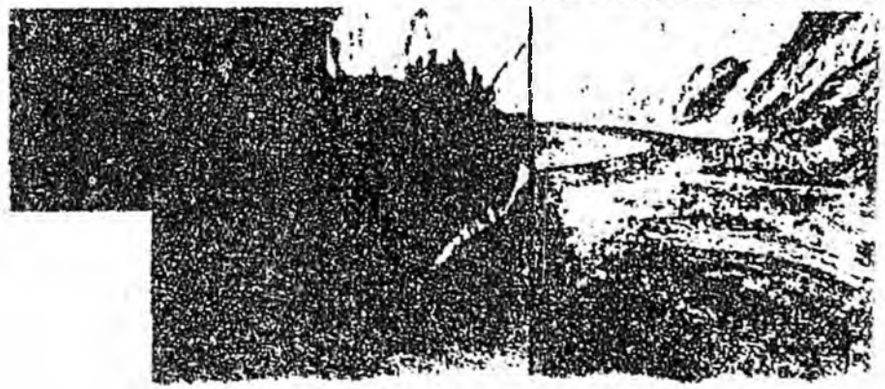
The Association was particularly concerned about possible damage to fish, to fish eggs buried in the river bed, and bank erosion.

Damage to fish has been shown to be minimal by two other studies. The resistance of young fish to physical shock was proven in one experiment in which 1209 young salmon were liberated in a power-scheme turbine-intake. Pressures in the turbine were as high as 72 lb/sq in., but a net placed at the outlet revealed that 1199 of the fry had survived.

In 1971, divers of the Marine Department studied the behaviour of adult salmon as jet boats passed over deep pools. The fish showed no reaction at all to the boats, although they were disturbed by the divers' air bubbles.







TO: SENATOR JONES RESOURCE COMMITTEE
SENATOR ELIASON

MARCH 30, 1992

WE THE UNDERSIGNED STRONGLY OPPOSE SENATE BILL NO. 417
SPONSORED BY SENATOR ZHAROFF, FROM KODIAK.
IT READS AS FOLLOWS:

"AN ACT RELATING TO THE USE OF JET BOATS IN ANADROMOUUS FISH STREAMS"

SECTION 1. AS 16.05 IS AMENDED BY ADDING A NEW SECTION TO READ:
SEC. 16.05.875 USE OF JET BOAT IN CERTAIN WATERS PROHIBITED.
A PERSON MAY NOT USE A JET UNIT TO PROPEL A BOAT IN WATER OF A DEPTH OF 12 INCHES OR LESS IN A RIVER, LAKE, OR STREAM, OR A PORTION OF A RIVER, LAKE, OR STREAM, IDENTIFIED BY THE DEPARTMENT UNDER AS 16.05.870 AS IMPORTANT FOR THE SPAWNING, REARING, OR MIGRATION OF ANADROMOUS FISH.

PLEASE DEFEAT THIS BILL!!!

SEE ATTACHED LIST OF SIGNATURES.

x [illegible]	ADDRESS	Box 957 Wrangell AK
x [illegible]	ADDRESS	Box 1793 Wrangell, AK
x E. W. Tollefson	ADDRESS	Box 525 Wrangell, AK
x Paul Tennyson	ADDRESS	Box 452 Wrangell AK.
x Mabel Tennyson	ADDRESS	Box 452 Wrangell, A.K.
x [illegible]	ADDRESS	Box 875 Wrangell, AK
x Barry Mongeon	ADDRESS	Box 1795 Wrangell Ak.
x Benjie Christie	ADDRESS	Box 1378 Wrangell AK
x Robert M. Rooney	ADDRESS	Box 2179 Wrangell, AK.
x William L. McMinimen	ADDRESS	Box 1103 Wrangell, AK.
x Jim Pibuen	ADDRESS	Box 515 Wrangell AK
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Stikine Sportsmen's Association Inc.

To Senator Lloyd Jones
Senator Dick Eliason

March 31, 1992

Subject: Senate Bill #417

Honorable Sirs:

The Stikine Sportsmen's Association consists of over 300 members who reside in and around Wrangell. Our organization was formed in the early 1950's and its purpose is to promote preservation, use and enhancement of fish and game in the Stikine River watershed and estuary as well as assist and support the local Search and Rescue Squad and other community groups.

On behalf of the Stikine Sportsmen s Association we are officially opposing Senate Bill #417. We ask you to please defeat this bill.

Thank you for your time and consideration.

All the best,

M. Steven Buness
President

cc: Robert S.. Prunella
Vice-President - Treasurer

P.O. Box 522 • Wrangell, Alaska 99929

#6506

EFFECTS OF JET BOATS ON FISH EGGS AND FRY

[by Kim Sundberg]
2/90

Summary

An extensive review of the available literature concerning the effects of jet boats on fish eggs and fry was conducted. A review of Federal regulations, state statutes, and New Zealand bylaws was also completed. The scientific literature indicates that jet boats are capable of causing mortality of salmon eggs during the early stages of egg incubation. However, studies have not demonstrated significant levels of mortality under field conditions. Jet boats can also disturb bottom substrate and create wakes which may accelerate erosion of stream banks. However, substrate and wake effects from jet boats have been found to be less than or equal to those of equivalent size prop boats in water depths where both types of boats can operate.

The available information does not support a regulatory ban on jet boat operations at this time. Additional research is needed to test assumptions made in the scientific literature and to measure direct mortalities of salmon eggs under field conditions. Until additional research is completed, jet boat operators should be asked to voluntarily refrain from operating in known spawning areas in shallow water (e.g.,less than 18 inches depth) during the period of spawning and early egg incubation.

Background

Proposal numbers 306, WO30, and WO33 request the Board of Fisheries to ban or severely limit the use of jet boats on portions of three river systems in Western Alaska. These proposals attribute mortality or injury of fish eggs and fry to jet units.

Concerns about the effects of jet boats on fish habitat are not

new. As early as 1968, the New Zealand Jet Boat Association (NZJBA) invoked a voluntary ban on jet boat usage in spawning areas in North Canterbury quinnat salmon (king/chinook, O. tshawytscha) streams during the spawning and early egg incubation period (Ogle, 1972). Subsequently, the NZJBA and the N.Z. Department of Agriculture and Fisheries (NZDAF) supported research by the University of Canterbury to examine the effects of their boats on the "environment" and how those effects might vary with boat speed. The research was prompted by a 1962 regulation prohibiting boat speeds greater than five miles per hour within 200 yards of the shore. This regulation, if enforced, would have effectively eliminated jet boat and other high speed boat usage from most New Zealand rivers. However, in practice, the regulation was largely ignored and it was later amended to remove the speed restriction after NZDAF divers observed no significant reaction of adult salmon to jet boats in deep pools and the NZJBA agreed to continue the voluntary ban on entering spawning areas during the spawning season (Ogle, 1972).

Current regulations on jet boats in New Zealand concern safety rather than environmental considerations i.e., minimum boater safety equipment, fuel system design requirements, and navigational rules in waterways (N.Z. Lakes District Waters Control Bylaws, 1989). However, the NZJBA has continued the voluntary ban on jet boat usage in spawning areas during the period of spawning and early egg incubation (approximately March through June). Apparently, this non-regulatory approach is felt to deal adequately with this issue in New Zealand (Guy Kerrison, N.Z. Dept. of Conservation, pers. comm.).

New Zealand Studies

During the period of 1969 through 1974 research was conducted in New Zealand to test the effects of jet boats on salmon eggs. The research findings are reported in a masters thesis (Ogle, 1972) and later summarized in the N.Z. Journal of Marine and Freshwater Research (Sutherland and Ogle, 1975). These studies reported the following conclusions:

* Jet boats generate pressure fluctuations in the streambed that are capable of killing salmon eggs during early stages of incubation by inducing intragravel flow surges that physically damage the developing embryo.

* Worst case tests indicate mortality of eggs in redds may be as high as 40%.

* Consideration should be given to restricting the activities of jet boats in spawning areas during the spawning season.

The studies included direct measurements of pressure fluctuations in "artificial redds" located in the bottom of a stream caused by the passage of a jet boat[1]. Measurements included boat passes at various speeds and distances from the pressure sensors and at various depths in the redd. These tests showed two significant pressure fluctuations in the redds caused by the passage of jet boats. The first fluctuation was caused by the displacement of the boat (analogous to the bow wake generated by a boat moving through the water) and the second fluctuation occurred just behind the intake of the jet unit. Laboratory experiments were then carried

[1] The test jet boat was described as a standard production model "Hamilton Jet 20", 12'-6" long with a Ford V4 motor (no horsepower was given although the automotive version of the Ford V4 reportedly ranges from 83 to 97 hp).

out on salmon eggs at various stages of development to test the effects of these measured pressure fluctuations on egg survival.

Laboratory experiments showed no significant mortality as a direct result of pressure changes in the water. However, the researchers hypothesized that pressure fluctuations would induce intragravel flows of sufficient strength to cause egg mortalities from sudden accelerations and decelerations of eggs within the gravel. Using a laboratory apparatus to simulate the disturbance of eggs at the flow velocities derived from the pressure measurements, maximum mortalities of 39% were measured with eggs in the ninth day of development at the flows simulated by a jet boat operating in 12 inches water depth at a speed of 12.5 mph. Mortalities were compared to control eggs placed in the apparatus with no simulated disturbances.

Table I Maximum Overall Mortality (from Ogle, 1972)

Water Depth (inches)	6	12	18
Boat Speed (mph)	20	12.5	9
Mortality (%)	37.5	39.4	23.9

The mortality of eggs caused by disturbance during the early stage of development is consistent with fish culturists' observations that salmon eggs are sensitive ("tender") until they reach the eyed stage at about 250-300 temperature units (up to 54 days at 42 degrees fahrenheit). Although these mortalities appear high, it is important to remember that they are largely based upon a laboratory simulation rather than field data. Mortalities measured in field tests could be significantly lower because:

1. Salmon eggs in natural redds do not generally have the degree of freedom to move through intragravel pore spaces and

impact on graval particles as they did in the laboratory simulation; and

2. The laboratory simulation occurred over a period of one minute which exposed eggs to a much longer flow surge than would occur during a normal jet boat passage over a redd. The degree of disturbance created in the simulation could occur only from prolonged or repeated passes by a jet boat over the same redd.

However, the research supports a plausible mechanism for egg mortality from jet units under the "worst case" conditions presented by the laboratory simulation. Moreover, it suggests caution in operating jet boats in shallow water over spawning beds during the early stage of egg incubation and argues for additional research to test the researcher's assumptions under field conditions.

Missouri Studies

In response to public concerns over jet boat uses, the Missouri Department of Conservation studied the physical impacts of jet boats versus prop boats (Bush, 1988). The study compared substrate disturbance and wake height from a 14-foot flat-bottom aluminum boat with a 35-hp outboard equipped with a jet lower unit with a 15-foot flat-bottom aluminum boat with a 20-hp prop outboard mounted on a lift. Two persons were in each boat.

At shallow depths (7-10 inches), both the prop and jet units caused significant disturbance of a gravel substrate (measured by observing displacement of painted rocks within metal frames). At moderate depth (14 inches) the prop boat caused more disturbance than the jet boat. At the greatest depth (17 inches) neither the jet nor prop boat caused significant disturbance.

Measurement of wake heights indicated differences between jet and prop boats depending on the direction of operation. The wake height of the prop boat was greater (8.9 inches) than the jet boat when run downstream but less (2.6 inches) when run upstream. Wake heights for the jet boat were similar both upstream (5.4 inches) and downstream (4.7 inches).

The researchers concluded that it is unlikely that jet boats cause more severe biological impacts (based on substrate disturbance) than prop boats at water depths where both boats can be operated. They further concluded that additional studies would be required to test biological effects of jet boats operating in very shallow water (less than 7 inches depth) where prop boats can not operate.

Jet Boat Issues in Other States

Issues concerning jet boat usage on streams have been addressed in other states through public debate, policies, regulations and proposed statutes. Federal regulations (36 CFR 7.83) originally proposed in 1972 and codified in 1989 prohibit jet boats on certain tributaries in the Ozark National Scenic Riverways, Missouri. The purpose of this regulation is to reduce conflicts between recreational users rather than to protect fish. Conflicts between canoeists, swimmers, floaters and jet boats on these and other Missouri streams were cited as the reason for several bills being introduced in the Missouri Legislature to ban jet boats or limit their horsepower (St. Louis Post Dispatch, 2-23-86). Recently, a citizen's initiative has proposed a state statute entitled the "Natural Streams Act" to be placed before Missouri voters in November, 1990 (Natural Streams Campaign, 1990). This act would create a system of "natural streams" in Missouri and prohibit, among other things, "excessively noisy motorboats" defined as boats generating a noise level in excess of 64 decibels. No states have prohibited jet boats based on concerns for fish eggs or fry.

Additional Research

Research concerning the effects of jet boats on salmonid reproduction has been proposed by the U.S. Fish and Wildlife Service (FWS) and the National Park Service (NPS). A draft research outline by the University of Alaska (UAF), Cooperative Fisheries Unit is currently being reviewed by FWS and NPS (Jim Reynolds, UAF, pers. comm.). The proposed research intends to expand upon the New Zealand study by: 1) determining effects on spawning behavior of adults, 2) evaluating factors affecting mortality of eggs and larvae, 3) estimating mortality rates of young under various conditions, and 4) recommending measures for minimizing effects. The study is designed around field experiments rather than laboratory simulations. Funding for jet boat research is being requested by NPS in FFY91 and is scheduled to be expended during 1991-93 (Ross Kavanaugh, NPS, pers. comm.). Additional funding is being sought from FWS (Larry Peterson, FWS, pers. comm.).

Staff Recommendation

A review of the available literature indicates that jet boats are capable of causing mortality in salmon eggs during the early stage of egg incubation. Egg mortalities are based upon the assumption that pressure gradients created as the jet boat passes over a redd in shallow water induce intragravel flow surges within the streambed which in turn causes physical damage to the eggs. However, the studies have not demonstrated that jet boats cause mortality of salmon eggs under naturally occurring conditions. The high variability in streambed composition, water depths, number of passes over the same redd, boat size, horsepower, and types of jet units suggest that mortalities in the field may be much lower than are reported by the New Zealand study. Additional research is needed to test the assumptions of the New Zealand study and to

determine mortality rates of eggs and fry under field conditions.

Consistent with the New Zealand example, jet boat operators should be asked to voluntarily refrain from operating in shallow water in known spawning areas during the period of spawning and early egg incubation until additional research can be completed. A depth of 18 inches or less is suggested as an advisory threshold because the New Zealand study is based on measurements of 18 inches, 12 inches, and 6 inches water depth. However, it does not appear that the available information justifies a regulatory ban on jet boat operations at this time.

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contribution to the total diet because they contribute only 3% of the total landings.

As fishing continues to develop in New Zealand and the accumulated stocks of the older larger survivors of the long-lived species are reduced, the average size of the fish and therefore the average concentrations of mercury in those which are landed will also be reduced. But, as the concentrations are already substantially below those which are acceptable elsewhere, there is no reason to regard New Zealand fish as unsafe for human consumption.

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EFFECT OF JET BOATS ON SALMON EGGS

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(Received 4 September 1974; revision received 25 February 1975)

ABSTRACT

The passage of jet boats through spawning areas can kill salmon eggs buried in the river bed. By using a jet boat on the Ashley River the pressure gradients created in a redd were determined. At the maximum boat speed investigated (11 $m.s^{-1}$) gradients up to 9.32 $kPa.m^{-1}$ were recorded. The induced water velocities through the gravel were then estimated from the equation of motion and reproduced in a gravel-filled tube in the laboratory. For the test conditions discharge velocities ranged from 0.38–0.3 $m.s^{-1}$. Studies of the effect of these flows on salmon eggs revealed fatality rates of up to 40% at their most critical stage on the ninth day of development.

INTRODUCTION

Very little quantitative information is available about the effect of a jet boat on the water and on the stream bed over which it travels. In spite of this, there have been many claims that the passage of jet boats through spawning areas is detrimental to and can even kill fish eggs that may be buried in the gravel of the stream bed. At the request of the New Zealand Jet Boat Association and with the support of the Department of Agriculture and Fisheries, an investigation was undertaken firstly to establish whether the passage of jet boats can harm fish eggs, and secondly to estimate the magnitude of such harm for a range of conditions typical of those in which jet boats operate.

The investigation was concerned only with the possibility of physical damage to the eggs. Other aspects such as damage to the nervous system of the developing embryo were not considered. The results indicate that consideration should be given to excluding jet boats from known spawning areas during the spawning season, approximately March to June of each year.

BACKGROUND CONSIDERATIONS

Quinnat salmon *Oncorhynchus tshawytscha* (Walbaum) were introduced to New Zealand waters at the beginning of this century and are now successfully acclimatised in rivers throughout the South Island. Their life-cycle has been documented by Flain (1971) and will be described only briefly herein.

The adult fish migrate from the sea to the river-mouths, usually in mid March, in the third or fourth year of their lives. They return to their parent streams and commence spawning towards the end of April. The females dig nests (known as redds) out of the gravel river bed and lay their eggs in pockets within the redds; the males participate only during the mating sequence. The females subsequently cover the eggs with coarse gravel. Depending on the temperature of the water, the eggs hatch 40–50 days later. The young fish spend varying times in freshwater, the greater number leaving the parent stream at a very early age while some spend up to a year in fresh water. Very little is known about the fish after they enter the sea until they return to spawn.

The egg consists of an outer membrane and an inner yolk, separated by a watery fluid, the perivitelline fluid. The egg is relatively strong during the first two days of its life when the surrounding redd may still be in the process of construction. After approximately one third of the incubation period, the egg reaches a most delicate state as it undergoes gastrulation.

Jet boats are shallow- or moderate-vee planing hulls approximately 3–6 m long with a beam of from 1.5–2.5 m. Their propulsion system uses a pump to draw water from an intake in the hull and discharge it, as a jet, through a contracting orifice at the rear of the boat. Among the many advantages of this system is its ability to operate in water depths as small as 150 mm, enabling the boats to traverse the shallow headwaters of rivers where the salmon spawing grounds are found.

The passage of the boat gives rise to fluid pressures in the vicinity of the hull which are different from the normal hydrostatic pressure. In shallow water, these pressure fluctuations will propagate to the stream bed and through the water between the gravel particles. As the bow of the boat passes over a given point a positive pressure fluctuation occurs. This is followed by a sudden reduction in pressure caused by the jet intake and then by a pressure recovery. There may be further small fluctuations as the stern and the wash behind the boat move over the given point. Depending upon the boat's speed and length the fluctuations may occur over time intervals as short as 0.2 s.

To determine the conditions most harmful to salmon eggs a series of exploratory tests was conducted. Full details of these tests are given by Ogle (unpublished 1972). The eggs were subjected to high (± 6 m of water) static pressures and to oscillating pressures up to 60 Hz. They were also tested under a static load applied directly to the outer shell, by prolonged rotation, and by sudden accelerations and decelerations, including impact on a stone or sudden wedging between stones. The high and low static pressures and the pressure fluctuations had no adverse effect on eggs. Only the acceleration and deceleration tests resulted in significant fatality rates; the yolks were easily ruptured by the physical shock, especially on impact. Such impacts and yolk rupture, which is inevitably fatal, may occur in a redd if the egg is moved through the gravel by a water flow.

Pressure fluctuations caused by the passage of the jet boat will result in intragravel flows. It is shown here that, in shallow water, jet boats can create flows of sufficient strength to cause fatal impacts.

EXPERIMENTAL WORK

One approach to determining the effect of jet boat passage over eggs in a redd would be to place eggs in an artificial redd and to run a jet boat over it. However, the uncertainties in placing and recovering the eggs and in assigning the resultant fatalities to the passage of the jet boat precludes such an approach. A natural redd cannot be used for the same reasons. Thus the experimental work was done in two stages. First, a series of field tests to investigate the induced hydrodynamic conditions in an artificial redd and, second, laboratory tests in which eggs were placed in conditions which simulated those found in the field. From the results of these laboratory tests and a knowledge of the distribution of eggs within a natural redd (Hardy 1963), percentage fatalities associated with jet boat passages over a redd could be estimated.

FIELD TESTS

Because the eggs are particularly susceptible to impact, it was necessary to determine quantitatively the dynamic character, in particular the maximum velocities, of flows induced in the gravel bed by jet boats. To place instruments of sufficient sensitivity and dynamic response which can continuously record the flow velocity (including direction) at points in a gravel bed would be extremely difficult. It is more practical to measure the pressure fluctuations and from these to deduce the associated velocities using a theoretical model as described below.

Three artificial redds, 1 m long, 1 m wide, and 0.5 m deep and conforming to the measured composition (Ogle unpublished 1972) of an actual salmon redd, were constructed in the bed of the Ashley River immediately downstream of the bridge on State Highway 1. Pressure fluctuations within these redds were measured by five pressure sensors mounted in a common frame (Fig. 1). The frame was placed perpendicular to the line of boat travel at various positions within the redds and covered with a coarse screen before replacing the gravel. The screen prevented stones from touching the sensors.

The sensors were 18-gauge (0.52 mm) brass strips of rectangular shape rigidly supported at their ends. They were 100 mm × 16 mm and spaced at 125 mm, thus ensuring that average fluctuations over an area equivalent to that occupied by several stones (average size 18 mm) were measured and that localised pore pressure fluctuations were ignored. An electrical strain gauge mounted on the underside of each sensor provided a record of the strains induced by the pressure fluctuations acting on the upper surface of the strip. An amplifier and portable battery-operated

6-channel recorder completed the measuring system (Fig. 1). Each sensor was calibrated statically using the weight shown in Fig. 1 before and after every test run.

The boat used for all the tests was a standard production model "Hamilton Jet 20", 3.8 m long, with a Ford V4 motor. It was driven over the redd four times (twice upstream and twice downstream) for each speed at each of three lateral positions indicated in Fig. 2. Boat position 3 is equivalent to having the boat positioned at 1 with the frame containing sensors turned end for end and placed on the other side of the redd. Thus fluctuation measurements over the whole width of the redd were obtained with an overlap in the centre. This allowed checks for consistency to be carried out and any doubtful records discarded. Boat position 2 gave measurements over half the width of the redd for the boat passing along the centre line of the redd. The procedure was repeated for other water depths and with the pressure sensors at different distances below the gravel surface.

During each passage of the boat over the redd a trace of pressure against time was recorded for each of the five gauges. A typical trace can be seen on the recorder in Fig. 1. For any given boat speed, the time scale on the trace can be converted to a distance scale with origin at the bow of the boat. By combining all traces obtained from a particular elevation, usually nine spaced evenly across a line perpendicular to the line of boat travel, contour maps of equal pressure fluctuation could be drawn. A typical map (Fig. 3) shows a plan view of the fluctuations occurring at points on a horizontal plane at a given depth in the redd for a particular boat speed. There were several such maps for every boat speed, each map representing fluctuations at different distances beneath the gravel surface. Sufficient tests were performed to allow fluctuation gradients in three mutually perpendicular directions to be determined for a series of 6 boat speeds ranging from 1.5–11.0 $m.s^{-1}$ in three different water depths: 150 mm, 300 mm, and 450 mm.

Preliminary analysis of the maps showed that maximum velocities (steepest pressure gradients) were likely to occur in one of two areas, either in the area of large positive fluctuations near the bow of the boat, or immediately behind the intake. Selected points in these areas were analysed for twenty two different combinations of boat speed, boat position (laterally relative to the redd), and water depth. At each point, fluctuation gradients as functions of time were deduced longitudinally along the forward line of boat travel, laterally away from the boat and vertically downwards. Vertical gradients were obtained by choosing two overlaying maps, the point under consideration being midway between them. Lateral and longitudinal gradients were obtained either from the map at that depth (if there was one) or from the average of the maps immediately above and below that point. These arrays of fluctuation gradients were used to deduce flow velocities through the gravel as a function of time.

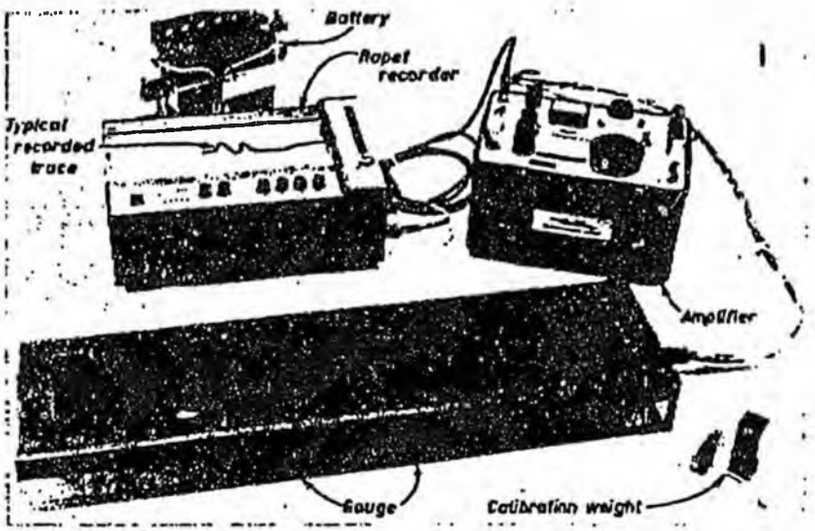

FIG. 1—Pressure sensing strips and recording equipment used to measure pressures induced by the passage of a jet boat in shallow water over an artificial salmon redd constructed in the bed of the Ashley River.

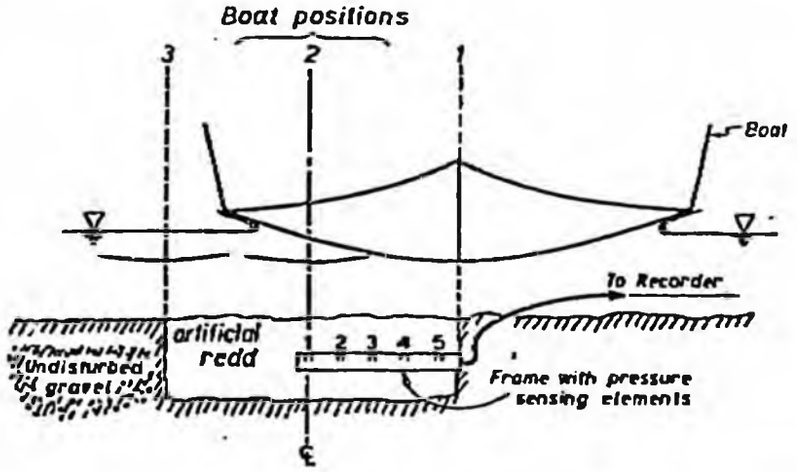

FIG. 2—Cross-section of artificial salmon redd, perpendicular to line of boat travel, at testing site on the Ashley River immediately downstream of the bridge on State Highway 1. Tests were made with the boat, shown in figure in position 1, in each of the three boat positions indicated.

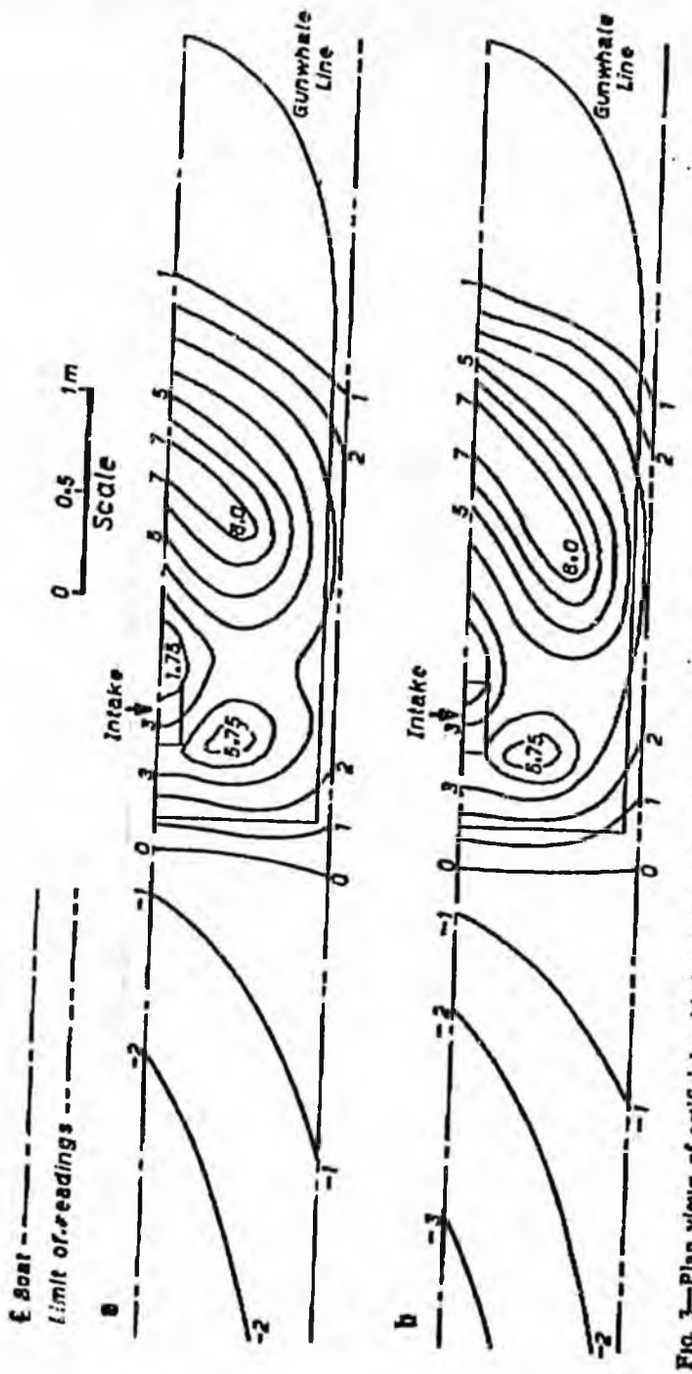

FIG. 3—Plan views of artificial redd showing contours of equal pressure fluctuation measured on a horizontal plane 130 mm beneath the surface of the redd. The fluctuations were induced by the passage of a jet boat in a water depth of 300 mm at speeds of 6.7 ms^{-1} (a) and 5.6 ms^{-1} (b). Values noted on the contours are to be multiplied by 0.25 to give pressure fluctuations in kPa.

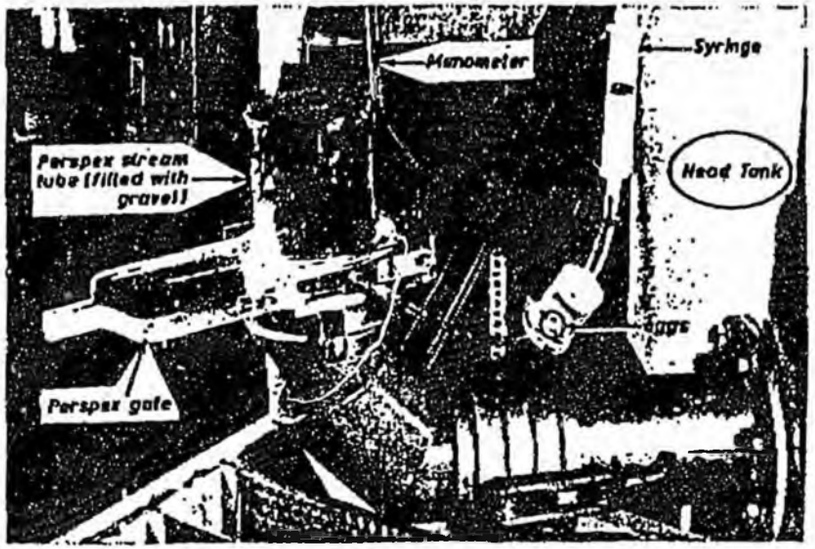

FIG. 4—Gravel filled tube and constant head tank used in the laboratory to simulate the flow conditions deduced from field measurements of pressure fluctuations induced in an artificial salmon redd by the passage of a jet boat.

LABORATORY TESTS

Salmon eggs were subjected, in laboratory tests, to intragravel flows which simulated those deduced from the field tests. From the time of fertilisation until the day of testing the eggs were stored in special containers at the North Canterbury Acclimatisation Society's Silverstream Hatchery. The containers were made from 50-mm-diameter perspex tubing and were 60 mm high. They were placed in a rack where a steady gentle flow of water passed up through each container. Individual containers could be removed from the rack without disturbing the others. On the day of testing a container, supported in a cradle inside a 2-litre plastic bottle filled with water from the hatchery, was transferred to the laboratory. The eggs were then split into batches, each containing some 10–20 eggs, ready for testing.

Conditions in the redd were simulated in the laboratory by applying a pressure gradient across a 150-mm-diameter tube packed with gravel taken from one of the artificial redds built in the Ashley River. The tube was mounted adjacent to a head tank as shown in Fig. 4. The head tank provided a controlled flow of water through the sliding perspex gate into the gravel packed tube. Different pressure gradients, the range of which encompassed those gradients found in the field tests, could be applied across the tube by adjusting the water level in the head tank. When the flow reached a steady state, a batch of eggs was injected into the tube by means of the syringe shown in Fig.4. In the tube they passed around the gravel particles undergoing accelerations, decelerations, and impacts equivalent to those experienced by eggs in the river bed. On impact the

eggs would thus experience the same shock mechanism as eggs in a redd. The water flow was continued after the eggs were inserted in the tube for periods of up to 1 min. The eggs were thus exposed to the flows for periods longer than eggs affected by the passage of a single jet boat. The chances of an egg being damaged are thus greater, and the laboratory results are therefore more representative of the effects of several passes by jet boats.

After such a test the eggs in the tube were examined and the fatality rate determined. Each day of testing included repeated tests, each with a new batch of eggs, at up to five different pressure gradients and a control test. As a check on the injection technique one of the batches of eggs was injected, using the same syringe and tubing, into the 150 mm diameter tube filled with still water. On each day these control tests showed negligible fatality rates.

Tests were performed on days 6, 7, 8, 9, 10, and 13 of egg development, new eggs being brought from the hatchery on each day. Percentage fatality as functions of the applied pressure gradient are shown in Fig. 5 which shows the ninth day to be most critical. Each point on the graph is a mean value of four or five repeated tests. There is no obvious explanation for the anomolous points taken on the eighth day.

ANALYSIS

The variation of velocity with time at a point in the redd can be deduced from the measured fluctuation gradients at that point by using the equation of motion for the fluid. The equation can be written as

$$-\frac{\rho g}{k}\vec{u} - \nabla p = \rho\frac{\partial \vec{u}}{\partial t} \qquad (1)$$

where ρ is the fluid density, g the gravitational acceleration, k the permeability of the redd, p the pressure fluctuation, ∇ the gradient operator, $\vec{u}$ the discharge velocity, and t time. The first term represents the resistance per unit volume offered to the flow by the gravel and embodies Darcy's Law. The second term is the pressure force per unit volume. On the right hand side is the mass acceleration product per unit volume from which the convective acceleration terms, which are expected to be small for the flows under consideration, have been neglected.

By finite differencing in time, using the initial condition of zero velocity and the measured fluctuation gradients, equation (1) can be solved in component form for $\vec{u}$ as a function of time. Laboratory tests with steady flows on a sample of gravel from a redd showed k to be velocity dependent. This dependence necessitated, at each time step, a trial and error solution for the new velocity. The analysis was performed by computer, the output being the discharge velocity as a function of time. Typical values ranged from 0.18–0.3 $m.s^{-1}$. Actual fluid velocities within the redd will be higher than these by at least a factor equal to the reciprocal of the porosity of the gravel; for the redds examined this factor was 2.8.

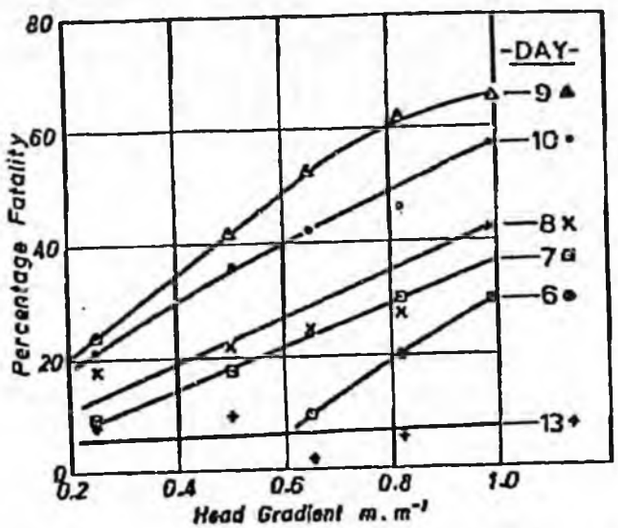

FIG. 5—Percentage fatality, during laboratory tests, of eggs of quinnat salmon *Oncorhynchus tshawytscha* as a function of applied pressure gradient. The eggs were injected into a gravel filled tube in which the flow conditions resulting from the passage of a jet boat over an artificial redd were simulated. The applied pressure gradient is plotted in terms of head. With the tests being done in water, 1.0 $m.m^{-1}$ is equivalent to 9.81 $kPa.m^{-1}$.

To determine the effect of a given discharge velocity on eggs that may be in the redd, the gradient required to produce that velocity is calculated from Darcy's Law, using the experimentally determined values for k, and the expected fatality rate found from Fig. 5.

Taking, for a given boat speed and water depth, the maximum discharge velocities that occurred in the upper and lower half of the redd, a percentage fatality can be determined for each half. Work by Hardy (1963) allows the distribution of eggs with depth in a redd to be estimated. Combining this with the fatality rates found above, an overall percentage fatality occurring in a redd can be estimated. Table 1 summarises the results of these calculations and shows, for each tested water depth, the *maximum* overall percentage fatalities for the redd as a result of the most destructive boat speed at each depth.

The values are termed *maximum* overall percentage fatality because in deriving them it was assumed that

(i) all eggs in the redd were 9 days old (the most sensitive time, see Fig. 5),

(ii) that all the eggs in the redd were exposed to the maximum induced velocities at their particular depth.

TABLE 1—Maximum overall percentage fatalities of eggs of quinnat salmon *Oncorhynchus tshawytscha* subjected to pressure gradients induced in their redds by passages of jet boats in shallow water

Water depth (mm)	150	300	450
Boat speed ($m.s^{-1}$)	8.9	5.6	4.0
Fatality (%)	37	39	24

Table 1 thus shows values which may be higher than those caused by a single pass of a jet boat over a typical redd. Now, at certain times in the spawning season, there will certainly be redds with 9-day-old eggs exposed to jet boats and further, when a number of jet boats are operating, it is quite possible that many eggs will, during one pass or another, be subjected to velocities at least close to the maximum. Consequently the figures of Table 1 may not be as exaggerated as might at first be assumed in light of the two assumptions above.

CONCLUSION

This investigation has shown that jet boats are capable of killing salmon eggs. The numerical estimates obtained indicate that the passages by jet boats through spawning areas may cause significant loss of eggs (possibly 20–40%) in some redds. This figure must be regarded as being indicative only, because it reflects the worst possible combination of circumstances. However, if a number of jet boats are active in a spawing area, their cumulative effect may be such that these conditions could be approached.

In view of these results it is suggested that consideration be given to restricting the activities of jet boats in spawning areas during the spawning season.

The New Zealand Jet Boat Association has voluntarily adopted a policy among its own members, who comprise the majority of jet boaters, of not entering known spawing areas during the spawing season. The problem of restricting those who do not belong to the Association remains.

ACKNOWLEDGMENTS

This study was assisted financially by a grant from the Ministry of Agriculture and Fisheries. Valuable assistance was also given by C. W. F. Hamilton Ltd who made a jet boat available for the field tests, by the North Canterbury Acclimatisation Society who provided the eggs, and by Dr V. Benzie of the University of Canterbury who advised on the zoological aspects of fish eggs.

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OGLE, D. G. unpublished 1972: The effect of jet boats on salmon eggs. Master of Engineering thesis lodged in library of University of Canterbury, Christchurch. 115 pp.

CONTROL OF WATER WEEDS BY GRASS CARP IN A DRAINAGE DITCH IN NEW ZEALAND

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(Received 19 September 1974; revision received 28 February 1975)

ABSTRACT

Two-year-old grass carp *Ctenopharyngodon idella* Val. were stocked at a rate of 350–650 $kg.ha^{-1}$ in a farm drainage ditch in the Bay of Plenty, New Zealand. During the months December to April the fish greatly reduced the standing crop and percentage cover of the weeds *Callitriche stagnalis* Scop. and *Nasturtium officinale* R.Br., but had no effect on *Polygonum decipiens* R.Br.

INTRODUCTION

Pond studies have shown that many weed species which cause problems in New Zealand waterways are eaten by grass carp (Chapman & Colfey 1971, Edwards 1974). Successful weed control in a natural water body is, however, also dependent on factors other than weed palatability, notably rates of weed growth and fish feeding activity, and fish stocking density.

Edwards (1973) reported that, even when abundant palatable weed is present, young grass carp kept in aquaria will eat invertebrates and fish fry. Studies in Poland (Fischer 1970, 1972, 1973) showed that grass carp weighing up to 400 g eat a mixed diet of animal and plant food, and that growth is retarded when animal food is not available. Preference for animal food in a natural environment could reduce the potential for weed control.

It was therefore important to test the potential of grass carp for weed control in a New Zealand waterway where weeds are a problem, and where aquatic animals are also present. An experiment was designed to establish the degree to which weed control might be achieved in a farm drainage ditch. Considerable expense is incurred on mechanical and chemical methods of weed control in drainage systems, and it is likely that a successful biological control would be widely used in these waterways.

This paper describes the effects of grass carp on the weed infestation in a drainage ditch. A study was also made of the effects on bottom fauna in the ditch, the results of which will be published later.

Alaska Environmental Lobby, Inc.

P.O. Box 22151 Juneau, Alaska 99802 907-586-2345

March 31,1992

Senator Fred F. Zharoff
Alaska State Legislature
State Capitol
Juneau, AK 99801-1182

Dear Senator Zharoff,

The Alaska Environmental Lobby would like to thank you for introducing SB 417 which prohibits the use of jet boats in shallow anadromous streams. The negative impact of jet boats on fish populations in streams is potentially damaging to fish resourses. Jet boats are also hazardous and annoying to people utilizing shallow stream areas.

Currently state statutes AS16.05.870(b) and AS16.05.895 prohibit and penalize wheeled and tracted vehicles from crossing anadromous streams without permits in order to protect fish spawning habitat. Therefore, it is reasonable to assume that jet boat noise and jet wash in less than 12 inches of water will disturb both the spawning adult fish and their redds in the same or worse manner as wheeled vehicles.

Alaska Environmental Lobby supports the passage of SB417.

Thank you for the opportunity to comment on this proposed legislation.

Sincerely,

Kristin L. Stahl-Johnson
Volunteer

FISCAL NOTE

STATE OF ALASKA
1992 LEGISLATIVE SESSION

BILL NO. SB 417

Revision Date: _____ Department Affected: Public Safety

Title: "An Act relating to the use of jet boats in anadromous fish streams" BRU: Fish and Wildlife Protection

Component: Enforcement and Inves. Services

Sponsor: Senator Zharoff

Requestor: Senate Resources **COMPONENT SERIAL NO.** | | 4 | 9 | 0 |

EXPENDITURES/REVENUES: (Thousands of Dollars) (inflation not included)

OPERATING	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	-0-	-0-	-0-	-0-	-0-	-0-
CAPITAL	-0-	-0-	-0-	-0-	-0-	-0-
REVENUE FUND SOURCE:	-0-	-0-	-0-	-0-	-0-	-0-

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER FUND SOURCE:						
TOTAL	-0-	-0-	-0-	-0-	-0-	-0-

POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

Estimate of current year impact: _____

ANALYSIS: (Attach a separate page if necessary.)

No fiscal impact upon the Division of Fish and Wildlife Protection is anticipated.

Prepared By: Capt. Seibel Phone: 269-5682

Division: Fish and Wildlife Protection Date: 4/1/92

Approved by Commissioner: Doug A. Mitchell for Richard L. Burton

Agency: Department of Public Safety Date: 4/1/92

Distribution (by preparer): Leg. Fin., Legislative Sponsor, Requestor, OMB/DBR, Gov. Legis. Ofc., & Impacted Agency(ies).

Rev 10/7/91

FISCAL NOTE

STATE OF ALASKA
1992 LEGISLATIVE SESSION

BILL NO. SB 417

Revision Date: 3/20/92 Department Affected: Fish and Game

Title: Jet Boats in Anadromous Streams BRU: Habitat

Component: Habitat

Sponsor: Zharoff

Requestor: Senate Resources COMPONENT SERIAL NO. 4 8 6

Expenditures/Revenues: (Thousands of Dollars)

OPERATING	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98
PERSONAL SERVICES	122	122	122	122	122	122
TRAVEL	3	3	3	3	3	3
CONTRACTUAL	4	4	4	4	4	4
SUPPLIES	1	1	1	1	1	1
EQUIPMENT	7	1	1	1	1	1
LAND & STRUCTURES	0	0	0	0	0	0
GRANTS, CLAIMS	0	0	0	0	0	0
MISCELLANEOUS	0	0	0	0	0	0
TOTAL OPERATING	137.0	131.0	131.0	131.0	131.0	131.0
CAPITAL	0	0	0	0	0	0
REVENUE FUND SOURCE:						

FUNDING: (Thousands of Dollars)

GENERAL FUND	137.	131.	131.	131.	131.	131.
FEDERAL FUNDS						
OTHER FUND SOURCE:						
TOTAL	137.0	131.0	131.0	131.0	131.0	131.0

POSITIONS:

FULL-TIME	2	2	2	2	2	2
PART-TIME						
TEMPORARY						

Estimate of current year impact: No impact on current year.

ANALYSIS: One full time position plus support in both Fairbanks and Anchorage at the Habitat Biologist II level will be needed to implement and enforce jet boat prohibition in anadromous fish streams.

Prepared By: Frank Rue, Director Phone: 465-4105

Division: Habitat Date:

Approved by Commissioner: Don Somerville

Agency: Department of Fish and Game Date: 4/1/92

Distribution (by preparer): Leg. Fin., Legislative Sponsor, Requestor, OMB/DBR, Gov. Legis. OSC., & Impacted Agency(ies).

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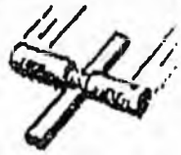

ROLLER - SPHERICAL - ROLL
TEFLON • STAINLESS S

March , 1992

Dear

Legislation (Senate Bill No. 417) has been introduced by Senator Zharoff of Kodiak which would effectively eliminate the use of jet boats on the rivers and streams of Alaska.

The inference is that jet boats are harmful to the spawning, rearing and migration of fish.

Jet boats have been in use in Alaska for about 30 years. If they were harmful, they would have been outlawed years ago.

Our tests have shown that a jet boat on a plane does not dredge the river bed. It scoops the water it needs for propulsion from straight ahead, even in 3-4 inches of water.

If the boat is started in water that is too shallow, by an inexperienced operator, prior to reaching a plane, it will suck up sand gravel and the pump clearances will be destroyed in a matter of minutes, sending the operator back home for expensive repairs.

Needless to say, if the jet boat were operated in a manner that would harm a spawning bed, it would also damage the jet pump. It would be like knowingly operating your automobile without engine oil.

The enclosed study, by the Oregon State Marine Board, addressed this subject in 1985. Note under "Social Impacts" it stated; "The greatest perceived impacts appear to be caused by conflicts between jet boaters and other user groups".

The jet boat itself is not to blame. It enables fishing and hunting which is one of Alaska's attractions.

When people learn to share our recreational areas and be courteous to each other we will have fewer problems.

Very truly yours,

Dick

Richard C. Stallma

Letters opposing
1 - 11 -

STIKINE SPORTSMEN'S ASSOCIATION

P.O. BOX 522, WRANGELL, ALASKA 99929, (907) 874-3530

from JD

FAXED

Earl Klosser

Juneau, Alaska

March 28, 1992

Hello Earl;

THE PARAGRAPH I HAVE CIRCLED YOU MAY NOT BE ABLE TO READ -- THIS IS WHAT IT SAYS

" THE ENCLOSED STUDY, BY THE OREGON STATE MARINE BOARD, ADDRESSED THIS SUBJECT IN 1985. NOTE UNDER " SOCIAL IMPACTS" IT STATED: " THE GREATEST PERCEIVED IMPACTS APPEAR TO BE CAUSED BY CONFLICTS BETWEEN JET BOATERS AND OTHER USER GROUPS "

Warren Wild
P. O. Box 32036
Juneau, Alaska 99803
March 25, 1992

Senator Lloyd Jones
State Capitol Building
Juneau, Alaska 99811

Dear Senator Jones:

I am writing you to express my concern as to SB No. 417, relating to the use of jet boats in anadromous fish streams.

I am an owner of a recreation cabin on Chilkat Lake, above Haines. Access to the lake is by means of a jet boat via the Tsirku River. We use the river for a distance of from 50 to 300 yards depending upon the stage of the river. There are about 50 cabins and homes on the lake plus a number of undeveloped lots sold by the State several years ago.

The bill as presently drafted would block our access to the lake as the river is less than 12 inches deep at some point in its course. I do not believe that this is the intent of the bill, but this would be the effect. Other rivers, such as the Taku and the Stikine have similar uses and resultant problems, I expect.

I am told that this bill resulted from concerns of people in the Bristol Bay region. I think that it would have adverse effects over the whole state, and thus it should be redrafted to address only the problem it is attempting to correct.

Thank you for attention to this matter.

Yours very truly.

Warren Wild

cc: Sens. Zharoff, Duncan, Eliasen

20 March 1992
Chilkat Lake

ATTN: SEN. JONES
RESOURCES

Re: Senate Bill 417

I would like to voice strong opposition to Senate Bill 417 the act relating to the use of jet boats in anadromous fish streams. My family and I live at Chilkat Lake year round and a jet boat is our means of transportation to and from the lake. I was about to start a commercial operation of transporting people and supplies to Chilkat Lake, but the threat of this actions has put this on hold.

If the reason for this bill is due to others misuse in urban areas, please deal with it on a case by case situation, not a blanket bill that has a negative impact for all the State. I also find that to single out jet boats sounds like knee jerk reaction to special intrest groups. Even canoes and river rafts impact fish streams. Are we to lock up our whole state to special intrest hysteria?

Is this bill the result of special intrest, emotional hysteria that is to serve a few and hurt many? Another tool to "lock up" our State, and regulate and change peoples lives and livelihood ?

Steve Brooks

STEVE BROOKS
P.O BOX 135
HAINES, ALASKA
99827

March 19, 1992

The Honorable Lloyd Jones, Chairman
Senate Resources Committee
Alaska State Legislature Room 30-C, State Capital
Juneau, Alaska 99801-1182

RE: SENATE BILL #417

Dear Senator Jones:

As a property owner and member of the Chilkat Lake owners association I would like to go on record as objecting to Senate Bill #417.

SB 417 would adversely affect those living on a permanent and part time basis at Chilkat lake.

Access to the lake is strictly by jet boat on a tributary to the Chilkat River, May through November.

All supplies, medical attention, etc. must be obtained in the community of Haines. Travel across the lake out the river and by road of some 32 miles are necessary to accomplish this. A drop of water to "a depth of 12 inches or less" in the river would (if "identified by the department") create a personal and financial hardship for many of the residents.

I'm quite sure that there are other rural areas in our vast State that would be affected by such legislation if passed.

Thank you for your time and consideration.

Sincerely,

W.D. (Dave) Gross

CC: Senator Duncan
Senator Sturgulewski

Box 555
Wrangell, Ak. 99929
March 30, 1992

Dear Senator Lloyd Jones,

My name is Shane Privett I'm 14 and live in Wrangell, Alaska. I wanted to voice my opinion on Senate Bill #417, that states that a jet unit will not be able to drive in a river with 12 inches or less of water becouse it destroys the fish.

I have been going up the river since I was three and there aren't any less fish than there were when I was three. My most memorable times have been up the river with family and friends and if you were to pass Senate Bill #417, that would be like losing a best friend to me and many other people in the community.

Thank you for taking the time to listen to what I have to say and hopefully you will make the right decision.

Sincerely,

Shane Privett

Shane Privett.

SB

423

S IATE COMMITTEE REPOI

FIRST COMMITTEE OF REFERRAL

78

DATE: 2/18/92

FURTHER: Senate Special Comte. on Domestic/Internat'l Commercial Fisheries

Date of 5-Day Notice: April 2 1992
(in accordance with Uniform Rule 23)

DATE TURNED INTO OFFICE: 4-14-92

Resources Committee considered SB 423

"An Act relating to temporary transfers of commercial fisheries entry permits."

and recommends:

[ ] replace with _____ CS SB423 (Res)

[ ] attaches amendment(s)

[X] same title
[ ] new title
[ ] technical title change (HB only)

[ ] adopts _____ Letter of Intent

[ ] further referral to the _____

[ ] do pass

[ ] do not pass

[ ] no recommendation

[X] individual recommendations

NEW FISCAL NOTES: Dept/Date

[ ] **zero** fiscal notes ADF&G 4/1/92
SB FCS

[ ] fiscal notes _____

[ ] **appropriation**--no fiscal note

PREVIOUS FISCAL NOTES: Dept/Date

[ ] **Governor's bill** with fiscal notes:
zero fiscal notes _____

fiscal notes _____

DO PASS:

OTHER RECOMMENDATIONS:

Sen Coster to see

Chair Signature and Recommendation

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 9, 1992

Permits Issued and Fished, 1989 through 1991

Fishery	Year	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
S01A SOUTHEAST SALMON SEINE	1991	420	383	91.19%	37	8.81%
	1990	420	360	85.71%	60	14.29%
	1989	420	365	86.90%	55	13.10%
S03A SOUTHEAST SALMON DRIFT GILL NET	1991	485	466	96.08%	19	3.92%
	1990	486	465	95.68%	21	4.32%
	1989	485	466	96.08%	19	3.92%
S15B SOUTHEAST SALMON POWER TROLL	1991	958	847	88.41%	111	11.59%
	1990	956	839	87.76%	117	12.24%
	1989	955	830	86.91%	125	13.09%
S05B SOUTHEAST SALMON HAND TROLL	1991	1,746	700	40.09%	1,046	59.91%
	1990	1,782	699	39.23%	1,083	60.77%
	1989	1,820	694	38.13%	1,126	61.87%
S04D YAKUTAT SALMON SET NET	1991	168	161	95.83%	7	4.17%
	1990	166	158	95.18%	8	4.82%
	1989	166	160	96.39%	6	3.61%
G01A SOUTHEAST SAC ROE HERRING SEINE	1991	51	22	43.14%	29	56.86%
	1990	51	50	98.04%	1	1.96%
	1989	51	51	100.00%	0	0.00%
G34A SOUTHEAST SAC ROE HERRING GILL NET	1991	121	84	69.42%	37	30.58%
	1990	118	70	59.32%	48	40.68%
	1989	122	108	88.52%	14	11.48%

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 9, 1992

Permits Issued and Fished, 1989 through 1991

Fishery	Year	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
C61A NORTHERN SE INSIDE SABLEFISH LONGLINE	1991	127	126	99.21%	1	0.79%
	1990	130	119	91.54%	11	8.46%
	1989	152	151	99.34%	1	0.66%
C61C SOUTHERN SE INSIDE SABLEFISH LONGLINE	1991	31	29	93.55%	2	6.45%
	1990	31	28	90.32%	3	9.68%
	1989	34	31	91.18%	3	8.82%
C91C SOUTHERN SE INSIDE SABLEFISH POTS	1991	2	1	50.00%	1	50.00%
	1990	2	0	0.00%	2	100.00%
	1989	4	1	25.00%	3	75.00%
K19A SOUTHEAST RED/BLUE KING CRAB POTS	1991	2	0	0.00%	2	100.00%
	1990	1	0	0.00%	1	100.00%
	1989	3	0	0.00%	3	100.00%
K29A SOUTHEAST RED/BLUE/BROWN KING CRAB POTS	1991	3	3	100.00%	0	0.00%
	1990	2	2	100.00%	0	0.00%
	1989	4	3	75.00%	1	25.00%
K39A SOUTHEAST BROWN KING CRAB POTS	1991	3	3	100.00%	0	0.00%
	1990	4	3	75.00%	1	25.00%
	1989	5	3	60.00%	2	40.00%
K49A SOUTHEAST RED/BLUE KING + TANNER POTS	1991	20	17	85.00%	3	15.00%
	1990	24	22	91.67%	2	8.33%
	1989	22	20	90.91%	2	9.09%

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 9, 1992

Permits Issued and Fished, 1989 through 1991

Fishery	Year	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
K59A SOUTHEAST BROWN KING + TANNER POTS	1991	8	6	75.00%	2	25.00%
	1990	8	8	100.00%	0	0.00%
	1989	11	10	90.91%	1	9.09%
K69A SOUTHEAST KING (ALL) + TANNER POTS	1991	41	39	95.12%	2	4.88%
	1990	46	46	100.00%	0	0.00%
	1989	44	42	95.45%	2	4.55%
T19A SOUTHEAST TANNER CRAB POTS	1991	15	11	73.33%	4	26.67%
	1990	12	9	75.00%	3	25.00%
	1989	10	10	100.00%	0	0.00%
S01E PRINCE WILLIAM SOUND SALMON SEINE	1991	271	253	93.36%	18	6.64%
	1990	271	265	97.79%	6	2.21%
	1989	270	241	89.26%	29	10.74%
S03E PRINCE WILLIAM SD SALMON DRIFT GILL NET	1991	541	517	95.56%	24	4.44%
	1990	541	521	96.30%	20	3.70%
	1989	542	485	89.48%	57	10.52%
S04E PRINCE WILLIAM SD SALMON SET NET	1991	30	29	96.67%	1	3.33%
	1990	30	29	96.67%	1	3.33%
	1989	30	0	0.00%	30	100.00%
G01E PRINCE WILLIAM SD SAC ROE HERRING SEINE	1991	107	104	97.20%	3	2.80%
	1990	107	96	89.72%	11	10.28%
	1989	106	0	0.00%	106	100.00%

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 9, 1992

Permits Issued and Fished, 1989 through 1991

Fishery	Year	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
G34E PRINCE WILLIAM SD SAC ROE HERR GILL NET	1991	24	24	100.00%	0	0.00%
	1990	24	24	100.00%	0	0.00%
	1989	24	0	0.00%	24	100.00%
L21E PRINCE WILLIAM SD HERRING SPAWN POUND	1991	128	119	92.97%	9	7.03%
	1990	129	124	96.12%	5	3.88%
	1989	129	0	0.00%	129	100.00%
S01H COOK INLET SALMON SEINE	1991	83	68	81.93%	15	18.07%
	1990	83	71	85.54%	12	14.46%
	1989	83	64	77.11%	19	22.89%
S03H COOK INLET SALMON DRIFT GILL NET	1991	584	578	98.97%	6	1.03%
	1990	585	582	99.49%	3	0.51%
	1989	585	10	1.71%	575	98.29%
S04H COOK INLET SALMON SET NET	1991	745	648	86.98%	97	13.02%
	1990	743	662	89.10%	81	10.90%
	1989	743	658	88.56%	85	11.44%
G01H COOK INLET SAC ROE HERRING SEINE	1991	76	58	76.32%	18	23.68%
	1990	76	72	94.74%	4	5.26%
	1989	75	74	98.67%	1	1.33%
S01K KODIAK SALMON SEINE	1991	388	348	89.69%	40	10.31%
	1990	388	354	91.24%	34	8.76%
	1989	388	4	1.03%	384	98.97%

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 9, 1992

Permits Issued and Fished, 1989 through 1991

Fishery	Year	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
S02K KODIAK SALMON BEACH SEINE	1991	33	17	51.52%	16	48.48%
	1990	33	21	63.64%	12	36.36%
	1989	33	1	3.03%	32	96.97%
S04K KODIAK SALMON SET NET	1991	189	185	97.88%	4	2.12%
	1990	189	184	97.35%	5	2.65%
	1989	189	87	46.03%	102	53.97%
G01K KODIAK SAC ROE HERRING SEINE	1991	70	32	45.71%	38	54.29%
	1990	72	26	36.11%	46	63.89%
	1989	72	37	51.39%	35	48.61%
G34K KODIAK SAC ROE HERRING GILL NET	1991	102	64	62.75%	38	37.25%
	1990	99	62	62.63%	37	37.37%
	1989	112	82	73.21%	30	26.79%
S01L CHIGNIK SALMON SEINE	1991	101	101	100.00%	0	0.00%
	1990	101	101	100.00%	0	0.00%
	1989	101	100	99.01%	1	0.99%
S01M PEN/ALEUTIANS SALMON SEINE	1991	126	120	95.24%	6	4.76%
	1990	126	121	96.03%	5	3.97%
	1989	126	119	94.44%	7	5.56%
S03M PEN/ALEUTIANS SALMON DRIFT GILL NET	1991	164	162	98.78%	2	1.22%
	1990	164	162	98.78%	2	1.22%
	1989	164	163	99.39%	1	0.61%

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 9, 1992

Permits Issued and Fished, 1989 through 1991

Fishery	Year	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
S04M PEN/ALEUTIANS SALMON SET NET	1991	114	110	96.49%	4	3.51%
	1990	114	110	96.49%	4	3.51%
	1989	114	111	97.37%	3	2.63%
S03T BRISTOL BAY SALMON DRIFT GILL NET	1991	1,881	1,873	99.57%	8	0.43%
	1990	1,878	1,869	99.52%	9	0.48%
	1989	1,867	1,855	99.36%	12	0.64%
S04T BRISTOL BAY SALMON SET NET	1991	1,025	950	92.68%	75	7.32%
	1990	1,028	971	94.46%	57	5.54%
	1989	1,025	971	94.73%	54	5.27%
L12T BRISTOL BAY HERRING SPAWN ON KELP	1991	448	241	53.79%	207	46.21%
	1990	479	266	55.53%	213	44.47%
	1989	1,028	277	26.95%	751	73.05%
S04P UPPER YUKON SALMON GILL NET	1991	72	36	50.00%	36	50.00%
	1990	71	35	49.30%	36	50.70%
	1989	70	42	60.00%	28	40.00%
S08P UPPER YUKON SALMON FISHWHEEL	1991	155	110	70.97%	45	29.03%
	1990	157	116	73.89%	41	26.11%
	1989	160	127	79.38%	33	20.62%
S04W KUSKOKWIM SALMON GILL NET	1991	833	814	97.72%	19	2.28%
	1990	833	819	98.32%	14	1.68%
	1989	831	820	98.68%	11	1.32%

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 9, 1992

Permits Issued and Fished, 1989 through 1991

Fishery	Year	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
S04X KOTZEBUE SALMON GILL NET	1991	219	137	62.56%	82	37.44%
	1990	219	151	68.95%	68	31.05%
	1989	220	163	74.09%	57	25.91%
S04Y LOWER YUKON SALMON GILL NET	1991	708	680	96.05%	28	3.95%
	1990	708	675	95.34%	33	4.66%
	1989	707	682	96.46%	25	3.54%
S04Z NORTON SOUND SALMON GILL NET	1991	201	125	62.19%	76	37.81%
	1990	201	127	63.18%	74	36.82%
	1989	202	110	54.46%	92	45.54%
G34N NELSON ISLAND SAC ROE HERRING GILL NET	1991	149	0	0.00%	149	100.00%
	1990	165	0	0.00%	165	100.00%
	1989	183	162	88.52%	21	11.48%
G34U NUNIVAK ISLAND SAC ROE HERRING GILL NET	1991	50	17	34.00%	33	66.00%
	1990	47	0	0.00%	47	100.00%
	1989	55	44	80.00%	11	20.00%
G34Y LOWER YUKON SAC ROE HERRING GILL NET	1991	100	80	80.00%	20	20.00%
	1990	132	95	71.97%	37	28.03%
	1989	131	114	87.02%	17	12.98%
G02Z NORTON SOUND SAC ROE HERRING BEACH SEINE	1991	11	7	63.64%	4	36.36%
	1990	13	8	61.54%	5	38.46%
	1989	13	6	46.15%	7	53.85%

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 9, 1992

Permits Issued and Fished, 1989 through 1991

Fishery	Year	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
G34Z NORTON SOUND SAC ROE HERRING GILL NET	1991	401	269	67.08%	132	32.92%
	1990	481	355	73.80%	126	26.20%
	1989	475	349	73.47%	126	26.53%

Number of Permits Issued and Number of Permits Fished By Year and Age For the Limited Entry Fisheries

Prepared by:

Susan M. Shirley

CFEC Report 92-08

April 10, 1992

Commercial Fisheries Entry Commission
8800 Glacier Highway #109
Juneau, Alaska 99801
Telephone: (907) 789-6160 FAX: 789-6170

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 10, 1992

Permits Issued and Fished, in 1991, by Age

Fishery	Age	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
S01A SOUTHEAST SALMON SEINE	Under 50	281	262	93.24%	19	6.76%
	50 - 59	66	60	90.91%	6	9.09%
	60 - 64	33	28	84.85%	5	15.15%
	65 and over	40	33	82.50%	7	17.50%
	Fishery Totals	420	383	91.19%	37	8.81%
S03A SOUTHEAST SALMON DRIFT GILL NET	Under 50	321	314	97.82%	7	2.18%
	50 - 59	94	87	92.55%	7	7.45%
	60 - 64	35	33	94.29%	2	5.71%
	65 and over	35	32	91.43%	3	8.57%
	Fishery Totals	485	466	96.08%	19	3.92%
S15B SOUTHEAST SALMON POWER TROLL	Under 50	550	497	90.36%	53	9.64%
	50 - 59	227	197	86.78%	30	13.22%
	60 - 64	80	71	88.75%	9	11.25%
	65 and over	101	82	81.19%	19	18.81%
	Fishery Totals	958	847	88.41%	111	11.59%
S05B SOUTHEAST SALMON HAND TROLL	Under 50	1,019	439	43.08%	580	56.92%
	50 - 59	382	141	36.91%	241	63.09%
	60 - 64	136	48	35.29%	88	64.71%
	65 and over	209	72	34.45%	137	65.55%
	Fishery Totals	1,746	700	40.09%	1,046	59.91%

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 10, 1992

Permits Issued and Fished, in 1991, by Age

Fishery	Age	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
S04D YAKUTAT SALMON SET NET	Under 50	124	121	97.58%	3	2.42%
	50 - 59	23	20	86.96%	3	13.04%
	60 - 64	6	6	100.00%	0	0.00%
	65 and over	15	14	93.33%	1	6.67%
	Fishery Totals	168	161	95.83%	7	4.17%
G01A SOUTHEAST SAC ROE HERRING SEINE	Under 50	29	10	34.48%	19	65.52%
	50 - 59	9	5	55.56%	4	44.44%
	60 - 64	5	4	80.00%	1	20.00%
	65 and over	8	3	37.50%	5	62.50%
	Fishery Totals	51	22	43.14%	29	56.86%
G34A SOUTHEAST SAC ROE HERRING GILL NET	Under 50	82	58	70.73%	24	29.27%
	50 - 59	28	20	71.43%	8	28.57%
	60 - 64	5	2	40.00%	3	60.00%
	65 and over	6	4	66.67%	2	33.33%
	Fishery Totals	121	84	69.42%	37	30.58%
C61A NORTHERN SE INSIDE SABLEFISH LONGLINE	Under 50	87	86	98.85%	1	1.15%
	50 - 59	16	16	100.00%	0	0.00%
	60 - 64	12	12	100.00%	0	0.00%
	65 and over	12	12	100.00%	0	0.00%
	Fishery Totals	127	126	99.21%	1	0.79%

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 10, 1992

Permits Issued and Fished, in 1991, by Age

Fishery	Age	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
C61C SOUTHERN SE INSIDE SABLEFISH LONGLINE	Under 50	17	15	88.24%	2	11.76%
	50 - 59	6	6	100.00%	0	0.00%
	60 - 64	3	3	100.00%	0	0.00%
	65 and over	5	5	100.00%	0	0.00%
	Fishery Totals	31	29	93.55%	2	6.45%
C91C SOUTHERN SE INSIDE SABLEFISH POTS	Under 50	1	1	100.00%	0	0.00%
	50 - 59	1	0	0.00%	1	100.00%
	Fishery Totals	2	1	50.00%	1	50.00%
K19A SOUTHEAST RED/BLUE KING CRAB POTS	Under 50	2	2	100.00%	0	0.00%
	Fishery Totals	2	2	100.00%	0	0.00%
K29A SOUTHEAST RED/BLUE/BROWN KING CRAB POTS	Under 50	3	3	100.00%	0	0.00%
	Fishery Totals	3	3	100.00%	0	0.00%
K39A SOUTHEAST BROWN KING CRAB POTS	Under 50	1	1	100.00%	0	0.00%
	50 - 59	2	2	100.00%	0	0.00%
	Fishery Totals	3	3	100.00%	0	0.00%

COMMERCIAL FISHERIES ENTRY COMMISSION
8800 GLACIER HIGHWAY #109, JUNEAU, ALASKA, 99801

April 10, 1992

Permits Issued and Fished, in 1991, by Age

Fishery	Age	Total Permits Issued	Total Permits Fished	Percent Permits Fished	Permits Not Fished	Percent Permits Not Fished
K49A SOUTHEAST RED/BLUE KING + TANNER POTS	Under 50	11	10	90.91%	1	9.09%
	50 - 59	4	3	75.00%	1	25.00%
	60 - 64	2	2	100.00%	0	0.00%
	65 and over	3	2	66.67%	1	33.33%
	Fishery Totals	20	17	85.00%	3	15.00%
K59A SOUTHEAST BROWN KING + TANNER POTS	Under 50	6	5	83.33%	1	16.67%
	65 and over	2	1	50.00%	1	50.00%
	Fishery Totals	8	6	75.00%	2	25.00%
K69A SOUTHEAST KING (ALL) + TANNER POTS	Under 50	29	28	96.55%	1	3.45%
	50 - 59	2	2	100.00%	0	0.00%
	60 - 64	4	4	100.00%	0	0.00%
	65 and over	6	5	83.33%	1	16.67%
	Fishery Totals	41	39	95.12%	2	4.88%
T19A SOUTHEAST TANNER CRAB POTS	Under 50	10	7	70.00%	3	30.00%
	50 - 59	5	4	80.00%	1	20.00%
	Fishery Totals	15	11	73.33%	4	26.67%