

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILES 8672

2432 SCOMM 102: HOUSE SPEC. COMM. ON FISHERIES



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SCOMM 102: HOUSE SPECIAL COMMITTEE ON FISHERIES, 1997-98

MEMBERS:

REPRESENTATIVE ALAN AUSTERMAN, CHAIR
REPRESENTATIVE MARK HODGINS
REPRESENTATIVE IVAN IVAN
REPRESENTATIVE GENE KUBINA
REPRESENTATIVE SCOTT OGAN

Established by House Resolve No. 6, 1997.

Contents: 26 files. 52 Cassettes are also available of meetings held 2/3/97 - 4/29/98.

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SCOMM 102: HOUSE SPECIAL COMMITTEE ON FISHERIES, 1997-98

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SCOMM

102:1

RUSSELL S. NELSON

2028 Woodriver Road, P.O. Box 161 · Dillingham, Alaska 99576 · Telephone: 907-842-2370

OBJECTIVE

Board Member, State of Alaska, Board of Fisheries

LEADERSHIP TRAINING

ALASKA NATIVE LEADERSHIP PROJECT

Sponsored by Bristol Bay Native Corporation and administered by the Alaska Native Foundation in cooperation with Alaska Pacific University.

- Grade Point Average for the duration of the project was 4.0
- Development of leadership skills in the areas of management, politics and culture.
- Areas of study included grant writing, role of Alaska Natives in the Alaska political structure, development of business entrepreneurial skills and social issues relevant to Alaskan natives.

TRAINING WITHOUT WALLS

Sponsored by Bristol Bay Native Corporation and Choggiung Limited using the Growth Company.

- Two executive management training sessions a year with The Growth Company.
- Monthly professional development and career coaching.
- Professional networking with people who can make a difference to your career.

EXPERIENCE

CHOGGIUNG LIMITED

Land Manager

April 15, 1997 to present

- Maintain land records.
- Manage land programs i.e. 14(c), lease, land use permit, subdivision, and gravel.
- Provide and/or solicit expertise in land development projects.
- Coordinate with other Native Corporations and resource agencies on land related programs or issues.
- Management of land related consulting agreements as necessary.
- Advise management on issues of importance.
- Submit anticipated operating budget needs and capital expense requests.
- Organize Land Committee meetings.
- Routine reports to Land Committee and/or Board of Directors
- Work with management and staff on training and improve skills in area of expertise.

RESUME

DR. JOHN R. WHITE

P.O. Box 190
Bethel, AK 99559

Phone (907)543-3778 (work)
Phone (907)543-2926 (home)
Fax (907)543-5441

Present Employment:

Commercial Salmon Fisherman
Kuskokwim area
1974 to present

Owner, Bering Sea Dental Center
P.O. Box 190
Bethel, AK 99559

Experience for position:

Twenty-one year resident of Alaska and Yukon-Kuskokwim Delta. Actively engaged in commercial, subsistence, and sport fish harvest for the same years. Bachelor's degree in biology.

Present Board Director and President: Salmon Research Foundation.

Present member and chair: Alaska Board of Fish.

Present member and chair: Kuskokwim River Salmon Management Working Group.

Past member: Lower Kuskokwim Advisory Committee.

Past member and chair: Western Alaska Salmon Coalition.

Past member: Governor Cowper's Board of Fish Review Committee.

Past member and chair: Governor Cowper's Advisory Group on Ending High Seas Salmon Interception.

Past Board Director: Bering Sea Commercial Fisheries Development Foundation.

BRISTOL BAY NATIVE ASSOCIATION

Environmental Coordinator

October 3, 1995 to April 14, 1997

- Traveled to villages of Bristol Bay to work closely with village councils.
- Conduct an assessment of the environmental problems and issues in Bristol Bay villages.
- Supervise all BBNA environmental programs and lead inspectors.
- Fulfilled all reports required in compliance with federal regulations.
- Track budgets for all BBNA Environmental Programs.

BRISTOL BAY NATIVE ASSOCIATION

Bristol Bay Marine Mammal Council Executive Director

November 7, 1995 to April 14, 1997

- Meetings with BBMMC, Qayassiq Walrus Commission, State of Alaska Subsistence Division, U.S. Fish and Wildlife, and National Marine Fisheries Service.
- Make travel and room arrangements for Bristol Bay Marine Mammal Council (BBMMC) and Qayassiq Walrus Commission and calculate per diem.
- Documented beluga throughout winter in the Nushagak Bay, Kvichak Bay and off Goose Point at Eggegik.

BRISTOL BAY NATIVE ASSOCIATION

Regional Land Use Specialist

August 30, 1993 to October 3, 1995

- Assisted Bristol Bay Village Councils in developing federal subsistence proposals.
- Submit Subsistence Proposals to the Bristol Bay Regional Advisory Board.
- Defend Subsistence Proposals at Federal Subsistence Board meetings.
- Worked with U.S. Fish and Wildlife Subsistence Division to develop a Fresh Water Fish / Large Land Mammal Survey Contract.
- Developed a contract with U.S. Fish and Wildlife Migratory Bird section to conduct a Migratory Bird Subsistence Survey in the Northern Bristol Bay region.
- Hired and trained village residents to conduct fresh water fish and migratory bird surveys.
- Wrote an Environmental Protection Agency, Indian General Assistance Grant and was funded for BBNA to start an Environmental Program.
- Was awarded a continuing Environmental Agency, Indian General Assistance grant for the 1997 fiscal year.

COMMUNITY SERVICE

- | | |
|---|---|
| • Nushagak Advisory Council Member | September 1997 to Present : (Fish + Game A/C) |
| • Dillingham City Planning Commission Member | February 1998 to Present |
| • Choggiung Limited, Board of Directors | 1981- 1991 |
| • Choggiung Limited, Board of Directors | March 1996-May 1997 |
| • Dillingham Native Village Council, Chief | 1981-1991 |
| • Rural Alaska Television Network, Board of Directors | 1983 to 1991 |
| • Rural Alaska Television Network, President | 1991 to 1995 |
| • Alaska Rural Communications Service, President | 1995 to Present |

- Dillingham Volunteer Crash Rescue Squad 1978-1982
- Dillingham Volunteer Fire Department 1977-1982
- Alaska Army National Guard, Honorable Discharge 1989-1992

HONORS

- Department of the Army, The Army Achievement Medal

SKILLS

- Commercial Pilot's License
- Former Togiak Herring Spotter
- Former Nushagak Bay Salmon Spotter
- Former Factory Engineer on F/V Excellence, a 362 ft. Factory Trawler in Bering Sea.
- Former Bristol Bay Commercial Drift Fishing Partner for 15 years

REFERENCES

HARVEY SAMUELSEN

P.O. Box 18

DILLINGHAM, ALASKA 99576

PHONE: (907) 842-5625

FRED TORRISI, SUPERIOR COURT JUDGE

P.O. Box 210

DILLINGHAM, ALASKA 99576

PHONE: (907) 842-2050

JUDI NELSON, CEO - BBEDC

P.O. Box 36

DILLINGHAM, ALASKA 99576

PHONE: (907) 842-5350



**Testimony to the
House Fisheries Committee
April 8, 1998
By Ron Rainey
Kenai River Sportfishing Association**

Representative Austerman, members of the House Fisheries Committee, I am Ron Rainey and I am speaking as a member of the Board of Directors for the Kenai River Sportfishing Association. We support the confirmation of Dr. John White and Russell Nelson to the Alaska Board of Fisheries.

As the chairman of the board, Dr. White is establishing the groundwork through the sustainable fisheries project to ensure Alaska's salmon resources are managed in a manner that will provide sustainable salmon returns for generations to come. His dedication to this process is unfaltering. It is a project that will benefit not only the resource but all users, whether they are subsistence, sport, personal use or commercial. Dr. White's grasp of fisheries issues and the ramifications those issues have upon the spawning grounds is unsurpassed. The knowledge of this symbiotic relationship has earned him the respect of fisheries scientists and lay fishermen.

Yet, the sustainable fisheries project is far from finished. A second term on the board will allow Dr. White to bring to fruition this most worthwhile effort.

We also support Dillingham resident Russell Nelson for the Board of Fisheries. As you know, there is nowhere in the world like Bristol Bay for harvesting sockeye salmon. On average, the tributaries of the Bay produce the largest returns of sockeye in the world. Because of this unique status, every governor since Jay Hammond in 1974 has placed a representative from the Bay on the Board of Fisheries. Russell Nelson will continue this rich tradition.

A former Bristol Bay commercial drift fisherman for 15 years and former herring and salmon spotter pilot, Mr. Nelson is currently the land manager for Choggiung Limited in Dillingham. In that position, he is exposed to the importance of sport fishing opportunity.

He is a man of high integrity and has the respect of those in the Bay and in the Native community, as shown by the letters of support he has garnered. They include, among others, the Bristol Bay Native Corporation, the Bristol Bay Native Association, the Bristol Bay Sportsfishing Association, the Association of Village Council Presidents, Kawerak, Inc., the Lake and Peninsula Borough and his employer Choggiung Limited.

Mr. Nelson is an avid supporter of the sustainable fisheries project. When appointed he will be committed toward working with his board colleagues in developing a project that will preserve the state's salmon resources for his children and their grandchildren.

You could not find more qualified candidates, with the breath of support, as that of Dr. John White and Mr. Russell Nelson. We urge their confirmation to the Alaska Board of Fisheries.

The Sportfishing Voice of the Kenai River

TOTAL P.01

Executive Director
Ben Ellis
P.O. Box 1228
Soldotna, AK 99669
Phone: (907) 262-8588
1-800 478 0724
Fax: (907) 262-8582

Post-It™ brand fax transmittal memo 7671		# of pages 1	
To	House of Fisheries	From	Ron Rainey
Co.		Co.	
Dept.		Phone #	283-4333
Fax #	465-4956	Fax #	283 4595

**UCIDA****UNITED COOK INLET DRIFT ASSOCIATION**

P.O. Box 389 • Kenai, Alaska 99611 - 0389

(907) 283-3600 • FAX (907) 283-3306 e-mail: ucida@kenai.net

April 8, 1998

via Fax: 465-4956

Representative Alan Austerman, Chair
House Fisheries Committee
State Capitol, Room 434
Juneau, AK 99801-1182

Subject: Alaska Board of Fisheries (BOF)

Dear Representative Austerman:

United Cook Inlet Drift Association (UCIDA) represents the 585 salmon drift permit holders in Upper Cook Inlet. Some 350 permit holders are current members of our association. UCIDA is also active at the state and federal levels as a member of the Executive Committee of United Fishermen of Alaska (UFA).

UCIDA supports the confirmation of Mr. Russell Nelson and opposes the confirmation of Dr. John White for the Board of Fisheries (BOF).

UCIDA recognizes the salmon fishery in Bristol Bay as the world's largest producer of sockeye salmon. In addition, we note that the fishery involves thousands of fishermen and the management is highly complex. Accordingly, we feel that it is appropriate for someone familiar with the fishery, local communities and local issues be appointed to the BOF.

Mr. Nelson's varied background as a land manager, herring and salmon spotter, engineer of a large vessel and past drift fishermen will hopefully serve him well as a BOF member.

UCIDA opposition to Dr. White's confirmation is based on two factors.

- 1) The BOF needs a better "balance" both in terms of regional and user-groups expertise. Efforts by many organizations to convince Governor Knowles to seek a better "balance" on the BOF have clearly not produced that result.

April 8, 1998
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If both Mr. Russell and Dr. White are confirmed the "balance" on the BOF would have:

- Six of seven board members involved with sport, terminal or in-river fisheries,
 - Six of seven board members involved with fisheries from Anchorage north, and
 - Only one of seven board members with extensive experience as a fishermen in non-salmon commercial marine fisheries.
- 2) Dr. Whites's sense of "public process" has been very controversial. This result is perhaps inevitable when a board is not comprised of individuals with widely varying backgrounds and experience in Alaska's complex fisheries.

Issues that have produced the most controversy among the public and advisory committees in our area include:

- Out of cycle board generated allocation proposals targeting Cook Inlet's commercial fisheries,
- Board generated allocation proposals asking the public to submit proposals to limit harvest by non-resident anglers,
- A fast track "Sustainable Fisheries Project" employing controversial contractors, and
- Recent actions by the BOF to remove a scheduled Cook Inlet hearing from the Kenai/Soldotna area based on perceived "safety" concerns.

In conclusion, UCIDA appreciated the willingness of Dr. White to continue to serve on the BOF. However, it is our conclusion that a better "balance" of regional and user-group expertise on the BOF is needed.

UCIDA appreciates this opportunity to comment and requests that you distribute our comments to committee members.

Sincerely,


Phil Squires
President

PS/ra

BSFA



Bering Sea Fishermen's Association

725 Christensen Drive
Anchorage, Alaska 99501
(907) 279-6519
FAX (907) 258-6688

Serving western Alaska small boat fisheries since 1980

April 8, 1998

Representative Alan Austerman
Chairman, Alaska House Fisheries Committee
Alaska House
State Capitol
Juneau, Alaska 99801-11822

Re: Reappointment of Dr. John White to the Alaska Board of Fisheries

Dear Representative Austerman:

We heartily endorse Dr. White for reappointment to the Alaska Board of Fisheries. During his tenure he has worked diligently to keep the Board headed in the direction of rational management and fair allocation of the fisheries resources of this state. And as chairman of the Board he has initiated a "committee" system that also brings a modicum of sweet reason and overall involvement in the allocation hurly-burly.

Thank you for your attention to this matter, and if you have any questions, please call.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jude Henzler".

Jude Henzler
Executive Director

cc: Senate House Fisheries Committee Members
BSFA Board Members
Dr. John White

Cordova District Fishermen United

Celebrating 63 Years of Service to Commercial Fishermen in Cordova, Alaska
P.O. Box 939 Cordova, Alaska 99574 / Telephone (907) 424-3447 / Fax (907) 424-3430

April 8, 1998

The Honorable Alan Austerman
Special Committee on Fisheries, Chairman
State Capitol
Mail Stop 3101, Room 434
Juneau, AK 99801-1182

Sent via facsimile to : (907) 465-4956

Dear Representative Austerman:

Cordova District Fishermen United (CDFU) would like to comment on the upcoming confirmation hearings for reappointment of Dr. John White to the Alaska Board of Fisheries (BOF). CDFU requests Dr. White not be confirmed by the legislature to this seat for the reasons that follow:

Out of Cycle Determinations

As chairman of the Board of Fisheries for the last year, Dr. White has accepted agenda change requests that did not fall into the guidelines set out for the BOF to follow. The Prince William Sound/Copper River District completed their board cycle in December of 1996. Since that time, the BOF allowed discussion of numerous agenda items which were relative to our district. CDFU, the Alaska Department of Fish and Game (ADF&G) and concerned resource users have had to travel extensively to track and testify on these issues. It is not in the best interest of anyone, budget constraints as they are, to be forced to respond to proposals out of cycle.

The Sustainable Fisheries Project

The Sustainable Fisheries Project initiated by Dr. White was an enormous undertaking that was put on a fast track without sufficient thought and consideration. Changing the management of Alaskan fisheries by use of a simplistic point system is frankly, not good science. The lack of local knowledge contained in the project and the incomplete overview of the history of the salmon fisheries is unacceptable when creating this new management style.

Imbalance of Boardmembers

There is a clear imbalance on the BOF. Only one boardmember has significant non-salmon commercial fishing experience. Another important element is the lack of a true statewide representation. One member is from Southeast Alaska with the remaining residing in the Kenai Peninsula and north. No check and balance exists for impartial application of allocation.

Hatchery Production Levels

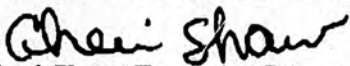
Dr. White took the BOF into the hatchery production level arena where there is already a mechanism in place to set levels via the Regional Planning Team. There seems to be no bounds for the BOF under his leadership. Dr. White has no compunction about going beyond the scope and intent of the BOF.

CDFU Comments Re: Dr. John White BOF Reappointment
April 8, 1998
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The BOF is huge commitment for anyone to make. We respect Dr. White for his eagerness to remain a board member. However, CDFU feels it is in the best interest of the appointment process to provide a fair balance.

Please give weight to the above comments when considering the confirmation of Dr. John White to the BOF. Thank you for this opportunity to comment.

Sincerely,
CORDOVA DISTRICT FISHERMEN UNITED


Cheri Shaw, Executive Director

cc: United Fishermen of Alaska



UNITED FISHERMEN OF ALASKA

April 7, 1998

211 Fourth Street, Suite 112
Juneau, Alaska 99801
907/586-2820
Fax: 907/463-2545
E-Mail: ufa@alaska.net

Representative Alan Austerman
Special Committee on Fisheries
Alaska State Legislature
Juneau, Alaska 99801

APR 07 1998

Dear Representative Austerman:

We are writing in regard to the reappointment of Dr. John White to the Alaska Board of Fisheries.

United Fishermen of Alaska represents over twenty commercial fishing organizations throughout the state. Our group represents the diversity of Alaska's fishing industry, and when brought together, it creates informed meaningful discussion and brings forth a wide range of views. Given the complexity of many fisheries issues, this is a vital element for good decision making.

We believe this element is missing from the current Board of Fisheries and our industry is suffering in its absence. The policies and policy direction established by the Board are crucial to our future. The lack of experience and understanding this Board possesses with regard to salt water commercial fisheries is truly alarming. The willingness of this Board to pursue policy objectives, with broad implications and without a thorough open public process, is also a source of great concern.

We have seen an erosion of public support for the Board of Fisheries. Commercial fishermen throughout the state have lost confidence in the ability of this Board to render balanced decisions and lead a balanced discussion on major statewide policy issues. For example, the manner in which the sustainable fisheries project has been handled and the debate surrounding the role of the Board in setting hatchery production levels. UFA believes it is extremely important to bring about a balance of experience and knowledge to the Board of Fisheries.

Toward that end, by a unanimous vote of those present, the UFA Board voted to not endorse reappointment of Dr. John White. The perspective Dr. White brings to the Board is more than adequately covered by existing

MEMBER ORGANIZATIONS

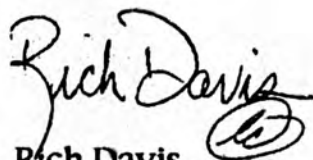
Alaska Crab Coalition • Alaska Longline Fishermen's Association • Alaska Trollers Association • Bristol Bay Driftnetters Association • Concerned Area "M" Fishermen
Cook Inlet Aquaculture Association • Cordova District Fishermen United • Kenai Peninsula Fishermen's Association • Kodiak Regional Aquaculture Association • Kodiak Seiners Association
North Pacific Fisheries Association • Northern Southeast Regional Aquaculture Association • Northwest Setnetters Association • Peninsula Marketing Association
Petersburg Vessel Owners Association • Prince William Sound Aquaculture Corporation • Purse Seine Vessel Owners Association • Seafood Producers Cooperative
Southeast Alaska Seiners Association • Southern Southeast Regional Aquaculture Association • United Cook Inlet Drift Association • United Southeast Alaska Gillnetters

members. This Board clearly needs the input that someone more familiar with marine fisheries could provide.

The UFA Board stands ready to work with the Governor's office and the Legislature to bring forward for your consideration, a list of candidates, which will be an asset to the State and to the Board of Fisheries process.

Thank you for your consideration.

Sincerely,

A handwritten signature in cursive script that reads "Rich Davis". The signature is written in dark ink and includes a stylized flourish at the end.

Rich Davis

President-elect and Chair, Board of Fisheries Committee
United Fishermen of Alaska

David R. Martin
HC-2 Box 860
Clam Gulch, Ak. 99568
April 3, 1998

Alaska Legislator
Juneau, Alaska

APR 07 1998

Dear *Representative Allan Austerman*

Tony Knowles has reappoint John White for three more years on the Board of Fish. I would strongly recommend that the legislature DO NOT confirm Dr. White's reappointment. The local fish and Game Advisory Committee and public process and trust in the BOF system has been greatly eroded under Dr. White's chairmanship. I do not believe there will be any credibility to the BOF process if we continue in the way Dr. White has been proceeding with his dictatorship manner.

I am the chairman of the Central Peninsula Fish & Game Advisory Committee in Ninilchik, but this letter is my own although many Board members and the public share my concerns and recommendation. Even Department of Fish and Game personnel have told me privately, they do not want Dr. White reappointed.

I have been involved in the Advisory Committee and BOF process for 23 years and chair an the last 5 years and believe in and am trying to uphold and strengthen this process.

Under Dr. White's tenure and chairmanship, on the BOF, we in Cook Inlet last year, which was an out of cycle year for Cook Inlet, attended four meetings trying to stop implementation of Board of Fish generated allocation proposals that the BOF was not even going to allow oral public testimony on. This was a total disregard and slap in the face for the Advisory Committees, the public and was stepping way over bounds in an abuse of the BOF's power.

Dr. White has continually told the Department of Fish and Game that he doesn't believe their professional scientific and biological data on the salmon resource management, habitat protection, escapement goals and biological escapement goals. Many times he has supported regulation that is in opposition to this data and the Department's recommendations and therefor against the biological management that will result in less than maximum sustained yields. This is not being a responsible steward of the resource for the people.

Under his chairmanship the Board has awarded unprecedented numbers of Agenda Change Request that are strictly allocation. Under the Boards own criteria an agenda change request should only be awarded if there is a conservation concern never awarded for allocation. That is what the three years cycle is for. Yet he has awarded these agenda change request even though the Department of F&G says there is no conservation concerns. This practice nullifies the three year Board cycle for the area. The three year cycle was established to bring stability to the fisheries and decrease the burden on the Advisory Committees, the local public, the Department and the BOF.

Dr. White's latest maneuver is to appoint subcommittees at the BOF meeting to work on each and every proposal and then give their recommendation to the full Board. This new maneuver will displace the Advisory Committee reports and the public testimony input along with staff reports. The subcommittee members are appointed by the Chairman and are only from the pool of people that are able to spend weeks attending the meetings. Subcommittees are fine if used, as they have been used in the past, on a contentious issue. This new subcommittee process will totally erode the Advisory Committee and public involvement and trust. The Advisory Committees are already the subcommittees of the Board and with representation from the local public of the area, they address each and every proposal usually taking 5 or 6 meetings to do so.

Dr. White's extremely fast push to develop a Sustainable fisheries management policy without the involvement of the Department of Fish and Game, the Advisory Committees and public input is yet another example of his dictatorship approach. Another example is the smokescreen to exclude the local public in participating in the next Cook Inlet meeting by saying they couldn't hold the meeting in the Kenai / Soldotna area because of security reasons. Let's get real!

These are only a few examples to support my request that you DO NOT confirm Dr. White to another three year term on the BOF.

This is no way to manage Alaska fisheries. These unprecedented deviations from the BOF process will erode the process itself, the Department, and the resource. We cannot let this happen.

There are other capable people in Alaska to occupy this seat who will promote and uphold the Advisory Committee, public and BOF process and who will maintain and strengthen the public trust and involvement in this process. They also will make darn sure are fisheries resources are managed biologically, not politically, so as to continue this abundant resource for future generations. We only have one chance, we don't want to end up like the lower 48 with little or no salmon.

Thank you for your time and consideration. The ball is in the Legislator's court. Please score for the public process and the resource.

Sincerely,



David R. Martin

cc; Representative Gary Davis
Representative Mark Hodgins
Representative Gail Phillips
Representative Allan Austerman
Senator John Torgerson
Senator Jerry Ward

*To the Attention of
Representative Austerman.*

Gail Phillips
Speaker of the House of Representatives

Dear Gail

APR 07 1998

These notes are to follow up on a phone call to your office on April 2nd 1998.

This is to inform you of our opposition to the confirmation of the appointment of John White to the Alaska Board of Fisheries.

Mr. White has shown in his prior term a complete lack of regard for the Board of Fish process and the complete disregard of the public and Advisory Committee participation in the process.

Mr. White has developed a new system of his own that he says is the way he will continue to operate in the future which leaves the public and all of the Advisory Committee work to be lost in his new process.

Mr. White says that all proposals must pass through another layer of committee at the Board of Fish meetings leaving all who cannot attend (due to any number of reasons) unable to participate in what is supposed to be a public process.

Mr. White also has told Advisory Committees and the public that they must be in a position and ready to negotiate rather than give testimony based on their committees findings at prior public meetings.

Since Mr. White in his wisdom of this new process will also have many meetings of his self appointed committees on all of the issues before the board going on simultaneously it will be impossible to attend all of the meetings and hear all of the staff reports and give meaningful comments to the sub committees.

Since no voice recording plan has been put into place for Mr. Whites new process it will fall upon the sub committee and or one or two board members to make whatever decision it may deem appropriate and report its findings to the full board for it rubber stamp.

The Kenai Soldotna Advisory Committee does not think it is proper for Mr. White to reinvent the process that was put in place many years ago and even though it may be cumbersome it has worked very well over time.

The latest scam pulled by Mr. White about not having the Board meeting in Soldotna due to security problems is totally un called for and just shows the true colors of this Board of Fish and its lack of regard for the public and the public process.

Even though we have made then back down from that decision what does it mean when we are now faced with a split board meeting.

Does the Mat-Su portion of the meeting come first or last?

Do we have to travel to the Mat-Su to give Advisory committee testimony?

Where do the Sub Committees come from under Mr. Whites new plan and where are the sub committee meetings going to be held?

Where does the Board deliberate on proposals?

Mr. White and other Board members mention something about needing a level playing field to conduct business that probably affects the Kenai Peninsula and its residents more than any other group and they don't want participation from the group that their decisions will affect the most.

It is time to say no to an out of control Board of Fish and its out of control Chairman Mr White

Edward N. Krohn



Chairman Kenai / Soldotna Fish and Game Advisory Committee

**Kodiak Fish and Game Advisory Committee
211 Mission Road
Kodiak, Alaska 99615**

March 19, 1998

 MAR 31 1998

Board Of Fish
Alaska Department of Fish and Game
Board Support Section
PO Box 25526
Juneau, Alaska 99802-5526

Dear Sirs:

The Kodiak Advisory Committee (KAC) is troubled with the State Board of Fish's (BOF) use of sub-committees and standing committees at the Board level and voted to send this letter outlining concerns that surfaced during the past year.

OUR CONCERNS ARE:

- (1) The sub-committee adds another layer to the process. Advisory committees try to bring different user groups to consensus at the local level. This is a negotiation process. It is feared that groups will not try to reach consensus locally if there is another layer of negotiation when they reach the Board level.
- (2) If more than one sub-committee meeting were being conducted at the same time it is possible that an AC representative might be required to make a choice as to which sub-committee they attended. Representation of the local people could be jeopardized.
- (3) Advisory committee representatives could be placed in the position of having to negotiate rather than reporting the findings, the reasons, and the process of their advisory committee.
- (4) Since no voice recording is kept of the sub-committee hearings and the report is brought back to the Board by one member of the Board, there is the potential for one or two board members to steer the sub-committee and thereby unduly influence the decision of the Board.
- (5) There is no review of the report from the sub-committee by the members of that sub-committee and no point at which the members could question the interpretation of the reporter.
- (6) The Board has a record of supporting the recommendations that come out of the sub-committees. This gives the individual, that reports to the Board, inordinate power and could lead to the appearance of bias reporting and manipulation.
- (7) The use of standing committees such as the Sustainable Fisheries Committee

make it difficult, if not impossible, for the advisory committees to respond in a timely manner and may push the affected public out of the regulatory process.

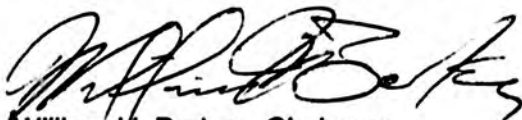
(8) There is the inherent danger that any board generated proposals will be viewed as heavy handed. The board becomes judge, jury and executioner.

OUR RECOMMENDATIONS ARE:

- (1) A written policy should be developed as to how sub-committee should operate.
- (2) The reports from the advisory committees should be given more weight in the deliberation, especially when the advisory committee represents all of the user groups.
- (3) The chair of the Board should check with advisory committee representatives to make sure that there are not conflicts in sub-committee meetings.
- (4) In sub-committees, advisory committee representatives should be cautioned to try to represent the majority of their local committee and not their own views.
- (5) Voice recordings should be made of all sub-committee and standing committee meetings.
- (6) Sub-committee members should be given the opportunity to comment on the report before the Board deliberates.
- (7) Board members should act as information gathers and not express views which could influence the discussion or which could be construed as the view of the Board.
- (8) Recommended changes that come from a standing committees should be subject to the same public review process and time lines that any proposed regulation change is subjected.

This letter has been reviewed by a majority of the Kodiak Advisory Committee, and is being sent to the chair of all active advisory committees.

Thank you for your consideration.



William H. Barker, Chairman
Kodiak Advisory Committee

cc. Governor, Tony Knowles
Senator, Jerry Mackie
Representative, Alan Austerman
All Advisory Committee Chairpersons



March 25, 1998

File for Hearings!
MAR 30 1998

Honorable Representative Austerman
Alaska State Legislature
State Capitol, Room 434
Juneau, AK 99801-1182

Dear Representative Austerman:

The Board of Directors of the Kenai River Sportfishing Association supports the confirmation of Dr. John White, of Bethel, and Russell Nelson, of Dillingham, to the Alaska Board of Fisheries.

As the chairman of the board, Dr. White is establishing the groundwork through the sustainable fisheries project to ensure Alaska's salmon resources are managed in a manner that will provide sustainable salmon returns for generations to come. His dedication to this process is unfaltering. It is a project that will benefit not only the resource but also all users, whether they are subsistence, sport, personal use or commercial. Dr. White's grasp of fisheries issues and the ramifications those issues have upon the spawning grounds is unsurpassed. The knowledge of this symbiotic relationship has earned him the respect of fisheries scientists and lay fishermen.

Yet, the sustainable fisheries project is far from finished. A second term on the board will allow Dr. White to bring to fruition this most worthwhile effort.

We also support Dillingham resident Russell Nelson for the Board of Fisheries. As you know, there is nowhere in the world like Bristol Bay for harvesting sockeye salmon. On average, the tributaries of the Bay produce the largest returns of sockeye in the world. Because of this unique status, every governor since Jay Hammond in 1974 has placed a representative from the Bay on the Board of Fisheries. Russell Nelson will continue this rich tradition.

A former Bristol Bay commercial drift fisherman for 15 years and former herring and salmon spotter pilot, Mr. Nelson is currently the land manager for Choggiung Limited in Dillingham. In that position, he is exposed to the importance of sport fishing opportunity.

He is a man of integrity and has the respect of those in the Bay and in the Native community, as shown by the letters of support he has garnered. They include, among others, the Bristol Bay Native Corporation, the Bristol Bay Native Association, the Bristol Bay Sportsfishing Association, the Association of Village Council Presidents, Kawerak, Inc., the Lake and Peninsula Borough and his employer Choggiung Limited.

Mr. Nelson is an avid supporter of the sustainable fisheries project. He is committed toward working with his board colleagues in developing a project that will preserve the state's salmon resources for his children and their grandchildren.

You could not find more qualified appointees, with the breath of support, as that of Dr. John White and Mr. Russell Nelson. We urge you to confirm them to the Alaska Board of Fisheries.

Sincerely,

Ben Ellis
Executive Director
Kenai River Sportfishing Association

Executive Director
Ben Ellis
P.O. Box 1228
Soldotna, AK 99669
Phone: (907) 262-8588
1-800-478-0724
Fax: (907) 262-8582



COOK INLET SPORTFISHING CAUCUS
3620 PENLAND PARKWAY
ANCHORAGE, ALASKA 99508
(907) 276 2222 FAX (907) 278-0896

March 13, 1998

Governor Tony Knowles
P. O. Box 11001
Juneau, Alaska 99811-0001

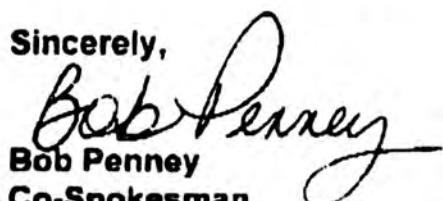
Dear Governor,

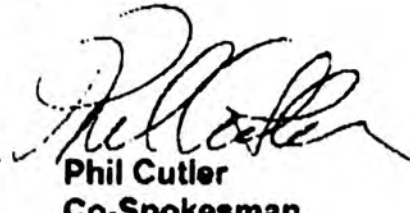
Please accept this letter as an enthusiastic endorsement for the reappointment of Doctor John White to the Board of Fisheries. We believe history will prove that Dr. White will be the best Chairman that Board has ever had. He hasn't just looked at today's issues, but also has looked at our long range needs. His plan for Sustainable Fisheries Management is a needed blueprint to protect stocks for future generations of Alaskans. It is far reaching and farsighted in its scope, as well as brilliantly designed.

We are also quite excited that Russell Nelson of Dillingham has agreed to commit a large portion of his time to serving on this Board. He appears to us to be very knowledgeable and will serve all parts of the state fairly. He will be a great Board member. We endorse his appointment.

With these two appointments we believe Alaska would have the strongest and most competent Fish Board in recent history. We promise to work diligently for their confirmation if they are appointed and will encourage other like organizations to do the same.

Sincerely,


Bob Penney
Co-Spokesman


Phil Cutler
Co-Spokesman


Bruce Knowles
Co-Spokesman

cc: All Legislators

BP/PC/BK/bcj

Distributed by 

SCOMM

102:2

THE PACIFIC SALMON TREATY

PART I

***The Salmon Treaty and the
Commission Process***

US/CANADA PACIFIC SALMON TREATY

- **International Treaty ratified in 1985**
- **The Pacific Salmon Commission implements the Treaty by addressing issues concerning intermingling stocks**
- **Treaty Principles (Article III):**
 1. **Each party shall conduct its fisheries and its salmon enhancement programs:**
 - **prevent overfishing and provide for optimum production**
 - **provide for benefits equivalent to the production of salmon originating —** *Equity Issue*
in its waters
 2. **The parties shall cooperate in management, research and enhancement.**
 3. **The parties shall take into account:**
 - **the reduction of interceptions**
 - **the avoiding undue disruption of existing fisheries**
 - **annual variation in stock abundance**

PACIFIC SALMON COMMISSION

ORGANIZATIONAL STRUCTURE

COMMISSION

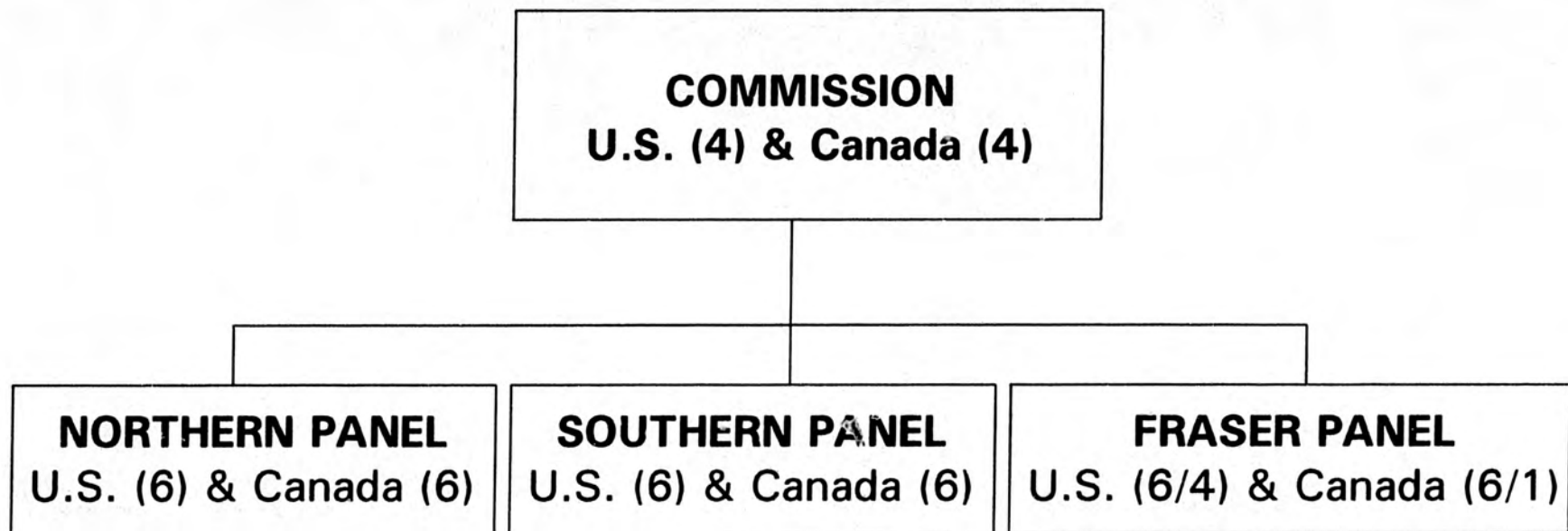
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graph TD; A[COMMISSION] --> B[UNITED STATES<br/>FOUR COMMISSIONERS<br/>(ONE VOTE)]; A --> C[CANADA<br/>FOUR COMMISSIONERS<br/>(ONE VOTE)]; B --> D["[UNANIMOUS VOTE REQ'D]<br/>ALASKA (1 VOTE)<br/>WASH/ORE (1 VOTE)<br/>N.W. TRIBES (1 VOTE)<br/>FED. GOVERN. (NO VOTE)"];
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UNITED STATES
FOUR COMMISSIONERS
(ONE VOTE)

CANADA
FOUR COMMISSIONERS
(ONE VOTE)

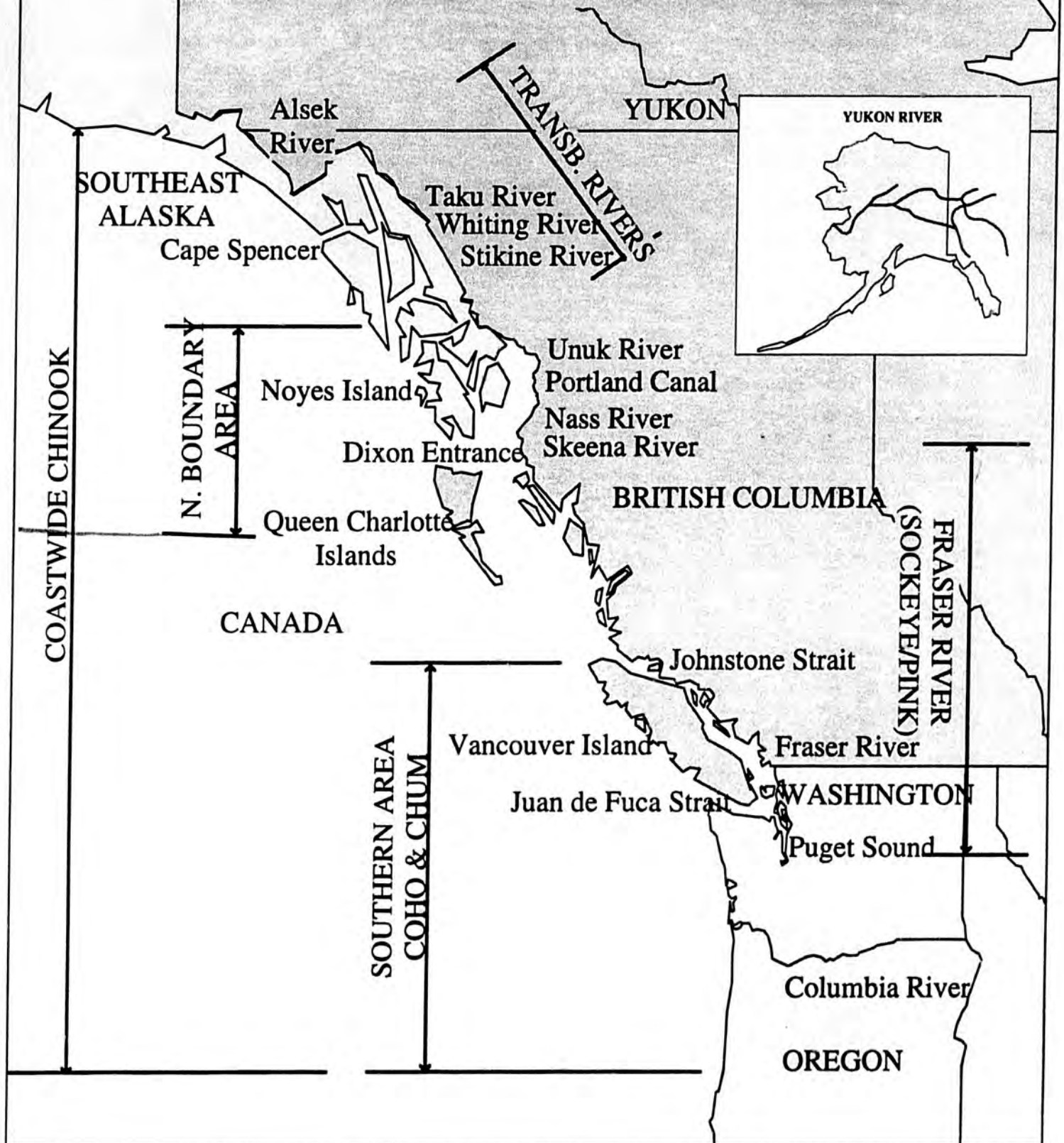
- [UNANIMOUS VOTE REQ'D]
- ALASKA (1 VOTE)
- WASH/ORE (1 VOTE)
- N.W. TRIBES (1 VOTE)
- FED. GOVERN. (NO VOTE)

1985 PACIFIC SALMON TREATY
Pacific Salmon Commission
Panel Membership



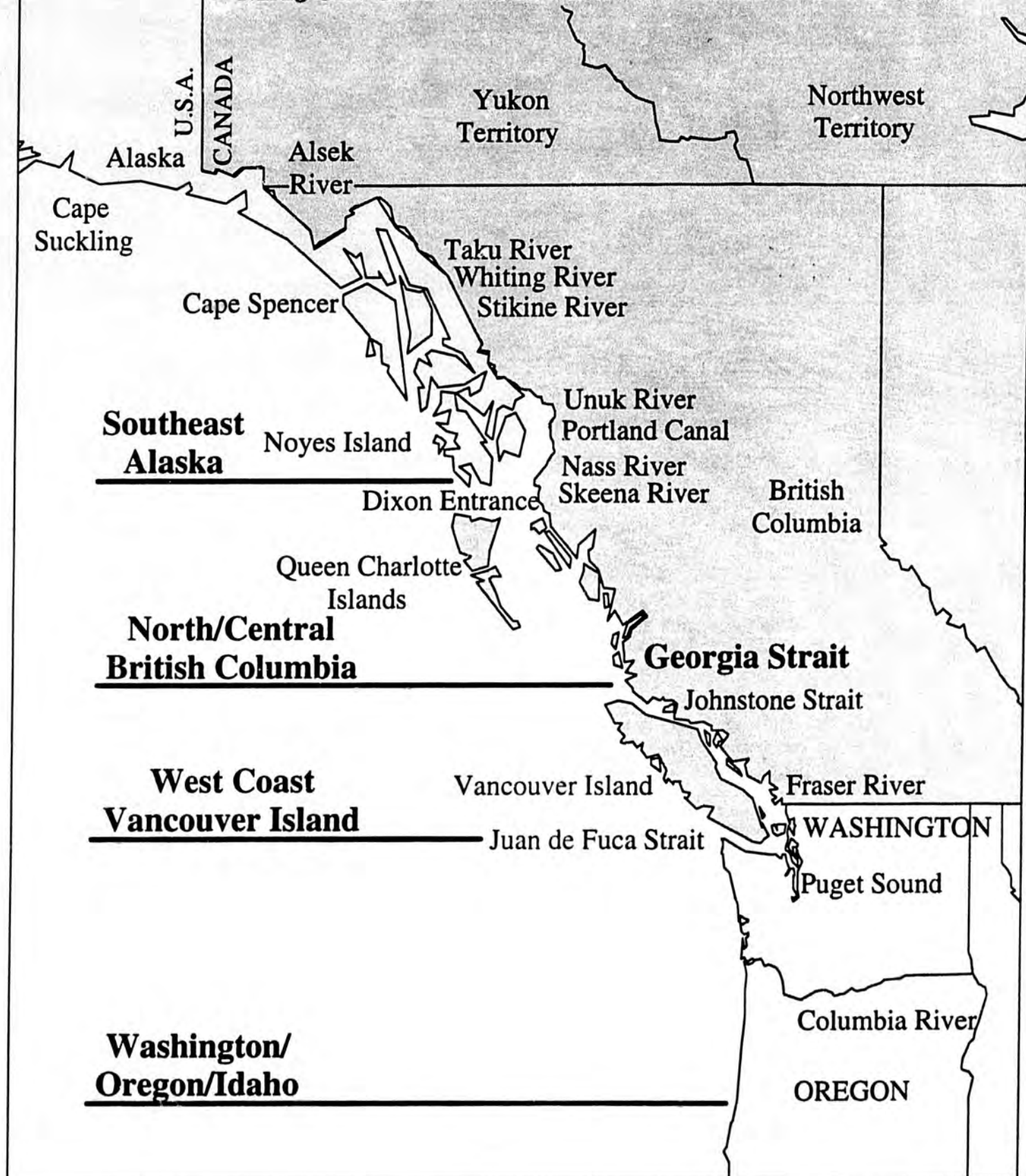
N BC - SE AK

MAJOR SALMON FISHING AREAS OF INTEREST TO THE PACIFIC SALMON COMMISSION



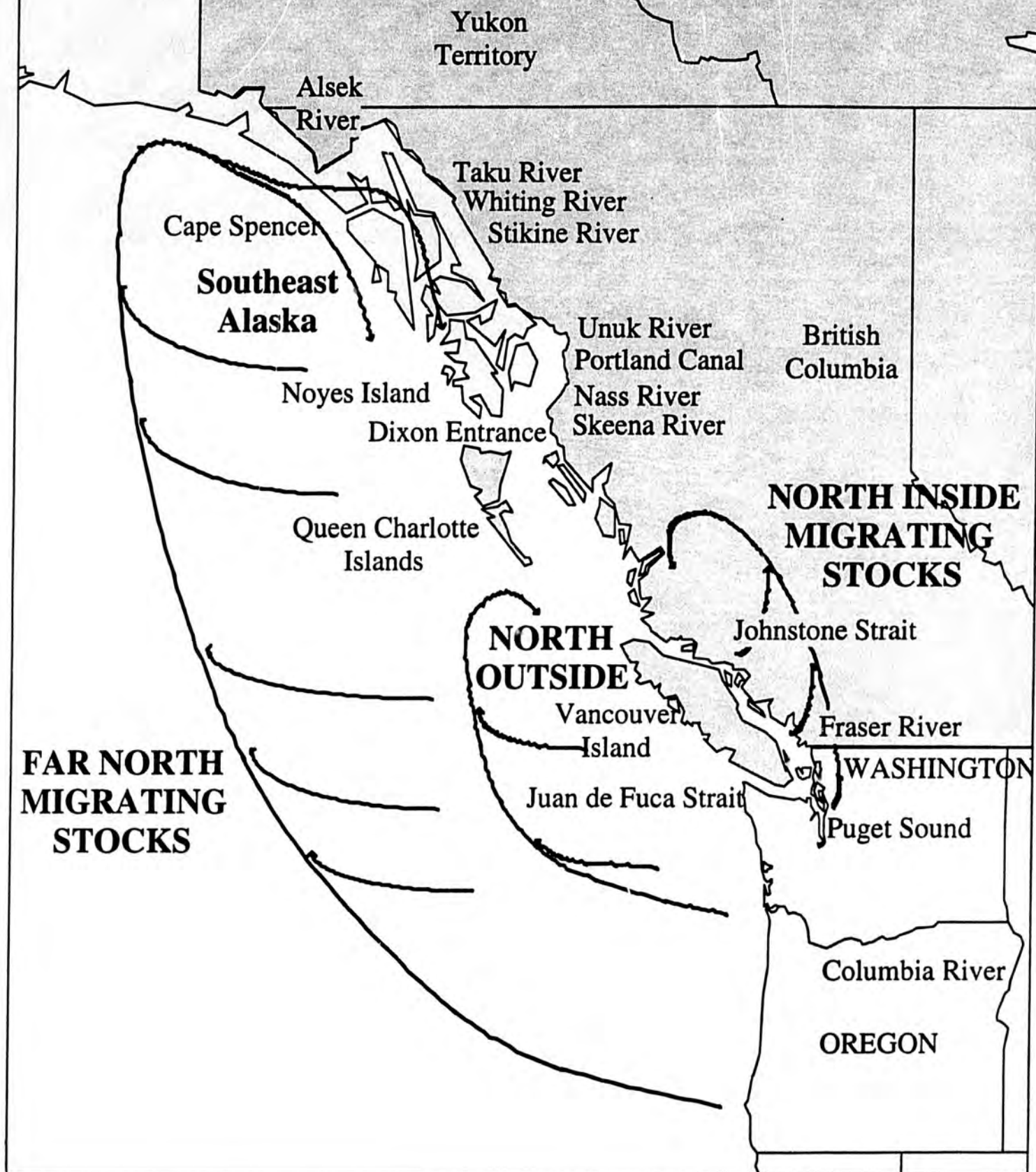
PACIFIC SALMON TREATY

MAJOR CHINOOK MANAGEMENT REGIONS

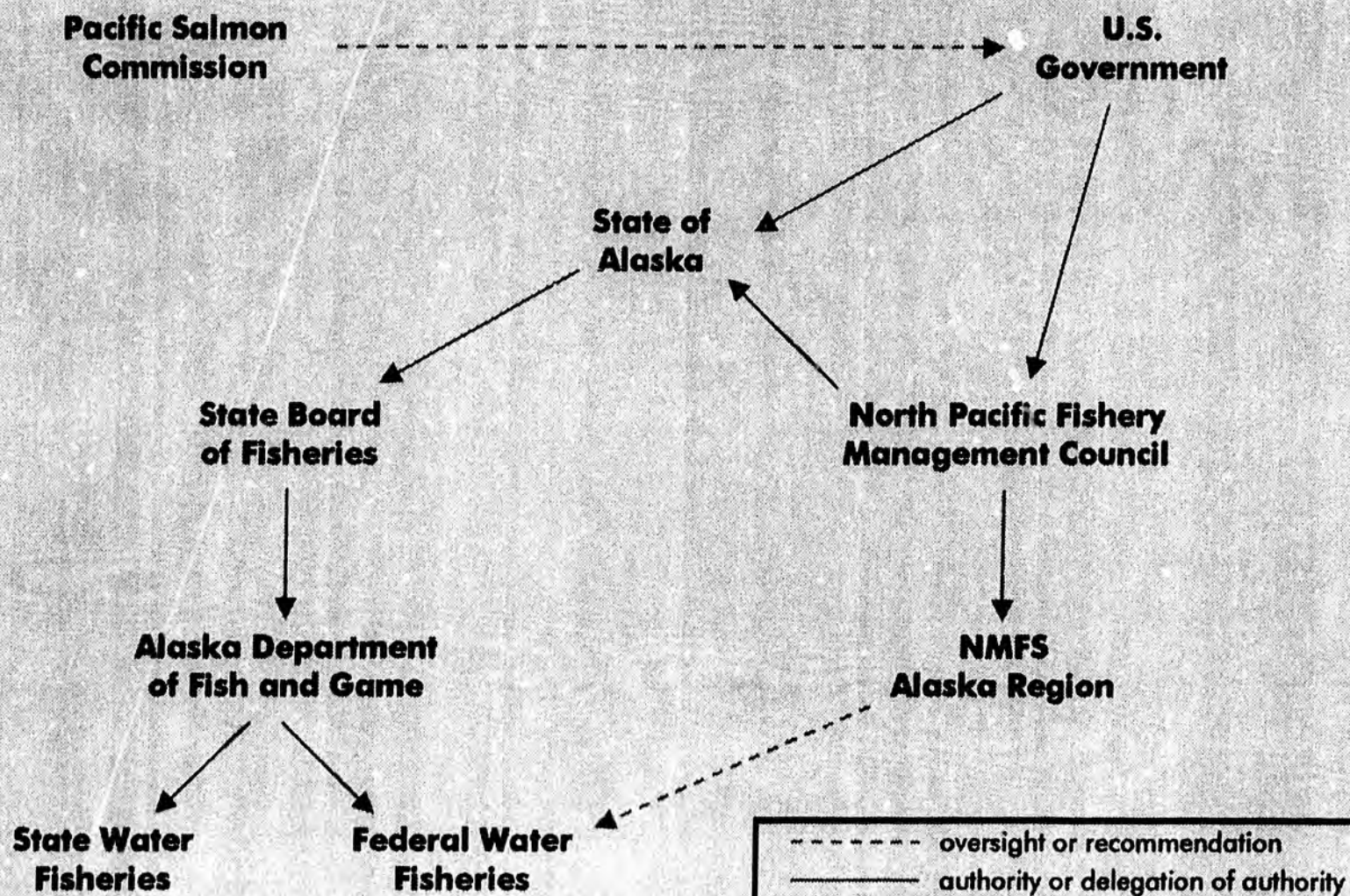


PACIFIC SALMON TREATY

MAJOR CHINOOK STOCK GROUPS



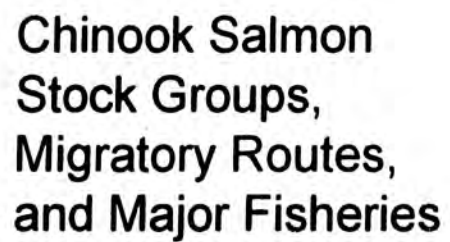
Southeast Alaska Fisheries Regulations for Pacific Salmon Commission-Affected Fisheries



PART II

Stock Aggregates and Fisheries Performance

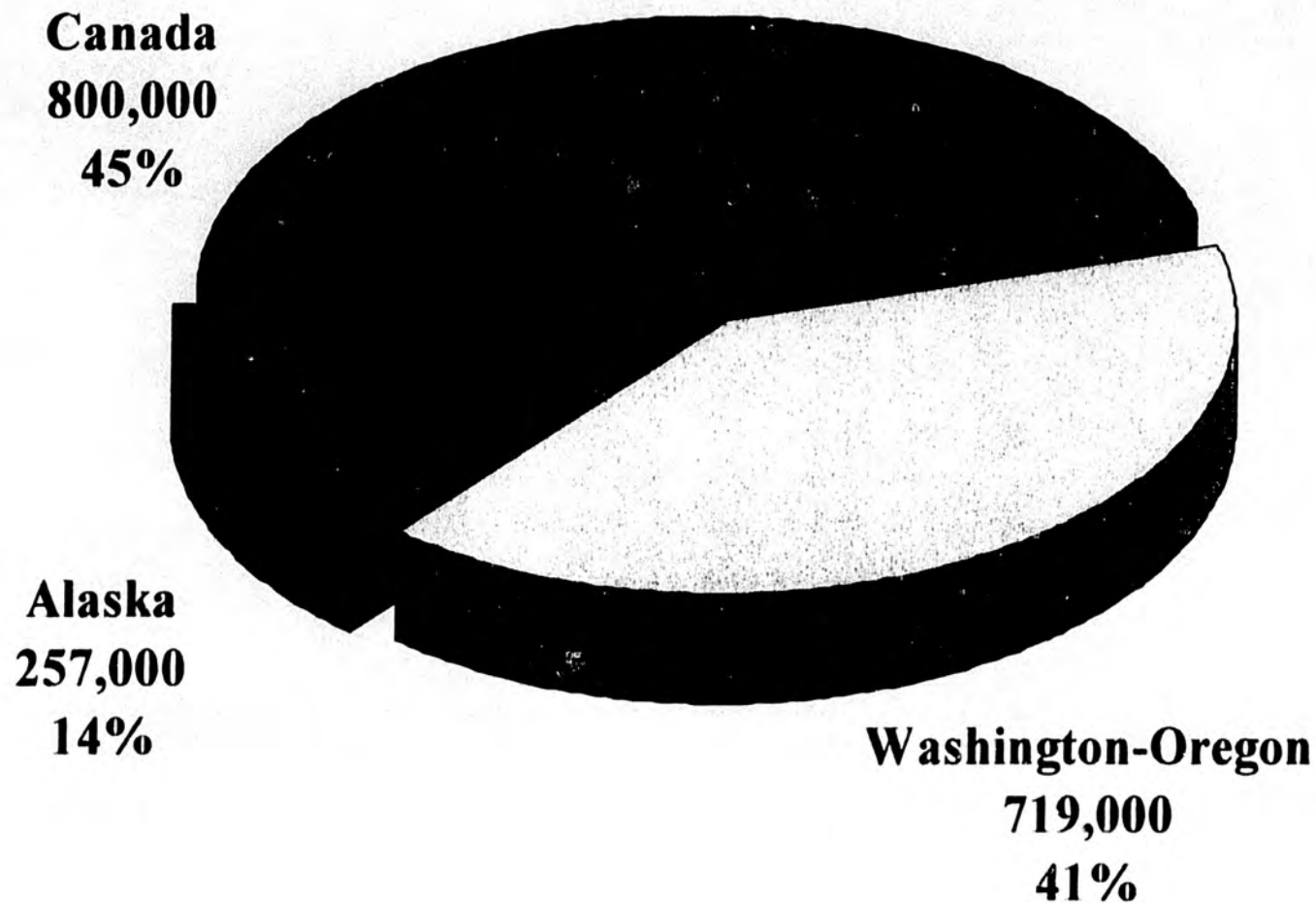
CHINOOK SALMON



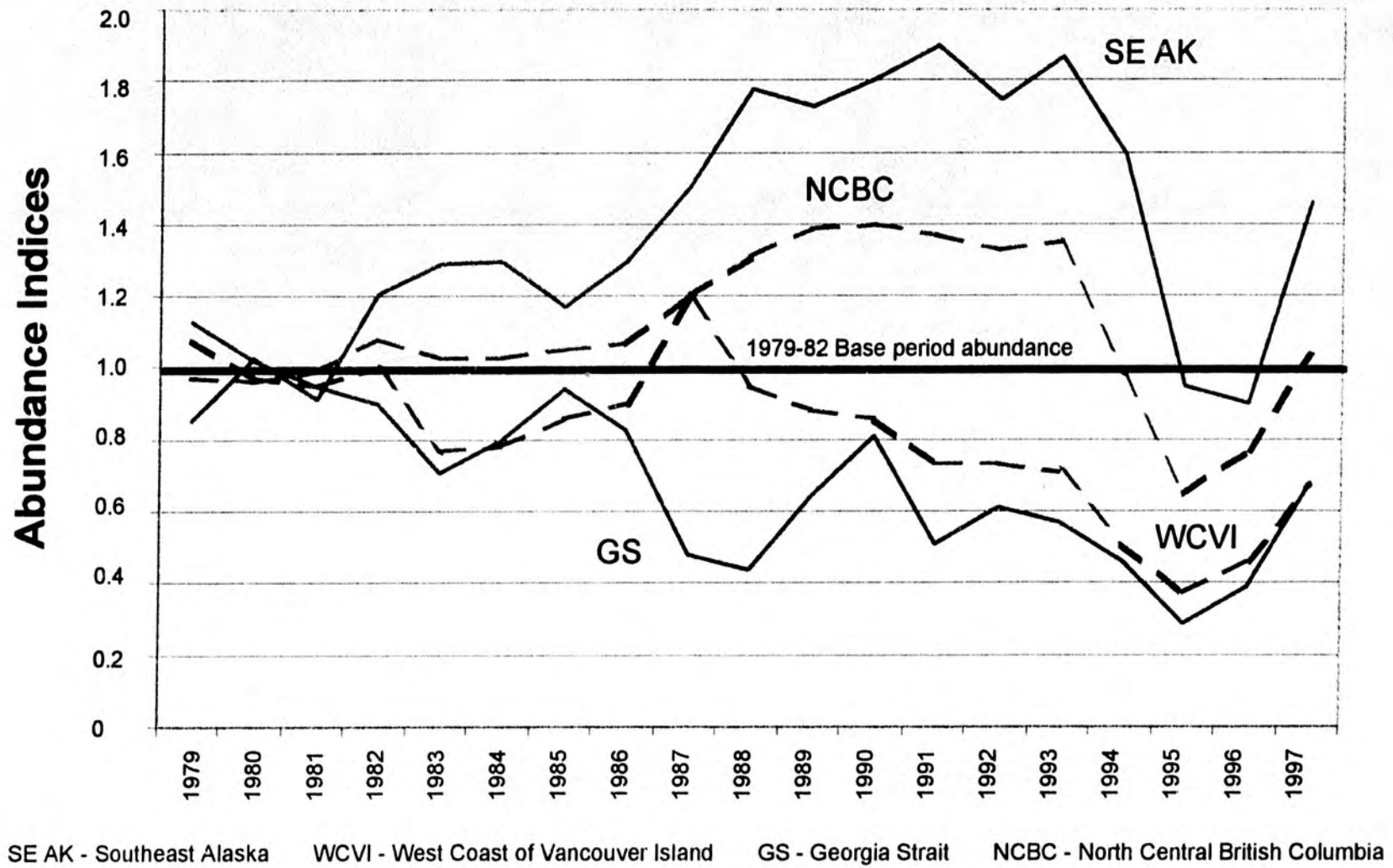
yearly

1985-1995 Average Chinook Harvest

(PSC Fisheries and Chinook Harvests)



Chinook Abundance Indices for Select Fisheries Along the Pacific Northwest Coast



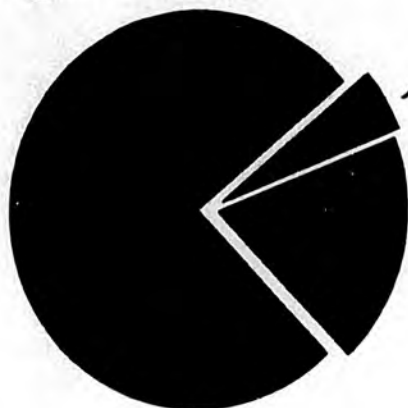
Stock Status of Naturally Spawning Chinook Salmon with the 1996 Catch in Selected Canadian and Alaskan Fisheries

■ Naturally spawning stocks not rebuilding

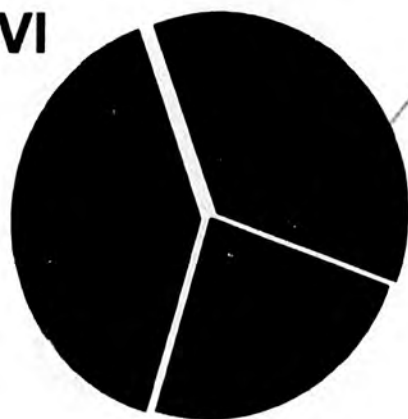
■ Naturally spawning stocks rebuilt

■ Hatchery Stocks

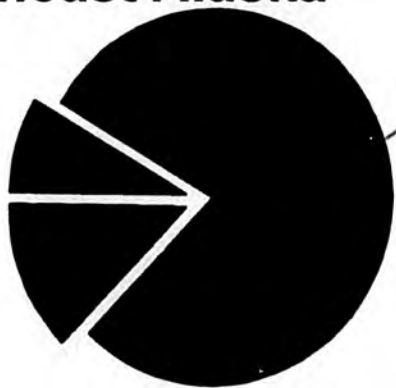
Georgia Strait



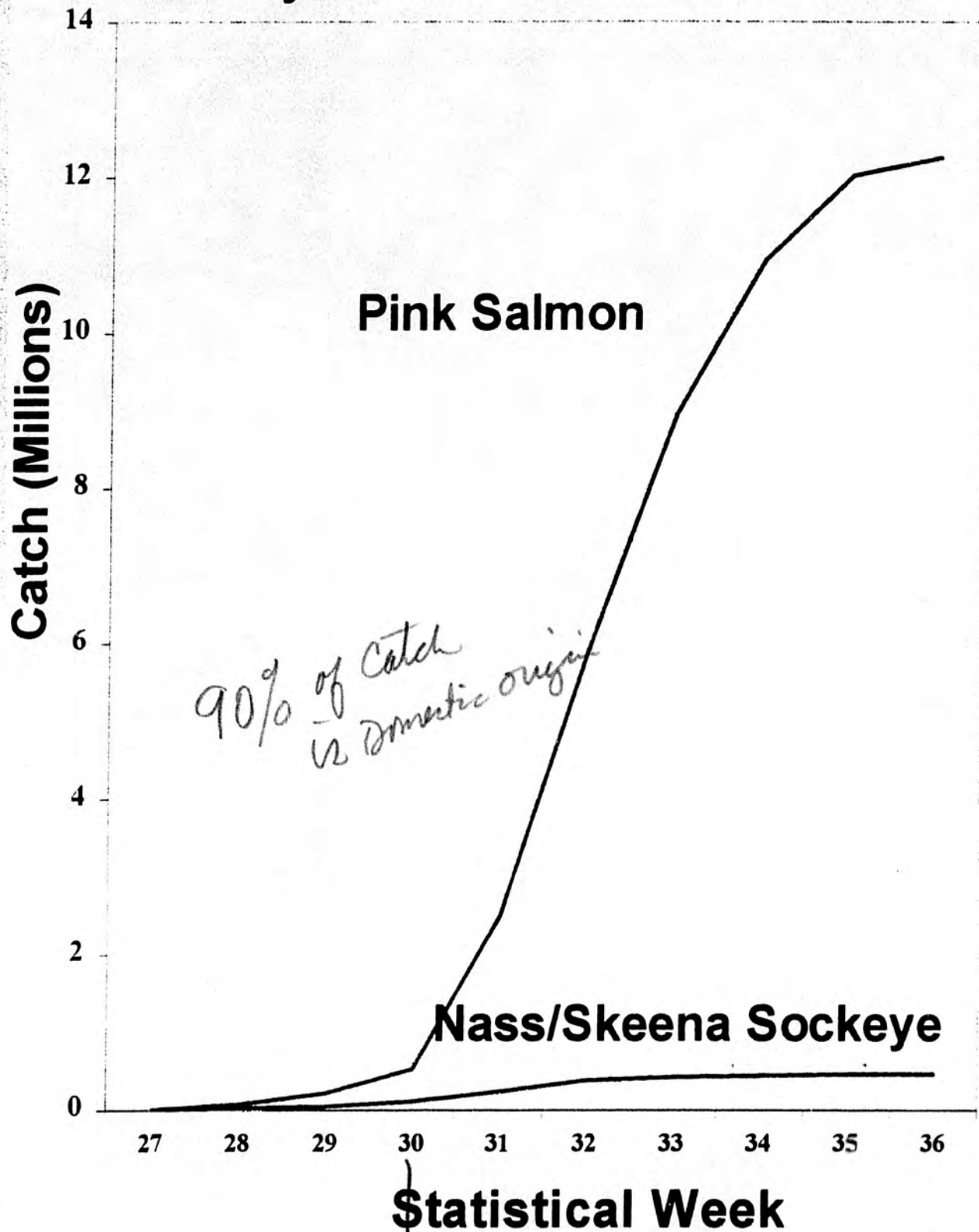
WCVI



Southeast Alaska

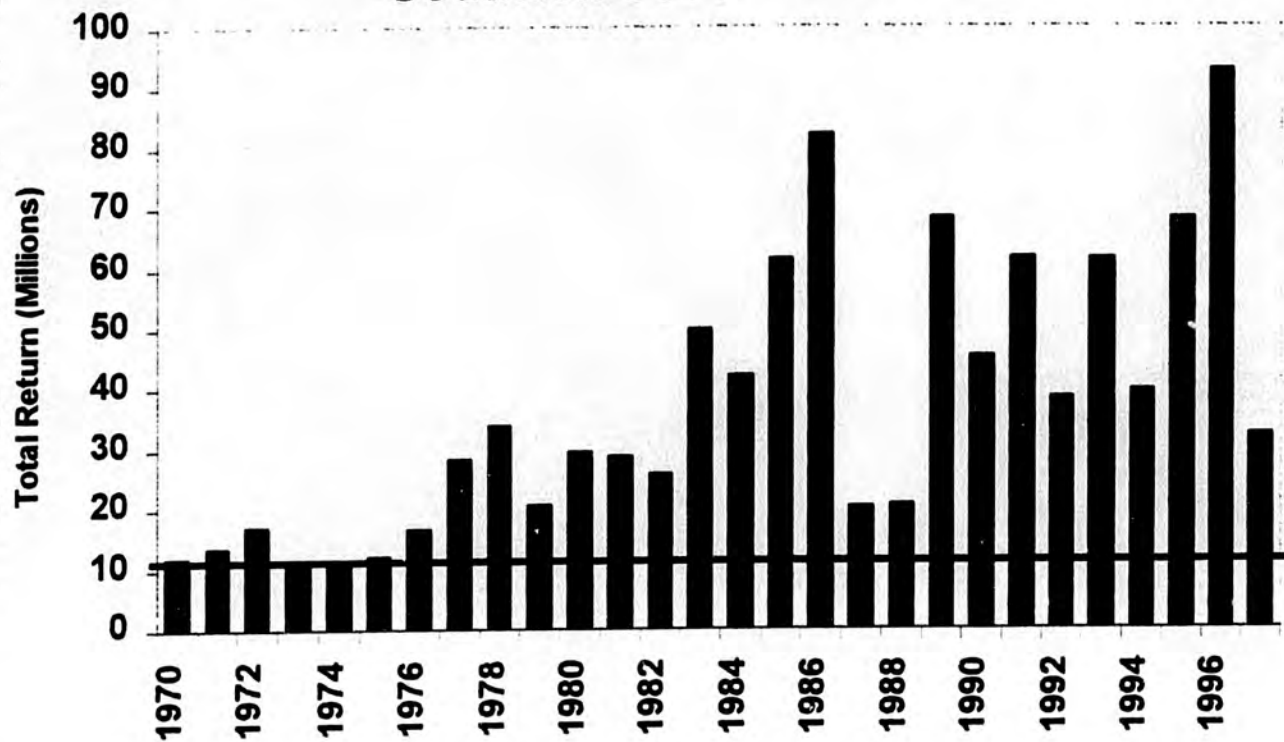


Alaska District 104 Average Cumulative Weekly Salmon Catch Since 1985

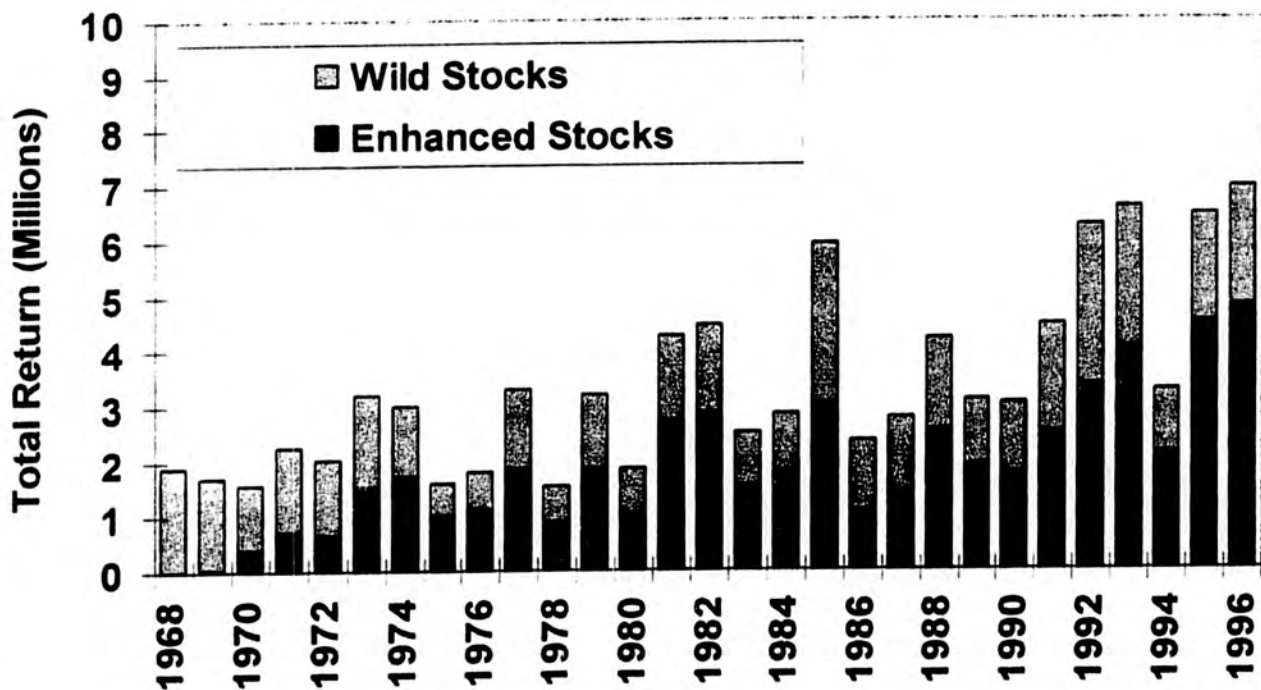


July August

Total Return of Pink Salmon to Southern Southeast Alaska

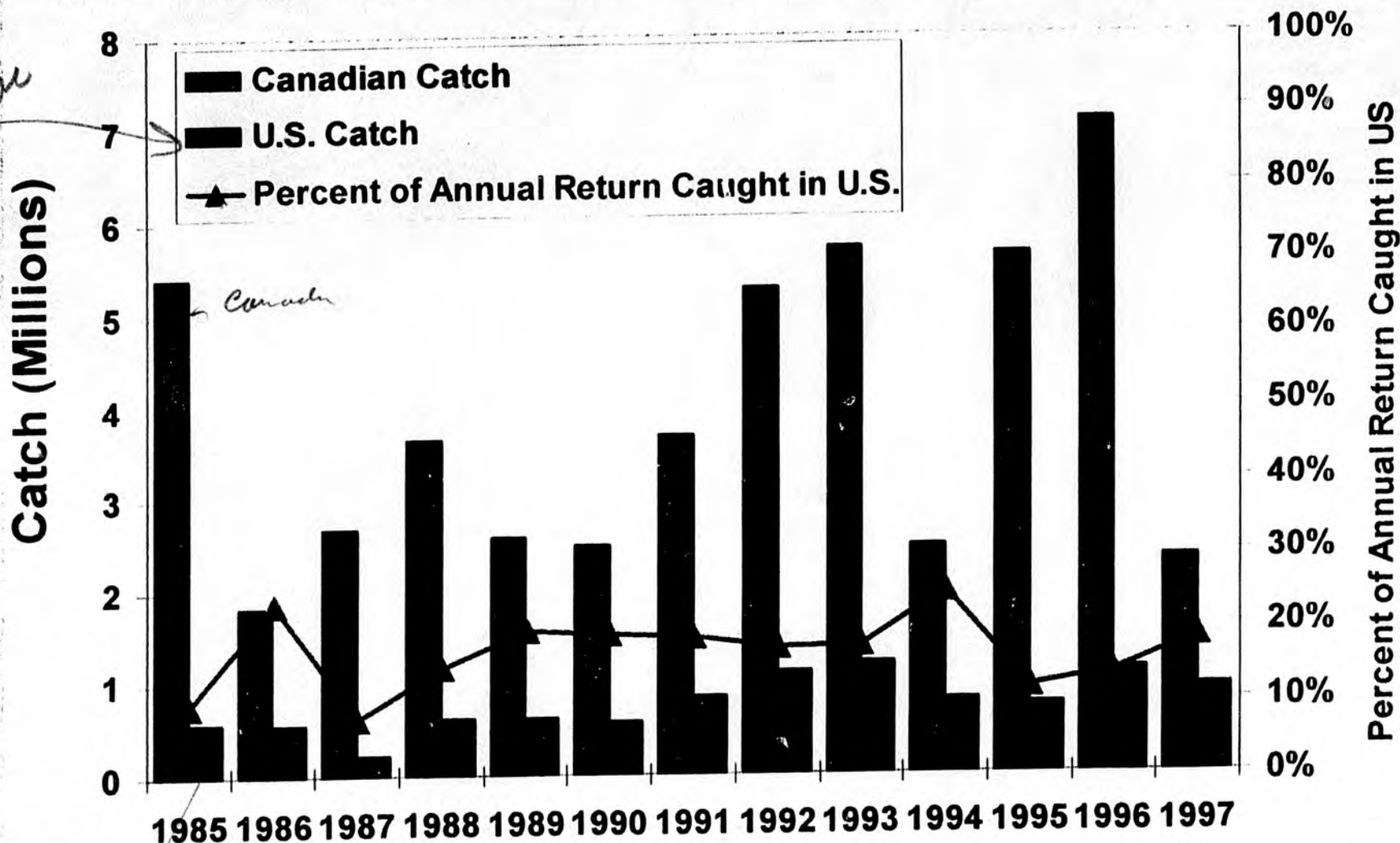


Total Return of Nass and Skeena Sockeye Salmon

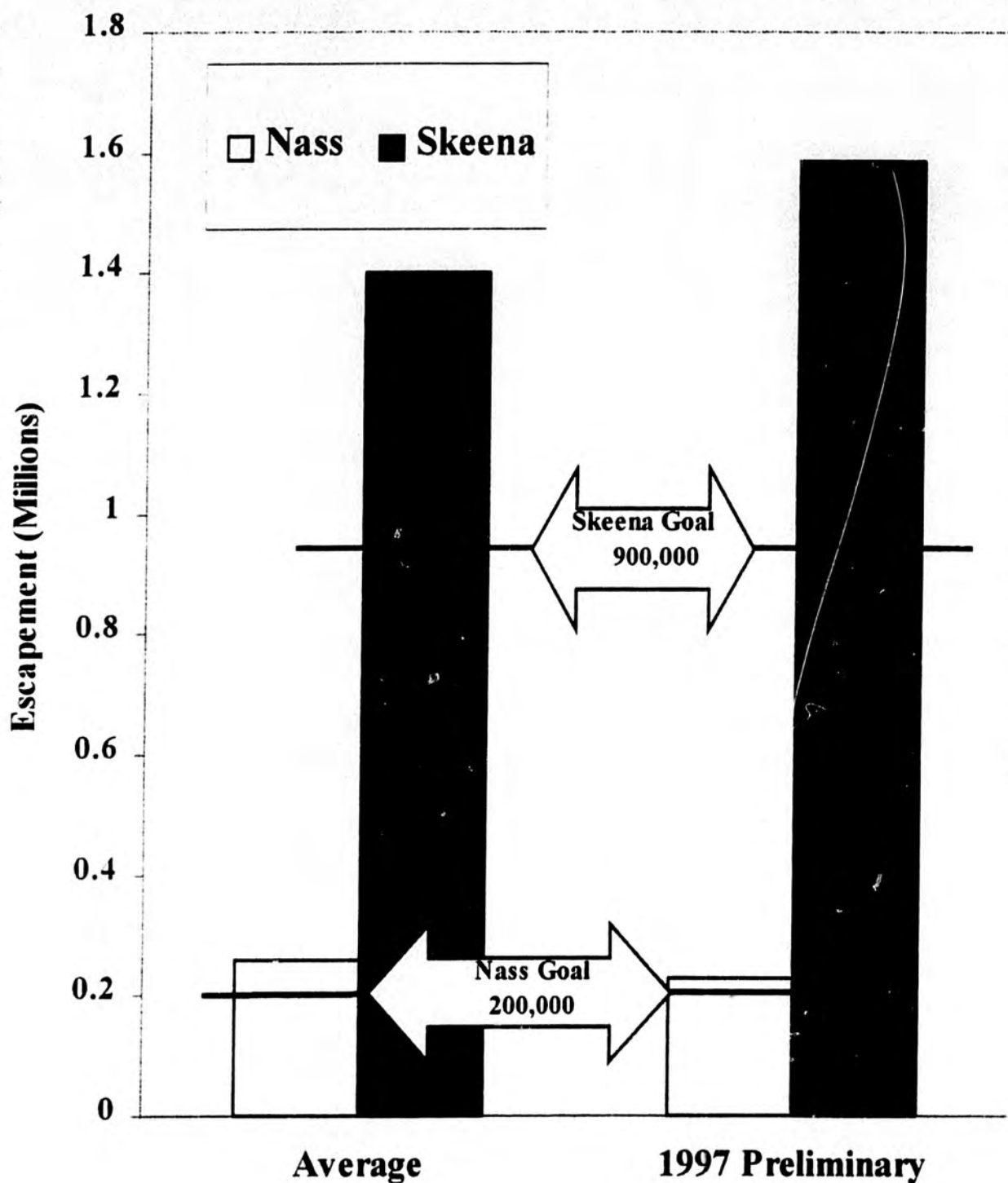


Catch of Nass/Skeena Sockeye in Canada and the U.S., and the Percent of the Total Annual Return caught in the U.S.

*Noyes
Island
Pink
Fishery*



Conservation (Escapement) of Canadian Nass and Skeena River Sockeye Salmon, Average 1985-1996 and Preliminary 1997



DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

P.O. BOX 25526
JUNEAU, ALASKA 99802-5526
PHONE: (907) 465-4100
FACSIMILE: (907) 465-2332

January 5, 1998

Mr. William Ruckelshaus
1000 2nd Avenue, Suite 3700
Seattle, WA 98104

Dear Mr. Ruckelshaus:

It was a pleasure meeting with you, Dr. Strangway, and representatives from Canada on December 19, 1997. I know that you are currently working with Dr. Strangway to prepare a report regarding the future of the stakeholder process. As such, I wanted to recap my main observations from the bilateral meeting of December 19th.

As you know, Alaska remains committed to the use of a stakeholder process that allows the stakeholders to talk candidly - without preconditions - about ways to resolve the dispute between Canada and Alaska arising out of the Pacific Salmon Treaty. Alaska views this process as a forum where stakeholders should be able to present proposals and explore creative solutions to resolve this dispute. Only through the open discussion of proposals will the parties find ways to narrow and resolve these issues. Alaska came to the meeting on the 19th prepared to engage in this type of dialogue and to demonstrate that we are willing and able to negotiate in good faith.

Unfortunately, the Canadian delegation came to the meeting with a set of preconditions which would effectively handcuff negotiations and defeat the purpose of the stakeholder process. In his opening statement, Mr. Chamut elaborated on the Canadian federal government's support of the stakeholder process if the process was thought to have a chance of being successful. However, this support was qualified with the caveat that the United States, as a necessary condition to resuming of the stakeholder process, had to commit to "significant and substantial transfers of fish from Alaska to Canada." In Canada's view, this would be the yardstick to measure success of the negotiations, if they were to resume. While this precondition appeared to be supported by all of the Canadian participants in the discussions, the representative of the Province of British Columbia was particularly adamant on this point. Moreover, as the talks continued, Canada made it quite clear that this "transfer of fish" was to occur in all fisheries subject to the negotiations. In essence, as a precondition to resuming talks, Canada was demanding that the United States accept Canada's narrow interpretation of Article III of the Pacific Salmon Treaty and that this be incorporated into the instructions you and Dr. Strangway would provide to the stakeholders.

As you will recall, Alaska tried several avenues to explore Canada's concerns and to persuade them that such preconditions were very counterproductive to your efforts to set the stage for renewed negotiations. We pointed out that in last years' stakeholder negotiations Alaska demonstrated considerable flexibility and the ability to compromise. In very clear terms, proposals were tabled by Alaska's stakeholders that would have significantly reduced our northern boundary fisheries at great cost to U.S. fishers. Such actions, we believe, show that our stakeholders can put meaningful proposals on the table to resolve this dispute.

In our bilateral sessions on the 19th, we provided information which showed that Canada recognized Alaska's willingness to negotiate in good faith during the previous rounds of stakeholder talks. For example, following the negotiations last year, Canadian Fisheries Minister, David Anderson, expressed to Governor Knowles Canada's acknowledgment that significant progress had been made in the north. Also included was a letter from Ives Fortier to Jim Bacon, the United States northern stakeholder chair, which expressed the view that significant progress had been made in the northern stakeholder talks.

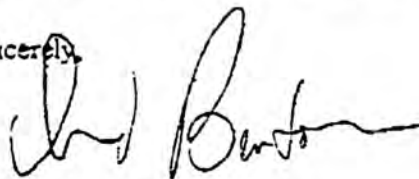
We also presented documents from the May, 1997 negotiations that demonstrated that we were close to a bilateral agreement regarding a framework for resuming the northern stakeholder negotiations in the fall. Interestingly, this agreement did not contain the kind of preconditions Canada now insists upon. We reminded the Canadians that the reason talks on this document were not concluded was the failure of the government-to-government negotiations on southern issues, which caused cessation of all further talks, not because of some irresolvable dispute over continuing talks in the north.

We also discussed with the Canadians our view that their preconditions ignored any concerns Alaska might have with the conduct of Canadian fisheries or related issues that Alaska might wish to bring to the negotiation table. And, the point was made that under an abundance-based fishery regime, the flow of fish could be in either direction depending on changes in the abundance of the stocks over time. As you no doubt observed, these arguments were not persuasive to Canada and they were unwilling to move off their hard-line precondition. In subsequent conversations I have had with Canadian officials, I would have to say that their position remains largely the same as it was on the 19th.

As we have said on many occasions, Alaska supports the use of a stakeholder process to resolve this dispute, and the meeting of December 19 was very unfortunate when you compare it to what was being said by the Canadians in May of 1997. However, the preconditions set forth by Canada do not create the climate necessary for such a process to be successful. I certainly wish it were otherwise.

I also want to take this opportunity to thank you for your hard work trying to restart the stakeholder negotiations. I know that both you and Dr. Strangway put in long hours in your efforts. If there is anything I can do to be of further service, please feel free to call.

Sincerely,



David Benton
PSC Commissioner for Alaska

cc: Governor Tony Knowles
Frank Rue, Commissioner
Jim Pipkin
Mary Beth West

Pollock's effect on marine mammals topic in joint meeting

By Charles Bingham

Alaska Newspapers

ANCHORAGE — The Steller sea lion has seen its numbers slip so much in recent years various stocks of the marine mammal are now on endangered and threatened species lists.

But trying to track the reasons for the decline is like piecing together a jigsaw puzzle, University of British Columbia professor Dr. Andrew Trites told a joint meeting of the Alaska Board of Fisheries and the North Pacific Fishery Management Council Feb. 3 at Anchorage's Hilton Hotel.

Trites said Alaska's western stock of the Steller sea lion (Prince William Sound to the Bering Sea) began to experience a sharp decline in 1974 and that stock is now on the endangered list. The eastern stock (Southeast Alaska) is slowly growing, but remains on the threatened list.

"There are several possible rea-

sons for this, it's like a jigsaw puzzle," Trites said. "Is it overfishing? Or the rise of pollock? We feel pollock is central to the problem, but we're not sure if it's too many or too few."

Trites said six Steller sea lions in captivity at the Vancouver Aquarium served as test subjects to a diet study. For some periods the captive sea lions were fed a diverse diet of herring, Atka mackerel, pollock, squid and other forage foods commonly found in Alaska. During other periods the sea lions were fed a diet heavy in pollock, which over the past 20-40 years has become the dominant staple food of the western stock of Steller sea lions.

Trites said during the pollock diets, the sea lions actually ate more food but lost as much as a pound a day. In fact, during some of the pollock periods the diets had to be switched back to herring because the sea lions lost too much weight.

"Is pollock a junk food?" Trites asked. "In areas where pollock is

strong, the sea lions are not as healthy. The strongest stocks (of sea lions) have diverse diets. Not only are they losing weight, but they go into a metabolic depression, so they lose twice."

Trites said there's no real sign the sea lions are starving, but animals in the 1970s were bigger than in the 1980s. He also said there are more fetuses aborted in the winter now. Trites also said there are similar declines in sea birds, sea otters, harbor seals and Northern fur seals, all starting about the mid-1970s.

Unfortunately, there are so many variables that even the decline of the Steller sea lion can't be officially linked to the rise of pollock, Trites said. He said other reasons to consider include the end of commercial whaling in the 1950s, or it could be industrial development or overfishing of a forage fish that shifted the ecosystem as larger animals were forced to alter their diets.

"The trouble may not be in the Bering Sea, it could be in the Gulf

of Alaska," Trites said. "The Steller sea lions range from northern Japan to California. We're trying to get a better understanding of how animals use the ocean food web, and what happened to cause the shift."

Trites' discussion of Steller sea lion research was just one of six main topics on Tuesday's meeting agenda. Members of the two fishery groups also heard reports on Bering Sea/Aleutian crab issues, a scallop fishery management plan, halibut management plans, groundfish issues, and issues concerning salmon bycatch reporting during the Bering Sea/Aleutian Islands groundfish seasons.

Even though they manage different fisheries, the two groups meet periodically to discuss areas

where they have similar concerns. Several years ago the two groups drifted apart, but now they're back to working with each other on key issues.

"We actually have a working relationship," said Dr. John White of Bethel, the chairman of the Alaska Board of Fisheries. "This helps keep us together on cross-jurisdictional issues."

"There are a lot of resources we're both interacting on," said Robin Samuelson of Dillingham, a member of the North Pacific Fishery Management Council. "They're mandated on some things, and we're mandated with different concerns. I think both fisheries benefit from a much better relationship."

Dr. Trites is the Research Director of the North Pacific Universities Marine Mammal Research Consortium which is undertaking long term research into the interactions between marine mammals and fisheries. He is also an Assistant Professor and Director of the Marine Mammal Research Unit at the University of British Columbia. His interests include the population biology, bioenergetics and censusing of seals, sea lions, sea otters, whales and dolphins, and involve a combination of field studies, captive studies and computer studies (data analysis and simulation modelling). Current research includes developing an ecosystem model of the Bering Sea, analyzing the long term dynamics of pinnipeds in the North Pacific, and estimating the dietary needs of marine mammals relative to commercial fishing activities.

Scientists puzzling out reasons for Stellar sea lion decline

By Charles Bingham
Alaska Newspapers

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"There are several possible reasons for this, it's like a jigsaw puzzle," Trites said. "Is it overfishing? Or the rise of pollock? We feel pollock is central to the problem, but we're not sure if it's too many or too few."

Trites said six Steller sea lions in captivity at the Vancouver Aquarium

served as test subjects to a diet study. For some periods the captive sea lions were fed a diverse diet of herring, Atka mackerel, pollock, squid and other forage foods commonly found in Alaska. During other periods the sea lions were fed a diet heavy in pollock, which over the past 20-40 years has become the dominant staple food of the western stock of Steller sea lions.

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Trites said there's no real sign the sea lions are starving, but animals in the 1970s were bigger than in the 1980s. He also said there are more fetuses aborted in the winter now. Trites also said there are similar declines in sea birds, sea otters, harbor seals and Northern fur seals, all starting about the mid-1970s.

Unfortunately, there are so many

variables that even the decline of the Steller sea lion can't be officially linked to the rise of pollock, Trites said. He said other reasons to consider include the end of commercial whaling in the 1950s, or it could be industrial development or overfishing of a forage fish that shifted the ecosystem as larger animals were forced to alter their diets.

"The trouble may not be in the Bering Sea, it could be in the Gulf of Alaska," Trites said. "The Steller sea lions range from northern Japan to California. We're trying to get a better understanding of how animals use the ocean food web, and what happened to cause the shift."

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so that a correction factor could be developed to calculate total abundance. In 1993 Congress began providing funds to the Alaska Department of Fish and Game, through the National Oceanic and Atmospheric Administration, to carry out research to investigate factors responsible for the harbor seal decline. These funds have supported studies of harbor seal behavior on land and at sea, physiology, disease, population dynamics, and trophic relationships.

Numerous research efforts on harbor seals continued in 1997. For example, researchers from the National Marine Fisheries Service and Alaska Department of Fish and Game satellite tagged 10 pups at Tugidak Island and 12 from Prince William Sound to study pup movement and behavior. Biologists from both groups also captured harbor seals and took samples of blood, blubber, whiskers, and skin to assess body condition, look for indications of disease or stress, and to help determine diet and stock structure. In collaboration with scientists at the National Marine Mammal Laboratory, a program is being developed to study fine structure of teeth as an indicator of sexual maturity and nutritional status. Work continues on the identification of the genetic structure of harbor seals in Alaska using mitochondrial DNA and micro-satellite DNA as a means of identifying biological stocks.

In collaboration with the Alaska Department of Fish and Game, the Alaska Native Harbor Seal Commission has undertaken a biosampling program that involves the collection and analysis of samples from harbor seals harvested by Alaska Native subsistence hunters. The University of Alaska also collaborated with the Department on studies of changes in the demography and pupping phenology of harbor seals on Tugidak Island.

Steller Sea Lion (*Eumetopias jubatus*)

Steller sea lions occur along the northern rim of the North Pacific Ocean from southern California to Hokkaido, Japan. About three-quarters of all Steller sea lions pup and haul out on U.S. beaches, with most animals occurring in the Gulf of Alaska and the

Aleutian Islands. Over the past 30 years, Steller sea lion abundance has declined precipitously throughout most of the western part of the species' range (see Table 4). In this region, counts have decreased by more than 80 percent since the 1960s, and at some sites, sea lions are in danger of disappearing altogether. Because of these trends, the National Marine Fisheries Service designated the Steller sea lion as threatened under the Endangered Species Act in 1990.

Although the cause of the species' decline is unclear, a leading hypothesis is that available prey has either decreased in abundance or changed in composition. This, in turn, is thought to have caused an increase in sea lion mortality, particularly among juveniles. Steller sea lions feed on a wide variety of fish, mollusks, and crustaceans. Because a number of key prey species — such as pollock, Atka mackerel, salmon, and flat fishes — are subject to intense commercial fishing in Alaska waters and elsewhere, commercial fisheries are suspected as a significant factor affecting prey availability for sea lions.

Other factors that have affected sea lions to varying degrees in at least some areas include incidental taking by foreign and joint-venture trawl fisheries off Alaska between the late 1960s and late 1980s, human disturbance at haul-out sites, deliberate shooting by fishermen, a commercial sea lion harvest in parts of Alaska from the 1950s to the early 1970s, a sea lion culling program in British Columbia from about 1900 to 1960 to reduce predation on fish stocks, and subsistence harvests in Alaska and Russia.

The National Marine Fisheries Service has lead responsibility for the recovery of Steller sea lions under the Marine Mammal Protection Act and the Endangered Species Act. At the recommendation of the Marine Mammal Commission, the Service established the Steller Sea Lion Recovery Team in 1990 and adopted the Steller Sea Lion Recovery Plan in 1991 to help guide recovery efforts. Key partners in the Service's recovery program have included the Alaska Department of Fish and Game, the Marine Mammal Commission, the North Pacific Fishery Management Council, and the North Pacific Universities Marine Mammal Research Consortium. The latter group, a consortium of academic institutions in Alaska, British Columbia, Oregon, and Washington,

was established in 1992 at the request of fishing industries to investigate the cause of the decline of Steller sea lions.

To address the decline of Steller sea lions, the Service, in cooperation with other agencies and groups, has mounted an intensive research effort to monitor the status of sea lion populations and to identify the cause of the decline. To mitigate direct and indirect effects of commercial fisheries, the Service established regulations in 1992 and 1993 to (1) prohibit discharges of firearms within 100 yards of a sea lion, (2) prohibit (with some exceptions) the operation of vessels within 3 nautical miles (nmi) of major Alaska rookeries, (3) establish no-trawl zones within 10 nmi of many major sea lion rookeries in Alaska and within 20 nmi of major rookeries in the Gulf of Alaska and eastern Aleutian Islands to protect sea lion foraging areas, and (4) adjust quotas for fishing areas to prevent concentrated fishing effort in foraging areas beyond the no-trawl zones around major haul-out sites. In 1993 the Service also designated all major rookeries and adjacent waters under U.S. jurisdiction as critical habitat under the Endangered Species Act. The designated areas include waters within 20 nmi of major haul-out sites in the western part of the species' range and within 3 nmi of sites in the eastern part.

Despite these efforts, the species' decline in the western portion of its range has continued. Recent efforts to address this situation are described below.

Steller Sea Lion Status under the Endangered Species Act

As noted above, the National Marine Fisheries Service designated Steller sea lions as threatened under the Endangered Species Act in 1990. The designation applied to Steller sea lions throughout their range and treated the species as a single population. Subsequent research, however, indicates that Steller sea lions are composed of at least two distinct stocks, one east and one west of Cape Suckling, Alaska, in the north central Gulf of Alaska near Prince William Sound.

Among other things, the research indicates that there are genetic differences between sea lions east and west of Cape Suckling and that there is little exchange of animals between haul-out sites and rookeries east and west of that point. With the exception of a marked decline in sea lion numbers at the species' southernmost rookeries in California, the eastern stock also appears to be relatively stable or increasing slightly, whereas rookeries and haul-out sites west of Cape Suckling generally have experienced steep, steady declines.

Based on this new information, the Steller Sea Lion Recovery Team and the Marine Mammal Commission recommended that the Service revise the species' listing status under the Endangered Species Act to recognize two stocks of Steller sea lions — an eastern stock that is threatened, and a western stock that is endangered. The Service agreed that the change appeared warranted and published a proposed rule in the *Federal Register* on 4 October 1995 to make the change. As noted in the previous annual report, on 11 January 1996 the Commission commented to Service in support of the proposed rule.

On 5 May 1997 the Service published final rules changing the status of Steller sea lions under the Act to designate the eastern stock as threatened and the western stock as endangered. In doing so, the Service noted that it did not appear necessary to modify designated critical habitat for Steller sea lions or existing protection measures; however, it also indicated that it was taking steps to reassess the effectiveness of existing protective measures with a view toward improving them.

Research on Steller Sea Lions

To provide an informed basis for identifying, evaluating, and justifying Steller sea lion conservation measures, the National Marine Fisheries Service, the Alaska Department of Fish and Game, the North Pacific Universities Marine Mammal Research Consortium, and others have developed a broad cooperative research program to monitor population trends and elucidate the cause or causes of the decline.

Table 4. Steller sea lion population estimates, 1960s-1994
 († = estimates excluding pups; ‡ = estimates including pups)

Area	1960s	1970s	1985	1989	1994	% Difference 1960s to 1994
Western Stock						
Russia†	41,000- 52,300	—	—	10,000	—	—
Aleutian Islands‡	127,300	115,700	78,400	24,400	19,000	-85%
Bering Sea‡	11,600	5,200	3,800	1,200	2,200	-81%
Gulf of Alaska‡	88,700	70,700	48,900	40,600	22,000	-75%
Total Western Stock‡ (U.S. areas only)	227,600	191,600	131,100	66,200	43,200	-81%
Eastern Stock						
Southeast Alaska‡	9,000	10,300	10,300	15,800	14,600	+62%
British Columbia†	11,500	6,100	6,100	6,100	8,100	-30%
Oregon & California‡	10,300	6,400	6,700	6,800	9,300	-10%
Total Eastern Stock‡ (U.S. area only)	19,300	16,700	17,000	22,600	23,900	+24%

Sources:

- Loughlin, T.R., A.S. Perlov, and V.A. Vladimirov. 1992. Range-wide estimation of total abundance of Steller sea lions in 1989. *Marine Mammal Science* 8:220-239.
- Small, R.J., and D.P. DeMaster. 1995. Alaska marine mammal stock assessments 1995. NOAA Tech. Memo. NMFS-AFSC-57. National Marine Fisheries Service. 93p.
- Olesiuk, P., pers. comm., as cited in National Marine Fisheries Service. 1995. Proposed change in listing status of Steller sea lions under the Endangered Species Act. *Federal Register* 60(192):51968-51978.

Together, funding for Steller sea lion research by all sources was about \$2 million in 1997. With regard to population monitoring, the Service and the State of Alaska have undertaken studies to assess and monitor the condition, productivity, and survivorship of sea lions at selected rookeries, and to coordinate a series of biannual statewide or rangewide surveys. The last rangewide survey was conducted in 1994 and the last statewide survey in Alaska was conducted in 1996. A summary of counts of adult and juvenile sea lions at key trend sites in Alaska that have been monitored since the 1970s is shown in Table 5. In 1998 the Service plans to conduct another rangewide survey in cooperation with scientists in Russia and Canada.

Given the suspected role of prey availability in the decline, particular emphasis has been placed on stud-

ies to better define feeding patterns and food preferences, and to look for signs of nutritional stress. For example, the Service has undertaken studies of declining sea lion colonies in the Aleutian Islands and western Gulf of Alaska to identify prey preferences by collecting and analyzing scats and comparing fatty acids in prey species and sea lion blubber. It also has been monitoring the condition of pups using weights and blood parameters, and tracking individual animals by satellite telemetry to identify at-sea foraging areas.

The Alaska Department of Fish and Game has undertaken similar studies in southeastern Alaska where rookeries and haul-out sites have been stable to provide a basis for comparing patterns between areas that are stable or increasing and areas that are declining. The Marine Mammal Consortium has undertaken

research on captive as well as wild sea lions to assess energetic requirements, identify the effects of restrictions in the amounts and types of food on blood chemistry and body condition, compare scat remains from captive sea lions with known diets with those collected in the wild, and develop new telemetry techniques to monitor feeding activity based on changes in stomach temperature. Many other studies also have been undertaken by these groups over the past several years.

To ensure that research provides the best possible basis for management decisions, the Steller Sea Lion Recovery Team recommended early in 1995 that a series of workshops be held to identify and rank future research priorities in four study areas: behavior patterns of sea lions at haul-out sites and rookeries, satellite telemetry, physiology, and food and feeding ecology. The purpose of the recommended workshops was to review ongoing and past work to help plan and prioritize future research activities and provide a basis for updating the Steller Sea Lion Recovery Plan (see below). Among other things, the workshops were intended to evaluate research hypotheses and methodologies, evaluate whether ongoing projects are likely to address proposed hypotheses, evaluate how ongoing studies complement one another, identify needs for coordination among related studies, and make recommendations for continuing, modifying, or deleting specific studies.

Although the team recommended that the workshops take place in 1996, lack of money and a vacancy in the Service's Steller sea lion coordinator position delayed things until late in 1997 when the two workshops were held. The first was a behavior workshop held on 5-7 December, and the second, a workshop on telemetry studies, was held on 8-10 December. During the workshops, scientists presented study results and plans to a panel composed of members of the Steller Sea Lion Recovery Team and outside experts not involved in Steller sea lion research. The format was designed to provide an independent perspective on program priorities and needs.

At the end of 1997 findings from the two workshops were being prepared for submission to the National Marine Fisheries Service early in 1998. The results are expected to be factored into research plans

for the 1998 field season. Plans for the remaining two workshops on physiology studies and food and feeding ecology studies are expected to be held in the fall of 1998.

Steller Sea Lion Stock Assessments

In response to provisions added to the Marine Mammal Protection Act in 1994 to address interactions between marine mammals and commercial fisheries (see Chapter III), the National Marine Fisheries Service completed stock assessments for the eastern and western Steller sea lion stocks in 1995. Among other things, the new provisions require that stock assessment reports, which are required for every marine mammal stock in U.S. waters, estimate the minimum stock abundance, calculate a potential biological removal level that could be taken annually from a stock (not including natural mortality) and still allow it to increase towards its optimum sustainable population level, and estimate the current level of human-caused mortality and serious injury.

To calculate the potential biological removal level, the Service multiplies the minimum population estimate by the maximum theoretical net productivity rate for the species and a safety factor. For populations that are declining, such as Steller sea lions, the Commission expressed concern about using the maximum theoretical net productivity rate and instead recommended that the current net productivity rates be used. However, the Service has not adopted this recommendation.

The 1995 stock assessment for the eastern Steller sea lion stock concluded that the minimum estimate of stock size was 23,900 sea lions, the potential biological removal level was 1,059 animals per year, and the recent level of human-caused mortality was eight sea lions per year (including four killed in commercial fisheries and four by Native subsistence hunters). The assessment report for the western stock stated that a minimum estimate of stock size for western Alaska was 42,536, the potential biological removal level was 766 animals per year, and the number of human-related deaths per year was 555 animals, including 41 sea lion deaths resulting from commercial fishing operations and 514 animals taken in Native subsistence harvests.

Table 5. Counts of adult and juvenile Steller sea lions at rookery and haul-out trend sites in seven subareas of Alaska during June and July aerial surveys, 1976-1997

Area	1976	1979	1985	1989	1990	1992	1994	1996	1997	Percent Change since First Count
Eastern Stock										
Southeast Alaska	—	6,376	—	8,471	7,629	7,558	8,826	8,281	—	+30%
Western Stock										
Gulf of Alaska										
Eastern	7,035	—	—	7,241	5,444	7,558	3,369	2,131	—	-70%
Central	24,678	—	19,022	8,552	7,050	6,273	4,520	3,913	3,352	-86%
Western	8,311	—	6,275	3,908	3,915	3,734	3,982	3,738	3,633	-56%
Aleutian Islands										
Eastern	19,796	—	7,505	3,032	3,801	4,839	4,421	4,714	—	-76%
Central	—	36,232	23,042	7,572	7,988	6,399	5,790	5,428	—	-85%
Western	—	14,001	—	—	2,327	2,869	2,037	2,189	—	-84%

Sources:

Sease, J.L., J.P. Lewis, D.C. McAllister, R.L. Merrick, and S.M. Mellow. 1993. Aerial and ship-based surveys of Steller sea lions (*Eumetopias jubatus*) in Southeast Alaska, the Gulf of Alaska, and Aleutian Islands during June and July 1992. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-17. 57p.

Strick, J.M., L.W. Fritz, and J.P. Lewis. 1997. Aerial and ship-based surveys of Steller sea lions (*Eumetopias jubatus*) in Southeast Alaska, the Gulf of Alaska, and Aleutian Islands during June 1994. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-AFSC-71. 55p.

National Marine Fisheries Service unpublished data.

During 1997 the Service drafted revised stock assessments that were expected to be circulated for agency and public review early in 1998. At the end of 1997, it was the Commission's understanding that the draft revised assessment for the western stock of Steller sea lions had not incorporated the results of stock surveys since 1994. As a result, it understood that the estimated stock size and potential biological removal levels in the revised assessment for the western stock were unchanged from those in the 1995 assessment despite new information indicating that the stock size had decreased significantly since 1994.

Workshop to Assess Steller Sea Lion Management Measures

As part of its proposal to change the status of Steller sea lions under the Endangered Species Act, the National Marine Fisheries Service requested comments on the adequacy of existing regulations to protect Steller sea lions. In this regard, the Commission's 11 January 1996 comments noted that, while it was not clear how effective fishing regulations have been in protecting sea lions, the continuing decline of the western stock indicates that they have not been adequate to halt the decline. The Commission there-

fore concluded that the most effective way to develop and evaluate appropriate fishery management measures may be through an experimental approach whereby different regulations or management measures are applied to different haul-out sites and feeding areas. To consider optional approaches in this regard, the Commission recommended that the Service convene a panel of independent experts to evaluate and make recommendations on the full range of fishery management practices that may be useful for reversing the decline of Steller sea lions.

In April 1996 the Service convened a meeting to plan such a workshop, and on 6-7 May 1997 it convened a panel of independent marine scientists and resource managers to develop an experimental design for evaluating the effectiveness of existing management measures to protect sea lions and their feeding areas. While the primary objective of the workshop was to consider experiments to test the efficacy of exclusion zones around major rookeries and haul-out and feeding areas, other experiments were also to be considered, such as tests of the effect of fisheries on prey availability. At the end of 1997 the Service was expected to release the panel's findings early in 1998.

Updating the Steller Sea Lion Recovery Plan

In 1988 the Marine Mammal Commission published a series of species accounts with research and management recommendations for 10 marine mammal species in Alaska, including Steller sea lions (See Lentfer 1988 in Appendix B). The purpose of the accounts was to summarize species-specific information that the National Marine Fisheries Service and the Fish and Wildlife Service could use as a basis for developing research and management plans on individual species in Alaska. Since then, the two agencies have developed conservation plans or recovery plans for about one-half of those species. Among the plans that have been developed is a recovery plan for Steller sea lions drafted by the Steller Sea Lion Recovery Team and adopted by the National Marine Fisheries Service in 1991.

During the Steller Sea Lion Recovery Team's meeting on 3-4 April 1997, the team concluded that the recovery plan should be updated to reflect new information and priorities that have been developed

since the initial plan was drafted. During the Marine Mammal Commission's annual meeting on 18-20 November 1997, representatives of the Service expressed their support for the team's efforts to update the plan. As noted above, the series of research workshops recommended by the recovery team are expected to provide an important basis for updating the plan. The recovery team expects to begin drafting a revised plan soon after that series of workshops is completed.

As a related matter, given the large amount of new information on Steller sea lions developed soon after the Marine Mammal Commission published its series of Alaska species accounts in 1988, the Commission in 1991 contracted for an update of its account for Steller sea lions. The update was not completed and a new contractor, working with the original contractor, expects to have the revised species account ready for review early in 1998, and publication is expected later that year. Along with the results of the series of workshops discussed above, the report should form a solid basis for revising the recovery plan.

As of the end of 1997 it appeared likely that an update of the recovery plan would be done late in 1998 or early in 1999.

Steller Sea Lion Subsistence Harvests

Steller sea lions are hunted by Alaska Natives in several coastal villages for subsistence purposes. Prior to the early 1990s little information was available on the numbers of sea lions taken by Alaska Natives. Therefore, to develop information on the subsistence hunt of Steller sea lions, as well as harbor seals, the National Marine Fisheries Service contracted with the Alaska Department of Fish and Game to conduct interviews with Native hunters in more than 60 coastal villages throughout the species' range. The interviews have been conducted annually since 1992.

The survey results suggest that the subsistence take of Steller sea lions has decreased steadily in recent years from an estimated 549 animals in 1992 to 339 in 1995. More than 90 percent of this take has occurred in areas occupied by the western stock, with Native hunters on the Pribilof Islands taking between 20 and 55 percent of total statewide catch. Interview

results regarding hunting effort in 1996 again indicated that few animals are taken from the eastern stock. The estimated subsistence harvest for all areas of Alaska except the Pribilof Islands was 140 sea lions. For the Pribilof Islands, however, information suggests that take estimates based on the interview data significantly underestimate the number killed, and thus, the statewide estimate of subsistence take for 1996 remains uncertain. At the end of 1997 results of harvest interviews in 1997 were not yet available.

Native subsistence harvests from the eastern stock of Steller sea lions are far below the potential biological removal level calculated by the National Marine Fisheries Service. However, harvest estimates from western Alaska are close to the calculated potential biological removal level for the western stock and hunting pressure has been focused at a relatively few haul-out sites. Also, there is concern about takes from the western stock because it is heavily impacted by factors other than direct human-caused mortality.

Recognizing the interest and role of Alaska Native hunters in conserving Steller sea lions, the Service has worked closely with them on sea lion conservation efforts. Among other things, Service officials met with Native sea lion hunters on the Pribilof Islands in August 1996 to discuss hunting practices that would minimize adverse impacts on sea lions. During the Marine Mammal Commission's annual meeting on 18-20 November 1997, it was noted that guidance on appropriate sea lion hunting practices had been developed by hunters on the Pribilof Islands, but the suggested practices had not yet been fully implemented. In May 1997 the Service also met with Native hunters to discuss development of a co-management agreement for Steller sea lions.

As noted in Chapter V, an umbrella agreement was signed in 1997 for developing a series of co-management agreements between the Service and various Native groups on the conservation of several species of marine mammals in Alaska. Although discussions were initiated on a co-management agreement and a Native commission on Steller sea lions in 1996, little progress was made in 1997 to bring these efforts to fruition. During the Commission's annual meeting in November 1997, the Service indicated that further meetings with Native representatives were planned.

Northern Fur Seal (*Callorhinus ursinus*)

Northern fur seals occur in coastal waters of the North Pacific Ocean from southern California to Japan and in pelagic waters from about 35°N latitude to the central Bering Sea (Fig. 6). About three-fourths of all northern fur seals breed and pup on St. George Island and St. Paul Island in Alaska's Pribilof Islands. Elsewhere, northern fur seals breed and pup in Russia on the Robben, Kuril, and Commander Islands. Small rookeries are also found on Bogoslof Island in the central Aleutian Islands and San Miguel Island off southern California. When not on these islands, northern fur seals usually are found at sea feeding. Many pups remain at sea for up to 22 months once they leave their natal rookery. Fur seals display a high degree of natal site fidelity, usually returning to their colony of birth to breed and molt.

Northern fur seals were harvested commercially for their pelts beginning in the late 1700s. By the 1800s excessive pelagic harvests of males and females of all ages threatened the species' economic and biological viability. As a result, the principal harvesting nations — Canada, Japan, Russia, and the United States — signed the Fur Seal Treaty of 1911. The treaty banned pelagic harvests in lieu of arrangements to share pelts from a managed onshore harvest of sub-adult male seals taken on U.S. and Russian rookeries. By limiting the harvest to sub-adult males, fur seal numbers were able to increase substantially over the next 30 years.

The treaty lapsed during World War II, and by the early 1950s the Pribilof Islands fur seal population had grown to about two million animals — a number thought to be at or near its pre-exploitation size. Beginning in 1956 some females as well as juvenile males were taken. This action was taken under a wildlife management theory prevailing at the time which predicted that, after an initial decline in fur seal numbers, pup production and survival would increase as the population attempted to compensate for animals removed by the harvest. This harvest strategy was continued under the Interim Convention for the Conservation of North Pacific Fur Seals, signed in 1957 by the four signatories to the former treaty.



MARINE MAMMAL RESEARCH

A Newsletter of The North Pacific Universities Marine Mammal Research Consortium

No. 3, 1997

Steller Winters

When a 16-oz can of pork and beans is kept cold enough, long enough, it explodes with a noise like a pistol-shot, scattering little bean-pellets everywhere, and leaving behind shrapnel-like fragments of torn metal. That discovery was but one of the pieces of scientific data brought back by Consortium researcher Boyd Porter. Porter spent three of 1996's coldest months camped out in below freezing temperatures on a small chunk of rock with the disingenuous name of Timbered Island, located a few kilometers off the coast of southeast Alaska.

Porter's presence on the island was deliberate. He was there to observe the wintertime behaviour of a herd of adult and juvenile Steller sea lions. His discovery of the explosive properties of 16 oz tins, however, was entirely inadvertent. "I couldn't get the propane heater going," explains Porter. "I'd get it lit and think – thank God, now I can go to sleep – and then I'd watch the flame sputter out again."

The heater, the tin cans, the 8x10 cabin in which Porter slept, even Porter himself had all been transported to the remote site via ship and helicopter. No plans had been made for a re-supply drop. When he put in a radio call the next day for a replacement part for the heater, his supply team could only promise to do their best. Six weeks passed before he got the part, air-dropped in a Rubbermaid container.

Despite the difficulties Porter – a burly 6 ft tall Alaskan – doesn't like to dwell too much on the discomforts of winter field work. "No one would ever want to do a winter field study again if I told what it was really like," he says. No one had ever done one before him for the obvious reason that spending extended time on the exposed Alaska coastline when the storms of winter come whipping unchecked across the Pacific can be an uncomfortable, even dangerous pastime.

And a vitally important one.

The Steller sea lion of Alaska has been in steep decline for nearly two decades. Over 75% of the



Steller sea lions give birth to a single pup in June. Some pups will remain with their mothers for up to three years.

animals have disappeared since 1980. "It's thought by many researchers that understanding juveniles is critical to unraveling the decline," says Porter. Population models have suggested that a poor survival rate among juvenile Stellers may be what is driving the population decline. The period during which the young Stellers switch from a diet of mother's milk to fish is thought to be especially critical. But until Porter began his study, no one had ever gone out to observe Stellers during the coldest, darkest half of the year when these events take place. "As far as we knew the animals were simply dying off during the winter," says Porter. "That, along with gathering natural history information about the winter ecology was the reason we began this whole study."



An aborted fetus discovered in January at a winter haulout site.

During his months on Timbered Island, Porter didn't discover any mysterious mass mortality of juvenile Stellers, but he did observe a high incidence of aborted fetuses. "The high abortion rate leads you to wonder whether the problem with Stellers is not that they are dying young, but that they are not being born in the first place," says Porter.

Reproductive failure aside, Porter has also uncovered a critical fact about winter behavior patterns that few Steller researchers had suspected: juvenile Steller herds are extremely skittish in winter. In the summer, Steller sea lion herds are generally quite tolerant of human disturbance, the result in Porter's view of the presence of a relatively high number of mature animals. On the winter haulouts, however, there is a much higher proportion of juvenile animals.

Porter observed one site that was home to approximately 60 adult females and 150 juveniles. Almost anything, says Porter, was enough to scare the herd. "Even an eagle flying overhead would cause the juveniles to panic and stampede towards the water. The adult females don't know what's going on and they don't wait to find out. In an instant, one massive stampede is underway, leaving the haulout bare."

Unlike summer animals, the winter animals will often not return to the haulout for days. Porter had come equipped with a number of ways of marking the Stellers, including paint pellets launched by a heavy-duty slingshot. But the skittishness of his subjects forced him to reconsider, for fear of driving off the animals for good. Fortunately, the Alaska Department of Fish and Game had some years earlier branded 800 pups on rookeries (breeding sites) some 200 kilometers to the south. As many of

these animals showed up at Porter's site he was able to use the markings to identify the animals in his study of such basic biology as wintertime activity budgets and nursing patterns.

Porter's original intention had been to compare this data — collected in Alaska's southeast where Stellers are thriving — with similar information collected at sites at Cape St. Elias and Marmot Island in the Gulf of Alaska, where Stellers have declined. It was hoped that comparing the two populations would yield some clues as to what is driving the Steller decline. Unfortunately, attempts to capture Stellers at the Marmot Island field site by an independent group of researchers changed those plans. The process of attaching satellite packs so spooked the young Stellers that they never returned in force to Porter's research site.

All is not lost, however. In January, 1997, a team of Consortium researchers returned to Marmot Island in the area of the decline to gather wintertime data on juvenile Stellers. "My first job [after they get back]," says Porter, "will be to take the data they gathered using my protocols and do the comparison and see if I can figure out what's driving the decline."

Porter's groundbreaking work on winter Steller ecology will also help establish a solid baseline for all future work "A lot of graduate work," says Porter, "is kind of like an exercise to prove that you can do science. It's kind of nice to know that this," he says pointing to the stacks of collected data on his desk, "will be used in a lot of work to come."

Boyd Porter: tracking individual Steller sea lions from dawn to dusk at one of Timbered Island's winter haulout sites.



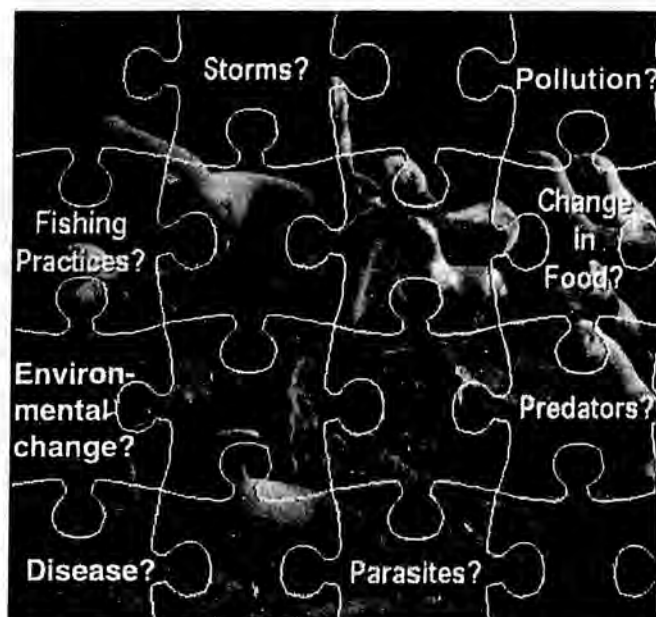
Ecosystem Puzzles

One of these things is not like the other. This old Sesame Street strategy forms the basis of a surprising amount of scientific research, including a study recently completed by University of Washington researcher Dr. Michio Shima. Shima compared the Gulf of Alaska with three similar ecosystems – the Barents Sea, the California Current, and the Benguela Current off the southwest coast of Africa – to see if it would help shed some light on the mysterious decline of Alaska's Steller sea lion population. Seals and sea lions are currently abundant in all of these ecosystems, except in the Gulf of Alaska. "I wanted to figure out what made the Gulf of Alaska unique in terms of some factor that could be causing the decline of Steller sea lions."

The presence of a large commercial trawl fishery was an obvious suspect, if only because the onset of the Steller population's decline coincides almost exactly with the expansion of the shore-based trawl fishery in the Alaskan Gulf. Shima's research, however, found that a large commercial fishing fleet is something all four ecosystems share. "If anything," says Shima "the rates of exploitation in the Gulf of Alaska are actually on the lower end of the scale in comparison with the Barents Sea and Benguela Current." She also found that direct interactions in the Gulf between Stellers and fishing boats were negligible in comparison with the other ecosystems.

So Shima turned her attention to environmental variables. A variety of evidence, including air and water temperature, atmospheric dust levels, CO₂ concentrations and ice cover suggests that the Gulf of Alaska and indeed the whole North Pacific experienced a stepwise environmental shift sometime in the late 70s. Perhaps most significantly for Stellers, arrowtooth flounder populations have increased dramatically since that time, even as the Steller sea lion population has declined. Arrowtooth flounder feed on pollock and capelin – known prey items for Stellers – so it's possible that the flounder are out-competing the Stellers for food. However, Shima's modelling work has shown that the abundance of pollock is sufficient to feed both Steller sea lion and arrowtooth flounder populations.

In any case, shifting environmental patterns are not unique to the Gulf. They too, are another thing all four ecosystems share. "Looking at environmental patterns and trends, all of them have gone through



Why Steller sea lions are disappearing throughout most of Alaska remains a puzzle.

changes between warm water and cold water regimes."

In fact, the only really significant difference Shima discovered was the undifferentiated nature of fish species in the Gulf. "I did a comparison of total biomass in the Gulf, and it's certainly not lacking in biomass." What is lacking is variety. "There isn't the same kind of small prey switching in the Gulf as there is elsewhere," says Shima. In the Barents Sea for example, there is a pretty regular variation over time between cod, herring and capelin stocks. The Barents Sea harp seal population switches opportunistically between these prey species, taking whatever is most readily available. "You don't see that with Stellers," says Shima. "Their dominant prey resource has remained pollock over the past two decades."

Preliminary research results from Consortium researcher Dr. David Rosen suggest that an all-pollock diet may not be especially healthy for Stellers. However, pollock have never constituted the entire Steller diet, and Shima's modelling results indicate that the abundance of pollock is sufficient. What is less clear is whether the decline of Steller sea lions could be related to small scale changes in the distribution of pollock. Now a post-doctoral fellow at the University of Washington, Shima is continuing her research into possible mechanisms for these changes, still looking for that one thing that is not like the other.

Northern Fur Seals

For over a century the northern fur seal was a veritable gold mine, earning sealers thousand of dollars annually until the stocks were critically depleted. Today, seventy years after the unregulated hunt ended, the fur seal is once again yielding up wealth, this time in the form of scientific information. Like the Steller sea lion, the fur seal has been hit by a mysterious population decline. Fur seal populations have been halved since the mid 1950s. Unlike the non-commercial Steller, however, the commercially valuable fur seal has been studied for over a century.

"There's just a wealth of data on this animal," says Consortium Director Dr. Andrew Trites. In revisiting this data to see if it could shed any light on the Steller decline, Trites uncovered a relationship between seal body length and the total seal population that seems to indicate that the current fur seal population may be the maximum sustainable in today's Bering Sea ecosystem. "Today's population appears to be at carrying capacity, which is half of what it was 40 to 50 years ago," says Trites.

Before any solid conclusion can be drawn, however, some gaps in the data need to be filled in. Trites hopes to use an innovative technique that involves examining the teeth taken by fisheries officials from fur seals over the past century. "Fur seal teeth contain a series of annual growth rings, much like the rings of a tree," says Trites. "Wider rings mark years of high growth and good feeding conditions. Comparing the growth rates from one year to the next may allow us to assess annual changes in the productivity of the North Pacific Ocean, as well as determine if an ecosystem shift occurred in the mid 1970s." Such a gold mine of information locked within each tooth contains a potentially important story about what has happened to the northern fur seals and the other species that share the North Pacific.

What's for Dinner?

As part of its ongoing work to determine the cause of the Steller sea lion decline, Consortium researchers from the University of Alaska will try this summer to assess the types and relative abundance of fish available to sea lions at Forester Island in Southeast Alaska, where Stellers are thriving. Other researchers from the University of British Columbia will track sea lions at sea using satellites to find out where and when they feed. They will also determine what the sea lions chose to



Most of the world's population of northern fur seals are born in July on the Pribilof Islands in the Bering Sea.

eat by identifying the bones of fish found in the sea lion scats (feces) left on the rocks. The data from this survey will be compared to data from a similar study conducted in the Gulf of Alaska where Stellers are declining. These studies provide a critical opportunity to test the hypothesis that prey availability is not adequate to support sea lions throughout most of their range.

Other Studies

Consortium researchers continue to study the nutritional needs of Steller sea lions housed at the Vancouver Aquarium. They will soon begin constructing a bioenergetics model to predict the food requirements for sea lions in the North Pacific, and plan to use an ecosystem model to determine whether the ecosystem shifted to lower levels of carrying capacity in the mid 1970s. Plans are also underway to study the role that disease and reproductive failure may be playing in the decline of Stellers. Results of these and other studies carried out by researchers at Oregon State University, and the Universities of Alaska, British Columbia and Washington will be highlighted in future newsletters.

PUBLISHED BY

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MARINE MAMMAL RESEARCH

A Newsletter of The North Pacific Universities Marine Mammal Research Consortium

No. 2, 1996

Sea Lion Pills

The island of Yunalaska rises out of the Bering Sea about mid-way along the Aleutian archipelago, smack in the middle of the region where Steller sea lions first began disappearing over 15 years ago. On June 5, 1996, the research vessel Provider was nosing its way slowly in toward Yunalaska's sheer basalt cliffs, looking for a place to anchor. Consortium researcher Russ Andrews – aboard a second research vessel in Alaska's southeast – later spoke with eyewitnesses about what happened next.

"They were only about 100 feet from the rocks," says Andrews, "when the skipper tried throwing the boat into reverse. Nothing happened." Reverse was jammed, or broken. There was no room to turn around. Ocean swells soon carried the little boat to the cliff face, and slammed it against the rocks with a crunch that sounded the death knell for the 1996 field season.

The National Marine Fisheries Service (NMFS) had chartered the Provider so that Andrews and other researchers could further investigate the mysterious decline in Steller sea lion numbers that has seen two-thirds of the Alaskan population disappear since 1980. The Alaska Department of Fish and Game had chartered a second vessel so that identical studies could be conducted at the same time in Southeast Alaska, where Stellers are thriving. In preparation for the voyage, Andrews had packed up several gallons of marine epoxy, and a small electronics shop worth of telemetry gear. Thus armed, he planned to take a shot at a question that scientists, wildlife managers, and fishermen had been asking since the decline began: namely, is it food?

The idea that Stellers weren't getting enough to eat was one of the first hypotheses put forward by scientists after the Steller decline was discovered in the early 80s. A symposium entitled *Is it Food?*, was held at the University of Alaska in 1991. Some researchers believed that the expansion of the Bering sea trawler fleet might have reduced available fish stocks. Others felt a longer term shift in the ecosystem might be responsible.



Steller sea lions: where do they feed and are they getting enough to eat? To answer these questions some sea lions are carrying satellite tracking tags and stomach temperature pills.

The most direct way of testing this hypothesis was to compare the foraging patterns of animals from the declining populations in the Aleutians and Gulf of Alaska with those in the flourishing populations in the Southeast. Unfortunately for researchers, Stellers invariably forage underneath many feet of cold, dark ocean. At the time they were declared threatened, no one was sure how to monitor exactly where and when they were feeding. Enter Russ Andrews.

While working on his Ph.D. at the University of British Columbia, Andrews developed a telemetry system for elephant seals that, among other data, was capable of recording stomach temperature. It had immediate applications for research with Stellers. "When I first got into this stomach temperature stuff," says Andrews, "it was mostly for getting a look at what is the body temperature of elephant seals out at sea. Then as kind of a byproduct of that I thought, hold on, we can use this to look at foraging



Female number 122 (sprayed on with hair dye) with a foraging data logger.

as well. So when the sea lion crisis came along, to me it was the perfect tool to use to try to answer the question, Is there something different between the stable and declining populations in terms of food availability?"

Answering that question, Andrews explains, really means coming up with answers to a number of smaller questions. "You need to know whether animals in the declining population have to spend more time getting their food; if they have to work harder; if they're getting less food. You need to know when are they getting food and how much food they are getting. This was the perfect tool to look at those things."

A tool that could provide data on where and when Stellers forage would be extremely valuable to wildlife managers faced with identifying critical habitat, a task that became mandatory after Stellers were declared threatened in 1990. It would also be useful to scientists trying to develop more accurate models of Steller sea lion energetics.

Even the perfect tool, however, requires a little R & D – Research and Development. In fact, Andrews spent many months crouched over circuit boards improving his existing telemetry system and adapting it for use with Steller sea lions. The result was an innovative two-part telemetry system. One part, called a foraging data logger (FDL), is designed to be epoxied onto the fur on the sea lion's back. It samples and stores data such as dive depth and water temperature, time, body temperature and swim velocity. When the sea lion is on the surface, the FDL also links up with a satellite to determine the animal's position. Finally, the FDL records a signal coming from the second part of the telemetry system, a twinkie-sized titanium cylinder called a stomach pill.

The sea lion swallows this component whole. The pill then gives off a signal with a frequency that varies with the temperature of the animal's stomach. Knowing the stomach temperature, it becomes possible to determine not only when but also how much a sea lion has been eating.

Ordinarily, the temperature of a warm-blooded Steller's stomach is the same as the rest of the animal's core. However, when the sea lion ingests one or more fish, the stomach temperature drops rapidly until it is fairly close to that of the cold-blooded prey. It then slowly rises again as the ingested prey warms up, eventually returning to the original core temperature. Thus, a large sudden drop in stomach temperature indicates a feeding event. The magnitude and duration of this drop in temperature is proportional to the amount of food ingested.

To calibrate the device, Andrews has been working with the captive Stellers at the Vancouver Aquarium. In a series of trials, animals harnessed with the telemetry system are fed known amounts of fish, and their stomach temperature curves recorded (see photo on opposite page). When the trials are completed in 1997, it should be possible to determine exactly how much a given Steller has eaten, just by looking at the stomach temperature graph.

Even now, field tests of the system have yielded some valuable results. In 1994, Andrews conducted trials on Alaska's Forrester Island with seven 7 mature females. Three of the devices were never recovered, but the remaining four yielded data for foraging trips that lasted from 8.5 to 50 hours. The results were surprising. "Until I did my work," says Andrews, "it was just sort of assumed that the animals were feeding the whole time they were underwater." The results, however, showed that Stellers sometimes search for up to 6 hours before successfully capturing prey.

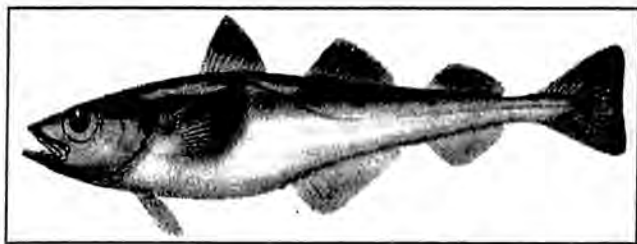
If the behavior of these four animals sets the pattern for the entire population, then many of the previous models on sea lion activity budgets will have to be revisited. More data are needed, however, before a solid conclusion about foraging behavior can be drawn. That's why Russ Andrews will be back out there in June, 1997, hoping that this will be the year that the comparative feeding study can be completed, and that no unforeseen events will ground this year's attempt.

The Problem with Pollock

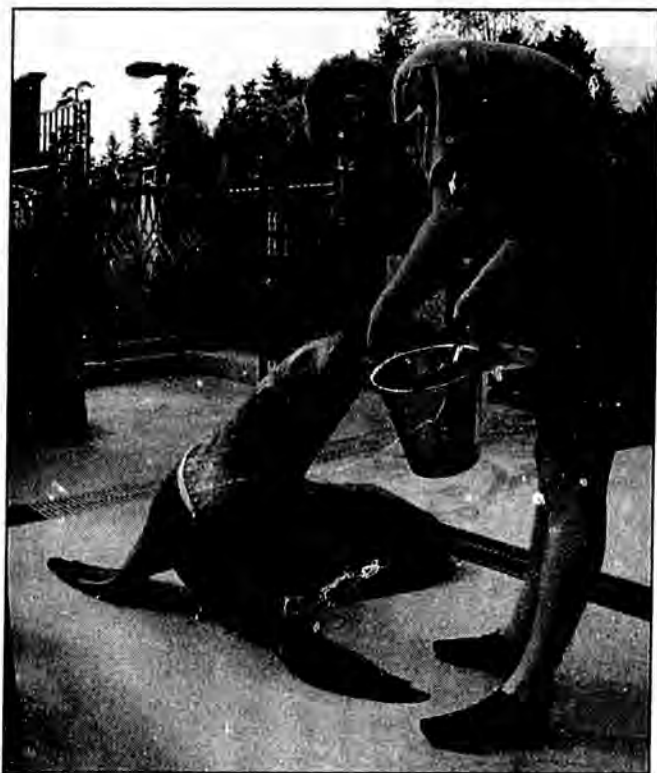
If you're a sea lion, pollock makes a lousy meal. That's suggested by the data from a number of captive feeding trials conducted at the Vancouver Aquarium by Consortium researcher Dr. David Rosen. During one trial, captive sea lions were fed exclusively on pollock, and despite the fact the sea lions were fed essentially ad lib – meaning they could eat as much as they wanted – the Stellers actually lost body mass. "You're talking 16 to 18 kilograms in only two weeks," says Rosen. "That's a major loss of weight for an animal that only weighs about 100 kg."

Rosen was particularly surprised that the sea lions weren't able to compensate in some way for the low energy diet. In a separate trial currently underway, Rosen has found that when Stellers are fed exclusively on squid – another low-energy food – they attempt to compensate by reducing their basal metabolism by as much as 25%. In spite of this, the squid-fed Stellers also lost weight. Trials with pollock haven't yet been completed, but Rosen expects the results to be similar. The ability to slow metabolic rate down, even combined with a limitless supply of fish, does not appear to be enough to keep pollock-fed Stellers healthy.

"When you see a drop in body mass like that," says Rosen, "you know that something serious is happening to their physiology. They're probably doing everything they can to compensate, but they're just unable. So in a wild population, it's hard to imagine any adjustment they could make so that they could survive on a total pollock diet. They just wouldn't be getting enough energy."



Walleye Pollock: *Theragra chalcogrammus*



Woody, one of six young Steller sea lions participating in the dietary studies at the Vancouver Aquarium.

That Stellers fare poorly on pollock lends credence to the "popcorn of the sea" theory put forth some years ago by fisheries consultant Dr. Lee Alverson. A specialist in fisheries management, Alverson hypothesized that the Steller decline was due not so much to a lack of prey, but to the low energy value of that prey. Pollock is now the single largest prey species in the area of decline. The results from the feeding trials suggest that Stellers could be starving in the midst of all this apparent abundance, just like a person that tried to live exclusively on popcorn.

Dr. Rosen has also been working with the captive Stellers on a number of trials designed to investigate the efficiency with which Stellers make use of different prey species. His work has resulted in a report, entitled *Heat Increment of Feeding in Steller Sea Lions*, that shows that Stellers lose out twice by ingesting low energy food like squid and pollock. Firstly, because of the simple fact that they are getting less energy in total, and secondly, because low-energy food has a higher relative cost of digestion. It seems that for sea lions, a healthy life style does not include a low-fat diet.

Harbor Seal Declines

Like Steller sea lions, harbor seals have also declined in most regions of Alaska (as much as 90% in some areas). The only exceptions to these trends are in Southeast Alaska and Bristol Bay.

Genetic research has shown that there are two stocks of Steller sea lions in the North Pacific. One which is threatened (the eastern stock) and one that NMFS is proposing to relist as endangered (the western stock). The line that divides the two stocks is Cape Suckling, near Prince William Sound.

Under the supervision of Consortium director Dr. Andrew Trites, Theresa Burg has completed an analysis of the genetic structure of harbor seals in the North Pacific. Burg extracted mitochondrial and microsatellite DNA from harbor seal blood and tissue samples taken from different areas of Alaska and British Columbia. The differences she found suggest the presence of three separate populations: 1) Japan, Alaska and northern British Columbia, 2) southern British Columbia, and 3) outer coast of Washington, Oregon and California. Burg estimates the harbor seals originally invaded the Pacific by swimming through the Arctic from the Atlantic Ocean 670,000 years ago. She believes that a second invasion occurred 380,000 years ago and that glaciation and reproductive isolation account for the distinctness of the 3 populations.

Genetics has also provided Burg with insights into the limited movement of harbor seals between southern BC and northern BC / Alaska. Her results show an average of only 20 males and one lone female migrate between the two populations every 30 years. It seems that harbor seals just don't like to leave home!

Other Studies

A collaborative project is currently underway with Dr. Lorrie Rea on the physiological effects of decreased food intake. The goal of the study is to figure out what Steller blood test results should look like if sea lions are indeed nutritionally compromised in Alaska. Dr. Rea is a postdoctoral fellow with NMFS. She is measuring the blood metabolite levels, body mass, and blubber thickness of the captive Stellers at the Vancouver Aquarium as they are subject to periods of reduced food intake and fasting.



Pacific harbor seals: three populations of home-bodies.

Amy Hirons at the University of Alaska has been attempting to delineate long-term changes in the diet of Alaskan Steller sea lions by examining the ratios of stable isotopes in whiskers and archived organ tissues. Her results indicate that a large isotopic shift occurred in the North Pacific in the mid 1970s. It appears that sea lions are still feeding at the same trophic level today as in the past, but that a major change has occurred in the phytoplankton or plants that support the sea lion's food web. This supports the hypothesis that an ecosystem regime shift occurred during the 1970s. Reasons for the change and the impact on Steller sea lions are being investigated.

UBC researchers Linda Milette and Boyd Porter have been diligently compiling and crunching data from many months spent observing Steller sea lions in the wild. Their main goal has been to contrast the behaviors and energy budgets of sea lions in summer and winter, between declining and thriving areas of Alaska. Results of these and other studies carried out by researchers at Oregon State University, and the Universities of Alaska, British Columbia and Washington will be highlighted in future newsletters.

PUBLISHED BY
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MARINE MAMMAL RESEARCH

A Newsletter of The North Pacific Universities Marine Mammal Research Consortium

No. 1, 1996

A Killer Steller Puzzle

"ALL I HAD WITH ME THE FIRST TIME I FOUND A DEAD KILLER WHALE ON THE BEACH WAS A 4 INCH KNIFE," recounts researcher Kathy Heise, who participated in a year long study of the effects of killer whales on Steller sea lions in Alaska and British Columbia. Capped in a baseball hat to protect her hair, Heise cut into the rotting flesh while her husband, Lance Barrett Lennard, sat retching 50 feet upwind. For Heise, this opportunity to cut into a dead whale was a "rare gift" because of the wealth of information that lay within its stomach and tissues.

Back in the summer of 1992, another dead killer whale was discovered on the shores of Prince William Sound. Inside this whale's stomach, researchers found flipper tags from 14 Steller sea lions swimming in a soup of marine mammal parts. "For one whale to have contained so many tags was puzzling" says Heise. Did all killer whales eat this many sea lions? Could killer whales have caused the decline of Stellers in Alaska, or were they merely a contributing factor that might prevent the depleted sea lion population from recovering?

With these concerns in mind, a collaborative study was initiated by a team of researchers from the University of British Columbia (Lance Barrett-Lennard and Kathy Heise), Fisheries and Oceans Canada (Graeme Ellis), and the North Gulf Oceanic Society (Eva Saulitis and Craig Matkin). The team surveyed mariners for accounts of predatory attacks on Stellers, compiled the available stomach content information, estimated killer whale abundance, and developed mathematical computer models to examine whether killer whale attacks could significantly affect Steller sea lion numbers. Their intriguing findings are contained in a recently released report titled "The impact of killer whale predation on



Dead killer whales, such as this one being cut up by Kathy Heise, provide valuable insights into what killer whales eat.

Steller sea lion populations in British Columbia and Alaska."

The whale cut up by Heise was one of only 22 killer whale carcasses found with stomach contents in the eastern north Pacific since 1973. Results summarized in the team's report show killer whale stomachs contained either fish or marine mammals, but not both, which suggests specialized feeding. Of the 8 animals that had eaten marine mammals, all had consumed harbour seals, 3 had also eaten porpoises and whales, while 2 had birds and sea lions (including the Steller tags), and one was also digesting an elephant seal.

That some killer whales eat marine mammals, while others dine only on fish, agrees with what scientists have learned about killer whales in the North Pacific. In fact, based on differences in diet, social structure, fin shape, and acoustic behaviour, researchers have split the killer whales of British



Flipper tags from 14 Steller sea lions found in the stomach of a dead killer whale that washed ashore in Prince William Sound in 1992.

Columbia, southeast Alaska and Prince William Sound into two distinct populations: fish-eating residents and mammal-eating transients. Transients are typically seen alone or in small groups of 2 to 10 individuals, and will often travel and hunt silently near shore. Residents, on the other hand, are found in larger groups, spend more time in open water, use echolocation frequently, and do not exchange individuals with other resident groups.

An additional group of whales was recently identified and tentatively called offshores. They have been observed feeding on fish, and have usually been sighted well off the mainland coast near the edge of the continental shelf. Offshores are generally found in large, vocally active groups of 30 to 60 individuals, and have not been seen associating with either resident or transient whales. Little is known about the diets of these offshore whales.

Transients then, are the only kind of killer whales known to feed on Steller sea lions. Using published and unpublished collections of killer whale identification photographs held by the North Gulf Oceanic Society (Homer, Alaska), Fisheries and Oceans Canada (Nanaimo, B.C.), and the US National Marine Fisheries Service (Seattle WA), the research team identified a total of 170 transient whales between northern Washington and southeast Alaska. A further 88 were identified in western Alaska, for a total of 258. This compares to an estimated 200 offshore and 364 resident killer whales identified in British Columbia and southeast Alaska.

To find out if the one transient killer whale with so many sea lion flipper tags in its stomach was the

norm or an exception, the research team distributed questionnaires to mariners along the North Pacific coast asking if anyone had witnessed interactions between killer whales and Steller sea lions. Returns from 126 mariners reported 492 incidences, of which 32 (6.5%) resulted in definite kills. Attacks on sea lion pups were witnessed rarely, although killer whales often were reported near sea lion rookeries.

The research team took the results from the questionnaire, stomach analysis and whale census, and used them to develop a mathematical model of the effects of killer whale predation on sea lion populations. The model indicates that killer whale predation may account for a significant portion of the total annual mortality of sea lions in Alaska and British Columbia. When sea lion populations exceed 100,000, the effects of killer whale predation on sea lion dynamics appears minimal. However, at levels of 50,000 sea lions or fewer, the effects are more significant, and may even be sufficient to drive a population decline.

"Killer whales did not cause the sea lion decline" notes Heise, but adds that "they may now be a significant contributing factor." Indeed, the mathematical model suggests that as many as 18% of the sea lions that die each year in Alaska are taken by killer whales. What is killing the other 82% of the missing Steller sea lions is anybody's guess at this time, and the subject of much debate and considerable research.



Researchers are able to identify individual whales from photographs of their dorsal fins and saddle patches.

Steller Sea Lions: ENDANGERED?

AS RECENTLY AS 1980, THE EXPOSED ROCKS AND ISLANDS ALONG THE PACIFIC RIM, FROM CALIFORNIA TO JAPAN, WERE HOME TO OVER 300,000 STELLER SEA LIONS. Since then, the population has declined to fewer than 100,000. No one knows why. Only in Oregon, British Columbia and southeast Alaska have Steller sea lion numbers remained healthy.

As a result of the overall population decline, Steller sea lions were declared a threatened species in their U.S. range in 1990 under the Endangered Species Act. The National Marine Fisheries Service (NMFS) is now proposing to uplist the sea lions that breed along the Kenai Peninsula and Aleutian Islands from *threatened* to *endangered*. The notification published in the U.S. Federal Register on October 4, 1995 proposes that the species be relisted as two distinct populations, with those east of Prince William Sound (144 °W) maintaining a *threatened* listing, while those to the west are relisted as *endangered*.

Dr. Andrew Trites and Dr. Peter Larkin from the University of British Columbia recently reviewed the proposal to reclassify Steller sea lions. They support the proposal to separate the population into two distinct segments. However, they disagree with the proposed reclassifications. Based on the available scientific information, Trites and Larkin believe that the western stock should remain listed as threatened and should not be changed to endangered at this time. The increasing eastern stock should be delisted.

There are 38 major rookeries and over 250 haulouts in Alaska. Most are on remote and exposed rocks and islands. The animals at each rookery site can be thought of as discrete populations. Tagging and branding studies show that the majority of marked pups return to their rookeries of birth as breeding adults. Stronger evidence for the discreteness of rookery populations also comes from genetic samples, and indicates a break in the breeding distribution along the Yakutat region of Alaska.

Except at the periphery of its range in California, all of the eastern populations are stable or increasing, and all appear to be healthy and larger



than in the past few decades. Trites and Larkin dispute the four reasons cited by NMFS for maintaining the healthy eastern stock as threatened, noting that there is "insufficient justification". "If this population is threatened then so are almost all other free ranging, wild populations" say the authors. "They are not threatened and should therefore be delisted".

The NMFS proposal to reclassify the western stock as endangered is based on two key arguments: 1) negative trends in population monitoring data, and 2) extinction predictions from a population viability analysis. Census counts from all regions of the Aleutians and Gulf of Alaska show an overall downward trend. However, the decline appears to have slowed or stopped within 4 of the 7 regions that make up this area. As for the technique used to foretell the demise of Steller sea lions, it is misleading and does not actually assess the viability of the population. In fact, it can only yield one inevitable outcome, extinction, for all populations that experience a period of decline. Trites and Larkin note that "if this type of analysis was extended to humans, then based on recent trends, world population is headed for infinity, and everyone will be unemployed."

Endangered classification should only be applied to those species that are truly at risk of extinction, say the authors. "Such is not the case for Steller sea lions at present."

Fishing Near Rookeries

WHILE THE CAUSE OF THE SEA LION DECLINE IS NOT KNOWN, MANY PEOPLE HAVE BEEN QUICK TO ASSUME THAT FISHERIES MUST BE AT FAULT. Sea lions are believed to currently feed predominately on small to medium sized Walleye pollock, in addition to smaller amounts of Pacific cod, octopus, squid, salmon, Pacific herring, Pacific sand lance, capelin, flatfish, rockfish and Atka mackerel. One way to assess whether fisheries have had an adverse affect is to compare the rate of sea lion population decline with the amounts of fish caught near sea lion breeding areas.

To date, researchers have made at least three attempts to find a connection between fish landings and the sea lion decline. None have been successful. A fourth attempt was made recently by Dr. David Sampson of Oregon State University. In a report entitled 'An analysis of groundfish fishing activities near Steller sea lion rookeries in Alaska', Sampson notes that large winter catches of pollock occurred near sea lion rookeries that suffered large declines in the early 1980s. However, he also reported sharp sea lion declines in other areas in the late 1980s, where no winter catches of pollock occurred. Nor could he relate the declines to the amount of fishing effort, total catches of groundfish, or catches of Pacific cod and Atka mackerel.

It is not clear how to interpret the results of Sampson's study. Does it mean that fisheries removed pollock that were critical to the survival of sea lions during winter? Or, if the catch of pollock was proportional to the abundance of pollock, does it mean that there were many pollock present in relation to other preferred prey? If so, sea lions may not have been eating the best food. Pollock has been termed the junk food of the sea, because it may not be as nutritionally good for sea lions as fattier prey such as herring and mackerel.

Since 1991, new fishing regulations have ensured that no trawling occurs within 10 to 20 nautical miles of sea lion rookeries throughout Alaska; nor may any vessel approach within 3 miles of rookeries west of 150°W (Prince William Sound). "If the winter pollock fishery was connected to the sea lion decline, it should no longer be a factor," says Sampson. "However, the only way to really know would be to conduct an experiment that would exclude fishing in some areas and allow fishing



close to other rookeries, while carefully monitoring the sea lion population."

Other Studies

COMPARATIVE STUDIES ARE BEING CARRIED OUT IN SUMMER AND WINTER IN SOUTHEAST ALASKA (where sea lion populations are healthy) and near Kodiak Island (where sea lions are declining). In addition, studies are continuing on six captive Steller sea lions at the Vancouver Aquarium. Work is focussed on the amount of food the animals need, their ability to digest different prey types, and the development of new techniques to study sea lions in the wild. Analyses are also underway on diet, stress hormones in blood samples, behavioral differences in breeding populations, the development of criteria for classification of endangered species, and the development of mathematical models that explore whether the North Pacific has undergone an ecosystem shift. These and other studies conducted by researchers at Oregon State University and the Universities of Alaska, British Columbia and Washington will be highlighted in future newsletters.

PUBLISHED BY
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New Blood

Four new Steller Sea Lions pups now make their home at the Vancouver Aquarium and are working with researchers to help figure out why some of their brethren in Alaska are in such dire straits. The two males and two females – named Kodiak, Timber, Hazy and Sitka after haulouts in the Gulf of Alaska – arrived in late June, after being captured off Cape Scott near the northern tip of Vancouver Island. A mere 20 kilograms when they arrived, the pups have since grown to 60 kgs, progressing from formula to liquefied fish to solid herring.

Thanks in part to the knowledge gained by the Aquarium in raising young Stellers, animal health technician Gwyneth Shephard has had no trouble training the new arrivals to take part in several ongoing Consortium experiments designed to understand the energy requirements and the relationship between growth and the different types of fish they eat. Metabolic trials – under the direction of Consortium researcher Dr. David Rosen – are now an expected part of the pups' weekly routine while morphometric measurements – with trainers measuring the pups' length and girth – are conducted twice weekly, again with the pups' full cooperation.

The youngsters have also participated in three different fasting trials, adding greatly to researcher Dr. Lorrie Rea's store of data on Steller blood chemistry and the changes it undergoes in response to food limitation. Such studies have also helped to understand how these creatures adapt their metabolism to periods of low food intake. Active metabolic trials, where the animal's metabolic rate is measured while it exercises in a large swim mill, are planned for the coming months. The pups will also soon experience the chill of their natural seas. A newly installed water-refrigeration unit will enable Consortium scientists to study the effects of cold temperatures on energy demands (the equipment can bring the water temperature down to a frosty 35°F/1.7°C). The pups will also be taking part in a series of new experiments, including tracing hormone levels through saliva samples, the effects of swimming and diving on heart rate, and tests of their visual abilities.

According to Shephard, the pup's sheer trainability should allow Consortium researchers to greatly augment the data obtained working with the previous six Stellers. "We're getting a lot of information that just wasn't possible with the last group," says Shephard. Practice, it seems, makes perfect.



Kodiak, one of 4 new Steller sea lion pups that joined the research team this summer.

Other Studies

A trawl vessel was chartered to assess the types of fish and the relative quantities available to Steller sea lions near their major summer breeding area in Southeast Alaska. Consortium researchers also collected over 400 fecal samples to determine what sea lions were eating, and tracked 10 mature females at sea with satellite tags to determine where and when they were eating. This study will provide valuable insights into the foraging ecology of Steller sea lions and the role that food availability might be playing in the population decline.

Results from the captive feeding studies at the Vancouver Aquarium are being published in the scientific literature. One recently published paper looked at the amount of energy used to digest meals of different sizes (called the heat increment of feeding). Other studies being prepared for publication include the effect of squid consumption on sea lion physiology, the triggers of metabolic depression, and the much-anticipated results of the pollock diet experiment. Results of these and other studies carried out by researchers at Oregon State University, and the Universities of Alaska, British Columbia and Washington will be highlighted in future newsletters.

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Hormonal Surges

Dealing with hormones can be complicated. Just ask any adolescent. It becomes especially tricky when the hormones belong not to people, but to pinnipeds. Just ask Tania Zenteno-Savin. Her Ph.D. thesis – researched and written under the supervision of University of Alaska Fairbanks Professor Michael Castellini – examined the role played by hormones in the physiology of pinnipeds, including Steller sea lions. It was, according to Zenteno-Savin, not at all a simple undertaking. "These little molecules do so much, accomplish so many different things."

For her thesis, Zenteno-Savin focused in on three vasoactive hormones – AVP, ANP, and ANG II – found in the blood plasma. In humans and other mammals, these compounds perform a wide variety of functions: they moderate the resistance of blood vessels, and thus affect heart rate; they participate in the maintenance of water and electrolyte balance; they control to some extent the responses governing hunger and thirst; and they may even play a role in moderating mammalian learning responses. Most intriguing of all, these three hormones might also provide some insight into the ongoing decline of Steller sea lions.

Steller sea lion populations in the Bering Sea and western Gulf of Alaska have been declining since the early 1980s, and according to a 1996 census are now down to under 75,000 animals. A food supply problem is thought by many scientists to lie at the root of the decline, but field observations of Steller rookeries have reported animals that, to human eyes at least, appear completely normal.

In human beings, studies have shown that individuals suffering from eating disorders like anorexia and bulimia have elevated levels of certain blood hormones. Zenteno-Savin felt that Stellers suffering from nutritional stress might well manifest similar changes in their blood hormone levels. To test this hypothesis, she collected and analyzed blood samples from nearly 200 Stellers at various rookeries and haulouts in southeast and northwest Alaska.

Zenteno-Savin also worked with the captive Stellers at the Vancouver Aquarium to determine if either fasting or a food restricted diet had any effect on the animals' blood hormone levels. For the food restricted part of the experiment, 4 juvenile Stellers had their rations cut from 8 kg to 4 kg of herring



per day for a period of 4 weeks. Their blood was sampled before the dieting began and at weekly intervals as it progressed. For the fast, two Stellers were taken off food completely, though water and ice cubes were freely available. Blood samples were taken after 0, 3, 7 and 14 days.

Zenteno-Savin's results were tantalizing, but not completely satisfying. One of the blood hormones, ANG II, did seem to respond to changes in the captive sea lions' diets. ANG II levels more than tripled over the 14 days of fast (of the other two, AVP was unaffected, while ANP seemed to decline, but not significantly). On the surface, this would seem to indicate that blood hormones do provide some gauge of how well a Steller has been eating. Unfortunately, Zenteno-Savin's other work with blood hormone levels in the wild comes in and muddles things up again.

In wild Stellers, Zenteno-Savin found that ANG II levels seem to vary all over the scale, with the levels in animals in the thriving southeast actually coming in higher than in the Aleutians. As well, though ANG II levels certainly rose over the course of the fast, their final value in absolute terms was well within the levels found among wild Stellers.

Zenteno-Savin's gut feeling is that her results hold a valuable clue to the Steller decline, but she also believes it will take a bit more effort to ferret out their full significance. "The hormones are doing so many things that we're just beginning to understand how they function, particularly in marine mammals where there's still so much that we know so little about."

As with so many things in adolescence, it seems, it's going take a few tries before things begin to fall into place.

to see if there were any significant differences in behavior between the two groups that could be correlated to nutritional distress.

Her graduate supervisor, Consortium Director Dr. Andrew Trites, went for the idea, and thus it was that Milette found herself from May to August 1994, sitting 12 hours a day on a rock near a rookery on Sugarloaf Island, noting down every move, every significant shake, snarl and roar of some 30 identifiable Stellers among a herd of more than 100. At the same time, another team of researchers at Lowrie Island in southeast Alaska was noting down the behaviors of a presumably healthy herd of Stellers. In 1995, the two teams, Milette included, came back and did exactly the same thing for another 10 weeks.

The result of these two years of field work was a mountain of data. After two full years of crunching numbers, the results began to sluice out from the data collected, and when they did they were exactly the opposite of what Milette had expected.

"I only found one behavior – the Stellers in the area of decline are more aggressive – that would suggest the animals are nutritionally stressed," says Milette. "Everything else that we found was inconsistent with that prediction."

Milette found that the sea lions on Sugarloaf spent more time nursing their pups and less time at sea searching for food. On the surface, all of these results would seem to indicate that these animals were not experiencing problems obtaining enough to eat, but Milette is nonetheless cautious about jumping to conclusions.

The behavioral differences might merely reflect how far the two sites are from their feeding grounds. Similarly, the fact that pups spend more time

nursing in the area of the decline could indicate that the mothers are actually having a hard time producing milk, and so the pups are sucking away in a vain attempt to get enough sustenance.

There is one result, however, about which Milette is not at all diffident. "The longer perinatal period is the big one," she says. "That's the female fast – from the birth of her pup to her first feeding trip. Because they're fasting, it has to be a true measure of how big her fat reserves are, and it's two full days longer in the area of decline, 10.5 days at Sugarloaf versus 8.5 days at Lowrie."

Taken together, Milette believes her results are inconsistent with the idea that Stellers in the Gulf of Alaska are experiencing nutritional stress, at least during the spring while they're building up fat reserves and in the summer while they're under observation. Problems may still be arising in the fall and early winter, which is why Milette would like to see the observation work continue.

"The only way to truly solve this is going to be lots of resightings to follow along and find out what's happening to the juveniles, and to see if there's a difference in reproductive rates between the two sites," says Milette.

Now on her way to begin a Ph.D. at Memorial University in Newfoundland, Milette intends to be one of those people returning to Sugarloaf in years to come. Apparently, there's something about storms, and tents, and little barren rocks in the North Pacific that grows on one after a while. And at least now, Milette does own a pocketknife.





MARINE MAMMAL RESEARCH

A Newsletter of The North Pacific Universities Marine Mammal Research Consortium

No. 4, 1998

Steller Summers

"Keep your Swiss army knife with you. If the tent gives way we'll have to cut our way out"

Not exactly the words you want to hear from your tent-mate, particularly when the tent itself is perched on the edge of a precipice overlooking the North Pacific, and the wind is roaring over like a freight train, and the supposedly secure wooden tent platform has already begun to rattle and tip. Especially not if the same gale force wind ripping away at the tent frame is also whipping up waves 20 feet high. Particularly especially not if – as was then the case for UBC graduate student Linda Milette – you're new to Alaska, and don't even own a pocket knife.

It was the darkest moment in Milette's whole time on Sugarloaf Island, a tiny rock outcropping in the western Gulf of Alaska. Lacking any other options, however, she rooted around in the kitchen supplies until she found a butcher knife, then hunkered back into her sleeping bag to wait out the storm. By the time the gale abated some 30 hours later, her tent-mate, a technician with years of experience in the field, offered Milette a chance to call it quits, call a chopper and head for home. Milette, however, decided to stick it out. She was there, after all, not for her health, or the existential joys of life on a barren bit of sea-swept rock, but to help shed some light on the mysterious disappearances going on among the island's only other mammalian inhabitants, a herd of Steller sea lions.

From about 1980 onward the Stellers on Sugarloaf, and indeed in all of the western Gulf of Alaska, the Aleutian Islands and the Bering Sea had gone into a steep decline. By 1994, when Milette first set foot on Sugarloaf Island, the worldwide population of Steller sea lions had plummeted from about 300,000 to under 90,000 individuals. No one knew for certain what was causing the decline, but the leading suspect was nutritional stress, the scientific term for starvation. Many scientists – Milette



included – felt that the Stellers simply weren't getting enough to eat.

Long-term studies of related species like California sea lions had shown that when food was scarce – during El Niño events, for example – behavioral changes manifested themselves among the animals. They spent more time out at sea foraging for food and less time on shore nursing their pups. When they were on shore, the animals tended to be more aggressive toward each other and at the same time less active overall.

Unfortunately, performing a similar comparison on Stellers was impossible because no base-line studies of Steller behavior in the western Gulf had been done before the decline set in. Fortunately, however, Steller sea lions in southeast Alaska and northern British Columbia had been completely unaffected by the decline. In these areas Stellers were maintaining and even increasing their populations slightly. The thing to do, Milette reasoned, was to send out two teams of researchers, one to the area of decline, and one to the area where Steller populations were stable,

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New Blood

Four new Steller Sea Lions pups now make their home at the Vancouver Aquarium and are working with researchers to help figure out why some of their brethren in Alaska are in such dire straits. The two males and two females – named Kodiak, Timber, Hazy and Sitka after haulouts in the Gulf of Alaska – arrived in late June, after being captured off Cape Scott near the northern tip of Vancouver Island. A mere 20 kilograms when they arrived, the pups have since grown to 60 kgs, progressing from formula to liquefied fish to solid herring.

Thanks in part to the knowledge gained by the Aquarium in raising young Stellers, animal health technician Gwyneth Shephard has had no trouble training the new arrivals to take part in several ongoing Consortium experiments designed to understand the energy requirements and the relationship between growth and the different types of fish they eat. Metabolic trials – under the direction of Consortium researcher Dr. David Rosen – are now an expected part of the pups' weekly routine while morphometric measurements – with trainers measuring the pups' length and girth – are conducted twice weekly, again with the pups' full cooperation.

The youngsters have also participated in three different fasting trials, adding greatly to researcher Dr. Lorrie Rea's store of data on Steller blood chemistry and the changes it undergoes in response to food limitation. Such studies have also helped to understand how these creatures adapt their metabolism to periods of low food intake. Active metabolic trials, where the animal's metabolic rate is measured while it exercises in a large swim mill, are planned for the coming months. The pups will also soon experience the chill of their natural seas. A newly installed water-refrigeration unit will enable Consortium scientists to study the effects of cold temperatures on energy demands (the equipment can bring the water temperature down to a frosty 35°F/1.7°C). The pups will also be taking part in a series of new experiments, including tracing hormone levels through saliva samples, the effects of swimming and diving on heart rate, and tests of their visual abilities.

According to Shephard, the pup's sheer trainability should allow Consortium researchers to greatly augment the data obtained working with the previous six Stellers. "We're getting a lot of information that just wasn't possible with the last group," says Shephard. Practice, it seems, makes perfect.



Kodiak, one of 4 new Steller sea lion pups that joined the research team this summer.

Other Studies

A trawl vessel was chartered to assess the types of fish and the relative quantities available to Steller sea lions near their major summer breeding area in Southeast Alaska. Consortium researchers also collected over 400 fecal samples to determine what sea lions were eating, and tracked 10 mature females at sea with satellite tags to determine where and when they were eating. This study will provide valuable insights into the foraging ecology of Steller sea lions and the role that food availability might be playing in the population decline.

Results from the captive feeding studies at the Vancouver Aquarium are being published in the scientific literature. One recently published paper looked at the amount of energy used to digest meals of different sizes (called the heat increment of feeding). Other studies being prepared for publication include the effect of squid consumption on sea lion physiology, the triggers of metabolic depression, and the much-anticipated results of the pollock diet experiment. Results of these and other studies carried out by researchers at Oregon State University, and the Universities of Alaska, British Columbia and Washington will be highlighted in future newsletters.

PUBLISHED BY

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The North Pacific Universities Marine Mammal Research Consortium

ANNUAL REPORT

1996-1997

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THE CONSORTIUM

In the summer of 1992, John Roos, Vice President of the Pacific Seafood Processors Association, on behalf of a group of representatives of the fishing industry, requested Pacific northwest universities to submit proposals for research concerned with the impacts of fisheries on Steller sea lions. From that request, the *North Pacific Universities Marine Mammal Research Consortium* was formed with four participating institutions: the University of Alaska, the University of British Columbia, the University of Washington, and Oregon State University.

The mission of the Consortium is to undertake a long term program of research on the relation between fisheries and marine mammals in the North Pacific Ocean and Eastern Bering Sea. Studies will focus initially on the biology of the Steller sea lion and could include research on the effects of species interactions and oceanographic conditions on changes in sea lion abundance. The scope could subsequently be broadened to include other marine mammals and possibly sea birds.



Peter Anthony Larkin
1924 - 1996

Peter Larkin was known internationally for his significant contributions to the areas of fisheries science, resource management, and science policy. Following his retirement from the University of British Columbia in 1989, he worked to establish the North Pacific Universities Marine Mammal Research Consortium and continued to devote his efforts to furthering the goals of the Consortium until his death on July 10, 1996. His sage and generous counsel will continue to assist in shaping the dialogue between the many Consortium stakeholders.