

SCOMM

74:41

→ individual facilities strong for...
Sikensulag hatchery...
personal use v. true substance.

hatchery

last page on report -

new index - substance 
1-2 11-12, 3

~~1~~ extent of tagging program. last spring

Coded wire tag lab -
who pays for what

decoding & analysis = state

people who tag fish - pay for it

1. if expanded

who should pay

om fish - need more money, & we

A night prison

operators - if we have to pay, then we should
be resolution of this issue.

no one will give up their position

new increments of production - put operator
on notice - operator will have to pay for
tagging & analysis.

5

Burnett Inlet -
PWS

new 9 of production

existing production is questionable -

- not figured into their cost of doing business
- or cost recovery needs.

PWS-

oil spill paid for 2 yrs tag study.

if show migration patterns & fish timing
just after few yrs.

but if use tags for in-season mgmt -
weekly basis -
maintained in perpetuity.

even a PWS - should we need for in-season mgmt.

Do it - but they aren't using it yet for - daily & weekly.
in-season mgmt - they aren't comfortable with it yet.

need to work things out of it.

~~grossantel~~

private sector also spends money.



other species

for private sector - of non-salmonids,
need addtl. legislation.

family - steelhead



some \$\$\$ for propose gen stock i.d. & tagging
in capital budget.

Harvest -

& John White

2

looks very promising), the use of coded-wire tags is not going to be replaced in the foreseeable future. The CWT Lab is a vital link in the in-season management of fisheries in Southeast and Prince William Sound. Chinook salmon fisheries from California to Alaska are managed by treaty convention on the basis of coded-wire tag data. The massive returns of hatchery pink salmon to Prince William Sound is critically assessed by in-season tag data. Coastwide, this laboratory has the reputation of being the best-run operation of its kind.

Fish Pathology Laboratory:

Active laboratories will be maintained in both Juneau and Anchorage to provide continuing fish health services to salmon hatcheries, mariculture operations, other fisheries divisions, and the public-at-large. The basic function of the fish pathology discipline is to implement policies and procedures that guard against the spread of fish and shellfish diseases in Alaska. The two laboratories serve this function. Routine diagnostics and processing of transport permits for finfish and shellfish will continue as in the past. Monitoring for viral hemorrhagic septicemia virus in Pacific cod will continue. Mapping the distribution and infection rates of bitter crab disease in tanner crabs will go forward in association with the ADF&G Commercial Fisheries Division and the crab fleet. Oyster spat certification for import into Alaska will remain a significant task for the pathologists. Transport permits for aquatic farming activities will increase significantly.

Genetics Laboratory:

The primary service of the genetics discipline is to implement policies and procedures that protect and maintain the genetic uniqueness of Alaska's wild salmon stocks in the face of North America's largest salmon enhancement program. In the coming year, the department's fish genetics policy will be reexamined and updated. Routine processing of transport permits for finfish and shellfish will continue as in the past; however, contentiousness now accompanies a growing number of transport requests, and it is our intent to establish a genetic-screening program for salmon stocks so that answers to tough questions regarding the genetic implications of stock movement can be facilitated. The Genetics Laboratory is now equipped and ready to process samples that will reveal the genetic conformation of our wild salmon stocks. This compatibility has application for stock separation in mixed-stock interception fisheries, identification to the country of origin of salmon caught on the high seas, and examination of the

DRAFT

Research will also be initiated to aid in the development of the industry. Areas identified as having high potential benefits include the feasibility of producing sterile scallops, developing shellfish and aquatic plant hatchery technology for Alaska species, researching new species for aquatic farming, site-evaluation techniques, broad-based research on determining optimal areas for aquatic farming in the state, oyster-maturation studies, broodstock development, and seedstock-collection research. FRED Division will use its technical expertise and facilities to accomplish the research and then transfer that technology to the private sector. Continual interaction with the industry will identify new areas of concern or benefit that cannot be addressed directly by the industry because of a lack of expertise, facilities, or high costs.

Technology and Development Services

DRAFT

The FRED Division operates five laboratories that serve ADF&G and other agencies. The Fish Pathology Section has two laboratories (one in Anchorage and Juneau) and provides diagnostic services and broodstock evaluation for both state and PNP fisheries programs. The Limnology Section has a laboratory in Soldotna and supervises all lake-enrichment projects and analyses of water, plankton, and juvenile fish populations sampled for lake-productivity studies. The Coded-Wire Tag Processing Laboratory (CWT Lab) decodes metal tags implanted in fish and supplies resultant information for hatchery and natural stock evaluation as well as for evaluation of U.S./Canada salmon interceptions. The Genetics Laboratory monitors the interaction of hatchery salmon stocks with wild hatchery salmon and employs genetic techniques for finfish and shellfish stock identification and stock improvement. In summary, these laboratories and their associated scientists provide a set of technical services in extremely strong demand by the department, regional aquaculture associations, aquatic farming industry, PNP hatchery operators, and other state and federal agencies.

Coded-Wire Tag Processing Laboratory:

DRAFT

The division is seeking a new home for its CWT Lab. Working conditions at the present facility have deteriorated to the point where the state is at risk to liability lawsuits from employees that work there. Further, the workload at the lab has tripled since 1985, outstripping the space available. Monies to acquire a different lab space will be requested in the FY 95 budget. While efforts are underway by this division and others to develop new marking techniques (e.g., otolith marking,

asked for further legal direction on their responsibilities to provide for hatchery broodstock and for cost recovery fisheries, especially when they appear to compete or reduce fishing opportunities in traditional fisheries. Staff is nearly finished with the legal analysis of this issue. The Legislature will definitely want to consider whether or not to put a stronger wild stock priority into law.

** if you need tagging for allocation reasons, can be factored in earlier on. - RPT's should have responsibility not necessarily the authority*

Allocation Conflicts

All rain in conflict

Minimizing or reducing allocation conflicts can and should be done through the planning and permitting process. However, this is not a perfect process, and it is inevitable that conflicts develop over who gets which fish. The Board of Fisheries has twice now (in Prince William Sound and in Southeast) directed the regional aquaculture associations to develop their own allocation plan for hatchery-produced fish. The Prince William Sound plan was approved by the Board of Fisheries in January, 1991, and has now been incorporated into the area's Comprehensive Regional Salmon Plan. Development of a Southeast allocation plan is currently underway, with a final product due in March '93.

Challenges of In-Season Management

Support study on quality.
** Board.*

More information about run timing and quality, as well as how to fund marking and tag recovery programs are the key here. ADF&G Commercial Fisheries Division has suggested a research project be funded for this year to analyze salmon quality at various distances from their terminal streams in an effort to determine how best to manage fishing effort to produce top-quality and marketable product.

** Potential problems of newly contracted issues state agencies - not gone thru PNP permitting process.*

VIII. OTHER ISSUES

This section deals with more minor "side" issues such as the use of hatcheries as a form of environmental mitigation, the role of hatcheries in international treaties, environmental regulations,

State Genetics Policy - Jim Se

* Describe here the current state policy and the process of reviewing Fish Transport Permits.

VII. MAJOR FISHERIES MANAGEMENT ISSUES

Over-Harvest of Wild Stocks

The fundamental issue facing fisheries managers is how to control fishing effort on stocks in mixed-stock fisheries. The predominant management concern is that the weakest stocks will be over-fished. In cases in which hatchery productivity is significantly greater than natural stock productivity, wild stocks face the risk of being depleted. Smaller stocks are always in danger of depletion in mixed-stock fisheries because there is a tendency to optimally harvest the larger stocks before quality declines in terminal fisheries.

The problems posed by mixed-stock fisheries are not new. Almost all Alaska salmon fisheries had some degree of mixed stocks prior to the development of current hatcheries. However, hatchery-produced fish further complicate management. An adequate program of tagging, recovery and analysis is essential for most mixed-stock fisheries comprised of large numbers of hatchery fish.

Tagging Needs and Requirements

* This section will describe current tagging technology, its usefulness, cost, and the question of who should pay.

3 legal questions.

Wild Stocks Priority Policy

Concern has been expressed by ADF&G managers and by the Board of Fisheries that the state does not have a strong enough wild stock priority policy in statute. In addition, Fisheries Board members have

Endangered Species act in: - WA Task Force

* Definition of stocks & guidelines for allocation of what is a stock

is statutory language very strong?
1) how should quality be factored into managing fishing - does board have enough authority?

clarify roles & uses - for biological info & allocation purposes.

level of tagging - much conflict - state agreement.

FRED Division - Weekly Report

Broodstock Development Center (BDC) staff discussed the hazards of bypassing the safety switch on the small tractor/snow blower while it is operating.

Division Highlights:

The 1991 Sockeye Culture Workshop was held at the Northern Southeast Regional Aquaculture Association's (NSRAA) headquarters in Sitka on October 24-25. Approximately 65 people from five states and British Columbia attended the workshop. Proceedings of the workshop will be available in approximately 5-6 months.

At the invitation of Chief of Technology and Development Bob Burkett, three Soviet fisheries scientists visited Alaska this week. In the delegation were Dr. Leonid Klyashtorin, Dr. Valentin Artemov, and Mr. Stanislov Karachune. Klyashtorin and Artemov are from VNIRO, Moscow, while Karachune hails from Magadan. These men arrived on Monday, October 28, in Anchorage and departed Juneau on November 1. Tours were made of Big Lake and Fort Richardson Hatcheries. In Juneau, activities centered on sockeye salmon, with the primary discussion on artificial production of fry, and yearling and underyearling smolts. The Soviets are extremely interested in launching a sockeye salmon hatchery program based on release of underyearling smolts; i.e., a program that handles sockeye salmon just like pink and chum salmon. Dr. Klyashtorin believes that the Japanese are positioning to convert their massive hatchery chum salmon program to sockeye salmon. Auke Bay Laboratory (National Marine Fisheries Service) scientists participated in the discussions.

Headquarters Office Highlights:

A memo from Director Jeff Koenings went out to all participants that have been involved in the review and drafting of Scientific or Educational permit regulations/policy. The memo seeks comments from representatives from all fishery divisions on the new, so-called "Fish Resource Permit." Comments on the regulations/policy are due to PNP Program Administrative Assistant Jeri Museth no later than November 6.

Chief of Technology and Development Bob Burkett was the keynote speaker at the Annual Sockeye Salmon Workshop.

PNP Program Fishery Biologist Steve McGee traveled on Wednesday to present to the Board of Fisheries the department's positions on the three hatchery-related proposals (83, 84, and 85), and to answer any questions from board members regarding the PNP hatchery program. In the end, the board took no action on any of the proposals. However, it does want a report on marking, tagging, and evaluation of hatchery fish by the end of March 1992.

Salmon Rehabilitation and Enhancement Coordinator Kevin Duffy spent the week chairing the Northern Panel meeting of the Pacific Salmon Commission in Portland, Oregon.

Assistant Director Johnny Holland, now the contract coordinator for the division, worked on Pillar Creek Contract No. IHP 92-006. He worked out verbage details in order to get the document signed

Distribute
to
Benton
JPPFC Adv
from
C. Meacham
11-10-91

MEMORANDUM

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

DRAFT

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 follow is a summary, extracted from the four opinions, of the arguments on both sides of the proposition that 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 the 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 of the fishery resources of the state." AS 16.05.221(a). The supreme court, in Kenai Peneinsula 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

6

7

(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 se. .illnetters),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 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.

8

9

2.

non-PNP, Mom+Pop hatcheries.

confusing statute - sale of surplus eggs - not used for broodstock,
suspension - that broodstock priority Bennett Inlet,
could be used as profit.

- 1) used stock priority first
- 2)

PNP's - not being required to integrate their
production plans - for allocation -

- 1) consider legislative passing statutes
- 2) legislation that

Endangered Species Act section

DRAFT

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

DIVISION OF COMMERCIAL FISHERIES

WALTER J. HICKEL, GOVERNOR

P.O. BOX 3-2000
JUNEAU, ALASKA 99802-2000
PHONE: (907) 465-4210

January 15, 1992

Molly

Ms. Molly McCammon
Room 510, Capitol
P.O. Box V
Juneau, AK 99811

Dear Ms. McCammon:

This letter is in response to your request that the Division of Commercial Fisheries provide a brief letter outlining management issues associated with large scale salmon hatchery enhancement activities such as those in Prince William Sound.

The Department has the constitutional responsibility to conserve and manage wild stocks of salmon for sustained yield. In a wild stock fishery, this conservation responsibility entails maintaining minimum spawning escapement levels for wild stocks. However, when hatcheries are established in wild stock salmon producing areas the department has two additional conservation responsibilities: 1/ maintaining the genetic diversity of wild stocks as stated in the department's genetics policy, 2/ maintaining fish health and prohibiting the spread of fish disease, and 3/ providing sufficient returns of fish to the hatchery to provide for brood stock and cost recovery. There are strict regulations regarding selection of brood stock, transporting, and remote releases of hatchery produced fry and smolt, which require a comprehensive genetic monitoring and permitting process.

Because salmon runs occur in a short period of time, early indicators of run strength based on fishery performance or test fisheries are required for effective management. Commercial fishing effort must be reduced whenever runs of hatchery or wild stocks are weak. Early in-season assessments of populations that are mixtures of hatchery and wild stocks require some capability to distinguish wild fish from hatchery fish. The effective management of mixed hatchery and wild stock fisheries is more difficult and more expensive than the management of fisheries on wild salmon stocks alone.

The division's principal concern with large scale hatchery enhancement is that the additional costs of managing mixed hatchery wild stock commercial fisheries, as well as the permitting requirements, are not always considered in the operation of these

facilities. When decisions are made to construct and operate these facilities, the general public and the hatchery operators, with no concomitant increase in funding, expect the division to be able to manage the commercial fisheries that subsequently, as a consequence of the hatchery, will be prosecuted on mixtures of hatchery and wild stocks. Further, the managers are expected to meet multiple (i.e. conserve wild stocks, maintain high product quality, assure an acceptable level of hatchery harvest in the commercial fishery, and provide for hatchery cost recovery/brood stock requirements) and inconsistent management objectives.

The basic management plans that addressed harvest of hatchery fish were developed cooperatively by the department and the operators of the Prince William Sound hatcheries. Returning adults were to be primarily managed using more terminal harvest areas, thereby minimizing harvest conflicts with wild stocks. Additional harvest management costs were not considered under this strategy. Initially, fish quality was not an issue as terminally caught fish were of high quality. However, as the program grew, processing capacities were filled, forcing delays in harvesting terminal fish. Such delays resulted in poorer quality fish and thus the demand to harvest fish farther away from terminal areas. To manage both hatchery and wild stocks away from the terminal areas requires additional management tools and costs.

The scale of the hatchery operations is the key factor in evaluating the additional management costs. In Prince William Sound the hatchery stocks now make up over 80 percent of the total pink salmon runs. Consequently, Prince William Sound is the focus of the division's concern. The division's pre-hatchery assessment and management program was adequate to protect the Prince William Sound wild pink salmon resource. With the emerging hatchery runs, the department initiated, during the mid 1980s, a hatchery/wild stock identification program. At the time of the oil spill, hatchery runs were greater than wild stock runs; however, the hatchery/wild stock assessment program necessary to protect wild stocks was not fully developed nor was the funding for such a program in the division's base budget. The department's program was not adequate to address the emerging hatchery/wild stock fishery issues, much less address the oil spill. The program could not begin to provide the level of accuracy and precision required for assessment of the oil spill damage, or for the stock specific management measures required to protect and restore damaged pink salmon stocks that might occur due to oil spill.

In the wake of the oil spill, Natural Resource Damage Assessment funds were available, and provided the department with sufficient resources to assess the population level response of the Prince William Sound pink salmon resources to the oil spill. The completion of these studies, together with funding of the pink salmon restoration studies, will ultimately provide the department

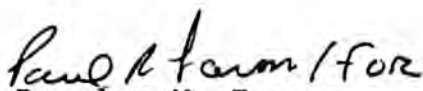
January 15, 1992

with the information base and tools to develop a harvest management system with the objectives of protecting wild pink salmon stocks both with respect to maintaining genetic diversity and escapement levels, providing for hatchery cost recovery and brood stock requirements, and responding to industry demand for high quality.

The oil spill has greatly exacerbated the problems in meeting these management objectives in two ways. First, certain pink salmon stocks were greatly impacted by the oil spill and require very stock-specific management measures in order to protect and rebuild these populations. Second, the delayed harvest of the large 1989 pink salmon run in PWS due to the presence of oil resulted in an extremely poor quality pack and a public perception of oil contamination of those fish harvested. These factors greatly impacted the marketability of PWS pink salmon. In 1991, the reputation of poor quality was further exacerbated by large pink salmon runs statewide and low prices. To maximize the intrinsic quality of the harvest, processors and fishermen demand to harvest returning adult pink salmon at the entrance areas to Prince William Sound. At these locations the wild stocks damaged by the Exxon Valdez spill are mixed with undamaged wild stocks as well as the large returns of hatchery fish. Harvesting in these areas, while maximizing quality, also puts these wild stocks at great risk of overexploitation.

It is anticipated that no additional general funds will be required to protect and restore the damaged Prince William Sound wild pink salmon stocks, provided that oil spill settlement funds continue to be available for completion of the department's damage assessment and restoration programs. However, when these funds expire additional general funds will be required for implementation of a stock-specific harvest management system. Since the harvest management system is underdevelopment, we do not have an estimate of the additional funds required. However, we anticipate the costs to be much less than the current combined general fund, damage assessment, and restoration programs.

Sincerely,


Douglas M. Eggers
Chief Fisheries Scientist

cc: Denby Lloyd
Jeff Koenings
Bob Clasby
Hal Geiger

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 it 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 guage 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.