

ALASKA LEGISLATURE COMMITTEE FILES, 1989-1990 8672  
5966 HOUSE RESOURCES

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management technology for gypsy moth, western spruce budworm, fusiform rust, southern pine beetle, mountain pine beetle, eastern spruce budworm and root diseases.

**B. \* Improve the development of technology to solve operational problems.**

Washington Office Forest Pest Management and Forest Insect and Disease Research examine opportunities to strengthen cooperation between research scientists and application specialists to provide for timely solutions to operational problems, including improving operational testing of new technology.

**C. \* Improve the program to transfer integrated pest management technology.**

Washington Office Forest Pest Management, the State and Private Technology Transfer specialist, Forest Insect and Disease Research, with participation by field unit specialists, will identify applied technology needs, new technology available for implementation, and develop a more effective technology transfer program for pest management programs.

## ISSUE 8- FOREST HEALTH MONITORING

Standardized indicators for monitoring forest health are needed.

### RATIONALE

- Forest health means different things to different people depending on their unique experiences and perspectives.

- Forest health is a moving target and not easily focused.

- Forest health is an impression.

- Forest health can be compared to the health of the nation's population, as distinct from individual health.

- Forest health will be perceived as a widespread, continuing problem until measures or indicators of change in the forest and a standard are established.

### OPTIONS

**A. \* Establish a task force to identify standards and procedures for monitoring forest health.**

Washington Office task force involving Timber Management, Cooperative Forestry, Forest Insect and Disease Research, Forest Environment Research, Timber Management Research, Forest Inventory and Economics

Research, Recreation, and Land Management planning will, in cooperation with state cooperators:

1. Establish a set of indicators that measure changes in the forest related to forest health;

2. Establish a system for monitoring the forest health indicators;

3. Use the information from Forest Inventory and Analysis, the annual assessment of Forest Insect and Disease Conditions in the United States, the monitoring systems of EPA (Environmental Protection Agency), and other federal, state, and private data systems;

4. Sponsor cooperation among federal, state, and private researchers and encourage the exchange of scientific information on the changes in the productivity and health of the forest ecosystems;

5. Annually compile and evaluate the above data and report on the magnitude of changes in the productivity and health of the forest ecosystems;

6. Coordinate with the Forest Response Program; and,

7. Examine the feasibility of a joint Canada-USA-Mexico coordinated monitoring system.

**B. Demonstrate mitigation actions on National Forest system sites where atmospheric deposition impacts have been confirmed.**

Washington Office Forest Pest Management lead a task force of Timber Management, Forest Insect and Disease Research, Forest Environment Research, and Recreation to evaluate and employ mitigation measures where atmospheric deposition damage has been confirmed.

## CONCLUSION

Forest health is a complex issue involving actual and perceived forest condition problems. The actual problems are the product of events occurring over a long period of time. The perceived problems reflect an incomplete understanding of forest ecosystems, the biological processes operating within them, and alternative views of the purposes to be served by the forest. However, regardless of whether forest health problems are real or perceived, a response must focus on long-term solutions. This proposed strategic plan identifies responses that the Forest Service and other forest resource management agencies can take to enhance and maintain the health of the forests entrusted to them. There are no "silver bullets" or "quick fixes." Correcting misconceptions about forests and forestry or eliminating

unwanted conditions in today's forests will require thorough long-range planning, conscientious implementation, and continuous monitoring.

This analysis dealt with forest pests and related atmospheric deposition because their effects on the forest are understood and many of those effects can be remedied by resource management activities. Forest pest and atmospheric deposition damage is commonly cited as evidence that a forest health problem exists. Since the severity of these effects is related to the condition of the forest vegetation, management activities that produce healthy vegetation help minimize pest and atmospheric deposition damage. The challenge is to employ vegetation management practices that achieve production objectives without sacrificing long-term production capability. Those practices also must be economically defensible, technically feasible, and politically acceptable.

#### Recommendations

The following recommended options for resolving the issues are proposed as a Forest Service strategic plan to enhance and maintain a healthy forest condition. Some of the recommended options require further analysis and the consideration of alternative procedures before they will be ready for implementation.

### ISSUE 1- PLANNING

Integrated forest pest management considerations are not adequately incorporated in forest resource management planning processes.

#### RECOMMENDED OPTIONS

- \* Develop procedures for including pest impact information in the next planning cycle.
- \* Transfer integrated pest management technology to the National Forest system and states.
- \* Require pest specialist input to National Forest system inter-disciplinary teams conducting forest resource management planning.

### ISSUE 2- PUBLIC INVOLVEMENT

Traditional forest management practices frequently conflict with public expectations.

#### RECOMMENDED OPTIONS

- \* Establish a nationwide information program on forestry and the dynamics of the forest ecosystem.

- \* Require a comprehensive public information effort in conjunction with forest pest management activities.

- \* Train federal, state, and county specialists in conducting public information meetings.

- \* Target high-use recreation areas for intensive integrated pest management.

- \* Clarify and apply integrated pest management policy in wilderness.

### ISSUE 3- RESOURCE MANAGEMENT

Certain forest management practices may aggravate forest pest problems.

#### RECOMMENDED OPTIONS

- \* Risk-rate all high-value forest analysis areas for pest outbreak potential.

- \* Include integrated pest management in forest resource management prescriptions.

- \* Identify imminent pest risks to high-value resources and reschedule management activities to minimize impacts.

- \* Analyze the feasibility of using fuelwood sales to achieve vegetative management objectives.

- \* Determine optimum levels of forest pest management support.

### ISSUE 4- PEST SUPPRESSION

Mechanisms are needed for prompt responses to pest outbreaks.

#### RECOMMENDED OPTIONS

- \* Include suppression funding need projections in the budget process.

- \* Establish a funding authority to suppress emergency pest outbreaks.

- \* Provide training in integrated pest management for all foresters in the National Forest system.

- \* Update guidelines setting priorities for funding pest prevention and suppression.

## **ISSUE 5- ENVIRONMENTAL ANALYSIS**

Programmatic NEPA documents permitting timely intervention against pest outbreaks are not available.

### **RECOMMENDED OPTIONS**

- \* Prepare programmatic NEPA documentation for potentially controversial pest management activities.
- \* Prepare programmatic NEPA documentation for pest management in forest nurseries and seed orchards.

## **ISSUE 6- PESTICIDES**

Alternatives to environmentally unacceptable chemical pesticides are needed for integrated pest management systems.

### **RECOMMENDED OPTIONS**

- \* Set priorities and conduct research to meet insecticide/ fungicide needs for integrated forest pest management.
- \* Determine Forest Service response to pesticide development needs for integrated forest pest management.

## **ISSUE 7- PEST CONTROL TECHNOLOGY**

Effective and economical integrated pest management technology is needed to protect forest resources from pest damage.

### **RECOMMENDED OPTIONS**

- \* Strengthen integrated pest management technology for major forest pests.
- \* Improve the development of technology to solve operational problems.
- \* Improve the program to transfer integrated pest management technology.

## **ISSUE 8- FOREST HEALTH MONITORING**

Standardized indicators for monitoring forest health are needed.

- \* Establish a task force to identify standards and procedures for monitoring forest health.

Although specifically applicable to the Forest Service, the actions listed above represent a positive first step for any forest resource management agency seeking ways to respond to concerns about the health of our Nation's forests.

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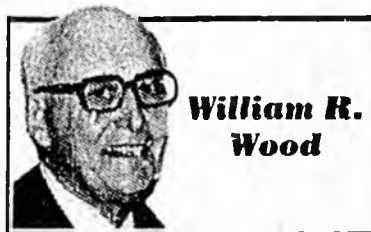
# Opinion

Wednesday, March 15, 1989

## Use Interior forests or see them deteriorate

Consider the boreal forest of Interior Alaska. Here are over 22 million acres of accessible timberland covered with some scattered, some dense growth of white spruce, paper birch, aspen, black spruce, cottonwood, poplar, tamarack, alder, willow, and a few other species. Despite relatively small-scale efforts over the years to harvest a portion of Interior timberlands, not much use has been made of the asset. There is a small cut annually of sawlogs, less than one-fourth of what is imported from Canada and the Lower 48 for local use here. A lesser amount is salvaged for firewood. In the early 20th century cordwood was harvested along the Yukon, the Tanana, and lesser streams to fuel the riverboats. For many generations throughout the Interior logs have been used for shelter and a few other purposes.

The boreal timberlands of Interior Alaska remain an idle resource of great promise if utilized sensibly. In idleness they constitute a recurring cost to the state and its residents—plus the burden



**William R.  
Wood**

*Views expressed here do not necessarily represent those of the Daily News-Miner*

of lost opportunity.

In Georgia where modern forest management techniques are practiced there are more trees harvested each year than were on the land when Oglethorpe landed in 1703. Here there are probably about as many trees standing today as were here when the Fort Yukon trading post was established well over a century ago.

In the boreal timberlands of Interior Alaska wildfire has consumed more timber than humankind. Unfortunately, not all of the burned-out acreage manages to regenerate itself. There are self-

destructive forces at work in the boreal forest. Overmature stands tend to retard their own growth. White spruce, a splendid tree of many uses, gives way to scrawny black spruce of limited usefulness. Where the black spruce takes over, there is not much food for wildlife. Its attraction as a recreation asset is minimal. Such areas are largely avoided by humankind and most other living things.

Set aside, left alone, the boreal forest as we know it today will deteriorate and likely in large part disappear in a few generations.

This need not happen, for sensible timberland management technology is known. It is possible not only to preserve but to enhance the total boreal forest habitat. State-of-the-art techniques are not static. There is much more to be learned leading to a wide-range of improvements.

Good husbandry of a living asset takes time. There is not much immediate pay-off in prospect, but the long-term outlook is exciting. An appropriate tree-improvement

program for Interior Alaska will take at least two generations, but the growth cycle of the white spruce, scientists are confident, can be reduced from 120 years to 80 years or less. The present scattering of wildflowers and berries can be increased manyfold, the entire habitat for wildlife enhanced.

There are ways to learn, to earn, and to enjoy a satisfying way of life that can become a reality by the enhancement and use of the boreal forest of Interior Alaska. There is a choice for us now: just preserve it and lose it or improve it and use it intelligently.

Trees are good. Let's plant a lot more of them of the very best stock. Let's take good care of them. Modern techniques of good stewardship are unfolding. We can augment natural reseeding with selected additional plantings of the very best. Reforestation of cut-over and burnt-over areas is a must. Other areas can be thinned and replanted with better types. The term afforestation is becoming familiar.

The state lawmakers have recog-

nized this, in part at least, and have set aside a portion of annual income from forest products for reforestation purposes. Yet this first step seems stalled for some reason, perhaps the overlapping and duplication of jurisdictions among state and federal administrative agencies as well as by competing special interests in the private sector.

When each of these insists on its own special-interest agenda that would exclude all other interests, not much happens. In fact, the lawmakers' intent to establish a meaningful forest management improvement program in Alaska, it seems, is being ignored.

It is time to straighten out the unnecessary tangle, to thin out the political underbrush and get on with the pleasant task of planting more trees—for the good future for Interior Alaska residents.

*William R. Wood is a retired president of the University of Alaska now volunteering his time as executive director of Festival Fairbanks '84.*

REP. TERRY MARTIN

ELECTORAL DISTRICT 13  
MOUNTAIN VIEW  
RUSSIAN JACK SPRINGS  
NUNAKA VALLEY  
ELMENDORF A.F.B.  
CREEKSIDE  
EAST ANCHORAGE



HOME  
3960 REKA DRIVE-86  
ANCHORAGE, AK 99508  
PHONE 333-6990

DURING SESSION  
P. O. BOX V  
STATE CAPITOL BUILDING  
JUNEAU, AK 99811  
PHONE 465-3783

Alaska House of Representatives

March 2, 1989

MEMORANDUM

To: House and Senate Resources  
Committee Members

From: Rep. Terry Martin *T.M.M.*

Subject: Spruce bark beetle

COPY

As a member of the Resources Committee, you are probably at least acquainted with the problem of spruce bark beetle infestation of Alaska's forests. In light of the upcoming meeting of the House Resources Committee in the Mat-Su area to discuss forest issues, I thought it would be an appropriate time to distribute the attached material on the current status of the beetle problem.

There are three important points to keep in mind in addressing this issue: First, that we need to stop the infestation and save what's left of our spruce forests for the future. Second, by harvesting the dead and dying, beetle-infested trees, we can put people to work during these economic hard times. And third, the potential value to be realized from harvesting the trees, even if it is only for chips, is significant, and would contribute greatly to Alaska's economy.

I appreciate that the Resources Committees are willing to take a look at a problem that has been with us for some time, and hope you will support an effective, realistic solution. I would also hope you will consider forming a joint oversight committee to monitor this issue.

Thank you.



THE SPRUCE BARK BEETLE -

"A DISASTER IN THE MAKING, AN OPPORTUNITY FOR ALASKA"

by Rep. Terry Martin

As many of you may know, this year marks the 25th anniversary of the Beatle invasion from England - in fact, just recently was the anniversary of the night they appeared on the Ed Sullivan Show, and opened a new chapter in the history of American pop music.

We here in Alaska, regardless of our individual likes and dislikes in music, are in the midst of another beetle invasion, or more accurately, a beetle infestation. These, of course, are nothing like the mop-topped, "fab four" of 1964, but they are still having a significant impact on Alaskans.

I am referring to our own spruce bark beetle, a prolific little bug that is chewing its way through our forests and turning one of Alaska's greatest - and greenest - assets into a dead and dying tinderbox.

I've been interested in the activities of this pest for sometime now, and have recently obtained a copy of a two-page summary of its activities and our efforts to combat it. I would like to share a few of the highlights of this report with you, if I may.

The spruce bark beetle has been around for awhile in Alaska, and while he doesn't eat the whole spruce tree, his activities efficiently kills it by girdling the cambium layer - where the tree's life-giving juices flow. Normally, the beetle lives on downed, mature spruce, or on slash or wind-felled trees. In a heavy infestation, as we are seeing in some parts of the interior, the beetle moves from trees on the ground to live, standing trees. In some particularly heavy infestations, the pests have even attacked black spruce, while

it normally would stick to its preferred white spruce or Sitka spruce.

What is the magnitude of our beetle infestation? The two page activity summary conservatively estimates that more than 10 billion board feet is effected, from Kachemak Bay, to the upper Kenai Peninsula, to Willow, Chickaloon, Tyonek and Mt. Susitna, the Copper River, the Kuskokwim and Holitna Rivers, to the Lower Yukon around Galena and Anvik. Glacier Bay has had an ongoing problem with the spruce bark beetle, and in some stands, as much as 70% of the spruce have been killed. In heavily infested stands in the Interior and on the Kenai, more than 80% of the white spruce have been killed. These little bugs get around, and no variety of spruce has been immune to their munching.

Total acreage of devastated forest, adds up to ~~957,016~~ <sup>through 1986</sup> <sup>at least 1,450,000</sup> acres throughout Alaska. That's ~~194,892~~ <sup>775,000</sup> acres of state lands, ~~117,012~~ <sup>275,000</sup> acres of Native lands, ~~100,000~~ <sup>100,000</sup> acres of National Forest, and ~~174,193~~ <sup>300,000</sup> acres of other Federal lands.

Aside from the detriment to aesthetics of turning a green forest brown, the economic loss on the forest is very high. The dead trees quickly lose their value, due to checking and cracking as they dry out, and they become susceptible to a fungus that turns the wood blue. As the trees die and fall over, the already thick organic mat on the floor of the forest becomes heavier, making it even more difficult for new seedlings to gain a foothold. Regeneration is slow or not possible at all, and so the spruce bark beetle eliminates not only this generation of trees, but stops the next as well, <sup>unless fire or some other factor disturbs the site.</sup>

Of course, the likelihood that a forest of dead trees will catch on fire and burn up is quite a bit higher than if the trees were still alive. Given the volume of timber dead or dying from the spruce bark beetle, we are looking at a potentially disastrous fire. It has been estimated that on the

Kenai Peninsula alone - based upon the \$23 million it took to suppress the last major fire there in the late 70s - we could expect to spend anywhere from \$50 million to \$100 million to contain a fire in beetle infested areas.

However, I believe there is hope in all this. Alaska should encourage the responsible development of its natural resources as our Constitution clearly dictates. If we have the willpower to do so, we can start a new revenue enhancement program, save the virgin forests from the spruce bark beetle, avoid the fire danger and the expense of fire suppression - and create substantial economic activity to private markets by harvesting the infected trees. We can also put youth to work through conservation programs of reforestation, starting the next generation of trees immediately.

Some professional foresters state the answer to this problem is to harvest these trees and remove them from the forest. Most of them can be chipped and sold to pulp mills. The potential economic activity that could be generated from this approach to solving this problem is tremendous: At ~~\$50~~<sup>\$650</sup> per thousand board feet for ~~chips~~<sup>finished pulp,</sup> our 10 billion b/f of infested timber is worth ~~1.5~~<sup>a minimum of 6.5</sup> billion dollars. The state sold the beetle-infested trees at Tyonek in the mid-70s at a ~~giveaway~~<sup>salvage</sup> rate of \$1 per thousand - ~~even at this low~~<sup>however, the total economic impact of that sale was in excess of 100 million dollars.</sup> ~~rate the state could bring in \$10 million to support state services, including the reforestation programs of the division of forestry which have never been funded.~~

Granted, not all the infested timber is accessible. Some of it is even located in state and federal conservation units where harvesting - for any reason - is not allowed. But remember, these estimates are conservative.

I believe that if we put into operation a policy of this type, we would be able to harvest a significant portion of the

beetle-killed timber, stimulate Alaska's economy, and PUT PEOPLE TO WORK.

I have talked with several members of the Resources Committee concerning this problem and they have expressed an interest in having the Division of Forestry present an overview. I hope that can be scheduled in the very near future. I have also advocated that a special legislative oversight committee be appointed that would provide direction to the administration consistent with the policy-solutions we adopt here in the legislature.

You may recall that, early last year, we passed the so-called "Jobs Bill", with the intent of putting \$75 million in construction projects on the street last summer. While I won't speak to the effectiveness of that particular effort, I would point out that we have been given an opportunity - through the gnawing of the spruce bark beetle - to create hundreds of jobs and millions of dollars of economic activity.

Of course, we are not the first people in America to face a "plague of locusts." I'm reminded that in 1874, Nebraska had quite a few more trees than it has now. But in that year, clouds of grasshoppers a hundred miles wide by 150 miles long appeared and ate up everything in sight. The sounds of grasshoppers chewing up the crops and treetops inspired one farmer to compose the song "Starving to Death on My Government Claim."

I would leave you with the lesson from another folksong - "The Boll Weevil" - who went lookin' for a home. While this little bug ate up half the economic viability of the poor sharecropper, he also presented the opportunity of figuring out a way to overcome him. This opportunity was met, and the boll weevil now has a monument erected to his memory in Louisiana.

Miles W. Dean  
P.O. Box 201341  
Anchorage, Alaska 99520

March 16, 1989

Mr. Bob Dick, State Forester  
Division of Forestry  
Department of Natural Resources  
400 Willoughby Avenue  
Juneau, Alaska 99801

RE: Proposed Tyonek II Sale & West Cook Inlet Area

Dear Mr. Dick:

An introduction is necessary at this time to fully acquaint you with my interest in development at West Cook Inlet Resources.

After three and one-half years of studies, engineering, permit process and many other related matters, I am preparing to build an all-purpose dock and bulk handling facility at Beluga, Alaska, more commonly known as Ladd Landing.

The last several months I gathered information on timber reserves in that area. Our findings indicate Tyonek II Sale has amiable timber along with other state timber lands.

Further investigation dictates markets are available for the timber resources; some have specialty uses while others need saw logs, chip logs and pulps.

For whatever uses, timber is in demand from a marketability standpoint. Other reasons are disclosed in memorandum of March 2, 1989 from Mr. Terry Martin, Alaska House of Representative (see enclosed).

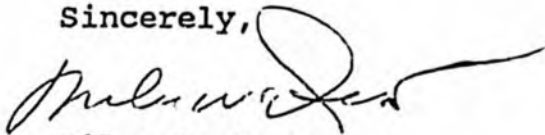
I am especially interested in purchasing all timber at West Cook Inlet and surrounding area which would add benefits to the dock facility for identified markets in hand. I would like full support of the State Forestry Division to further develop our resources and which in turn would create more employment and badly needed funds for the State Treasury. In addition, it should address the memorandum from Mr. Terry Martin for that area.

Mr. Bob Dick, State Forester  
March 16, 1989

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I am prepared to move on the timber issue as quickly as the State.

Sincerely,



Miles W. Dean

cc: Rep. Terry Martin  
P.O. Box V  
State Capital Building  
Juneau, Alaska 99811

Mrs Lennie Gorsuch  
Commissioner of Natural Resources  
State of Alaska, DNR  
3601 "C" Street, Suite 1210  
P. O. Box 107005  
Anchorage, Alaska 99510-7005

Honorable Governor Steve Cowper  
3601 "C" Street, Suite 758  
Anchorage, Alaska 99503

STATE OF ALASKA  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF FORESTRY

TIMBER SALE PROSPECTUS  
(Preliminary Draft)

SC-781.

TYONEK NUMBER 2

ADL 210965

This prospectus covers the sale named above and should not be used as a comparison to other timber sales or timber management projects on adjacent lands. This document is intended to supplement the sample contract which has been prepared for this sale, so that prospective bidders or other concerned parties may have more details as to bidding requirements, logging conditions, description of timber, access, and numerous other considerations.

Location

The sale area lies approximately 38 miles west of Anchorage near the village of Tyonek. The entire sale area lies between the two major drainages of the Beluga River on the north and the Chuitna River on the south. The village of Tyonek is approximately four miles to the southeast of the nearest portion of the sale area.

Sale Area Description

The sale area is located on the following legally described lands:

T13N, R10W, S.M. That portion of the Township south of the Beluga River in Sections 7-9, 16-21 and 28-33.

T13N, R11W, S.M. That portion of Township South of Beluga River in Sections 4-10 and 14-36, excluding USS 3964.

T13N, R12W, S.M. Sections 32-36.

T12N, R11W, S.M. That portion of township north of Chuitna River in Sections 3-10, 15-22, 27-29, excluding USS 4547.

T12N, R12W, S.M. That portion of the township north of the Chuitna River in Sections 1-15, 23 and 24.

There are approximately 9456 acres of merchantable timber designated for cutting. The sale area, roads and cutting units are shown on page \_\_\_ of this prospectus.

Description of Timber

The timber on this sale is an uneven aged stand of white spruce (52%), birch (36%), and cottonwood (12%). Trees of all species larger than six inches D.B.H. are designated for harvesting and utilization.

The timber stands are generally considered to be mature <sup>with</sup> minor stem damage and some mortality in the white spruce due to bark beetle activity. Stand characteristics for the average acre are listed in the table below:

<u>Species</u>	<u>Trees/ Acre</u>	<u>Average DBH</u>	<u>Average Total Height</u>	<u>Average % Sound</u>
White Spruce	63	10.0"	56'	96
White Birch	63	11.0"	53'	83
Black Cottonwood	3	21.3"	70'	93
Total	129			

Tyonek II Sale Summary

	<u>Acres</u>	<u>Net MBF Spruce</u>	<u>Net MBF Birch</u>	<u>Net MBF Cottonwood</u>	<u>Net MBF All Spec.</u>
Sale Area Excluding Mental Health *	7,061	20,368.1	14,150.1	5,960.4	40,478.6
Mental Health Lands	2,395	7,446.5	5,226.6	325.1	12,998.2
Sale Area Including Mental Health	9,456	27,863.7	19,245.6	6,555.0	53,664.3
Average Acre Net Bd. Ft.		2,947	2,035	693	5,675

\* The volumes are computed from a separate cruise excluding plots on Mental Health lands. Because of this, adding the first 2 lines will not give the volume for the sale area including Mental Health land.

METHOD OF VOLUME DETERMINATION

The timber on this sale was cruised by Division of Forestry personnel. The sale area was cruised between August 1981 and March 1982 using variable plot sampling techniques with a 10 factor prism. One hundred forty three (143) measure plots were taken and the DBH, total height, and defect class of each tally tree was recorded. For more accurate volume determination the sale area was divided into 7 operable types. A 6% sampling error was achieved for the combined types.

Volume and Minimum Price

<u>Species</u>	<u>Estimated Volumes</u>	<u>Appraised Unit Price</u>	<u>Total Value</u>
Spruce	27,860 MBF		
Birch	19,250 MBF		
Cottonwood	6,550 MBF		

Total =

Access

Access to the sale area is provided by dedicated public easement on constructed all-weather gravel road. The Purchaser may need to construct a log storage and transfer site, camp, and log processing facility. Any requirements for permits will be the responsibility of the Purchaser.

Roads and Airstrips

The Purchaser is required to construct about 33 miles of summer mainline road, 23 miles of summer spur road, upgrade about 12 miles of mainline road, and construct about 27 miles of winter road. One existing airstrip is to be rehabilitated and graded, another airstrip is to be new construction.

Further information is included in the Forest Management Sale Report and in the sample Timber Sale Contract.

Maintenance

The Purchaser may be required to sign joint road use and maintenance agreements with several parties having operations or interests within the vicinity of the sale area. Other maintenance requirements are specified in the contract.

Logging Conditions

Most units and strips are ideally suited for highly mechanized feller-buncher-delimber operations. Use of rubber-tired grapple skidders and mobile chipping units are highly practicable for most areas of the sale.

Areas designated for summer logging may be harvested any season of the year. Areas designated for winter logging, however, will only be harvested during periods when the ground is fully frozen.

Method of Payment

No timber shall be cut or removed until payment has been made in accordance with the following:

(a) Stumpage Deposit An initial stumpage deposit shall be deposited with the STATE at least 30 days prior to the initial commencement of timber harvesting under this contract. The PURCHASER shall furnish the deposit in the form of cash, certified check, money order, surety bond acceptable to the STATE, or any combination of these, to guarantee payments for timber. The total stumpage deposit shall be \$10,000 for the duration of the contract. The STATE may apply a portion or all of the stumpage deposit to cover stumpage payments which are more than 15 calendar days past due.

(b) The PURCHASER shall pay within 15 days of the first of each month for all timber scaled during the previous month.

(c) All payments and deposits shall be made payable to the Alaska Department of Revenue and shall be submitted to the Department of Natural Resources, Division of Forestry, Southcentral Region.

Performance Bond

A performance bond in the amount of 10 percent of the sale value is required. It must be submitted to the STATE with the signed contract within the thirty (30) day period allowed following receipt of the contract by the PURCHASER.

Release of the bond is conditioned upon faithful compliance with all contract provisions.

Authority

The sale of timber is offered under the authority of the Alaska Statutes, Sections 38.05.020 through 38.05.120 and the Alaska Administrative Code, Sections 11 AAC 71.005 through 11 AAC 71.350 and Sections 11 AAC 71.900 through 11 AAC 71.910 referred to as the "Timber and Material Sales Regulations".

Contract Requirements and Stipulations

A sample contract is available and should be reviewed.

Primary Manufacture

Primary manufacture is not required.

Period of Contract and Timber Removal Schedule

The contract period is \_\_\_ years. A minimum of five million board feet of timber must be paid for and removed from the sale area not later than three years following the effective date of the contract.

### Sale Procedure - Bid Deposit Requirements

The sale of timber will be by oral outcry auction. As qualifications for bidding, all bidders must submit a bid deposit of five percent of the total appraised price either in cash, certified check, cashier's check, or money order, in favor of the Alaska Department of Revenue. The bid deposit shall be submitted to the selling agent between 1:00 p.m. and 2:00 p.m., prevailing time, on \_\_\_\_\_, 1985, at the Frontier building conference Room, Suite 336, 3601 "C" Street, Anchorage, Alaska.

A bid deposit will not constitute a bid; all bids will be by oral outcry. A minimum increase of twenty-five cents (25¢) per MBF will be required. A two minute time period between bids will be observed. Bids will be accepted on any species. The total bid value of all species will be the basis for determining the highest bid. Bids for less than the appraised value will not be accepted.

The Division will reject any bid containing or submitted with a condition, qualification or alteration of the terms as specified in the Notice of Sale, this Prospectus, or the contract, or which is otherwise not in accordance with law.

The successful bidder's deposit may be credited to the total amount due to the State for the Stumpage Deposit. The apparent successful bidder may be required to furnish a sworn financial statement showing ability to fulfill the terms of the contract. The deposit furnished by the apparent successful bidder shall be retained as liquidated damages if the successful bidder does not execute the contract and furnish satisfactory bonds within 30 days of receipt of contract. The deposits furnished by unsuccessful bidders will be returned at the end of the auction.

The State reserves the right to reject the highest bid and to award the timber for the amount of the next high bid to the next highest bidder, if the Director considers the highest bidder unqualified to fulfill the requirements of the contract or if the contract is not executed by the highest bidder. The State also reserves the right to waive minor technical defects in this prospectus. The timber sale contract is the binding document.

### Qualification of Bidder

At the time of bidding, if bidding as an agent for another individual, a partnership, corporation, or other legally established firm, the bidder shall submit to the selling agent a notarized letter attesting to that fact or a power of attorney. A person, in order to qualify for bidding must be financially and legally competent to enter into and carry out the provisions of the sales contract. The Director may request conclusive evidence of any bidder's qualifications.

### General

Further information can be obtained concerning the timber and conditions of this sale from the Alaska Division of Forestry at: Southcentral Regional Office, Pouch 7-005, Anchorage, Alaska 99510, telephone 276-2653; Southeast Regional Office, Pouch M, Juneau, Alaska 99801, telephone 465-2433; State Forester's Office, Pouch 7-005, Anchorage, Alaska 99510, telephone 276-2653; or Northcentral Regional Office, 4420 Airport Way, Fairbanks, Alaska 99701, telephone 479-2243. Alaska's area code is 907.



United States  
Department of  
Agriculture

Forest Service

Alaska  
Region



# Forest Pest Management Report

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R10-88-C-1

FOREST INSECT AND DISEASE CONDITIONS

IN ALASKA - 1988

December 1988

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**DAVID W. ORR**  
INSECT AND DISEASE FORESTER



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DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF FORESTRY

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# FOREST INSECT AND DISEASE CONDITIONS IN ALASKA, 1988

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## FOREST PEST CONDITIONS IN ALASKA - 1988

### CONDITIONS IN BRIEF

Spruce bark beetle activity increased in 1988 throughout Alaska. Aerial detection surveys noted 387,120 acres of white, Lutz, and Sitka spruce mortality. Areas of increased spruce beetle activity were most apparent in interior Alaska's white spruce stands. *Ips* populations decreased for the third year in interior Alaska. Approximately 1,500 acres of spruce mortality was apparent near timber harvest units in the Bonanza Creek Experimental Forest near Fairbanks.

Hardwood defoliator activity in interior Alaska decreased for the third consecutive year. Large aspen tortrix larvae defoliated 118,391 acres of aspen. River bottom willow was heavily defoliated (4,313 acres) for the third consecutive year along the Mulchatna and Yukon Rivers. Western tent caterpillar activity was noted on recently planted landscape material in downtown Anchorage. This is the first recorded incidence of this pest in Alaska. Tent caterpillar egg masses were apparently brought into the State on nursery stock.

Black-headed budworm defoliation levels in Prince William Sound were high; 145,000 acres of defoliated western hemlock and Sitka spruce were aerially detected. Cottonwood defoliation (leaf beetles and blotch-miners) occurred on 11,000 acres near Valdez and Kings Bay.

Forest insect problems were relatively minor in southeast Alaska in 1988. The cottonwood leaf beetle defoliated black cottonwoods and willows on 4800 acres along river bottoms near Haines and in urban areas near Juneau. Low-level spruce beetle activity was detected in Glacier Bay National Park and in the Yakutat Forelands. Defoliators of western hemlock remained at very low levels, producing no visible defoliation in 1988. About 3000 acres of previously undetected hemlock top-kill and mortality were mapped in 1988. This brings the total area severely affected during the hemlock sawfly infestation in the mid-1980's to 14,000 acres. Spruce nee-

dle aphids were active near the communities of Juneau, Sitka, Petersburg, Craig and Klawock.

Hemlock dwarf mistletoe, wood decays, and decline of Alaska-yellow cedar persist as the most important forest diseases of Alaska. Some 340,000 acres of cedar decline have now been detected, primarily on the Tongass National Forest. Spruce needle cast was present at the highest infection level in recent memory in young spruce trees growing on cutover land and in urban areas throughout southeast Alaska. Most other diseases were at low, endemic levels this year. Porcupines continued to damage spruce and hemlock in valuable young-growth stands in southeast Alaska.

### STATUS OF INSECTS

#### SPRUCE BEETLE, *Dendroctonus rufipennis* (Kirby)

Alaska spruce beetle populations increased in 1988 by more than 100,000 acres; on-going as well as new infestations now cover approximately 387,120 acres throughout south-central and interior Alaska's spruce forests. Increased spruce beetle activity was most apparent in interior Alaska along the Yukon and Kuskokwim River drainages.

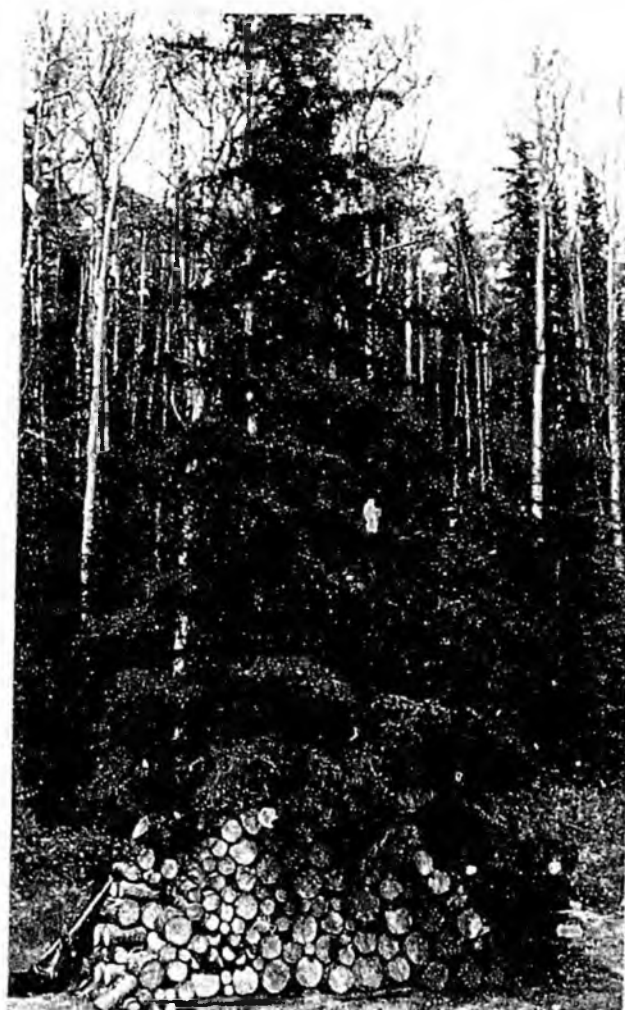
White, Lutz, and Sitka spruce mortality continues on approximately 36,413 acres of the Chugach National Forest; an increase over the area infested in 1987 (29,586 acres). Spruce beetle activity is most apparent near Summit Lake, Cooper Landing, and the Russian River Campground area. Spruce beetle pressure was extremely high in the Cooper Creek and Russian River Campgrounds where more than 90% of all spruce greater than 5" in diameter has been killed. A reflection of the extremely high beetle pressure was the occurrence of black spruce mortality; trees as small as 3" in diameter were successfully attacked. Black spruce is rarely attacked by the spruce beetle, but when populations are extremely high and preferred hosts (white and Lutz spruce) have been previously killed, beetles have little

choice but to attack black spruce. New spruce beetle activity was noted at Upper Trail Lake near the Johnson Pass trail.

Spruce beetle activity continues to increase on the Kenai National Wildlife Refuge where approximately 80,000 acres are currently infested; the majority of the infested forested lands occur in the Mystery Hills and Skilak Lake areas. Scattered spruce beetle activity has been apparent for 2-3 years on 41,000 acres southwest of Tustumena Lake. Spruce beetle populations continue to decline along the Fox River Drainage near Homer; no spruce beetle activity was detected in 1988. However, across Kachemak Bay from Homer, spruce beetle populations are increasing in the Sitka spruce stands of Kachemak Bay State Park where more than 10,000 acres are lightly infested: approximately 1,000 acres are infested in the Halibut Cove Lagoon area; 800 acres near Mallard Bay, and 9,000 infested acres are apparent from Aurora spit to Battle Creek. The spruce beetle is spreading in a northeasterly direction. Spruce beetle activity is static on approximately 300 acres near Seldovia. Infested trees are most apparent in stands bordering recent subdivision roads north of Seldovia.

Spruce beetle activity on the west side of Cook Inlet continues to decrease; approximately 26,000 acres of scattered beetle activity was detected near Beluga Mountain; a 50% decrease over 1986 levels. Future declines are expected as the beetles have attacked and killed the majority of the susceptible host material in this area.

Spruce beetle activity in the Anchorage Bowl and Chugiak-Eagle River areas continues to decrease. Scattered mortality is still evident throughout the spruce-hardwood type on Fort Richardson Military lands and in the spruce stands along upper Ship Creek. Further up the Mat-Su Valley, 14,000 acres of scattered spruce beetle activity are apparent south of the Matanuska River near Kings Mountain. An additional 19,000 acres of beetle activity was aerially detected for the third year between Willow Creek and Little Willow Creek.



Lutz spruce killed by spruce beetles which emerged from firewood

The Tiekel River outbreak along the Richardson Highway has decreased by 9,000 acres and now encompasses 14,733 acres. Areas most heavily infested continue to occur along the Tiekel River and along the Richardson Highway from Stuart Creek to Pump Station 12. Infestations will continue to decrease in intensity as the spruce beetle has killed the majority of the susceptible host type after more than eight years of activity. Spruce beetle activity however, is increasing in other localities in south-central and interior Alaska. A large spruce beetle outbreak was detected along the Yukon River south of Nulato in 1986. This was the first recorded spruce beetle outbreak north of the Alaska Range. The outbreak continued to expand in 1987 and by 1988, beetles have infested approximately 140,000 acres. Infestations are scattered throughout the white

spruce stands bordering the Yukon River from Anvik to Nulato with some spot activity occurring near Galena. Infestations are expected to intensify and spread along the Yukon in an easterly direction during the next few years. New spruce beetle activity was detected on 14,000 scattered acres north of the Wood-Tikchik State Park approximately 30 miles southwest of the Taylor Mountains. Scattered spruce beetle activity also continues along the Kuskokwim River on 10,000 acres between Sleetmute, Devil's Elbow and McGrath.

1988 spruce beetle infestations throughout south-central and interior Alaska by ownership are as follows: National Forest Land--36,413 acres; State and Private--139,613 acres, and other Federal lands (e.g. Kenai National Wildlife Refuge, National Parks, etc.)--211,094 acres.

In southeast Alaska, spruce beetle activity was low in 1988. Light additional spruce mortality occurred in Glacier Bay National Park, but the total affected acreage did not expand appreciably from the previous year. Slightly over 18,000 acres have been affected in the Park, with mortality ranging from 5 to 75% of the trees in nearly pure stands of Sitka spruce. Small patches of older spruce mortality are evident along the outer coast of Glacier Bay National Park from Dundas Bay to Palma Bay. These patches total less than 500 acres, and do not appear to be expanding.

Nearly 2000 acres of spruce in the Yakutat Forelands have been infested by the spruce beetle. The level of mortality in these areas is low, averaging 10-20% of the stand, and only 3-5% of the trees in these stands are presently infested. The mortality is concentrated around two large salvage sale units on either side of the Situk River.

No current spruce beetle activity was noted elsewhere in southeast Alaska.

#### ENGRAVERS, *Ips perturbatus* (Eichh.)

Engraver infestations were detected on approximately 1,500 acres, similar to acreages infested in 1987. The areas most heavily impacted occur within the Bonanza Creek Experimental Forest in spruce

stands bordering logging roads and recent timber harvest areas.

#### SPRUCE BUDWORM, *Choristoneura* sp.

No spruce budworm activity was detected in Alaska's spruce stands in 1988. However, visible defoliation is expected near Copper Center and Palmer in south-central Alaska in 1989. Historically, budworm (*C. orae*) defoliation is prevalent every two years, a reflection of the prolonged budworm life cycle.

#### LARGE ASPEN TORTRIX, *Choristoneura conflictana* (Wlkr.)

Tortrix populations in interior Alaska declined for the second consecutive year. Defoliation was aerially detected on 118,391 acres of aspen; a decrease of almost 50,000 acres from 1987 defoliation levels. Major areas of defoliation occurred near Fairbanks, Delta Junction and Denali National Park. Defoliation levels are expected to decline in 1989. Minimal tree mortality is expected as a result of this outbreak.

#### SPEAR-MARKED BLACK MOTH, *Rheumaptera hastata* (L.)

Black moth populations significantly declined in 1988. Only 234 acres of birch defoliation were aerially detected in interior Alaska this year versus 25,707 acres in 1987. We can expect little or no black moth activity for the next few years.

#### GYPSY MOTH, *Lymantria dispar* (L.)

One adult male gypsy moth was trapped in Centennial Park Campground on the outskirts of Anchorage in 1987. A thorough ground check of the campground as well as an expanded pheromone trapping program was carried out this year. No gypsy moth larvae were found in the Campground and no male adult gypsy moths were captured in the traps. State-wide pheromone trapping will continue next year.



Tent caterpillar larvae and webbing

**TENT CATERPILLAR, *Malacosoma* sp.**

Last summer, tent caterpillars were common on a variety of recently planted landscape materials along the newly completed A Street renovation in downtown Anchorage. This is the first time that tent caterpillars have been reported in Alaska. At this time, the species has yet to be identified but is believed to be the Western Tent Caterpillar (*M. californicum*). Caterpillars and their associated tents were prevalent last June on mountain-ash and Canadian red cherry. All nests and larvae were subsequently treated with insecticide in the latter part of June. The infested area will be thoroughly inspected next season for signs of larval feeding and treated if necessary. The introduction of this insect pest may prove extremely damaging to Anchorage's urban trees if not exterminated. Tent caterpillar feed-

ing can result in reduced tree growth, damage to browse plants, and reduction of aesthetic values. Final identification of the species in question will be available this winter.

**HEMLOCK SAWFLY, *Neodiprion tsugae*  
(Middleton)**

Populations of the hemlock sawfly were at low levels throughout southeast Alaska in 1988. No visible defoliation was noted, whereas nearly 2000 acres were defoliated in 1987. Previously undetected top-kill and mortality of western hemlock were mapped on nearly 3000 acres. This damage was the result of heavy sawfly infestations from 1983 to 1985. Most of this additional top-kill was in the southern part of the Tongass National Forest, including Prince of Wales Island, Cleveland Peninsula, and Revillagigedo Island. In total, the sawfly infestation of the mid-1980's produced top-kill and mortality of hemlock on more than 14,000 acres throughout southeast Alaska.

Although sawfly defoliation was not evident from the air, the total larval counts from the 1988 defoliator survey were similar to the numbers in 1987. The highest sawfly populations were recorded on Thorne Island, where defoliation was noted in 1986 and 1987. Other areas where larval numbers increased in 1988 were Tuxekan, Stevenson Island, and Calder Bay, all around the northern part of Prince of Wales Island. Larval numbers also increased in Moira Sound (S. Prince of Wales Island). Sawfly numbers declined on most plots in the southern half of Prince of Wales Island, including Cholmondeley Sound, Skowl Arm (McKenzie Inlet and Polk Inlet), Karta Bay, Thorne Bay, and Kendrick Bay. Other areas with substantial declines in sawfly numbers included Smeaton Bay (Behm Canal), Edna Bay (Kosciusko Island), Kadake Bay (Kuiu Island), Todd (Chichagof Island), and Hood Bay (Admiralty Island).

**WESTERN BLACK-HEADED BUDWORM, *Acleris gloverana*  
(Walsingham)**

The most recent western black-headed budworm infestation in Prince William Sound occurred in 1983 in the Port Gravina and Fildago areas where 13,000 acres of western hemlock and Sitka spruce were defoliated. This outbreak declined by 50% the following year and by 1985, was not apparent during

annual aerial surveys. In 1988, budworm populations dramatically increased and defoliation was detected on approximately 145,000 acres. Areas most heavily impacted include: Port Fildago and Gravina areas; sw end of Hawkins Island; nw and sw side of Montague Island; all of Green, Knight and Perry Islands; portions of Latouche, Ekington, Evans, Chenega, Naked, Glacier and Culross Islands. This outbreak is surprising with respect to its intensity and magnitude. Budworm defoliation was not detected in 1987. The present outbreak is not expected to last more than three years followed by an equally impressive population decrease. Some scattered tree mortality and top kill are expected.

For the most part, black-headed budworm epidemics are rare in Prince William Sound due to the normally unfavorable climatic conditions for population build-up. This year's large infestation is probably a result of the unseasonably warm August and September weather the previous year (1987). This is the dispersal and oviposition period of the budworm.

Western black-headed budworm populations were at very low levels in southeast Alaska in 1988. No defoliation was noted, and larval numbers declined sharply from 1987 levels. The most substantial decreases in budworm larvae were noted in the southern part of the Forest, including Coning Inlet (Long Island), Grace Harbor (Dall Island), S. Prince of Wales Island (Dora Bay, Moira Sound, Thorne Bay), and Princess Bay (S. Revillagigedo Island). The only area where black-headed budworm numbers increased was in Tuxekan, near the northern part of Prince of Wales Island.

**SPRUCE NEEDLE APHID, *Elatobium abietinum*, (Walker)**

Due to a relatively mild winter, spruce needle aphid populations rose in 1988. Damage to Sitka spruce was noted around several communities including Juneau, Sitka, Petersburg, Craig and Klawock.



Black-headed budworm defoliation in Prince William Sound

**COTTONWOOD DEFOLIATION, *Chrysomela* sp. and *Lyonetia* sp.**

Approximately 11,000 acres of cottonwood were defoliated in Prince William Sound. The majority of the damage occurred near the town of Valdez. 2,500 acres of cottonwood defoliation also occurred at the head of Kings Bay in the Port Nellie Juan area. The causal agents were identified as the cottonwood leaf beetle (*Chrysomela* sp.) and a leaf blotch miner (*Lyonetia* sp.).

The occurrence of both defoliators on cottonwood resulted in widespread, heavy defoliation which may result in limited growth reduction and top kill. Populations are expected to remain high for a few more years followed by a rapid decline.

Populations of the cottonwood leaf beetle remained high in 1988 in southeast Alaska. Willows and black cottonwoods were heavily defoliated in several areas including the Whiting River (800 acres) and the Takhin and Chilkat River drainages near Haines, where defoliation totalled nearly 4000 acres. Homeowners in the Mendenhall Valley near Juneau also

reported heavy defoliation of willows and cottonwoods for the fourth consecutive year.

**WILLOW LEAFBLOTCH MINER, *Lithocolletis* sp.**

For the second consecutive year, willow discoloration was noted along a four-mile stretch of highway from Peterson Creek to Eagle Beach north of Juneau. The discoloration is believed to be caused by *Lithocolletis* sp., the willow leafblotch miner.

**WILLOW DEFOLIATION, Tortricidae**

After two consecutive years of increases in levels of willow defoliation, 1988 aerial surveys detected only 4,318 acres of defoliated willow versus 18,000 acres of willow damage in 1987. The causal agent has yet to be identified but is believed to be a tortricid larva. The most heavily impacted areas continue to occur near the confluence of the Mulchatna and Nushagak Rivers and along the Yukon River near the town of Galena. Although larval numbers are high in these areas, damage appears to be minimal.



Cottonwood leaf damaged by *Lyonetia* sp.

## STATUS OF DISEASES

### HEMLOCK DWARF MISTLETOE, *Arceuthobium tsugense* (Rosendhal) G.N. Jones

Dwarf mistletoe is a destructive disease of western hemlock throughout southeast Alaska as far north as Haines. Within the range of western hemlock, dwarf mistletoe is absent further west along the coastal area of the Gulf of Alaska. In southeast Alaska, old-growth hemlock stands vary in their level of infestation; dwarf mistletoe is absent in some stands but in other stands almost every hemlock is infected. Sitka spruce and mountain hemlock are only rarely infected by this parasite. Heavily infected western hemlock trees have branch proliferations (witches-brooms), bole deformities, slowed radial growth, or may die.

Infected, non-merchantable hemlock trees are sometimes left standing in cut-over areas. The spread of dwarf mistletoe from these infected residuals is probably the principle form of infestation of young hemlock stands. A demonstration area near Thorne Bay on Prince of Wales Island, Alaska was developed to provide information on the recognition, biology, impact, and recommended silvicultural techniques for managing hemlock dwarf mistletoe in young-growth stands. The killing of infected residual hemlocks (by girdling or felling) during pre-commercial thinning and the care in laying out cutting boundaries to avoid infected old-growth hemlock on clearcut perimeters can help reduce the initial spread to young stands.

### SPRUCE NEEDLE CAST, *Lirula macrospora* (Hartig) Darker

One-year old needles of Sitka spruce had symptoms of severe attack by *Lirula* in many areas of southeast Alaska this year. Young spruce trees growing in cutover areas or in urban areas were the most severely affected. Research conducted during the last two years demonstrated that most infectious spores are produced by the fungus in early spring when spruce buds are breaking and young needles are emerging. *Lirula* spores are most likely spread by splashing rain water. Once infected, these young needles do not exhibit symptoms until the following

spring. These infected, reddish-brown one year old needles were the most noticeable symptom this year. Next year, when these needles are two years old, characteristic *Lirula* fruiting bodies and spores will be produced. Thus, we also expect high infection levels next year.

### SIROCOCCLUS SHOOT BLIGHT, *Sirococcus strobilinus* Pruess.

The incidence of *Sirococcus* remained at fairly low infection levels this year, although this fungus is still causing damage in some young-growth stands in southeast Alaska. *Sirococcus* attacks the shoots of western hemlock and, to a lesser degree, the shoots of Sitka spruce. Young hemlocks in thinned stands have fewer infections than in unthinned stands. Most infections are concentrated in the lower portions of the live crown where they have less effect on tree growth and do not distort the terminal leader.

### SHOOT BLIGHT OF ALASKA-YELLOW CEDAR, *Apostrasseria* sp.

The incidence of shoot blight on Alaska-yellow cedar (*Chamaecyparis nootkatensis*) has not changed appreciably over the past several years. Terminal and lateral shoots are killed back 10 cm or so on seedlings and saplings during winter or early spring. Growth rates of affected cedars are probably not significantly reduced unless trees are severely attacked or unless the terminal leader is killed. Mature trees were found to be uninfected by this fungus in an intensive survey of diseases of Alaska-yellow cedar.

### SPRUCE NEEDLE RUST, *Chrysomyxa ledicola* Lagerh.

Spruce needle rust was somewhat less abundant than in previous years throughout Alaska. The spores that infect spruce needles are produced on the alternate host, Labrador-tea (*Ledum* spp.), a plant that is common in boggy, poorly drained areas. Therefore, the disease on spruce is usually confined to areas near large muskegs or bogs. Spruce trees rarely, if ever, die from this disease even in years of intense infection.

**SPRUCE BROOM RUST,**  
*Chrysomyxa arctostaphyli* Diet.

Spruce broom rust is a perennial disease of white, Lutz spruce, Sitka, and black spruce; its incidence changes little from year to year. It is common wherever spruce grows near the alternate host, bearberry or kinnikinnik (*Arctostaphylos uva-ursi*). The disease is common in interior and south-central Alaska, where scattered individual trees are infected, but only occurs in localized areas of southeast Alaska. The rust fungus causes perennial infections that result in large, dense clusters of branches. Top kill or mortality sometimes occur.

**HEMLOCK NEEDLE RUST,**  
*Pucciniastrum vaccinii* (Rab.) Joerst.

Hemlock needle rust occurred at somewhat higher-than-usual levels on needles of western hemlock for the second consecutive year. The alternate host for this rust fungus is blueberry (*Vaccinium alaskensis* How.), a very common component of understory vegetation in hemlock-spruce forests.

**WESTERN GALL RUST,**  
*Endocronartium harknessii* (J.P. Moore) Hirat.

This rust fungus continues to cause spherical galls on branches and main boles of shore pine. *Endocronartium* is common throughout the distribution of pine in Alaska. This year, another fungus, *Nectria macrospora*, colonized and killed many of the pine branches with these galls. In cases where galls were located on the main bole, *Nectria* commonly caused top-kill.

**FOLIAGE DISEASES OF CEDARS,**  
*Gymnosporangium nootkatensis* Arth. and  
*Didymascella thujina* (Durand) Maire

Two fungi that occur on the foliage of cedar, *Gymnosporangium* on Alaska-yellow cedar and *Didymascella* on western redcedar, occurred at low, endemic levels this year. They neither severely defoliated nor killed cedar trees.

**HEMLOCK CANCKER, *Xenomeris abietis* Barr.**

Damage by *Xenomeris*, which was restricted to hemlock adjacent to roads on Prince of Wales Island in recent years, has subsided. Old damage from several years ago is still evident.

**ALASKA-YELLOW CEDAR DECLINE**

Decline and mortality of Alaska-yellow cedar persists as one of the most spectacular and important forest diseases in southeast Alaska. Some 340,000 acres of decline have been mapped during aerial detection surveys. Cedar trees have probably died throughout southeast Alaska every year since the onset of the problem about 100 years ago. This year, dying discolored trees were particularly concentrated on the southern half of Kuiu Island and the northeast portion of Slocum Arm on Chichagof Island. The patterns of tree death and apparent absence of a pathogen as the primary cause suggest that some form of environmental stress may be the cause of the problem.

An hypothesis is now suggested to explain cedar decline. The general climatic warming that has occurred in Alaska for about the past 100 years coincides with the onset of decline in about 1880. Although winter daily temperatures may have increased by only several degrees than before 1880, many more winter days have had temperatures just above freezing rather than just below freezing. Considerably more precipitation would have occurred as rain and less as snow. Thus, snow pack at lower elevations would be expected to much reduced during the 20th Century. Our recent research has demonstrated that fine root death is one of the earliest symptoms in a declining cedar tree. Also, decline occurs on wet, poorly drained sites and is particularly severe at lower elevations. It seems conceivable that the primary cause of cedar decline is freezing damage to fine roots during winter cold spells. Because of the anaerobic nature of boggy soils, fine roots of cedars growing in poorly drained sites are very shallow--where they may be susceptible to freezing in these exposed open canopy forests. Also, water-saturated soils are poor insulators against cold. In contrast, cedars growing on sites with better drainage, where decline does not occur, have fine roots that are deeper and better insulated from freezing by the drier soils. We have located some wet sites dominated by cedar but

where decline does not occur. These sites are above 500 ft elevation where cedar fine roots are presumably protected from freezing damage by snow during most winter months. This explanation for the cause of cedar decline is currently hypothetical and research is needed to aid in its acceptance or rejection.

The following list of acreage of land affected by Alaska-yellow cedar decline has been determined from a composite map developed by mapping dead and dying cedar during annual aerial detection surveys conducted over the previous 20 years. Recent research suggests that the total acreage of cedar decline increases very slowly because there is no site-to-site spread of decline. The slow increase in area of cedar decline is a result of encroachment (i.e., <1m/yr) of decline to adjacent stands. Contained within most declining stands are trees that died up to 100 years ago, more recently killed cedars, dying cedars (with red or thin crowns), healthy cedars, and other tree species.

**STANDS OF DEAD AND DYING ALASKA-YELLOW CEDAR IN SOUTHEAST ALASKA**

	Acres
<b>NATIONAL FOREST LAND</b>	<b>333,037</b>
Chatham Area	107,992
Juneau Ranger District	1,011
Hoonah Ranger District	1,556
Sitka Ranger District	
Chichagof I	32,071
Baronof I	52,804
Kruzof I	15,205
Total	100,080
Admiralty Island Nat'l Monument Wilderness	5,345
Stikine Area	137,961
Petersburg Ranger District	
Kupreanof I	56,561
Kuiu I	36,897
Mitkof I	4,710
Woewodski I	2,258
Mainland	5,060
Total	105,486

Wrangell Ranger District	
Etolin I	12,533
Wrangell I	8,874
Zarembo I	5,760
Woronofski I	311
Mainland	4,997
Total	32,475
Ketchikan Area	87,084
Thorne Bay Ranger District	
Prince of Wales I	18,150
Kosciusko I	2,997
Heceta I	529
Total	21,676
Craig Ranger District	
Prince of Wales I	17,021
Dall I. and Long I	856
Total	17,877
Ketchikan Ranger District	
Revillagigedo I	13,622
Gravina I	1,955
Mainland	11,753
Total	27,330
Misty Fjords Nat'l Mon. Wilderness	
Revillagigedo I	7,084
Mainland	13,117
Total	20,201

<b>OTHER FEDERAL LAND</b>	<b>233</b>
Annette I	233
<b>NATIVE LAND</b>	<b>6,537</b>
Prince of Wales I	3,658
Kupreanof I	312
Ketchikan area	2,567
<b>STATE LAND</b>	<b>3,969</b>
Sitka area	1,090
Mitkof I	1,206
Kupreanof I	156
Prince of Wales I	476
Ketchikan area	1,041
<b>TOTAL LAND AFFECTED</b>	<b>343,776</b>



Decline of Alaska-yellow cedar at Slocum Arm on Chichagof Island, Alaska.

#### HEMLOCK FLUTING

Fluting on the boles of western hemlock continues to be a problem throughout southeast Alaska. Hemlocks with fluting have deeply incised grooves and ridges extending vertically along their boles; a condition that reduces the value of hemlock logs because they yield less sawlog volume and bark is contained in some of the wood. The cause of fluting is not completely known, but researchers have recently explored reasons for this bole deformation and have documented its presence in young hemlock stands.

#### UNIDENTIFIED MORTALITY

Mortality of Sitka spruce located near Petrof Glacier on the southeast portion of Kenai Peninsula was reported to Forest Pest Management personnel this fall. Approximately 25% of the mature trees in the area examined showed signs of mechanical or animal damage at the root collar. Patches of bark had been completely removed from the upper surface of at least some of the primary structural roots for a distance of 20-50 cm back from the root collar. Examination of sapwood samples from these trees revealed the consistent presence of a stain visible as faint black streaks. Identification of the fungal isolates will be undertaken this winter.

#### DECAYS

Heartrot fungi cause substantial loss of wood volume in Alaskan forests. The problem is particularly serious in Alaska where long-lived trees in old-growth forests are still predominant and the slow-growing decay fungi have ample time to cause significant losses. In southeast Alaska, the following fungi are the most important causes of wood decay:

##### Sitka spruce-

*Fomitopsis pinicola* (Schwartz:Fr.) Karst.  
*Phellinus pini* (Thore:Fr.) Pilat  
*Armillaria* sp.  
*Phaeolus schweinitzii* (Fr.) Pat.  
*Laetiporus sulphureus* (Bull. ex Fr.)  
 Bond. et Sing.

##### Western hemlock-

*Fomitopsis pinicola*  
*Armillaria* sp.  
*Heterobasidion annosum* (Fr.) Bref.  
*Laetiporus sulphureus*  
*Phaeolus schweinitzii*  
*Phellinus robustus* (Karst.) Bourd & Galz.  
*Phellinus pini*

##### Western redcedar-

*Poria albipeliucida* Baxt.  
*Phellinus weirii* (Murr.) Gilbn.

High incidences of heartrot fungi was reported from the Kenai Peninsula, based on the presence of sporophores. Species with perennial sporophores have been most notable (e.g., *Phellinus tremulae* on aspen, and *P. igniarius* and *Fomes fomentarius* on birch). The frequency of species with annual sporophores (e.g., *Pleurotus ostreatus* and *Pholiota adiposa*, both on birch and aspen) is much less certain, since this has been a relatively dry summer and fruiting may have been reduced.

Heartrots are quite common in mature stands of mountain hemlock, with sporophores of *Phellinus pini* being encountered most commonly. Sporophore incidence frequently exceeds 10%. Decay losses to this pathogen are no doubt considerably greater, however. Sporophores of *Echinodontium tinctorum* have been observed much less frequently.

*P. pini* is also relatively common in spruce stands (white, Sitka, and Lutz), but not to the extent observed in hemlock. In addition, at least 20% of trees attacked by spruce beetles 5-10 years ago contain advanced decay caused by *Fomitopsis pinicola*. The actual percentage may be considerably higher.

Survey of the incidence of root and butt rots of conifers on the Kenai Peninsula also was initiated this year. Since most identifications are based upon

isolation and fungal growth in culture, a tabulation of incidence by pathogen species will not be available until late fall '88. However, total incidence by stand appears to typically be about 10-20%.

## STATUS OF ANIMAL DAMAGE

### PORCUPINE, *Erethizon dorsatum*

Porcupine damage was noted in a regenerated stand along the East Fork of the Bradfield River in central southeast Alaska. Porcupines continue to cause damage in precommercially thinned conifer stands on Mitkof Island.

### BROWN BEAR, *Ursus arctos*

Brown bears wound the lower boles of Alaska-yellow cedar trees every year on Baranof and Chichagof Islands, particularly in the Peril Strait and Slocum Arm areas. Approximately one-half of the cedars in some stands have at least one scar. Other tree species are unaffected. Fresh scars on cedar are produced in spring and have teeth marks in exposed wood. Trees with old scars have associated columns of wood decay that will limit the value of butt logs from scarred trees.

**1988 FOREST INSECT AND DISEASE INFESTATION  
IN ALASKA BY LAND OWNERSHIP AND PEST IN ACRES**

PEST	NATIONAL FOREST	OTHER FEDERAL	NATIVE	STATE & PRIVATE
Spruce Beetle <i>Dendroctonus rufipennis</i>	37,191	144,392	48,095	92,764
Engravers <i>Ips perturbatus</i>		20		1,270
Large Aspen Tortrix <i>Choristoneura conflictana</i>		27,354	11,734	79,303
Spear-Marked Black Moth <i>Rheumaptera hastata</i>				234
Hemlock Sawfly <i>Neodiprion tsugae</i>	2,960		156	
Black-headed budworm <i>Acleris gloverana</i>	102,457		43,910	
Cottonwood Defoliation	778	254		15,096
Willow Leafblotch Miner <i>Lithocolletis</i> sp.	20			
Willow Defoliation		2,180	502	1,636
Alaska-yellow cedar Decline	333,037	233	6,537	3,969
High Water Damage	856		78	
<b>Totals:</b>	<b>477,299</b>	<b>174,433</b>	<b>111,012</b>	<b>194,272</b>

State Total (Insects and Disease)\*: 957,016

\*These values do not include many of the most destructive diseases (e.g., wood decays and dwarf mistletoe) because these losses are not detectable in aerial surveys.

## INTEGRATED PEST MANAGEMENT ACTIVITIES

Integrated pest management has been described as a "systems approach to reducing pest damage to tolerable levels through a variety of techniques, including predators and parasites, genetically resistant hosts, natural environmental modifications and, when necessary and appropriate, chemical pesticides." Considering the broad parameters offered by this definition a listing of Region 10 IPM activities conducted by FPM is as follows:

(1) Participation in a cooperative effort with Alaska Agricultural Research Station and the Cooperative Extension Service to provide pest management information to Alaska residents. The program which includes education, research and survey activities, provides integrated pest management information concerning urban forestry and garden and greenhouse pests. This program includes a Teletip recorded message service as well as an IPM Newsletter which is published monthly throughout the summer.

There were five full-time and three half-time pest scouts employed from May until the end of September in Fairbanks, Delta Junction, Palmer, Anchorage, and Soldotna. Two additional half-time pest scouts were also hired; one in Juneau and one in Sitka. In addition, there are four Extension Agents working with the program. It is anticipated that an additional half-time pest scout will be placed in Kodiak next summer.

(2) A selective cut and fertilization study was initiated this fall on a 9 acre island directly across from the Granite Creek Campground (Chugach National Forest) which had been set aside for research purposes. Two and one-half acres of mature spruce forest were thinned and all thinned material removed with a Zig-zag monocable yarder. The remaining plots will be thinned and fertilized next fall. The purpose of the thinning and fertilization is to determine which treatments or combination of treatments will increase the vigor of the residual spruce thereby reducing their susceptibility to spruce beetle attack.

(3) The testing of systemic insecticide implants for the prevention of spruce bark beetle attacks as well as the use of these implants as a remedial treatment for attacked spruce was initiated in May of 1987 and terminated this fall. Treatment efficacy indicated little or no effect of these treatments in preventing spruce beetle attack or killing established spruce beetle brood.

(4) Testing of trap trees treated with silvicides (MSMA and Cacodylic acid) was continued on the Kenai Peninsula, the Tokwim River, and at Fairbanks. The objective of the testing was to determine which treatment significantly reduced spruce and engraver (*Ips*) beetle progeny production compared to untreated trap trees. Treatment efficacy will not be known until later this year.

(5) The testing of diesel with and without carbaryl as a remedial spray for the reduction of spruce beetle brood on infested spruce was undertaken this summer on the Kenai Peninsula. Although efficacy data have not yet been analyzed, preliminary findings indicate that both carbaryl with diesel and diesel alone were effective in killing late instar and new adult spruce beetles. This study will be continued next year with treatments aimed at the reduction (mortality) of early instar larvae.

(6) A two year study comparing bucking length of infested spruce bolts on spruce beetle survival was finished this summer. Although analysis of the data has not yet been completed, preliminary data suggest that, although fewer spruce beetles survived in the smaller bolts, the reduction was not significant to realistically affect population numbers.

(7) A cooperative (PSW/INF/FPM) standing lethal trap tree study was initiated this summer and will terminate at the end of the 1988 field season. The objective of this study is to determine the efficacy of using carbaryl treated uninfested spruce baited with synthetic aggregating pheromone as lethal traps to suppress spruce beetle populations.

## SUBMITTING INSECTS AND DISEASES FOR IDENTIFICATION

People interested in obtaining identification of insect and disease specimens should submit samples to specialists. The following procedures for the collection and shipment of specimens should be used:

### I. Specimen collection:

1. Adequate material should be collected
2. Adequate information should be noted, including the following:
  - a. Location of collection
  - b. When collected
  - c. Who collected the specimen
  - d. Host description (species, age, condition, # of affected plants)
  - e. General description of area (eg, old or young forest, bog, urban); unusual conditions (e.g., frost, poor soil drainage, mis-application of fertilizers/pesticides?).
3. Personal opinion of the cause of the problem is very helpful

### II. Shipment of specimens:

1. General: Pack specimens in such a manner to protect against breakage.
2. Insects: If sent through the mail, pack so that they withstand rough treatment.
  - a. Larvae and other soft-bodied insects should be shipped in small screw-top vials or bottles containing at least 70% isopropyl (rubbing) alcohol. Make certain the bottles are sealed well. Include in each vial adequate information, or a code, relating the sample to the written description and information. Labels inserted in the vial should be written on with pencil or India ink. Do not use a ballpoint pen, as the ink is not permanent.
  - b. Pupae and hard-bodied insects may be shipped either in alcohol or in small boxes. Specimens should be placed between layers of tissue paper in the shipping boxes. Pack carefully and make certain that there is very little movement of material within the box. Do not pack insects in cotton.
3. Needle or foliage diseases : Do not ship in plastic bags. Sprinkle lightly with water before wrapping in newspaper. Pack carefully and make sure that there is very little movement of material within the box. Include the above collection information. For spruce and other conifers, include a description of whether current year's-needles, last-year's needles, or old-needles are attacked.
4. Mushrooms and conks (bracket fungi): Do not ship in plastic bags. Either pack and ship immediately, or first air dry and then pack. To pack, wrap specimens in dry newspaper and pack into a shipping box with more newspaper. If on wood, include some of the decayed wood. Be sure to include all collection information.

### III. Shipping:

1. Ship as quickly as possible, especially if specimens are fresh and not air-dried. If samples cannot be shipped rapidly, then store in a refrigerator.
2. Include address inside shipping box.
3. Mark on outside: "Fragile: Insect-disease specimens enclosed; For scientific purposes only; No commercial value."

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***STATE AND  
FEDERAL OIL  
SPILL LAWS***



# Alaska State Legislature

HOUSE OF REPRESENTATIVES  
COMMITTEE ON RESOURCES

POUCH V  
JUNEAU, ALASKA 99811  
(907) 469-3718

## HOUSE RESOURCES COMMITTEE, OIL SPILL HEARING

Thursday, January 18, 1990  
3:00 to 5:00 p.m.  
Capitol Room 124

EXISTING STATE AND PROPOSED FEDERAL LAW  
STATE PRE-EMPTION  
INTERSTATE COMPACTS

John Katz - Special Counsel, Federal State Relations,  
Office of the Governor, Washington D.C.  
Status of federal legislation, the conference committee and  
the state's priorities for the legislation.

Zygmunt Platter - Boston College and Harvard Law School  
Professor, Sea Grant  
Sea Grant Project on Alaska Oil Spill including Pre-emption  
and Interstate compacts.

Amy Kyle - Deputy Commissioner  
Department of Environmental Conservation  
Status of legislation passed last session, the B.C. task  
force, the state's position on pre-emption as it relates to  
state requirements and possible federal pre-emption.

- Attorney General's Office  
SB 406 and reintroduction of legislation that may potentially  
be pre-empted by federal law.

# SPILL

The Wreck of the *Exxon Valdez*

Implications for Safe Marine Transportation



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HAS BEEN REPHOTOGRAPHED  
TO ASSURE LEGIBILITY**

# SPILL

The Wreck of the *Exxon Valdez*

Implications for Safe Marine Transportation



Report of the Alaska Oil Spill Commission  
Executive Summary

# SPIII

The Wreck of the Exxon Valdez  
Implications for Safe Marine Transportation

January 1990

## FOREWORD

On March 24, 1989, Alaskans awoke to the shock of disaster. Shortly after midnight, the 987-foot-long supertanker Exxon Valdez had run hard aground on Bligh Reef, spilling 10.8 million gallons of crude oil into the unspoiled waters of Prince William Sound. The worst case had occurred.

This was the threatened tanker catastrophe residents of Prince William Sound had dreaded — but many had come to discount — ever since the trans-Alaska pipeline system was proposed in the late 1960s. A few of those scrambling to cope with the disaster knew something more chilling still. Though nearly 11 million gallons of crude oil already had escaped the fully-loaded *Exxon Valdez*, another 40 million gallons remained on board — and the ship was in considerable danger of capsizing. The spill that became the environmental disaster of the decade easily could have been five times worse.

The system that carried 25 percent of America's domestic oil production had failed. So had the regulatory apparatus intended to make it safe. The promises that led Alaska to grant its rights-of-way and Congress to approve the Alaska pipeline in June 1973 had been betrayed. The safeguards that were set in place in the 1970s had been allowed to slide. The vigilance over tanker traffic that was established in the early days of pipeline flow had given way to complacency and neglect. In the months following the spill, more than 1,000 miles of Alaska's coastline would be sullied by North Slope crude.

Communities touched by the effects of the spill staggered under the damage to land and water upon which they lived or the impact of the massive cleanup mobilization after the spill. Alaskans from walks of life as diverse as the oil industry and subsistence communities struggled with the economic losses, sorrow and dislocations as well as, for some, the opportunities that came with the spill and cleanup. Attitudes toward oil development, the land, the industry and the future were examined and re-examined as Alaskans searched for answers to the question of how things went wrong.

The Alaska Legislature created the Alaska Oil Spill Commission to provide some of the answers. Two months after the spill, the governor appointed an independent panel to study the event and recommend public policy remedies. The commissioners came to their work with broad experience in government and public affairs. Their sole purpose was to learn the causes of this disaster and propose changes that would prevent a recurrence of similar disasters anywhere. The mission was clear: Our report must show a path for Alaska, the United States and the world to a vastly improved system for transporting oil and other hazardous substances in the marine environment.

*source of life, the water. We will need much help, much listening in order to live through the long barren season of dead water, a longer winter than before. . . . We have never lived through this kind of death. But we have lived through lots of other kinds of death. We will learn from the past, we will learn from each other, and we will live.*

Port Graham is about 250 miles, by water, from Bligh Reef. To get there, the oil had to travel the length of Prince William Sound, past Green, Story, Knight, Montague and LaTouche islands, out into the Gulf of Alaska and along the rocky headlands of Kenai Fjords National Park. It had to round the corner at the end of the Kenai Peninsula, plastering Elizabeth Island and heading into Cook Inlet and the outer reaches of Kachemak Bay. Moving beyond Port Graham and the surrounding area, the oil fouled beaches down the Alaska Peninsula — in Katmai National Park, along the Shelikof Strait, on Kodiak Island and beyond. As the oil spread so, belatedly, did the impact of cleanup and containment efforts, with an army of workers and a navy of boats to move and house them.

To trace on a map the tortured routes of the oil spilled from the *Exxon Valdez* is to appreciate the vulnerability of every coastline on earth as supertankers of 500,000 deadweight tons and more carry crude oil to market. When the Alaska pipeline was being planned and built, the largest tankers in the U.S. flag fleet were about half that size. The world's oil shipping companies, to the benefit of consumers and corporate shareholders, have created a megasystem that carries oil from wellheads in the far corners of the earth to refineries in its major industrial centers. But this megasystem is fragile. It requires careful scrutiny from outside the industry in design, construction and operation. When it fails, as it has in tanker disasters around the world, entire coastlines are at risk. Had a spill the extent of the *Exxon Valdez* disaster occurred off the United States East Coast, the devastation would have stretched from Cape Cod to Chesapeake Bay.

This is not a fictitious risk. Alaskans assume such risks daily as supertankers carry 2 million gallons of North Slope crude through Prince William Sound and out into the Gulf of Alaska. Other Americans on three coasts face just as ominous a threat as the world tanker fleet delivers 43 percent of all U.S. oil consumption daily from overseas.

What will limit these risks? Obviously, the present system, providing minimum penalties for creating massive environmental damage, has not deterred the industry from putting the coasts and oceans of the world at constant hazard. The system calls out for reform. The mission of this commission is to explain what must be done and why.

Walter B. Parker, chairman  
Alaska Oil Spill Commission  
January 5, 1990

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This disaster could have been prevented — not by tanker captains and crews who are, in the end, only fallible human beings, but by an advanced oil transportation system designed to minimize human error. It could have been prevented if Alaskans, state and federal governments, the oil industry and the American public had insisted on stringent safeguards. It could have been prevented if the vigilance that accompanied construction of the pipeline in the 1970s had been continued in the 1980s.

In 1977, when tanker operations began from Valdez, we thought we had created a system that offered guarantees against most disasters. As chairman of Alaska's Oil Tanker Task Force, I pulled together a team that provided the first full-scale simulation of marine operations ever done for a North American port.

Our simulation model demonstrated to the masters and pilots the conditions that would put their ships on the rocks. Tanker lanes into Port Valdez were set to insure the maximum feasible level of safety in tanker operations. Restrictions were imposed to limit operations in high winds. Agreements between the state, the industry and the Coast Guard established that when ice was encountered, the ships would slow down and proceed at minimum speed in the tanker lanes, rather than proceeding outside the lanes at sea speed, as did the *Exxon Valdez*.

The historical record developed by the commission is clear: The original rules were consistently violated, primarily to ensure that tankers passing through Prince William Sound did not lose time by slowing down for ice or waiting for winds to abate. Concern for profits in the 1980s obliterated the concern for safe operations that existed in 1977.

This disaster could have been prevented by simple adherence to the original rules. Human beings do make errors. The precautions originally in place took cognizance of human frailty and built safeguards into the system to account for it. This state-led oversight and regulatory system worked for the first two years, until the state was preempted from enforcing the rules by legal action brought by the oil industry. After that, the shippers simply stopped following the rules, and the Coast Guard stopped enforcing them.

This past year the Alaska Oil Spill Commission traveled to the coastal towns and villages of Prince William Sound and Southcentral Alaska to hear from the people most affected by the spill. We found communities and individuals whose lives and trust had been destroyed, but who had rededicated themselves to protecting their livelihood on water and land. Walter Meganack, Sr., traditional village chief of the Alaska Native subsistence community of Port Graham offered these words at a conference of mayors from spill-affected communities:

*It is too shocking to understand. Never in the millennium of our tradition have we thought it possible for the water to die. But it is true. ... what we see now is death. Death — not of each other, but of the*

*source of life, the water. We will need much help, much listening in order to live through the long barren season of dead water, a longer winter than before. . . . We have never lived through this kind of death. But we have lived through lots of other kinds of death. We will learn from the past, we will learn from each other, and we will live.*

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# INTRODUCTION

*The evidence points to eight fundamental conclusions that form the basis of this report:*

- I. Moving oil by sea involves a complex, high-risk megasystem whose breakdown can threaten the welfare of entire coastlines.*
- II. Risk is unavoidable in modern oil transportation. It can be reduced but not eliminated.*
- III. Prevention of major oil spills must be a fundamental goal in the oil trade since cleanup and response methods remain primitive and inadequate.*
- IV. In government as well as industry, enforcement zeal declined, alertness sagged and complacency took root in the years preceding the Exxon Valdez disaster. Prevention was neglected.*
- V. Without continuing focus on the safety of the entire system by government and industry leaders, the oil transportation system poses an increasing risk to the environment and people of Alaska.*
- VI. The State of Alaska has primary responsibility for protecting the resources of the state and the welfare of its people, who bear the risk of unsafe conditions in oil transportation.*
- VII. Privatization and self-regulation in oil transportation contributed to the complacency and neglect that helped cause the wreck of the Exxon Valdez.*
- VIII. The safety of oil transportation demands review and overhaul. Not just new technology, but new institutions and new attitudes in old institutions are required.*

These are the basic premises we believe policymakers should understand in designing remedies for a flawed system of oil transportation.

Tankers carrying North Slope crude oil from the Valdez terminal of the trans-Alaska pipeline had safely transited Prince William Sound more than 8,700 times by the time the *Exxon Valdez* left port at 2112 hours (9:12

*"I warned the community that the possibility of an oil spill in Valdez was very high. Given the high frequency of tankers into Port Valdez, the increasing age and size of that tanker fleet, and the inability to quickly contain and clean up an oil spill in open water of Alaska, we felt that we were playing a game of Russian Roulette. We knew 'The Big One' was only a matter of time."*

*Dr. Riki Ott, Cordova District Fishermen United*

*House Committee on Interior and Insular Affairs hearing, May 1989*

U. S. uses 18.1 million barrels of oil every day



p.m., Alaska Standard Time) on March 23, 1989. This experience gave little reason to fear impending disaster. Yet less than three hours later, the *Exxon Valdez* grounded at Bligh Reef, rupturing eight of its 11 cargo tanks and spewing some 10.8 million gallons of crude oil into Prince William Sound.

No human lives were lost as a direct result of the *Exxon Valdez* disaster, and only one life was reported lost in the massive cleanup effort. Indirectly, however, the human and natural losses were immense—to fisheries, subsistence livelihoods, tourism, wildlife. The most important loss, for most Americans who will never visit Prince William Sound, was aesthetic—the sense that something sacred in the relatively unspoiled land and waters of Alaska had been defiled.

Experienced mariners express astonishment that a modern, well-equipped supertanker ran aground at Bligh Reef. The *Exxon Valdez* was traveling through well-charted waters in conditions of moderate weather and visibility. Bligh Reef was a well-known hazard, and all mechanical and navigational systems on the ship were working properly. Coast Guard Commandant Paul Yost engaged in only slight hyperbole when he said after inspecting the accident scene that his 10-year-old son could have steered the tanker safely through the area.

Yet the events leading to the grounding, and the institutions and procedures reflected in them, revealed a situation where the risk of disaster had increased steadily through years of relatively incident-free tanker trade. Success bred complacency; complacency bred neglect; neglect increased the risk—until the right combination of errors finally led to an accident of disastrous proportions.

The wreck of the *Exxon Valdez* was not an isolated, freak occurrence, but simply one possible (and disastrous) result of policies, habits and practices that for nearly two decades have infused the nation's maritime oil transportation system with increasing levels of risk. The *Exxon Valdez* was an accident waiting to happen, the link that broke first in a chain with many unreliable couplings. The specific lapses that permitted the *Exxon Valdez* to run aground on Bligh Reef are being remedied, but similar circumstances easily could be repeated in some other combination to allow some other disaster. What is required now is comprehensive action to reduce the risk in the system.

At one level it is obvious that a combination of human actions and errors led to the *Exxon Valdez* disaster. Many have been scrutinized in the public record, particularly the proceedings of the National Transportation Safety

Board. Not even the root of this disaster—departing from traffic lanes—was unique: The 1967 *Torrey Canyon* grounding off England took place when the captain left the traffic lanes to save time.

Yet behind all human actions in the Valdez tanker trade, supporting the men and women who load and operate the tankers, is a system—one whose design and function clearly failed that night in Prince William Sound.

The system includes hardware in the form of pipelines, terminals, storage tanks, loading facilities, tankers and all the associated gauges, meters and machinery that operate them. It also involves operating instructions in the form of technical and design standards, international protocols, capacity ratings, terminal procedures, loading instructions, contingency plans, pilotage rules, maritime rules of the road, local navigation regulations, vessel traffic monitoring and economic and career pressures on all participants. Finally, the system involves institutional oversight in the form of corporate management, private insurance systems, state inspection and enforcement, local port management and Coast Guard regulation.

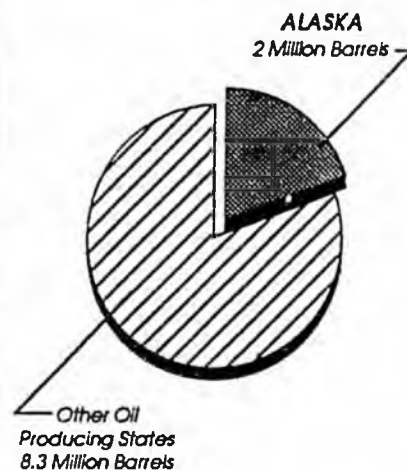
The objective is to move oil safely across the seas regardless of inevitable human error. System design must provide for redundancy—backup systems to prevent error from becoming disaster and overbuilding to provide for wider margins of error. Proper functioning requires constant testing, inspection vigilance, cooperation, discipline, expertise and commitment of organizations at every level of government and industry.

Yet for reasons of maritime tradition, economics, politics, public policy and modern practice, the maritime oil transport system is relatively more error-prone than safety-inducing. Industry tends to measure success as operating the biggest vessel with the thinnest hull and the smallest crew at the highest speed with the quickest port turnaround consistent with meeting minimum government requirements. Efficiency in a competitive world dominated by profit is all important in the oil transportation business, even in the Alaska trade where transportation competition is muted.

A comparison between the nation's passenger air transport system and the maritime transport system is instructive, if not exact. Air transport safety is better reinforced, backed up and institutionally safeguarded than maritime transport.

- Air pilots share responsibility with co-pilots and foster teamwork in the cockpit, while marine masters hold absolute authority,

Alaska produces 2 million barrels of oil every day



*"It takes great strength to recognize the reflection in the mirror. Look in the mirror, and dig deep within yourself. Don't create an image that isn't there. Act on what you see. The environment is a reflection of who we are. We can't ignore the reflection we see. We have to live with it—today, tomorrow, and forever."*

Dolly Reft, Kodiak native  
Alaska Oil Spill Commission  
hearing, 8/11/89

*"We in industry cannot  
assume that all  
regulation is bad; it's  
not."*

*Jerry Aspland, President, ARCO  
Marine, Inc.*

*Alaska Oil Spill Commission  
hearing, 9/1/89*

sharing little command responsibility with other ship officers. Mistakes in the cockpit are more easily challenged than on the bridge;

- Air traffic control is mandatory, and ground controllers share responsibility with air pilots for safety of takeoffs, landings and approaches. There is no equivalent to ground control in marine transport, and vessel traffic systems are typically only advisory;
- The federal government imposes strict standards and enforcement carried out by the Federal Aviation Administration in air transport, while the federal presence is minor and interspersed among other Coast Guard duties in the marine environment;
- Strong international cooperation governs air transport practices, while international cooperation remains weak in the maritime field; and
- Working conditions in air transport are governed by strictly enforced limits on work hours, while overwork and long hours are routinely permitted to create fatigue among crew members in marine transport.
- Airline accident victims are identifiable and directly linked to the business of air travel, while the victims of marine accidents—seamen, fishermen, wildlife—are more likely to be anonymous.

The analogy to air transport is not perfect. The issues described here reflect institutional settings, demands and traditions that go beyond considerations of safety. But two points illustrate the relevance of the comparison.

First, there are approximately 17,000 airline departures per day in the United States. On most days, every single one of these departures safely arrives at its destination. The *Exxon Valdez* was a catastrophic failure—the oil transport equivalent of a major airliner crash. Studies performed for the commission indicate that a catastrophic failure such as the *Exxon Valdez* disaster can be expected to occur in the Valdez tanker trade approximately every 13 years, or about once every 11,600 transits. At a similar rate of catastrophic failure, the air transport system would produce 1.5 airliner disasters every single day, or 550 per year. If an average of 150 people died in each airline crash, such an accident rate would result in the loss of about 82,500 human lives per year—an unthinkable carnage that

is prevented by a tight, safety-reinforcing system of regulation and oversight.

Technological and human systems aren't perfect: Airlines occasionally do crash. But we have built a system that does not tolerate in air traffic anything like the catastrophic failure rate we can expect in the Valdez tanker trade. Because of that system, air travel can be considered safe and reliable. Risk cannot be eliminated, but it can be reduced—if we accept the costs involved.

Second, as vessels carrying oil and other hazardous materials impose higher and higher risks upon the world's oceans and coastlines, the environmental and social costs of marine transport accidents increase. The growth of a massive international system of transportation of oil by sea since World War II has not been accompanied by the development of organizations and active constituencies of those affected by the environmental hazards inherent in the trade. Those stakeholders, however, deserve increasing attention, for the risks they suffer are growing as the world's oil transportation system grows. And the marine transport system must become tighter and more safety inducing as the costs of failure grow more serious and more pervasive.

Alaska, like other states, has long relied on the National Contingency Plan to provide the manpower and resources to handle a catastrophic spill. But the *Exxon Valdez* response illustrated the emptiness of the NCP: It failed to provide the necessary resources, and indeed the record of the past decade shows that the federal government has relied on private industry to contain or clean up a major spill. The government provided no resources of its own to handle even moderate-sized spills adequately. Nor is there any indication that either the Environmental Protection Agency or the Coast Guard, the federal administrators of the NCP, made any effort to determine whether the oil industry actually had the capability to clean up a catastrophic spill.

The proposals in this report aim to revive the commitment of the state and nation to tanker safety and response preparedness. The basic premises behind these proposals are highlighted at the beginning of this chapter. The major recommendations for state, federal and industry actions are then divided by subject into seven sections.

The first section includes general prescriptions concerning prevention as a comprehensive policy goal of maritime oil transportation. It focuses on direct citizen oversight, improved industry and government attitudes,

*"I think there's probably going to be reluctance from the management agencies that were involved, both at the state and federal levels, to take a hard look at their performance."*

*Dr. David G. Shaw, University of Alaska*

*Alaska Oil Spill Commission hearing, 9/21/89*

*"The level of inability to function in chaos that's going on out there is ridiculous. The amount of money that is being spent is obscene."*

Dennis Holan, Cordova fisherman  
Alaska Oil Spill Commission  
hearing, 6/28/89

knowledge of risk at all levels and regulatory vigilance as primary building blocks to a safer system.

The second section defines some commitments that must be made by the oil industry to provide better environmental protection, just as it would for human safety.

The third section addresses actions the State of Alaska should take to bolster its oil spill prevention and response systems. It provides insights on the state's relationship with the federal government and ideas on focusing the state's position on oil and gas transportation, expanding its regulatory position, creating interstate compacts, and adding greater local input to decision-making.

Recommendations to the federal government in section four, if adopted, would have considerable impact on tanker safety. Tanker design changes, including double hulls, improved traffic control systems and a increased emphasis on proper manning and crew training are the key elements. If adopted, these could decrease spill probabilities of the *Exxon Valdez* size more than four-fold. If further recommendations for increased federal oversight also were carried out, we could expect a five-fold improvement in oil tanker safety—and therefore a substantial decrease in the present devastation of our coasts and oceans.

Section five describes what the commission believes should be the government's posture toward future spills—the response mechanisms of state, federal and local governments, and how they might fit together better to prepare for future spills. The private sector is included as a critical element of response, but not as the governing element. The key to a proper response system is speedy mobilization of manpower and resources immediately after a spill. The next element is to insure protection of key environmental areas if a spill cannot be contained. We recommend that the Incident Command System—currently familiar to many federal agencies for emergency response—be put into use widely to respond to natural disasters.

In section six we make recommendations on how to implement an oil spill response and how to integrate the Incident Command System into existing organizations. Our goal is to show how to use existing government systems in the most efficient manner while avoiding the creation of a separate spill response bureaucracy in every government agency concerned with oil spills. We have also emphasized an increased and structured role for local communities both to insure that local resources are available and that rapid mitigation of spill impacts occurs when

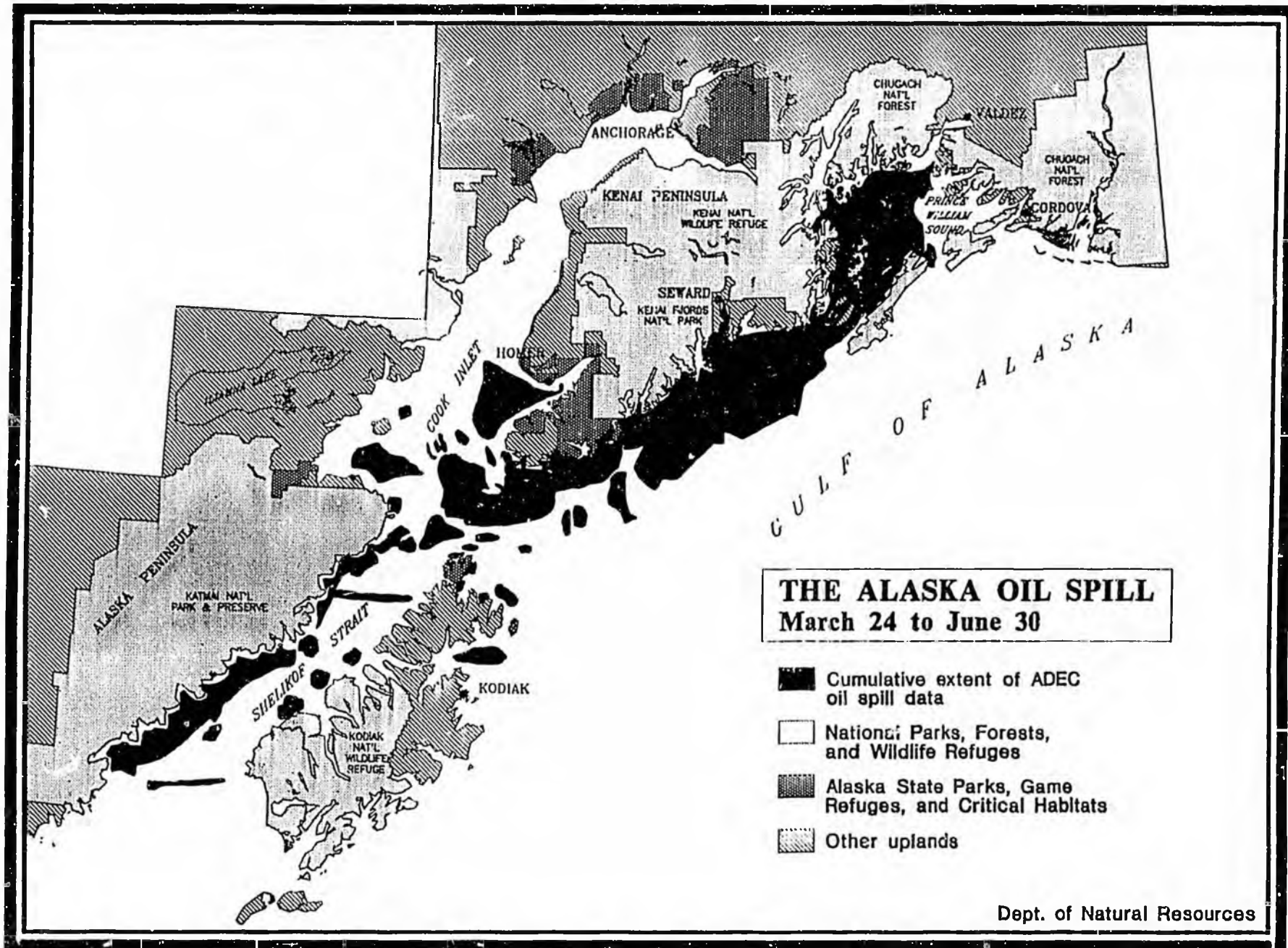
necessary. The role of private contingency plans also is defined in this section.

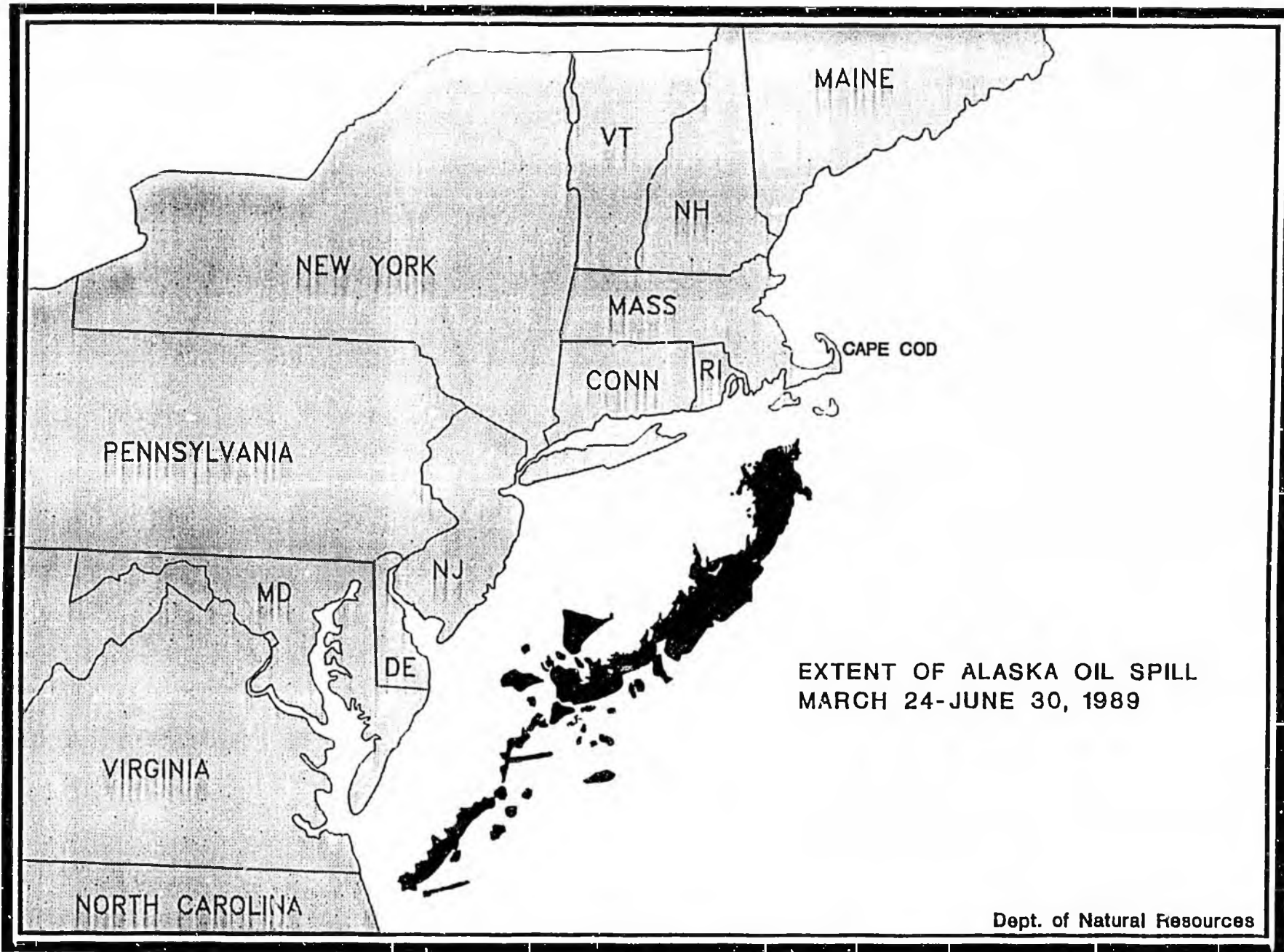
Section seven concludes this report with some ideas for improving research and development efforts toward oil spill prevention and response. We were able to use information gained from around the United States by the General Accounting Office and Office of Technology Assessment in their studies done after the *Exxon Valdez* spill. We also were able to obtain substantial information on advanced technologies in use by the U.S. Navy that were ignored in the *Exxon Valdez* incident. Finally, we have accumulated information on advanced spill response technology in Great Britain, the Netherlands, West Germany, Norway, France and South Africa. Information from the Middle East, the Soviet Union and Japan still remains to be gathered, a task we leave to our successors. In this section we also include our comments on the use of simulators in crew training.

If the commission's labors have been successful, the implementation of its proposals should considerably improve the safety of oil transportation by sea. But implementation rests in forums from the White House to local council halls, corporate board rooms to legislative chambers. Future vigilance rests in the hands of state and federal leaders, industry and public agency officials, terminal operators, tanker officers and crew, technical advisors and, perhaps most important of all, citizens exercising a watchdog presence and role.

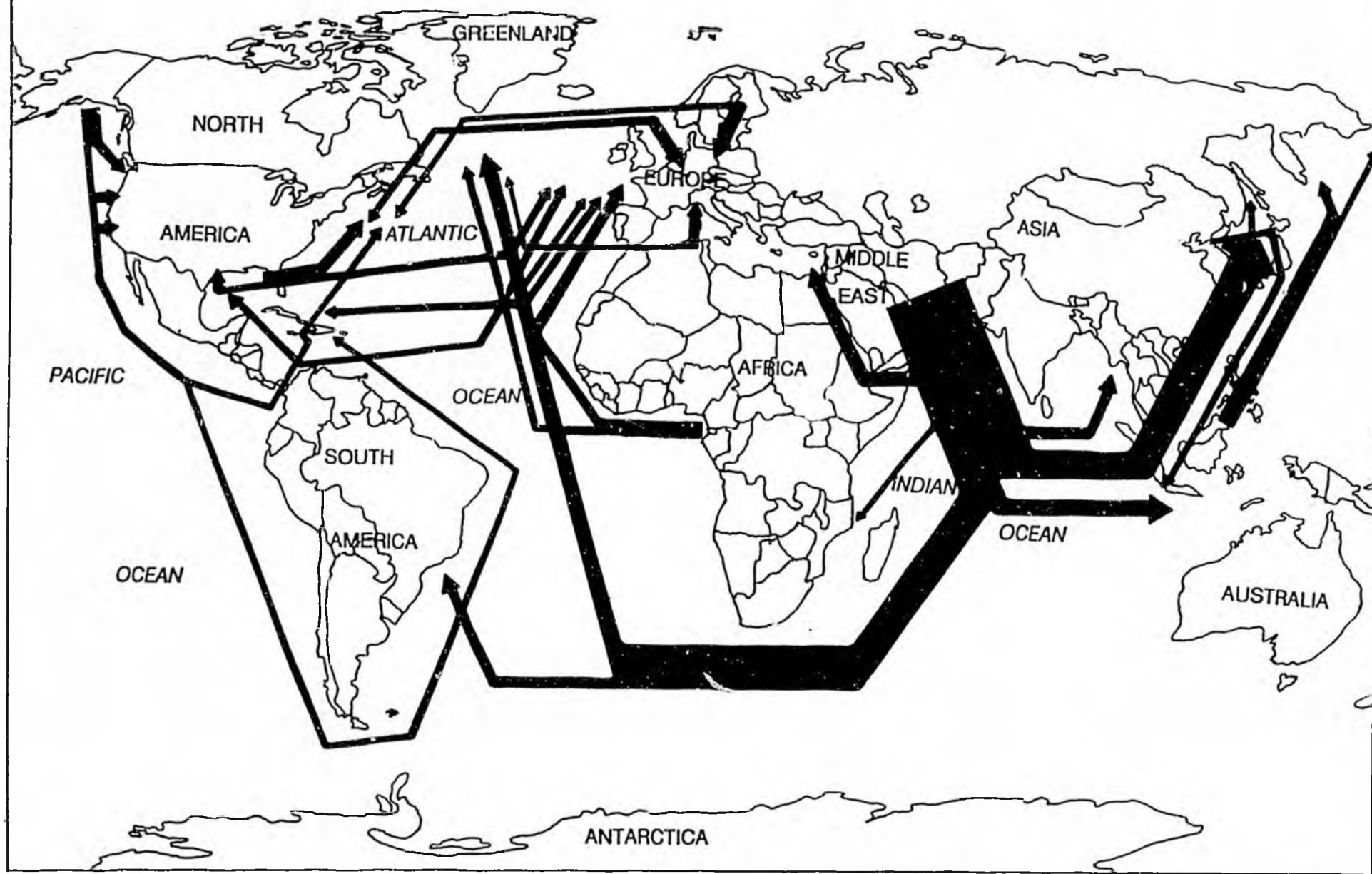
*"What I'm afraid of is that the commission could end up being in such a defensive mode that it could end up making the world safe for oil spills."*

*Mike Milligan, Kodiak  
Alaska Oil Spill Commission  
hearing, 8/11/89*





# WORLD OIL TANKER ROUTES BY VOLUME



# COMPREHENSIVE PREVENTION POLICY

Prevention is the only way to protect the oceans and coastlines from oil spills. Once it reaches the water, spilled oil is extremely difficult to contain and collect, even under ideal conditions. And the conditions under which oil is spilled are seldom ideal.

General Accounting Office data suggest no more than 10-15 percent of oil lost in a major spill is ever recovered. The Office of Technology Assessment estimates that only 3-4 percent of the oil spilled from the *Exxon Valdez* was recovered, despite Exxon's summer-long beach cleanup and oil skimming effort.

The urgency of establishing strong prevention policies for Alaska is also suggested by computer-assisted simulations done for the Alaska Oil Spill Commission by ECO, Inc., of Annapolis, Md. Its report notes that more tonnage of crude oil is shipped through the Valdez marine terminal than through any other port in the United States. Its simulations show that under typical winds and currents a catastrophic spill any time in Prince William Sound can be expected to coat the beaches of much of the sound and the Kenai Peninsula with oil. And its calculations indicate that under policies prevailing at the time of the *Exxon Valdez*, a similar occurrence can be expected in Prince William Sound approximately every 13 years.

Worldwide figures gathered by ECO show that during the past 20 years, tanker spills of the magnitude of the *Exxon Valdez*—more than 10 million gallons—have occurred approximately yearly. Spills of up to 1 million gallons have occurred approximately monthly. As this report goes to print, less than 10 months after the *Exxon Valdez* disaster, the *Khark-5* spill off the coast of Morocco has exceeded 30 million gallons, with the full cargo of 72 million gallons still at risk.

Both the frequency of oil spills and the failure of human capacity to clean them up argue for strong prevention regimes at every level.

*"The die is cast, that Prince William Sound is going to recover pretty much at its own rate. And that no matter what we do, the rate isn't going to change a whole lot."*

*Professor David G. Shaw, University of Alaska*

*Alaska Oil Spill Commission hearing, 9/21/89*

**Recommendation 1**  
**Prevention as policy**

*"The most telling remark, the president of Exxon, Mr. Stevens, said that the contingency plan cannot deal with a spill like this."*

*Rep. George Miller, California  
House Committee on Interior and  
Insular Affairs hearing, May 1989*

**Recommendation 2**  
**Changed attitudes**

***Prevention of oil spills must be the fundamental policy of all parties in the maritime oil transportation system.***

Worldwide experience has shown repeatedly that containing and collecting significant amounts of oil lost in a spill is beyond present technological capability except for relatively small amounts under optimum conditions. Data collected by the U.S. General Accounting Office suggests that no more than 10-15 percent of all spilled oil is ever recovered. Full repair of environmental and ecological damage caused by a major spill is similarly beyond human capabilities. Cleanup and containment technology remains primitive, although recent research and development initiatives offer promise of some improvement. With present technology, natural recovery often is the most effective recourse after a spill hits shore, but generations may lose the advantages of environmental quality during the recuperation.

These lessons were relearned in the response to the Exxon Valdez spill. Given the increasing capacity of supertankers carrying more and more oil through the world's oceans and the acknowledged shortcomings of cleanup methods, a sharpened focus on prevention is the key to environmental protection and, indeed, the only adequate response to the increasing risk in the system.

***All parties must instill the attitude that spilled oil in the water is unacceptable into the approach of the maritime transportation industry in the United States and abroad.***

The shipping industry historically has neglected the environmental costs to the public of oil spills. Maritime losses traditionally are measured only by the financial value of vessel and cargo. Economic calculations have emphasized short-term expenses over long-term protection. Attitudes in regulatory and response agencies, particularly the Coast Guard, tend to reflect a similar disregard for environmental costs. Protecting property has a long legal and practical tradition — witness the Coast Guard's longstanding focus on salvage of vessel and cargo — while protecting the environment still receives too little emphasis. Finally, cost-benefit analyses undertaken by public officials charged with regulating the maritime transportation industry sometimes assume that the costs and benefits accrue to industry alone, thus neglecting the interests of others affected by the risk of accident.

As public concern for environmental protection grows, industry and regulatory attitudes must change. The shipping industry has an incentive

to adopt stronger approaches to prevention as increasingly it is being required to pay for environmental costs previously borne by society.

*Because many individuals and communities are placed at risk by modern oil transportation systems, citizens should be involved in oversight arrangements at every level of government.*

Shipping oil involves inherent risk. The risk cannot be eliminated, only reduced. Citizens deserve to know and make informed social judgments about what constitutes an acceptable level of risk. Reducing the risk involves costs, both public and private. Citizens may or may not be willing to pay the incremental costs of reducing particular risks, but to make informed choices they should be made aware of the tradeoffs involved. Present federal committees for oversight and policymaking are made up of industry and government representatives. There are no equivalent state committees.

*The nation and the state need strong, alert regulatory agencies fully funded to scrutinize and safeguard the shipment of oil.*

The notion that safety can be insured in the shipping industry through self-regulation has proved false and should be abandoned as a premise for policy. Alert regulatory agencies, subject to continuous public oversight, are needed to enforce laws governing the safe shipment of oil.

National and state agencies formally vested with responsibility for overseeing the environmental safety of oil transportation frequently have been complacent. Regulatory authority has been weak, and there has been a dramatic decline in vigilance since 1981. State authority has been further impaired by conflict with federal authority. Funding ordinarily furnished to protection agencies has left broad areas of concern without oversight. Between disasters, appropriations have tended to decline. As federal administrations have changed, funding and commitment have fluctuated as well. Missions have been attenuated by the addition of further responsibilities without further funds, as in the case of the U.S. Coast Guard, whose duties have greatly expanded without a commensurate increase in budget.

In such an environment the nation's maritime oil transportation system becomes more, not less, prone to risk of accident. The nation's regulatory agencies must be committed to the safe shipment of oil and other

**Recommendation 3**  
***Citizen knowledge of risk***

*"We can't rely on government agencies to be the sole watchdog over industry."*

*Unidentified witness, Port Graham, Alaska*

**Recommendation 4**  
***Regulatory vigilance***

*"The best way to keep the oil from becoming a problem is to keep it in the ship, because historically ... we clean up very little of the oil. ... So I guess prevention is one of the things that we certainly would look at as the strongest avenue to avoid having a catastrophe."*

*Commander Dennis Rome, U.S. Coast Guard*

*Alaska Oil Spill Commission hearing, 8/31/89*

**Recommendation 5**  
*Foreign flag spill prevention*

*"We should look beyond ineffective sticks and consider some carrots as well. I think we should consider paying the industry to stay ready and to stay on top of technology—with their money, of course."*

*Professor Steve Coll, University of Alaska  
Alaska Oil Spill Commission  
hearing, 9/21/89*

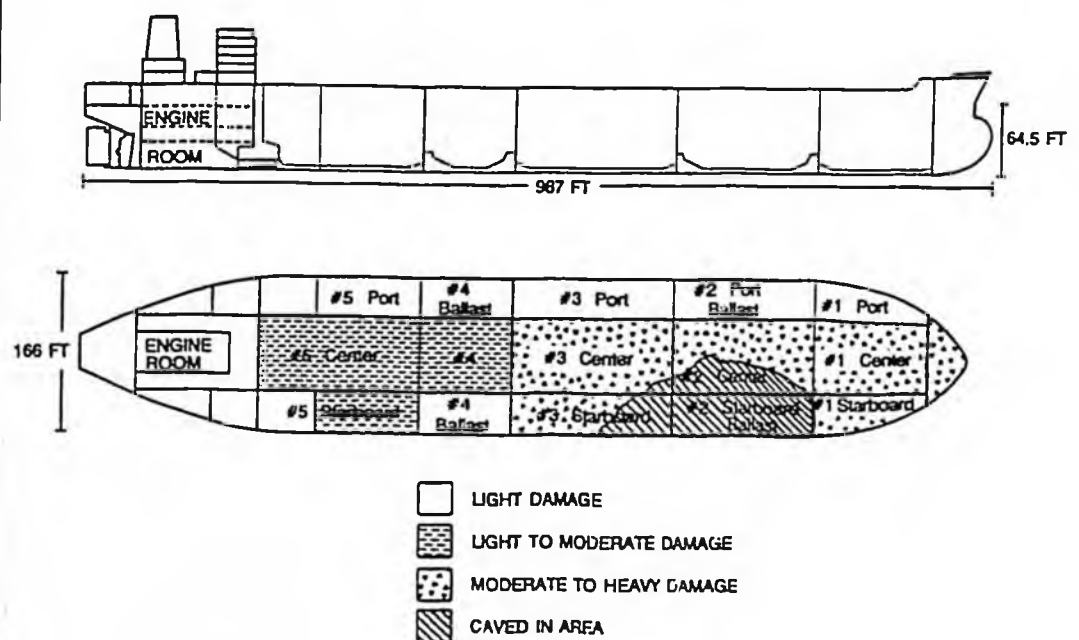
hazardous substances, and they must be encouraged by the regular oversight of citizens who have the greatest stake in the relevant environments. Without such an invigoration of these agencies, accidents such as Exxon Valdez are bound to increase.

*State laws protecting the environment from oil spills should be applied to foreign flag vessels equally with other vessels engaged in the transportation of oil.*

The state has been unduly deferential to constitutional limits supposedly restricting a state's ability to impose containment and cleanup planning and equipment requirements on foreign flag vessels. A changing congressional intent will produce revised judicial interpretations of preemption doctrine. While most vessel design features are subject to exclusive federal rule, the state is empowered to protect its environment by all reasonable, non-burdensome means.

Containment and cleanup planning and readiness regimes established under state authority should apply to barge or tanker traffic under any flag in the waters of a state.

**EXXON VALDEZ DAMAGE**



## RESPONSIBILITIES OF INDUSTRY

Public authority can do a great deal to enforce safety standards in oil transportation, but industry promises, policies and practices are typically the starting point for discussion. Industry bears a heavy obligation to operate safely and responsibly, regardless of the regulatory structure imposed by government.

Alyeska Pipeline Service Company has demonstrated a commitment to safer operations since the spill by establishing new procedures, including escort vessels, new spill response equipment, speed limits for tankers and dictates that tankers stay in designated traffic lanes while pushing through ice. Some of these reforms were more sweeping and costly than required by government.

Private industry's task is to carry oil to market responsibly and efficiently. Government's task is to regulate that trade prudently in the public interest. The obligation to protect the safety of the public and the environment is mutual, and shared by both sides.

*"I think it's important to begin a process of informing society about the uncertainty, the risks and the tradeoffs that are involved in most human activities and especially in these kinds of large scale resource development activities."*

*Professor David G. Shaw, University of Alaska*

*Alaska Oil Spill Commission hearing, 9/21/89*

**Recommendation 6  
Industry commitment**

*"Each of the various interested parties is trying to pass on their own real or perceived costs to everybody else."*

Professor Matt Berman, University of Alaska  
Alaska Oil Spill Commission hearing, 9/21/89

*The nation and the state need a private oil transportation system with management that is committed to environmental safety.*

The *Exxon Valdez* incident refocuses attention on industry's obligation to operate safely and responsibly. Decision-making by private industry is the first and, in many ways, most important pressure point for safety in the oil transportation system. Government regulation and public oversight can help safeguard the system, but industry can — and should — move rapidly and effectively on its own to establish procedures to reduce the risk of oil spills.

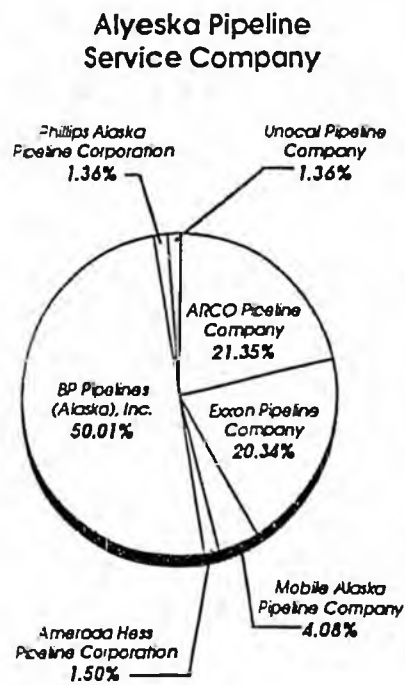
Response to the *Exxon Valdez* disaster illustrated industry's ability to mobilize quickly after a disaster. Exxon, though unprepared for a spill so large, responded far more swiftly than any government agency. The company committed vast human and material resources and reportedly spent more than \$1 billion to respond to the spill. (Luckily, Exxon was able and willing to bear this expense, but the industry would have had to spend comparatively modest sums to provide stringent prevention measures instead.)

Though the industry's safety record is mixed, by and large it has not been committed to environmental safety. Driven by competition and profit-maximizing goals, the industry has focused on economic efficiency and opposition to government regulation, claiming it could operate with as great or greater regard for safety without regulation. An industry ideology that regulation is a nuisance can drive an industry attitude that the objectives of regulation are also a nuisance.

In addition, maritime liability limits and low levels of accountability for oil spills have led to neglect of the interests of those who are not owners of vessels and cargo but whose exposure to risk makes them stakeholders in the system.

Historically, the industry has "externalized" the costs of environmental degradation — that is, shifted the costs to others. As concern about oil spills increases, however, industry will be forced to "internalize" more of these costs as incentive to protect the environment.

Properly motivated and funded, private industry can move more swiftly and effectively than any regulatory agency to correct deficiencies in the oil transport system. A tenacious commitment to environmental protection by industry could do more, quicker than any government inducement. Management and shareholders should insist that the traditions and operating assumptions of the shipping industry reflect this commitment.



Source: Alyeska Pipeline Service Company

*Government and industry should strive to adopt the best available standard technology in establishing performance standards.*

Consciousness of the importance of prevention, spill preparedness and corporate responsibility varies greatly among oil carriers. The blurring of responsibility within each oil company and within the Alyeska consortium, coupled with the independence of each shipping company and its owners, argues for uniform application of standards by government authority.

In the past the oil transportation industry has attempted to reduce virtually every performance standard sought, asking that government impose only minimum standards and claiming that most carriers voluntarily will exceed those minimums. But when accidents have occurred, industry representatives have frequently claimed that it has no obligation to go beyond those minimums. The public no longer should tolerate this double standard — and the conflict should be resolved as soon and as much as possible by the adoption of improved standards of performance by industry.

*Every company shipping oil through the United States should identify a full-time environmental safety officer empowered to take recommendations to the highest level of the company.*

Corporate performance on safety issues can be significantly improved by making safety a specified goal and giving primary responsibility to identified managers charged with increasing awareness at the highest executive level. Such corporate structures operated effectively, for example, during construction of the trans-Alaska pipeline system and should be recreated for operations as the system ages and becomes more prone to risk.

The designated corporate safety officer should be required to report annually to shareholders and the public concerning the safety of the tanker fleet, accidents and near-misses, state-of-the-art technology, and company plans for bringing its fleet into compliance with the most appropriate standards.

Public pronouncements by Alyeska and its owners that the company employed the best available technology and committed adequate resources to safety purposes turned out to be false. These assurances were aided by corporate institutional advertising and a sense of well-being

**Recommendation 7**  
*Best available technology*

**Recommendation 8**  
*Corporate safety executive*

*"The marine industry needs to revamp all personnel training and development programs to meet today's modern fleet demands."*

*Jerry Aspland, President, ARCO Marine, Inc.*

*Alaska Oil Spill Commission hearing, 9/1/89*

arising from the flow of oil revenue to Alaska's citizens which encouraged an atmosphere of laxity in state oversight of oil transportation.

A report to the public and corporate shareholders should provide accurate information about each shipper's spill prevention plan and preparedness posture to encourage greater corporate accountability for safety practices.

Recommendation 9  
*Tank farm*

*Tank farm capacity at Valdez should be increased to meet the original design requirement for maximum throughput.*

Limited storage capacity at the Alyeska terminal can create undue pressure on loading and shipping schedules of tankers calling at Valdez. Shortage of storage capacity could lead terminal operators to load tankers under otherwise marginal weather conditions, for example, to avoid an expensive slowdown or shutdown of the pipeline.

It may be that the cost of tank farm construction is high enough that a slowdown or risk of slowdown is a preferred cost. If that is the case, standards for slowdowns and shutdowns should be clearly stated so that safety is not sacrificed to revenue or pipeline flow considerations.

*"In boarding both the Japanese vessel and the Soviet vessel I had no problem getting on those vessels, but yet there was a guard at the door of the VECO office when I tried to enter that door. And I started wondering who is really afraid of me."*

*Rita Turner, Seward  
Alaska Oil Spill Commission  
hearing, 7/14/89*

## STATE REGULATION AND OVERSIGHT

The State of Alaska carries primary responsibility for protecting the state's public resources. Neither federal nor local authority and self can take the place of strong state regulation of industries that vitally affect the economic and environmental welfare of Alaskans.

State authority must be exerted to protect fish and wildlife resources, to vouchsafe federal regulation, to oversee industry operations, to inform the public of risk, and to insure proper response capabilities in case of accident. State government was not fully prepared in any of these categories before the *Exxon Valdez* disaster.

Alaskans have benefited strongly from the production and transportation of oil in the state, but they have not invested commensurate resources and attention in regulating and safeguarding the operations of the industry. It is incumbent upon Alaskans, through their elected officials as well as their own efforts, to create workable and effective institutions to protect their interests in the production and transportation of oil in the state.

*"If you had an enforcement unit in place, staffed by the people who were solely charged with it and not distracted by some of the other responsibilities, that they would be able to take the time to account for what are our main polluters in the state."*

*Sue Libenson, Executive Director  
Alaska Center for the Environment  
Alaska Oil Spill Commission  
hearing, 9/21/89*

Recommendation 10  
*Obligation to manage and protect*

*The people of Alaska should recognize they are the stewards of vast natural resources that are the mainstay of their livelihood and a national treasure. Among the obligations of state stewardship is the duty to protect these resources as much as possible from harm.*

The State of Alaska has not spent an amount appropriate to the job of natural resource management and protection. There are many reasons for this, including low recognition of the magnitude of the task.

Compare the total amount spent by the people of Alaska to manage fish and game resources to that for overseeing the oil industry. Recognizing the importance of fish and game to the state, the people of Alaska have spent substantial sums on regulation, enforcement, research and development, as well as a statewide system of citizen advisory committees. The amount spent overseeing the oil industry and its safety practices, by comparison, is a fraction of that total.

Recommendation 11  
*Federal preemption*

*The state should adopt stringent standards regulating the transportation of oil in its own waters without fear of federal preemption.*

Alaska has had unsatisfactory experience with federal preemption in the field of tanker safety and local navigational controls, but Congress no longer intends to override more stringent state regulation.

In 1976 the State of Alaska adopted a law giving broad authority to state agencies to oversee and regulate the safety of tanker traffic to Valdez. In 1977 the oil companies responsible for carrying Alaska's oil initiated a lawsuit (*Chevron, et al. v. Hammond*) challenging the state's right to regulate the safety of marine oil transportation on grounds that congressional action and Coast Guard regulation preempted the field. By 1979 the plaintiff companies had gained both a favorable ruling from the U.S. District Court and negotiated concessions from the state. The result was a gutting of key provisions in the legislation.

Industry encouraged the view that it should be allowed to take care of its own safety matters; that state activity was a needless and obstructionist interference with private prerogative; and that left to its own devices the industry would employ the best available technology with the optimum commitment of resources. This was not remotely the case. The evisceration of the state's regulatory framework and the antiregulatory temper of the times laid a foundation for repeal of the 1976 legislation and a slashing of state budgetary allocations for oversight. As a result, the role of the Department of Environmental Conservation was sharply reduced. The

*"I think what's missing here is an attitude among state leaders that the buck stops here, with the people of Alaska and not in Houston or Washington, D.C."*

*Professor Matt Berman, University of Alaska*

*Alaska Oil Spill Commission hearing, 9/21/89*

department's small staff was overwhelmed by technical licensing and permitting activities, leaving no opportunity for the agency to perform its role as overall environmental policy watchdog. Though the state retained certain powers over water quality, the overall effect of preemption through the federal courts was to reduce or eliminate the state presence in the oversight of oil industry affairs and demoralize state personnel engaged in such activity.

In the absence of the state presence, the already weak federal regulatory presence declined further. In 1990 Congress is likely to adopt legislation that would eliminate any presumption of federal preemption in actions taken by the state with respect to safety and response. Thus the way is open for the state to reassert its historic role in resource protection.

*A citizens' advisory council should be established in the office of the governor and given responsibility for overseeing the safe transportation of oil, gas and other hazardous substances.*

No state agency has as its primary mission oversight of environmentally safe transportation of Alaska's resources. Regulatory authority over such transportation is spread among several agencies that do not always coordinate information or resources. The only overall view of the system is exercised by the governor, but he has no single designated officer or council to provide information or maintain consistent oversight.

The state should establish a citizens' advisory council, supported by a full-time executive director and small staff, to provide focus to state oversight. Members should be chosen from among the general public, selected for their concern for environmental safety. The council should have power to subpoena information and witnesses, to inspect facilities, to conduct investigations, and to collect information and statistics on safety.

The council's duties should be to:

- Advise the governor and legislature on the environmental safety of the transportation of Alaska oil, gas and other substances posing environmental risks;
- Advise on potential initiatives in state and federal regulations and at the governor's request, represent the state's interests in the development of multistate compacts and national and international policy;

**Recommendation 12  
Oversight council**

*"What we have is a system driven by the fact the pipeline is pumping 2 million barrels of oil into the sound, and they have to get it out of here. They choose not to restrict it, turn it off, or anything else. The decision to sail or not to sail is not a dispassionate decision based on weather or traffic."*

*Rep. George Miller, California House Committee on Interior and Insular Affairs hearing, May 1989*

*"What tends to happen is DEC will get dragged into a septic tank argument and it will drain away as many resources as fighting, for instance, the Alyeska ballast water treatment plant. There's a real problem with priorities within DEC."*

*Sue Libenson, Executive Director  
Alaska Center for the Environment  
Alaska Oil Spill Commission  
hearing, 9/21/89*

**Recommendation 13**  
*Enhanced regulatory strength*

- Identify unmet needs and recommend priorities, strategies and obstacles to achieving them;
- Encourage coordination of spill prevention and response programs currently spread among several agencies that cumulatively deserve high priority;
- Make budget and resource allocation recommendations;
- Evaluate programs and recommend elimination of marginal activities;
- Recommend changes based on new technologies and scientific impacts;
- Designate advisory panels, if deemed necessary, including appropriate representation, ex-officio, of appropriate departments of the state and municipalities, regional oil spill authorities, representatives of fishing and environmental groups, and shippers, owners and residential groups on the pipeline route; and
- Issue an annual report and safety assessment. Reports to the governor should include regular statistical and special reports on accidents and near-misses, the status of major risks, the performance of state and federal agencies, and long-term options for improving safety.

*The state should expand and exercise its regulatory authority over environmental safety. Measures voluntarily adopted by industry should be backed up by state regulation. Federal technical standards and safety requirements should not preclude more stringent state standards.*

The State of Alaska currently does not exercise its full power under the U.S. Constitution to regulate environmental safety. Recent congressional enactments and judicial decisions make it clear that Congress does not intend that states should hesitate to protect local environments with greater stringency than the minimums established under federal law. The state should have the power, for example, to prohibit vessels from entering or departing Alaska ports and waters under unsafe circumstances.

Regulatory effectiveness also should be improved through assessment of administrative and civil penalties to encourage prevention, no preen-

forcement review of compliance orders, environmental audits, stronger criminal penalties, and statutory provision for citizen lawsuits. Private voluntary prevention measures, though commendable, are often ignored as memories fade unless backed up by state regulations.

*The state should renew and strengthen its authority to conduct inspections and spill response drills on vessels calling at Alaska ports and marine terminals.*

The Valdez tanker fleet, built in the 1970s is approaching obsolescence. Structural weaknesses, technical malfunctions and other equipment problems can be expected to increase in frequency and seriousness.

Inspections and reports, done in cooperation with the Coast Guard or alone, should include examinations for structural integrity and environmental hazards. Inspection duties may be allocated between the harbor administration office proposed in this report and the Department of Environmental Conservation. State authority should include the power to levy substantial summary civil fines for interfering with inspections or failing to cooperate with response drills.

The lack of any quality control or assurance program on tanker operations from Prince William Sound or Cook Inlet allows serious hazards to arise. Coast Guard authorities already perform inspections on tankers calling at Valdez, but state inspection would provide an added measure of safety. In the past, when the state and the Coast Guard both inspected vessels, the two agencies reenforced each other's effectiveness. When the state was stopped from making inspections on the grounds that the activity was exclusively federal, the quality of Coast Guard inspections declined. Inspection by two governments is not needless duplication but needed redundancy, providing a greater measure of safety.

The "two-tier" system of quality control was adopted during construction of the trans-Alaska pipeline. The value of the two-tier system has been reenforced by the National Aeronautics and Space Administration experience with space disasters. The official inquiry into the 1986 Challenger space shuttle explosion found that system capabilities had been stretched to the limit in the winter of 1985-86 to support the flight schedule of the shuttle program. System capabilities for shipping oil from Valdez were similarly stretched to accommodate increasing throughput of the trans-Alaska pipeline to 2.2 million barrels per day without increasing other elements of the system, such as tank storage capacity.

**Recommendation 14**  
***Strengthened state inspections***

*"We are obligated to provide systems which enhance marine transportation safety, and we do it economically."*

*Jerry Aspland, President, ARCO Marine, Inc.*

*Alaska Oil Spill Commission hearing, 9/1/89*

When systems are stretched thin, redundancy in oversight and inspection is doubly important to reduce the risk of catastrophic failure.

**Recommendation 15**  
***State presence at Alyeska terminal***

***Government agencies should be given space at the Alyeska terminal to carry out their duties.***

State inspection efforts at the Alyeska terminal should be situated so as to maintain a continuing presence, instant response and constant vigilance over environmental safety at the terminal and on vessels calling there. Until the Exxon Valdez wreck, various agency personnel were hampered by lack of quick and easy access to the terminal. Alaska Department of Environmental Conservation officials attempting to inspect Alyeska facilities were told they might be required to procure a warrant, a laborious and time-consuming process. A more cooperative posture by Alyeska staff might result if state personnel were seen not so much as an opposing force, but as a normal and integral part of the operation. Office facilities on-site might normalize relations between government and industry officials so that regulatory activities, which on occasion can be adversarial, need not become unnecessarily antagonistic.

**Recommendation 16**  
***State licensing of safety managers***

***A state licensing system should be established for oil transportation system safety personnel, including pipeline pump station and terminal managers.***

Oil transportation safety managers should be required to show educational qualifications or equivalent experience and pass examinations reflecting an understanding of environmentally safe resource transportation in Alaska.

Mariners, captains, engineers and ship's pilots, all water based transportation managers, already are licensed to encourage safety and public accountability. Similar practices should be established to insure that personnel meet a state standard of professionalism for all important managers in the oil transportation system. Few of the managers brought in to oversee contingency plan development or respond to the Exxon Valdez spill had significant prior knowledge of Alaska environmental laws, resources or local capabilities.

Licensing can significantly help assure knowledge of prevention and response capabilities as well as public accountability. For example, regardless of whether particular conduct may be tacitly approved or

tolerated by an employer, a licensee who falsifies a report, bypasses a required procedure or otherwise violates the professional obligations covered by the license can lose his or her opportunity to engage in the employment.

*To the extent it does not already have such authority, the state should seek from Congress authority to require and enforce prevention and response regimes on vessels trading in Alaska or adjacent waters.*

Spilled oil recognizes no state boundaries. State jurisdiction is necessary because spilled oil may come ashore or ravage important local fisheries hundreds of miles from the point of the spill. The risk of breakup of a tanker or loss of a barge in the Gulf of Alaska is real. Gulf of Alaska shipping routes should be covered by an adequate regional response developed under the National Contingency Plan and backed by capabilities of the state, the Coast Guard, the carriers and other relevant authorities.

*The State of Alaska should negotiate interstate compacts with other coastal states and provinces for the development of prevention strategies, storage of response capabilities and to effect coordination of assets in case of another major spill.*

The western coastal states and provinces may share common environmental concerns about spilled oil. Compact agreements have the force of federal law and may enable these states to create an appropriate regional administration to oversee oil shipping.

*The state should require maintenance and personnel audits at oil transportation facilities to provide information and pinpoint problems in spill prevention.*

Accurate, timely information is central to the exercise of the oversight function and must be available to all government actors in prevention and response. The state can gather information on conditions relating to spill prevention through technical maintenance audits, thereby supporting the work of the state advisory council and regulatory agencies. Technical and personnel audits may be done by outside contract.

**Recommendation 17**  
*Enforcement in state waters*

**Recommendation 18**  
*Interstate compacts*

**Recommendation 19**  
*Maintenance and personnel audits*

**Recommendation 20**  
**Marine pilot qualifications**

*Training and experience standards for marine pilots in Alaska should be upgraded to require actual experience in Alaska operations of vessels at thresholds of 60,000 and 150,000 deadweight tons.*

Training and experience requirements have been reduced for pilots of large tankers in Prince William Sound and Cook Inlet since the late 1970s, allowing pilots to qualify for very large ship operations on insufficient experience. While no accidents have been caused by this circumstance, a system with multiple thresholds is inherently safer.

**Recommendation 21**  
**State as co-insured**

*Insurance policies should identify the State of Alaska as an additional insured or named beneficiary.*

The shipping industry is responsive to economic incentives. Insurance premiums and premium requirements create incentives. The insurance industry is responsive to the needs of co-insureds. Such practices were required during construction of the trans-Alaska pipeline. There is every reason to revive them.

**Recommendation 22**  
**Remote spill response**

*The state should set rigorous requirements for private oil spill prevention and response capability in remote locations. The state also should develop response plans for major spills and articulate a prevention program from the Aleutian Islands to the Arctic.*

Despite the state's obligation to respond to major spills, only if private resources are committed to prevention systems and response can an acceptable reduction in risk be achieved.

Marine traffic in arctic Alaska already poses unacknowledged risk. Fuel provisions delivered by sea and vessels fueled by oil create risks of damage in these hazardous and environmentally fragile waters. Spills are usually impossible or much more difficult to contain and collect in arctic waters. Immediacy of response is the key to cleanup if a spill occurs.

Measures should be undertaken to reduce spill risk in the arctic, including better vessel tracking and contingency plan requirements for all large vessels transiting the arctic, and for smaller vessels carrying oil or major fuel supplies.

*Given the high risk involved in arctic oil transportation, the options for developing systematic environmental safety protections for this region should be a priority for scientific authorities.*

The long-term need to develop environmental safety regimes of great stringency cannot be ignored. Development of arctic oil discoveries dependent on maritime transportation should await the preparation of approved systems of oil transportation using experience gained from the trans-Alaska pipeline system. But any increase in traffic simply to accommodate increases in oil production should be accompanied by a major increase in preventive safety.

*The state should establish a task force to review the environmental safety of the trans-Alaska pipeline system independently or in concert with a federal counterpart.*

More than enough evidence is available regarding sharply increasing risk of a pipeline breach and raising questions regarding government response capability. On the advice of contractors showing evidence of massive corrosion problems with the pipe, Alyeska already has undertaken a review and reconstruction program of the trans-Alaska pipeline system. The state was intimately involved in oversight of the original design and construction of the pipeline. This pattern of oversight should be renewed to protect the same public interests.

The task force should make recommendations to better oversee the long-term safety of the pipeline and gathering system. Specifically, it should review the environmental safety of:

- the trans-Alaska pipeline and gathering system;
- applicable government and private contingency plans; and
- the response plans and capabilities of government agencies.

The commission endorses the concept of a presidential task force on pipeline safety as proposed by Congress and urges that provision be made for state participation.

Recommendation 23  
*Arctic prevention research  
priority*

Recommendation 24  
*Pipeline evaluation*

*"The community must be imbedded in the bureaucracy because this is the only way oversight is going to happen. It's the only way that continued community involvement is going to happen. And it's the one way to guard against apathy if you don't have another oil spill for 20 years."*

*Jlm Sykes  
Alaska Oil Spill Commission  
hearing, 9/21/89*

Recommendation 25  
State harbor administration

*The state should create harbor administration offices for Prince William Sound and Cook Inlet to help regulate traffic and navigation and to implement terminal and vessel inspections.*

Local oversight of navigation and port operations can improve conditions by bringing local perspectives to bear. A harbor administration office should have the power to:

- Regulate traffic and navigation issues not preempted by Coast Guard regulation to impose more exacting standards in the best interests of the state.
- Advise and oversee the Coast Guard's management of such issues and make recommendations for changes;
- Certify and declare disasters, and order state management of a spill in the port area; and
- Assume functions given under contract by the Coast Guard and participate in joint management arrangements.

The state asserted greater control over harbor activity in the mid-1970s, but conceded its management prerogatives in negotiations leading to a resolution of the Chevron, et al., v. Hammond lawsuit. Pending legislation clarifies congressional intent that the state may undertake safety regulations relating to local harbor conditions, weather and the like, and that the vessel must follow the more stringent rule. Collaboration with federal authority is required to assure that no direct conflict with Coast guard regulations are involved and that optimum safety conditions are observed.

In the event of a spill, the harbor administration at Valdez probably would be the headquarters of the on-scene commander carrying out the governor's delegated emergency authority.

Oil transportation in Cook Inlet, a body of water widely noted for its extreme tides, currents, winds and ice conditions, faces a high risk of spills. Though smaller volumes of oil pass through Cook Inlet than Prince William Sound, similar oversight arrangements should be duplicated there, allowing for appropriate variations in representation and the difference in geographic circumstances.

Research done for the Alaska Oil Spill Commission indicates that a major spill of between 300 and 1 million gallons can be expected in Cook Inlet approximately every 2.2 years, a spill of between 1 million and 9 million

*"I would promote that there is a state group that deals with marine transportation, kind of a one-stop shopping group."*

Jerry Aspland, President, ARCO  
Marine, Inc.

Alaska Oil Spill Commission  
hearing, 9/1/89

gallons about every 24 years, and a spill of 9 million gallons or more about every 66 years. Oversight arrangements should be created to provide appropriate public accountability and awareness of spill risks.

*A system of regional advisory councils should be formalized under state authority to oversee harbor administration, state and federal regulation and private safety functions.*

The people living closest to a danger have the most to risk and are the most likely to insure that readiness and alertness are maintained. As a Prince William Sound resident told the commission, "People take care of the things they love."

Regional oversight councils can both encourage protection of local resources and provide an opportunity to make use of local residents' knowledge of conditions and needs in crafting workable spill prevention and response policies. Regional advisory councils should provide advice to the statewide policy council proposed in this report and respond to its recommendations. A similar council should be considered for permanent oversight of the trans-Alaska pipeline system.

*Local governments should be represented on the regional advisory councils and the harbor administration.*

Local residents complained that their views and knowledge often were ignored. Residents in small villages, in particular, believed they were bypassed despite their great, direct interest in events. Villagers rarely are able to send delegates to advisory boards, even though their lives may be severely traumatized by a spill. Special provisions should be made to assure no neglect of these stakeholders.

**Recommendation 26**  
*Regional advisory committees*

**Recommendation 27**  
*Local government representation*

## FEDERAL REGULATION AND OVERSIGHT

Congress has mandated a comprehensive system to protect the safety of oil and gas transportation, but for lack of enthusiasm and underfunding enforcement has been a failure. The quality of federal oversight of oil transportation in Alaska was typified by the U.S. Coast Guard, whose safety and regulatory efforts gradually declined for most of the decade leading up to the *Exxon Valdez* disaster.

The Coast Guard supported safe traffic monitoring systems and design standards, including double-hulled tankers, when the trans-Alaska pipeline system was approved in 1973. But by 1978, after strong industry opposition to double hulls in international regulatory forums, the Coast Guard backed off its support. The Coast Guard also imposed stringent safety inspections and vessel monitoring practices during the early years of tanker operations after the opening of the pipeline in 1977. Inspection and monitoring efforts waned noticeably after parallel state inspections were stopped in 1979, and gradually thereafter as Coast Guard funding and resources for these activities declined.

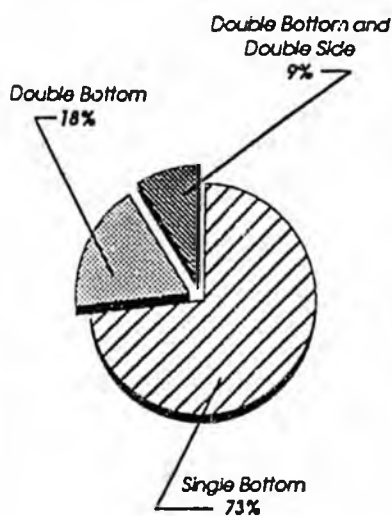
Some federal agencies performed admirably in events surrounding the spill — notably the U.S. Army Corps of Engineers and the U.S. Navy in cleanup response efforts and the Coast Guard itself in successful measures to salvage the ship and the unspilled cargo. As a rule, however, federal authority must be reinvigorated in several ways if it is to provide significant leadership in the safety and oversight of maritime oil transportation.

*"Figure out what 25 percent of the nation's oil is worth."*

*Rep. George Miller, California  
House Committee on Interior and  
Insular Affairs hearing, May 1989*

**Recommendation 28**  
**Double hulls and vessel design**

Hull designs of the 93 tankers registered for Alaska trade.



**Recommendation 29**  
**Mandatory traffic control**

*Double hulls and other technological advances in tank vessel design should be required on an accelerated timetable, including prohibition of nonqualifying vessels, regardless of flag registry, in all U.S. waters.*

The loss of oil from the *Exxon Valdez* wreck would have been substantially less if the vessel had had a double hull of appropriate design. A U.S. Coast Guard study undertaken after the accident indicated that up to 60 percent less oil — about 6 million gallons — would have entered the water if the *Exxon Valdez* had been equipped with a double hull. Double hulls already are required for chemical tankers and gas carriers to provide maximum protection to cargo tanks. A study for the Alaska Oil Spill Commission by ECO, Inc., of Annapolis, Maryland, says double hull design “provides the highest probability of surviving damage, either from a collision or grounding, with no loss of cargo.”

Technical measures to reduce risk of accident and oil spillage have been advocated by naval engineers and others over the past two decades, but this advocacy has not produced significant voluntary changes in the way the industry does business. Suggestions regarding multiple screws, horsepower enhancement and other design overbuilding proposals to enhance safety have received only a negative response. Required changes are necessary, particularly as the size and carrying capacity of modern supertankers has increased.

*Mandatory traffic control systems should be installed in due course in Cook Inlet, Prince William Sound and all waters of the U.S. where an equivalent or greater risk occurs.*

Any of several common practices relating to positive vessel traffic control would have prevented the *Exxon Valdez* from straying so far off course as to run aground on Bligh Reef. The wreck would not have occurred if there had been a traffic control system covering operations to Hinchinbrook Entrance, as was promised by owners of the trans-Alaska pipeline system at the time the system was approved. The wreck would not have occurred if Loran C retransmit or radar had provided reliable coverage to Hinchinbrook Entrance, as was promised by the owners. And the *Exxon Valdez* wreck would not have occurred if the Coast Guard had not, according to regular, informal practice, given permission to the vessel to move outside established tanker lanes.

The *Exxon Valdez* wreck would have been less likely if the vessel had been traveling at lower speed and would not have occurred if the captain had

chosen to push through ice in the traffic lanes at low speeds, as was more common practice in the early years of operation of the Valdez terminal.

A mandatory vessel traffic control system operated by personnel more experienced than those now posted to the advisory system would require strict monitoring of a vessel's position in relation to traffic and known hazards and would prevent corner-cutting to save time, a conspicuous cause of the well-known Torrey Canyon disaster.

*Crew levels on tank ships must be established to reflect manning needs under emergency conditions, not just normal operating circumstances, and must reflect the need to avoid fatigue and overtime among those with responsibility for safe navigation.*

Crew sizes and fatigue factors have been subjects of investigation since the *Exxon Valdez* accident. A second qualified officer on the bridge would have made the wreck substantially less likely by increasing the likelihood that the bridge would have been alerted to the ship's errant position, the impact of the automatic steering mechanism, or to alternative last-minute navigation strategies for avoiding the reef, in time to avert the accident. Similarly, the wreck would have been less likely if crew members and ship's officers required to do double duty in Valdez harbor during loading operations had not been subject to fatigue.

A 1984 survey indicated that the ability to make schedules is viewed as the single most important factor in a company's evaluation of a captain's performance. Under such circumstances, a captain is strongly motivated to run whatever crew he has as long and as hard as necessary to meet the required schedule, despite formal duty time limitations. National Transportation Safety Board hearings on the *Exxon Valdez* accident showed that several crew members — including Third Mate Gregory Cousins, who was at the helm at the time of the accident — had worked extraordinarily long hours the day of the wreck. This practice is not rare in the trade.

Crew training standards must be strengthened and retraining and reexamination reviews tightened. Physical standards, in addition to those proscribing alcohol or drug abuse, must be met. A captain having a "predictable" heart attack is of no more use than one under the influence.

Recommendation 30  
*Crew levels*

*"The tradeoff in risk involved with a double hull is that to carry a given amount of oil, you now have to have 60 percent more tankers, and if you do the arithmetic that's the way it comes out."*

*Frank Iarossi, President, Exxon Shipping Company*

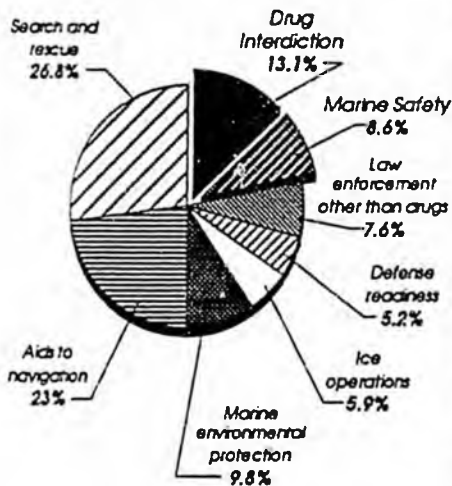
*Alaska Oil Spill Commission hearing, 9/1/89*

Recommendation 31  
Coast Guard role

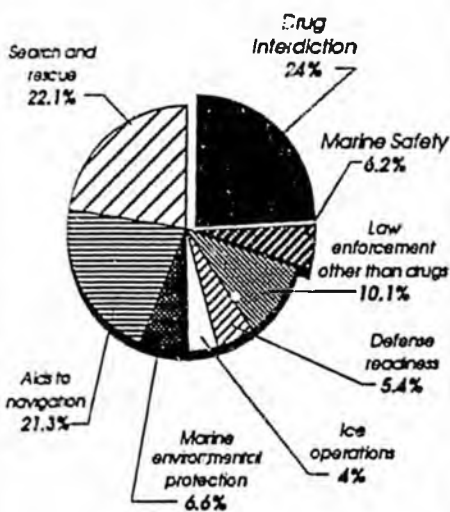
*The mission of the U.S. Coast Guard to protect the safety of navigation should be defined specifically to include the safe transportation of oil by sea. Sufficient funding, resources and institutional support should be given to insure the strengthening this purpose.*

Coast Guard  
Budget Comparisons

1982



1989



Source: *The Seattle Times*

For reasons that include not just underfunding, but also confusion of mission and an unduly friendly relationship with industry, the Coast Guard has failed the American people in providing oversight of the country's oil transportation system. Enforcement must be strengthened and the penalty structure raised to a point where it weighs in the economic calculations of each company.

While various Coast Guard units have operational responsibilities for tanker safety, the Coast Guard's primary mission is not the environmentally safe transportation of oil by sea. There is a general disposition in the agency to keep commerce moving without regard to all environmental or social costs. This disposition may be in conflict with the need to "follow the book" to insure safety. The lack of particular focus on the environmental risks of oil transport was revealed in the system weaknesses that permitted the wreck of the *Exxon Valdez*.

The Coast Guard commandant is selected by the president and accordingly is likely to reflect the philosophical perspective of the times. After President Nixon's declaration of a policy of oil independence, which President Carter pursued through establishment of a Department of Energy, the national mood under President Reagan moved to industrial self-regulation. This mood was reflected in a greater resonance with industry wishes in Coast Guard performance. Relaxed regulation has contributed to a lack of progress in maritime environmental safety. Safety does not do well in a laissez-faire environment.

Underfunding and relaxed attitudes toward regulation increased the likelihood of the *Exxon Valdez* wreck in several ways. The junior Coast Guard personnel posted to Valdez did not think they had the authority to instruct tanker operators in navigation or to require frequent position reporting. Only one Coast Guard employee was on duty at the time of the accident. The wreck would not have occurred if the Coast Guard had prioritized the installation of up-to-date vessel monitoring systems. The wreck would have been less likely if the Coast Guard had exercised strong oversight of crews and manning practices.

The Coast Guard's power to determine required crew levels is of little consequence as exercised. The determination is largely a paper exercise in which the shipper submits a proposal that typically is routinely

approved without inspection, sea trials or a determination of need under foreseeable emergency or unusual conditions.

In the normal course, Coast Guard personnel retire or transfer to the shipping industry in large numbers, particularly at the executive level. It may be that the prospect of working for industry is reflected in the attitude of some Coast Guard personnel. The "revolving door" and the resulting sympathy of interests between regulators and the regulated is a common problem in other areas of government service.

***Congress should revisit the antitrust exemption granted to marine industrial insurance to require that premiums reflect design and operational considerations in accident prevention and pollution abatement.***

The shipping industry is responsive to economic incentives. Insurance premiums and premium requirements create incentives. Congress has adopted special provisions concerning the conditions under which marine insurance is exempt from antitrust regulation. Various requirements must be observed as a condition of the exemption. These conditions should require additional features affecting premium structure and loss control to encourage design improvements and operational practices that enhance environmental safety in the shipment of oil.

***Congress should require corporations transporting oil or hazardous substances to file environmental safety reports as part of their Securities and Exchange Commission 10K filing. These corporations also should include a separate environmental report card in their annual reports to shareholders.***

Safety is a factor in long-term profitability that may be neglected in management preoccupation with annual profit. Safety is a factor of cost and accountability. SEC requirements are intended to inform investors of facts needed to assess risk. A company's record and status concerning environmental safety should be available to inform such assessments.

A company responsible for oil transportation should report to its shareholders on the safety of its operations in addition to their profitability. The report should include an account of accidents, close encounters, technological developments, goals and objectives. This information should also be collected for the government's report.

**Recommendation 32**  
***Insurance premiums to reflect risk***

**Recommendation 33**  
***Corporate safety reporting***

***"A lot of the Coast Guard personnel that came in did not have an understanding or a local knowledge of the area. I think that should be ... Local knowledge is going to be a key ingredient."***

***Jim Butler, Kenai Peninsula Borough  
Alaska Oil Spill Commission  
hearing, 9/7/89***

The meaning of corporate democracy should involve full discussion of all matters shareholders may care about. Environmental responsibility is a large part of corporate social responsibility for most large corporations, and certainly for companies carrying oil or hazardous substances. Shareholders should be kept informed of the corporation's stance toward its environmental record.

**Recommendation 34**  
***International action***

*The United States should pursue an aggressive policy in bilateral and international regulatory forums to demand safety improvements. The practice of deferring to international transportation safety standards in U.S. waters should cease. Environmental regimes established by state or federal government should apply to tanker or barge traffic under any flag in U.S. waters.*

U.S. law should provide for the protection of U.S. waters, resources and regulatory standards regardless of whether international standards are consistent with them. Trade with the United States is at a high enough volume that this country should set the standard for environmental safety rather than accept a lower standard set by other nations.

Improvements in international safety standards have not been commensurate with growth in maritime oil transportation. The policy of the United States in international forums has been cautious, and forums have been dominated by U.S.-based multinational corporations to the disadvantage of environmental protection. American policy should be reoriented toward leadership in the establishment and maintenance of rigorous standards of safety and environmental protection. The United States should pursue bilateral agreements with its North American neighbors and its trading partners to provide cooperative standards, enforcement and spill response. The need for international spill response systems is shown dramatically by the 30 million-gallon spill from the Iranian supertanker *Khark-5* off the Morocco coast in December 1989. International standards should be viewed as a floor beneath which U.S. requirements will not fall rather than a ceiling above which they cannot rise.

**Recommendation 35**  
***Offshore tanker lanes***

*Tanker lanes should be established to keep tankers and fuel barges in the Gulf of Alaska and North Pacific trade at least 100 miles offshore.*

Time is critical in efforts to protect coastlines from oil spill damage. In the event of tanker collision or breakup at sea, sufficient distance from imperiled coastlines can provide time to prepare defenses for key resources or habitats before oil reaches them.

*A system of tracking large vessels in the North Pacific should be developed.*

The technology exists at modest cost to take the "search" out of search and rescue by tracking vessels broadcasting a signal on the high seas. Similar systems are required on all commercial air carriers and should be done for vessels. The system would not only enhance the environmental safety of tankers but also for modest marginal cost would enhance life safety systems in one of the most hazardous areas in the world.

*Congress should ask the president to require the administrator of the Environmental Protection Agency and the secretaries of Transportation and Commerce to issue a special report on the safety of oil transportation by sea. Annually thereafter, the Office of Science and Technology Policy or the Council on Environmental Quality should report on progress made by all parties, close encounters and accidents during the year, and emerging issues in the field.*

No federal agency has as its primary mission oversight of the environmentally safe transportation of oil. The focus provided by a presidential-level report on the safety of maritime oil transportation would help alert the nation and the federal government to shortcomings in the system, as well as emphasizing the importance of safeguarding this system.

The report to the president should include:

- A history of accidents involving oil, gas and hazardous substances;
- An assessment of current risks and safety practices with reference to national energy policy;
- An assessment of prospects for progress in the enhancement of prevention technologies and techniques;
- An account of the activities of all federal agencies with responsibility for maritime safety, including a report on maritime recommendations of the National Transportation Safety Board, actions taken on them and reasons recommendations may have not been followed;
- An account of penalties levied for violations of oil, gas and hazardous substance transportation safety regulations;

Recommendation 36  
*Tracking vessels in the North Pacific*

Recommendation 37  
*Presidential Report*

*"The few Coast Guard people that I have met in the field are green. I mean, they reminded me of summer hires. They were kids right out of school, and I can't help feeling that the powers that be are up there telling them to get those guys out of here and get this signed off so we can get this paper work, this paper chase done and get on with our business of running government."*

*Rich King, Upper Cook Inlet  
fisherman  
Alaska Oil Spill Commission  
hearing, 9/7/89*

- A specific report on the safety of the trans-Alaska pipeline system, the preparation of which should include adequate provision for state participation; and
- An overview evaluation of the effectiveness of private contingency and public response plans to oil spills in U.S. waters.

The Alaska trade is substantially less than a fifth of the maritime oil transportation system requiring national oversight. Either a strengthened Council on Environmental Quality or a more focused new agency as a watchdog over national environmental protection might better serve the nation's interests in reporting on the protection of the marine environment.

*"In spills of this kind the Coast Guard has primary jurisdiction, and it is only when, as I understand the law, only when the responsible party either refuses to clean up or fails to do the job that the Coast Guard has the ability to step in."*

*Dennis Kelso, Commissioner  
Alaska Department of  
Environmental Conservation  
Alaska Oil Spill Commission  
hearing, 8/31/89*

## GOVERNMENT RESPONSE POSTURE

Alaska and other states have depended upon the National Contingency Plan to organize catastrophic spill response, but the *Exxon Valdez* incident illustrated the emptiness of its promises. The NCP provided neither the resources nor the manpower for effective action against a 10.8 million-gallon spill.

What is required in a successful oil spill response is to blend the resources of state, federal and industry response teams into an effective organization, and to provide sufficient manpower and resources to make a significant attack on the spill within 24 hours.

The greatest weakness of the NCP, as revealed in the *Exxon Valdez* incident, was that it failed to establish the firm, predesignated working relationships that are vital to a successful emergency response. Yet if that had been accomplished, it only would have revealed the weaknesses in the rest of the plan: lack of matériel, lack of trained manpower and lack of established common goals.

*"What really happened here is that the system failed. We were down to the kicker on the football team making the tackle, and no coach wants that."*

*Vice Admiral Clyde Robbins, U.S. Coast Guard*

*Committee on Interior and Insular Affairs hearing, May 1989*

**Recommendation 38  
Government in charge**

*The spiller should not be in charge of response to a major spill. A spiller should be obligated to respond with all the resources it can summon, but government should command that response.*

Response should be a cooperative effort of government and industry under the direction of either the state or federal government, depending on which one has the stronger interest or can marshal resources more quickly and effectively.

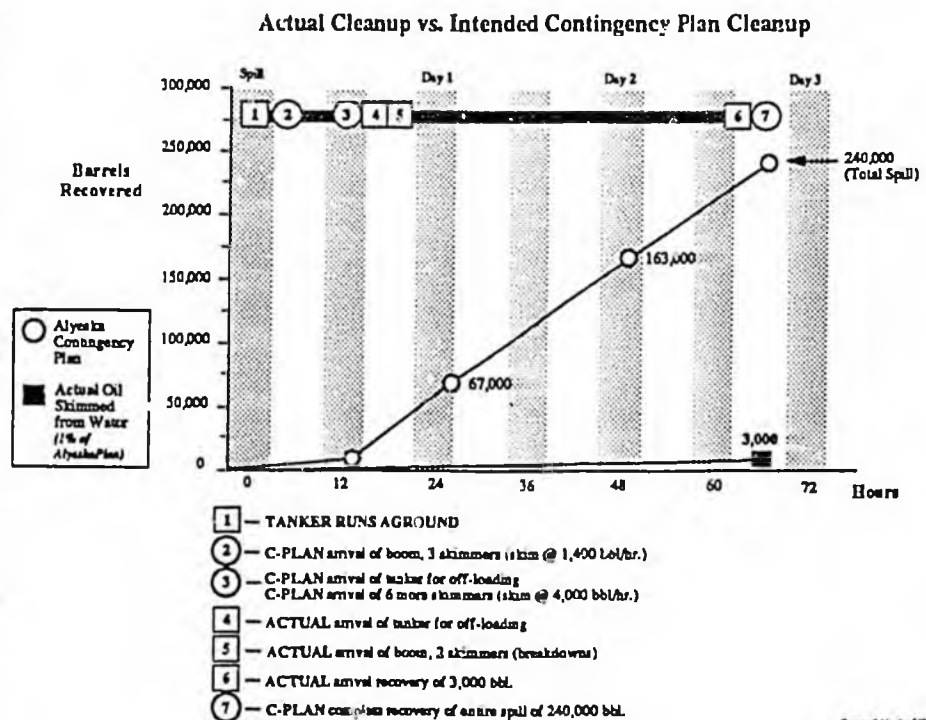
The spiller was obliged to respond to the spill under contingency plans in effect at the time of the *Exxon Valdez* wreck. Neither Alyeska Pipeline Service Company nor Exxon Shipping Company was prepared to respond to a spill of such magnitude. The handoff of spill response authority from Alyeska to Exxon was not anticipated by all authorities and contributed to command confusion. Key decisions, such as the focus on "Corexit," an Exxon dispersant, were unduly influenced by the fact that the spiller was in charge of the spill.

Spill response regimes should provide for government direction of the response effort, with the full participation and resources of both the spiller and government. Small spills, according to DEC regulations, can continue to be handled by the spiller.

*"It's just a simple question of who's in charge."*

*Jim Butler, Kenai Peninsula Borough*

*Alaska Oil Spill Commission hearing, 9/7/89*



*Congress should either strengthen the Coast Guard's oil spill response capability or transfer oil spill containment and cleanup responsibilities to the U.S. Army Corps of Engineers.*

One of the real and relatively unsung success stories in the response to the *Exxon Valdez* disaster was the work of Exxon and the U.S. Coast Guard in lightering crude oil off the grounded vessel and later moving the ship safely off the reef. That success is a marked contrast to the failure of all efforts to contain and collect the oil that escaped in the accident.

By tradition and practice, the Coast Guard has developed considerable expertise and experience in salvage and rescue, but comparatively little ability in oil spill response. The Coast Guard is seriously underfunded and underdirected in the field of oil spill response. The Coast Guard has been given one mission on top of another—most recently drug interdiction, a critically important task—without proportionate increases in appropriations. Thus the Coast Guard is obliged to do too many things for too many people and is not doing at least this one well.

Corps of Engineers and U.S. Navy equipment and workforces were the largest component of public response to the *Exxon Valdez* spill. There is a long history of cooperation between the Corps of Engineers and the Navy. The Navy has long experience in spill cleanup. Approved career patterns in the Corps of Engineers allow the development of career-long expertise and professionalism in a particular specialty. The Corps of Engineers' dredging capacity (which can be converted to skimming and oil recovery) and its nationwide mission involving the movement of water, soils, the management and preservation of wetlands, give it an unmatched spill response presence in all regions of the country.

Transferring spill response duties to other agencies would allow the Coast Guard to focus on tasks it does well—salvage and rescue—while permitting greater expertise of other agencies to be brought to bear on cleanup. Short of a formal transfer of functions, the Coast Guard should consider entering into delegation agreements for spill response functions.

*The Environmental Protection Agency is not adequately funded and staffed for oil spill prevention and response. Unless the agency receives sufficient resources, these functions should be delegated to the states or transferred to agencies better able to perform them.*

The Environmental Protection Agency commitment of staff and funding to activities in Alaska does not support the public perception that the

**Recommendation 39**  
**Coast Guard role in response**

*"It's very important that a defined chain of command is recognized. You've got a couple of windows of opportunity in the initial management of a spill. You've got 12 hours, which is one tide cycle, a flood and an ebb. And then you've got, I'd say, four days and then after that it's gone."*

*Jim Buller, Kenai Peninsula Borough  
Alaska Oil Spill Commission hearing, 9/7/89*

**Recommendation 40**  
**Role of Environmental Protection Agency**