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STATE OF ALASKA

Department of Commerce and Economic Development
Division of Economic Development

Date: Tuesday, May 3, 1994

To: Dave Wallingford
DOF, DNR
Anchorage

From: Daniel J. Golden, Jr.
DED, DCED
Anchorage

Subject: FHI Accomplishments (Your File 9-3100)

The project report "1993 Forest Health Initiative" will provide the information requested. Completion in my spare time, review by Canadian contributors, University contributors, and the need to verify everything for accuracy delayed completion of this effort.

STATE OF ALASKA

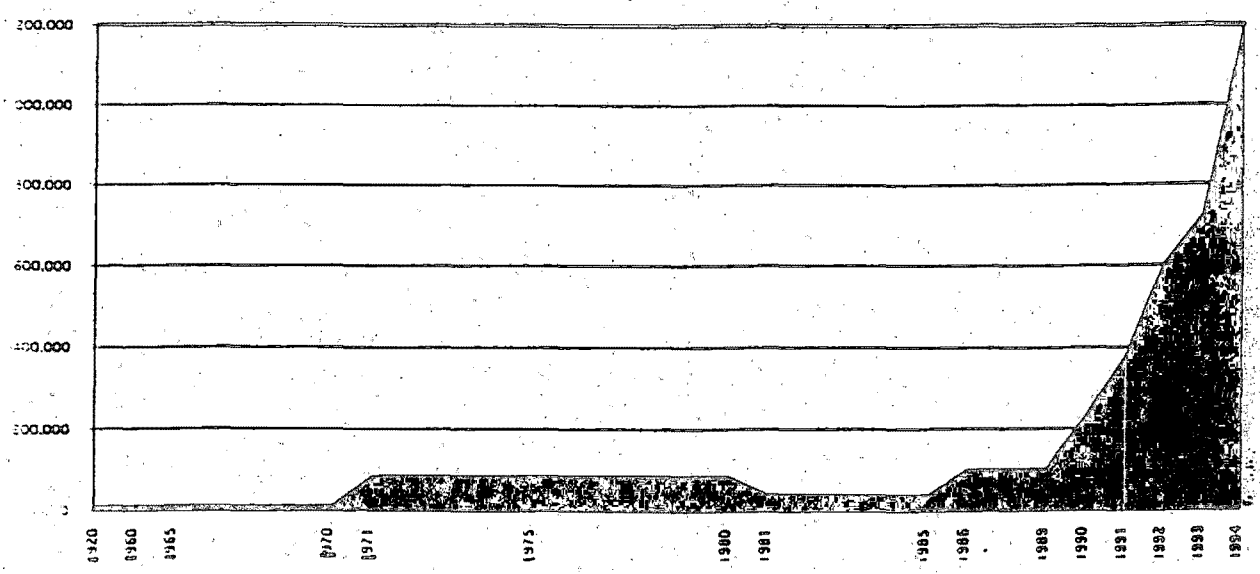
1993 Forest Health Initiative

Project Report

by

Daniel J. Golden, Jr.
Project Director

Acres Infested with Spruce Bark Beetles
74 Years



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EXECUTIVE SUMMARY, FORESTS AT RISK?

Insects kill millions of Alaskan spruce trees each year. Alaska has the largest spruce beetle (*Dendroctonus rufipennis*) infestation in the world! Billions of one-quarter inch long beetles continue to attack and kill, throughout Alaska, spruce trees worth hundreds of millions of dollars. Reality is, forest health in Alaska is in steep decline and tragically, timber, wildlife, recreation, and aesthetic values will follow. Increasing fire danger places devastated forest lands and remaining resource values at greater risk because dead spruce increase forest floor fuels. Ghost trees produce no seed; lost are the important seed sources and genetic diversity. Infestations change the landscape; scientists conclude that one-half of the infested spruce forests of the Kenai Peninsula may convert to an open forest of scattered trees or grassland.

Is the above scenario what Article VIII of the Alaska State Constitution intends when referring to maximum sustained yield to benefit Alaska's people? Dead and dying spruce trees do not sustain yields of wildlife, water, timber, etc.! Dead and dying spruce trees do not maximize benefits to the people and are a liability! A more tragic danger because it is preventable.

In August 1993, the Forest Health Initiative invited forestry experts from across North America to review the spruce beetle epidemic. This North American (International) Panel advised that beetle infestations the size and level in Alaska are "not natural." In their opinion a "forest emergency" exists! In 1992, emergency federal forest health matching funds were already available for the State to address forest insect problems. Even at that time, there was concern that an emergency existed which was confirmed by the Panel. Efforts to address the epidemic in 1992 to present have been largely thwarted by "process"; process superseded all common sense. Resource managers held more than 100 public meetings while the epidemic exploded. One could say that "Nero fiddled while Rome burned and continues to fiddle"!

As forest health declines so do social values and our quality of life. View sheds of spruce forests die, turn gray degrading forest experiences for tourists, hunters, and recreationalists. The increases in fire danger with standing dead trees reduce property values and increase liability.

Cumulative effects over years of expanding beetle infestations made control in 1992 impossible, not to say anything about 1994! Salvage and sanitation harvest or prescribed fire, all with reforestation, are the only way to return forest health and productivity. Without such efforts, responsible levels of sustained yield for all resources are not possible. Where beetle infestations are still limited in size and to individual stands such as in much of the Susitna and the Tanana-Yukon river basin, prompt sanitation harvesting can preclude or forestall the tragedy of the Kenai Peninsula and Copper River Basin.

In 1994 alone, beetle epidemics will kill spruce on acreage 3.3 times greater than all ever logged on the Tongass National Forest (360,000 acres).[1] Process allowed reported increased killing beetle infestations on over 700,000 acres in 1993 with a 1994 explosive estimate 1,200,000 acres! Process allowed stumpage value to decrease from $100-$150 per thousand board feet to $10-15 per thousand board feet as trees die. Financial losses in the hundreds of millions partially recovered used for reforestation could contribute to all values.

Recommendations based on historically successful Canadian and U.S. experiences in beetle control offer the most direct route to forest health and productivity. Dr. Jack Ward Thomas', now Chief of the USDA Forest Service, provides direction: "To say we don't know enough is to take refuge behind a half-truth and ignore the fact that decisions will be made regardless of the amount of information available."[2]

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[1] Boughton, Jerry, 1994, US Forest Service, Anchorage Total Tongass National Forest Acreage 17 million acres, 5.7 million acres classified commercial forest, 360,000 acres cumulatively logged, personal communication.

[2] Thomas, Jack ward. (ed.). 1979. Wildlife habitats in managed forests: the Blue Mountains of Oregon and Washington. USDA Agricultural Handbook No. 553. 512 p.

TIMELY ALTERNATIVES

IMMEDIATE

√ Declare a forest emergency as provided for under state law.[3]

√ Continue public involvement program.
- School education
- Forester exchange program
- Project specific public involvement process

√ Capture maximum economic value from the dead and dying forests.

√ Reinvest salvaged economic value into green healthy productive forests.

√ Require reforestation on all salvage sales.

√ Assemble low cost emergency assistance from:
-- US Forest Service,[4]
-- Canadians (British Columbia) by the "Scondmint Program,"[5]
-- Retired Forester's Coaching Teams and,
-- Volunteers for reforestation (employees, students, and youth).

√ Restrict infested log export and seasonally limit transfer of beetle infested log.

√ Limited pesticide use for use on ornamental and high value trees.

√ Institute a quality spruce seed collection.

√ Enforce Strict Forest Practices Act[6] Compliance for beetle sanitation and control.

√ Reintroduce fire into the ecosystems as management tool.

LONG RANGE STRATEGIC PLANNING

√ Create and use a statewide "Sustained Yield Plan" employing ecosystem management as a tool focusing on biodiversity and multiple use.

√ Review long term fire management for ecosystem health and productivity.

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3 11 AAC 70.10 (d) and AS 38.05.113

4 Detailer, a temporary assignment of determined length, usually less than one year.

5 A Canadian program to authorize the payment of forester's salary with only travel and per diem paid by receiving government. Details can be secured through Consulting Forester, Del Blackstock, 604-962-8440, H&D Enterprises, 4248 Chestnut Drive, Prince George, B.C. B2K 2T5

6 AS 41 Chapter 15. Forests, Article 1. Protection of Forested Land.

BACKGROUND

Abundance of natural resources made Alaska statehood possible. Income from the responsible development of natural resources would provide essential revenues for full participation by the state in the federal union. Indeed, income from natural resources provides 85 percent of total state revenues and is the foundation of Alaska's economic viability. Today, oil is the dominant income-generating resource. However, production of oil is beginning to fall and other natural resources must contribute to the social, political, and economic quality of life. Alaskan forests have the potential to contribute to the high quality of life. The Alaska Constitution mandates resource managers to develop and utilize renewable resources on a "sustained yield" basis for the maximum benefit of the people.

Aware of forest insect problems and declining forest health, Governor Walter J. Hickel established the "Forest Health Initiative." In August 1992, on recommendations of Commissioner of Natural Resources Dr. Glenn Olds and Lieutenant Governor Jack Coghill, Governor Hickel appointed Mr. Daniel J. Golden, Jr. director of the Forest Health Initiative. The Initiative was designed to develop plans for halting excessive environmental and economic losses caused by insects and diseases.

The Forest Health Initiative determined that the spruce beetle (*Dendroctonus rufipennis*), a bark beetle, was the most damaging forest insect in Alaska. Upon examination, spruce beetle infestations proved to be much worse and more widespread than expected. Alaska has the largest spruce beetle infestation in the world! Billions of one-quarter inch long beetles continue to attack and kill Alaska's native spruce: white spruce (*Picea glauca*), Sitka spruce (*Picea sitchensis*), the hybrid spruce (*Picea X lutzii*), and even black spruce (*Picea mariana*).[7] Healthy trees worth hundreds of millions of dollars; once killed and dried, they are worth only one-tenth that value.[8] Forest health in Alaska is in steep decline. Tragically, timber, wildlife, recreation, and aesthetic values follow this downward direction.

Increasing wildland fire danger places beetle devastated forest lands and remaining resource values at greater risk because dead spruce add fuels to the forest floor. The concern is sufficiently great that firebreaks have been constructed, at considerable cost, around some communities. Ghost trees do not produce seed; lost are an important seed source and genetic diversity. Following infestations, the landscape can change; scientists conclude that one-half of infested spruce forests on the Kenai Peninsula may convert to an open forest of scattered trees and grassland.[9] The health of the forest is simply declining.

The Forest Health Initiative was created to address the following concerns:

Define forest health issues: the causative agents and magnitude of the problem;
Determine alternatives for coping with the issues and problems;
Develop and implement a plan to reduce excessive environmental and economic losses to the citizens of Alaska.

The magnitude of the spruce beetle problem eclipses all other injurious agents. Although other injurious agents are active in the State forests, none approach the urgency of the spruce beetle. In most areas of beetle activity, prevention or control are no longer an option the damage is already done. Salvage dead trees through sanitation harvesting are the only economic options; in some cases.

A second effect of dead spruce is the reduced wildlife habitats for many species. Beetle caused habitat changes prompted Fish and Game's Area Biologist Ted Spreaker in April 1994 to ask the

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7 Holsten, E. H.; Werner, R.A.; Laurent, T.H. 1980, U.S. For. Service Alaska Reg. Rep. 75. Anchorage, Alaska.

8 Packee, Edmond C. 1994. Associate Professor of Forest Management. School of Agriculture and Land Resources Management University of Alaska Fairbanks. Personal communication.

9 Holsten, E.H. 1994, U.S. Forest Service, Draft Copper Landing Regeneration Report a 15 Year Study.

Board of Game for a 33% reduction in the Kenai black bear taking and a split of harvests into two periods.[10] Moose populations are also predicted to drop by a similar amount.

The spruce bark beetles starts by attacking and killing the biggest and oldest trees, "high grading" and "clear cutting" the spruce from the forests. The larger trees provide a host for beetle populations to multiply exponentially. The magnitude, severity, and cumulative long term trauma of beetles appear to far exceed even that of clear cut logging.

The Alaska Division of Fish and Game has noted clear cutting in other areas of the state that:

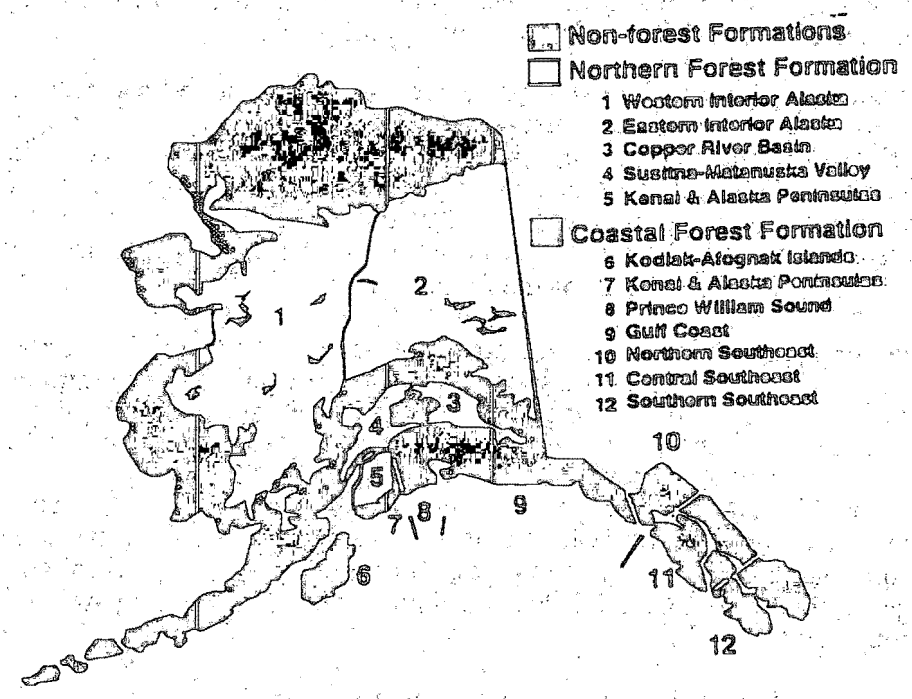
> "The potential long-term adverse impacts of clear-cut logging ...on the fish and wildlife species in the region have been particularly well documented for rearing salmon and trout. Research also indicates that adverse impacts can be expected for moose, black bear, brown bear, mountain goat, marten, wolf, land otter, cavity-nesting birds, and other bird and small mammal species requiring aspects of old-growth forest."[11]

The spruce bark beetle may soon have a far greater cumulative impact to the forest ecology than all the logging ever attempted by man in Alaska.

Beetle kill in riparian zones of all mature spruce pose a potential nightmare for habitat managers. Well known is the requirement for a reasonable amount of "woody debris" to create fish habitat. In streams surrounded by dead trees, what's to keep the fall down from overwhelming the stream and create damming in early years? Beetle kill fall down of entire forests could destroy stream channels, create barriers, and accelerate erosion. Once the trees are gone it may be 150 years or longer before the important woody debris is again available, meanwhile, where will the seed source be for those future spruce trees?

Map 1.

ALASKA FOREST LANDS



10 Fish and Game's Area Biologist Ted Spreaker in April 1994. Personal communication.

11 Alaska Department of Fish and Game, Juneau, "Status of Measures to Protect Fish and Wildlife in the Tongass National Forest" A report on Section 706(b) of the Alaska National Interest Lands Conservation Act, February 1986.

A HISTORY OF THE SPRUCE BARK BEETLE IN ALASKA[12]

The USDA Forest Service has documented spruce beetle activity in Alaska dating back to at least 1920. Although incomplete, early data provided a base upon which to begin to understand the spread of the spruce beetle and associated damage.

Bark beetles are known as "tree killers." The spruce beetle (Figure 1) is no exception. Adults breed under the bark. They construct upright tunnels[13] in the inner bark; eggs are laid in these tunnels. The larvae tunnel outward from these egg galleries and, then, as individuals upward. They leave a distinct pattern (Figure 1). Larvae and adults hibernate over winter. The cycle from egg to adult is one to two years and depends upon environmental conditions, especially climate. Tunneling in the bark interrupts movement of water and nutrients in the tree. Excessive tunneling essentially cuts off all flow and the tree gradually dies.

The spruce beetle. *Dendroctonus rufipennis* (Kirby). A. Adult spruce beetle. B. *D. rufipennis* eggs. C *D. rufipennis* larvae. D. *D. rufipennis* adult galleries E. Adult and larval spruce beetle galleries. (Source: Ives, W.G.H., and Wong, H.R. 1988. Tree and shrub insects of the prairie provinces. Infor. Rept. NOR-X-292. Northern For. Centre, Can. For. Serv., 327 pp.)

Figure 1. Adult spruce beetle and typical tunneling pattern.

A healthy forest contains small (endemic) populations of "destructive organisms"; bark beetles are no exception. "Destructive organisms" are "destructive" only in the sense of human values. However, they are an essential component of biodiversity and in some cases to the maintenance of healthy ecosystems. Endemic populations of spruce beetles serve as food for birds, especially woodpeckers, and small mammals. Bark beetles are also the agent of death for stressed or overmature trees. Thus, in managed forest stands, the provision for small populations of bark beetles is essential for biodiversity and normal ecosystem processes.

Disturbance (fire, insects, disease, wind, snow breakage) is also an integral component of the Northern Forest. It is essential for the replacement of aging forests, the recycling of nutrient cycling, and maintenance of productivity. Fire is often recognized as an unacceptable disturbance factor because it instantaneously destroys human-valued objects; thus there is a major fire control effort in Alaska. The spruce beetle's effort is more subtle; severely attacked

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12 Portions of this section are derived from work done under contract to DOF by Forester Terry Brady 1993 and Packee, Edmond C. 1994. Associate Professor of Forest Management. School of Agriculture and Land Resources Management University of Alaska Fairbanks. Personal communication. .

13 Tunnels appear to go up the tree to prevent them from filling with water during rain.

trees take two or three years to die. Under epidemic conditions, the bark beetle can be as effective as fire in destroying the forest canopy. However, the forest stand replacement scenarios of fire and spruce beetle may be quite different.

Because of changes in forest stand conditions or other environmental factors, the spruce beetle is able to increase its population from an acceptable endemic level to that of an epidemic. Normal control agents such as woodpeckers cannot keep up with the exploding population and the beetle becomes an agent for major change affecting the continuing development of the ecosystem. Dr. Malcolm L. Hunter, Jr. of the Wildlife Department at the University of Maine states "[s]pecies that are not dominants, but still hold critical roles in ecosystems...[and] have a central role on which the integrity of the whole ecosystem relies" are "keystone species."[14] The eminent ecologist Dr. Edward O. Wilson defines a keystone species as a species "that affects the survival and abundance of many other species in the community in which it lives; its removal or addition results in a relatively significant shift in the composition of the community and sometimes even in the physical structure of the environment."[15] It appears that the small, one-quarter inch long spruce beetle is just such a keystone species! When it reaches epidemic proportions, it significantly changes the forest community.

Environmental change: Forest stand structure, species composition, and environment change drastically following an infestation. As the proportion of dead trees increases fire danger increases and then drops with the drop of fines (needles and small branches) only to rise again as ground fuel loading increases. The spruce trees are now ghost trees–they produce no seed; lost are the important seed sources and genetic diversity. Following infestations, the landscape can also change; scientists conclude that one-half of the infested spruce forests of the Kenai Peninsula may convert to an open forest of scattered trees or grassland. Lost stand structure affects wildlife populations; birds such as the wren can increase and the kinglet will decrease. Lost seed sources will affect seed-eating birds and mammals; this could have an impact on other species further up the food chain.

We can accept reasonable swings in ecosystems as being natural, swings that do not break the ecosystems. Castrophic loss by other destructive agents is unacceptable as it is with fire. We are dependent on the spruce forests for our quality of life. The wasting of all mature spruce by humans is unacceptable, then why is it acceptable to permit the beetle to do the same? We control fire for a multitude of values including life and property. Logically, we should not protect the forest from one destructive agent and not another. We cannot permit the spruce bark beetle to castrophically remove all mature spruce. In reality, nature operates on a boom or bust scenario. Can Alaska tolerate such swings? The answer is no, if the Alaska State Constitutional mandate for sustained yield is to be followed. "Continuous, sustainable, flow of goods and services of replenishable resources. Reality is that in less than 10 years (1986 through 1993), reported active spruce beetle infestations increased from less than 100,000 acres to over 800,000 acres; the estimate for 1994 is 1,200,000 acres! The public trust to maintain a healthy forest and the Alaska Constitution mandates responsible management of the replenishable resources of the State for the benefit of all Alaskans.

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[14]Hunter, Malcolm L., Jr. 1990. Wildlife, forests, and forestry. Principles of managing forests for biological diversity. Englewood Cliffs, NJ: Prentice-Hall, Inc. 370 p.

[15]Wilson, Edward O. 1992. The diversity of life. New York, NY: W.W. Norton & Company, Inc. 424 p.

BEETLE POPULATIONS EXPLODE

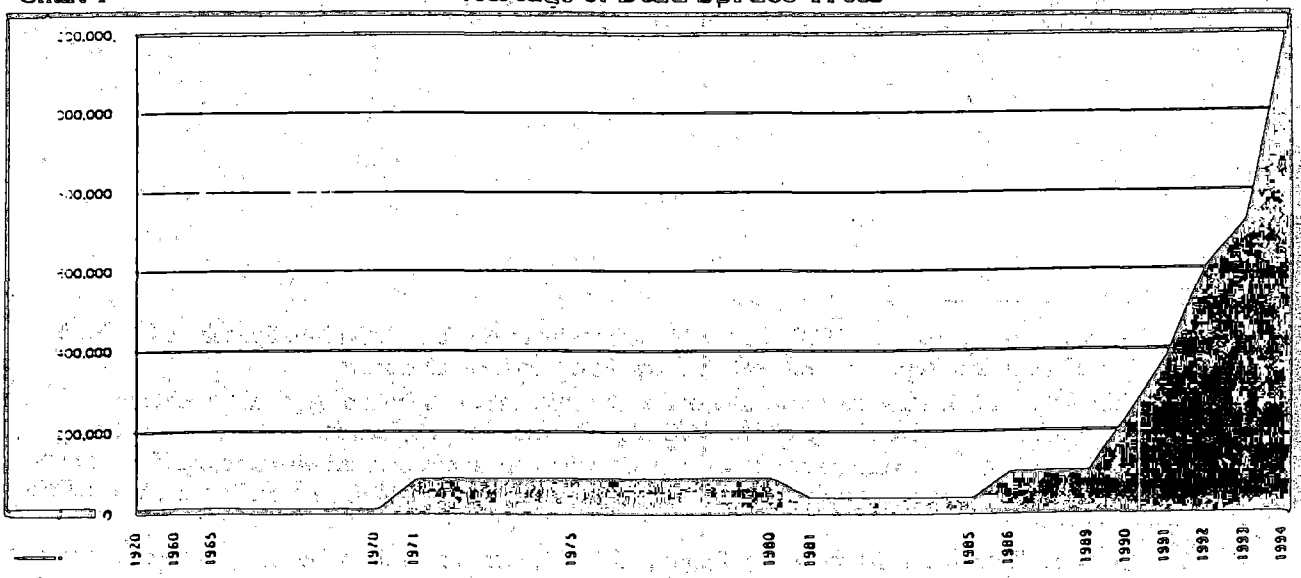
Is the Dendroctonus beetle (Alaskan Spruce Bark Beetle) at an epidemic level in Alaska? The following facts, provided by the U.S. Forest Service, should put this issue to rest. Explosion of Alaska spruce bark beetle killed trees is reported the highest in North America, likely, largest in the world in 1993. Predictions for 1994 survey results estimate 1,200,00 acres of dead trees. The largest infestations are on the Western Kenai Peninsula for the third year in a row. Data taken from US Forest Service annually aerial surveys on insect damage in Alaska.
Table 1.

1920 to 1994 US Forest Service Bark Beetle Surveys , Alaska.

	Acres	Years	Ave. Acres/Year	Dead Trees (Ave. 150 trees / acre)[16]
1920 - 1970	-608,800	51	-11,937	-1,790,588
1971 - 1980	-880,140	10	-88,014	-13,202,100
1981 - 1985	-196,232	5	-39,246	-5,886,960
1986 - 1989	-308,786	3	-102,929	-15,439,300
1990	-232,406	1	-232,406	-34,860,900
1991	-376,817	1	-376,817	-56,522,550
1992	-604,809	1	-604,809	-90,721,350
1993	-724,750	1	-724,750	-108,712,500
Est. 1994	-1,200,000	1	-1,200,000	-180,000,000 million

Dramatic increases after decades of an acceptable level of infestations. 12,000 acres to a predicted increase of 100 times or 1,200,000 million acres in 1994 demonstrates the huge losses. Endemic (normal) levels of beetles are part of the forest. Epidemic (abnormal) can be detected in the graph below starting in 1989 and continuing uncontrolled.

Chart 1 Acreage of Dead Spruce Trees



16 Uses average trees per acre from the 1994 USFS Moose Pass Cooperative Project , Team Leader Forester Warren Oja. Also see UAF, Weston Chart in this report.

Historic: The USDA Forest Service[17] estimates that from 1920 through 1970 Alaska suffered spruce bark beetle infestations on 608,800 acres this an average annual infestation of 11,937 acres. (Equal to 6,000 city blocks) This includes a 200,000 acre Copper River area infestation reported in 1920; a 100,000 acre Afognak Island infestation occurring between 1930 and 1940, and a 220,000 acre infestation in north Kenai Peninsula. Edwin Packee,[18] Associate Professor of Forest Management, University of Alaska Fairbanks, reports geological records from 1910-1920 refer to a major infestation throughout the Susima Valley. Although severe, they were isolated locally, with the overall level of infestation in this area could be considered to be normal, even ecologically acceptable for the times.

Table 1 also lists estimated number of trees killed by the beetle. An average number of 150 trees[19] was used; this number is thought to be realistic. The Moose Pass and Falls Creek research confirms this estimate.

The U.S. Forest Service, through historical research and contemporary monitoring, has compiled records of spruce bark beetle (*Dendroctonus rufipennis* -Kirby) in Alaska dating back to 1920. The early data is incomplete, but does give a base on which to begin analyzing the spread of the beetle damage.

The spruce bark beetle, depending on environmental influences, may have a one or two year life cycle. Monitoring does not usually note the beetle damage until one or two years after the tree has been infected, resulting in a lag time in estimating the acreage and timber volume damaged by the beetle.

Detection Methods: Insect detection and control is a cooperate management program finance by the US Forest Service for the State of Alaska. Each year a team of trained professionals, supervised by entomologists, "fly" the state in late August and early September looking at indicators of pest activity. One of those indicators is "flagging" spruce trees. A "Flagging," spruce tree has dying needles. The tree changes color from green to red due to a lack of nutrients. Large numbers of beetles eating away the under bark, cut the nutrient flow transportation mechanism. Spruce bark beetles cut off the nutrient flow by "girdling" the tree.

Aerial and visual observations based upon the color change of the tree records beetle impacts from a previous year's infestation. The trees infested in the reporting period will not die until the following year. Therefore, reported magnitudes are always one year behind the beetle activity.

The Forest Service also uses infra-red photography to detect insect activity. This method is expensive, limited to clear weather, requires precision flying at low levels, takes time to develop, and requires additional staff time for interpretative work.[20]

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17 *Forest Pest Management Report*, 1990. Spruce beetle activity in Alaska: 1920-1989. Juneau, AK: USDA Forest Service Technical Report No. R10-90-18 Forest Pest Management Report.

18 Packee, Edmond C. 1994. Associate Professor of Forest Management. School of Agriculture and Land Resources Management University of Alaska Fairbanks. Personal communication.

19 Weston, Michelle. 1994. Graduate Student. School of Agriculture and Resources Management University of Alaska Fairbanks. Draft report, personal communication. Also see Oja, W., 1994, US Forest Service, Moose Pass Cooperative Project.

20 Brady, Terry T., "Forest Land Emergency Report," 6/15/93, Contract with the Division of Forestry, Forest Health Initiative.

Research: The Forest Health Initiative established a small study with the School of Agriculture and Land Resources of the University of Alaska Fairbanks to investigate stand structure in the Falls Creek area of the Kenai Peninsula. Funding was a joint effort.[21] Creation of Table 2 provides preliminary information from the Falls Creek study; completion of the study is anticipated in late 1994. Preliminary stand structure for 7 spruce (white or Lutz) stands support the estimate of 150 trees per acre and shows rate of death. [22]

Table 2. Note: Table does not reflect dead trees standing in survey area.

University of Alaska Fairbanks
Stand Structure 1993
Western Kenai - Falls Creek Area

LOCATION Stand Composition	Trees	# (spruce /Acre >6 in diam...)	Crown Class	% live trees with beetles	Ave. Ht. (Feet)	Ave. Diam. (Inches)
Cockell Shell						
Spruce, birch	479	150	Dominant	56%	54'	10.8"
			Codominant	47%	41'	8.1"
Crooked Creek						
Spruce, birch	367	166	Dominant	86%	56'	10.9"
			Codominant	76%	45'	8.2"
Clam Gulch A						
Spruce, birch	300	150	Emergent	100%	78'	17.8"
cottonwood			Dominant	83%	59'	13.1"
			Codominant	12%	49'	9.5"
Clam Gulch B						
Spruce, birch	343	170	Dominant	37%	68'	13.1"
cottonwood			Codominant	29%	52'	9.6"
Borgen						
Spruce with	396	140	Dominant	43%	63'	12.4"
grass			Codominant	43%	53'	9.4"
Falls Creek						
Spruce, birch	462	n.a.	Dominant	53%	57'	11.5"
cottonwood			Codominant	58%	41'	9.1"
Tower						
Spruce	306	163	Dominant	79%	80'	16.9"
			Codominant	20%	57'	8.8"

[23]

The percentage dead spruce per site is devastating to the forest habitat. Table 2 does not account for standing dead trees from previous years. Table 2 only notes to trees with beetles that will be killed. The remaining spruce trees are expected to die in the future from spruce bark beetles.

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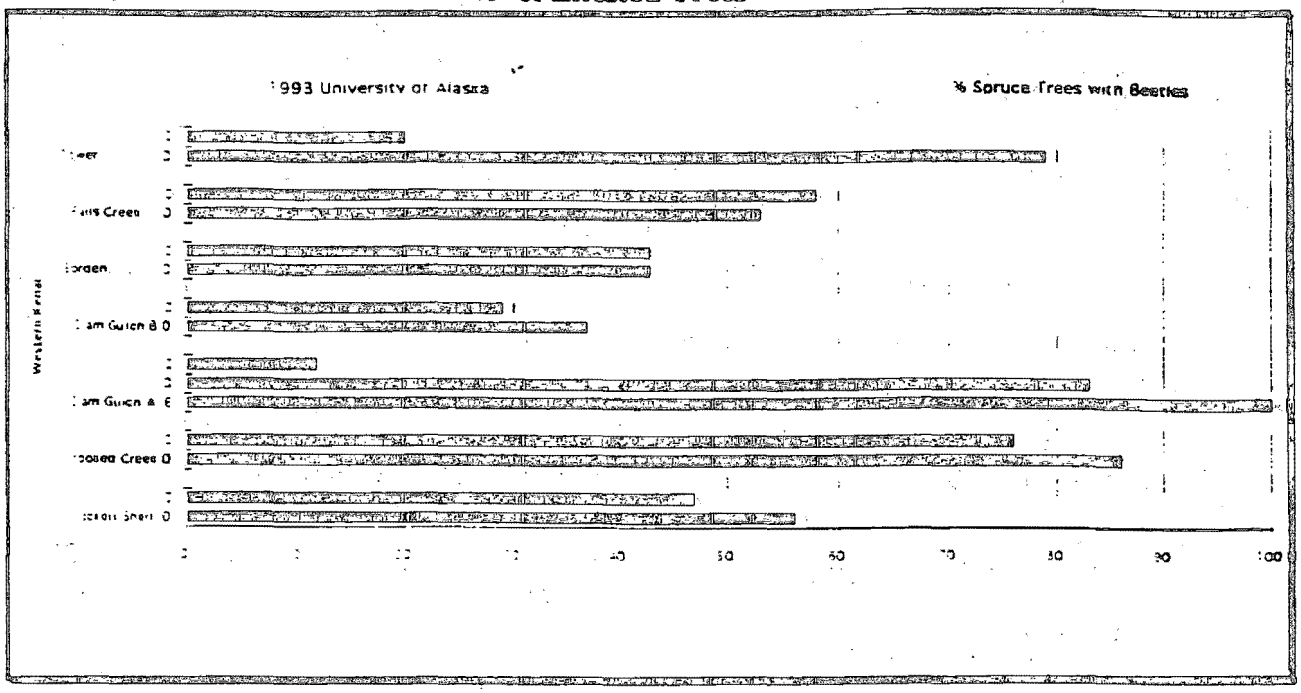
[21] The Forest Health Initiative was a major contributor.

[22] Weston, Michelle. 1994. Graduate Student. School of Agriculture and Resources Management University of Alaska Fairbanks. Personal communication.

[23] Weston, Michelle. 1994. Graduate Student. School of Agriculture and Resources Management University of Alaska Fairbanks. Personal communication.

Stand Structure 1993
Western Kenai - Falls Creek Area
% of Infested Trees

Chart 2.



Why: The first question that comes to mind is "Why the sudden increase in spruce beetles?" Two contributing factors emerge: One is natural and the other is man-related. Beetle populations built to record levels with mild weather and increasing stressed conditions of spruce trees due to natural stocking levels (natural number of trees per acre) and increasing age. The development and ecological processes of the Northern Forest are closely tied to a certain level of disturbance. Disturbance is essential for maintaining healthy ecosystems and biodiversity. Dr. William A. Niering of the Department of Biology at Connecticut College states that "natural disturbances are critical in maintaining landscape diversity."[24]

Disturbance: This is not only fire, but also insects, windthrow, snow and ice breakage. Bennett[25] in 1916 refers to major fires on the Kenai Peninsula, in the Anchorage Bowl, and the lower Matanuska valley. Weston[26] found charcoal in the soil profile of most stands she investigated in the Falls Creek area. Previous bark beetle infestations in Alaska are documented as a disturbance factor and are being related to data collected by Ms. Weston. Presence of shade intolerant species such as cottonwood (*Populus balsamifera*), aspen (*Populus tremuloides*), or paper birch (*Betula papyrifera*) are also evidence of past disturbances.

Environmental policies of the past 50 years, especially attempts to exclude fire and then the willful decision to "let nature take its course" without fire, profoundly affected forest stand structure. Exclusion of fire allowed another disturbance agent, the spruce beetle, to alter the direction of the plant community's development. Poor forest sanitation practices allowed the beetle to increase in numbers and even allowed transport of the beetle to other locations.

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[24]Niering, William A. 1987. Vegetation dynamics (succession and climax) in relation to plant community management. Conservation Biology 1:287-295

[25]Bennett, Hugh H. 1918. Report on a reconnaissance (sic) of the soils, agriculture, and other resources of the Kenai Peninsula region of Alaska. USDA Bureau of Soils. 142 p.

[26] Weston, Michelle. 1994. Graduate Student. School of Agriculture and Resources Management University of Alaska Fairbanks. Personal communication.

Indiscriminate clearing (subdivision, road or utility right-of-ways, seismic lines, timber sales) without sanitation left quantities of slash on site and encouraged beetle brood development. Removal, as firewood or logs, of wood containing live adults or larvae transported beetles beyond the local infestation area. Lack of prompt salvage and sanitation in infected stands, the "let nature take its course" syndrome, allowed local infestations to increase in area and local infestations coalesced into large infestations.

In addition to the spruce bark beetle, *Dendroctonus*, many other insects and diseases, some working independently and some complementary are at work within the forests. Thus figures shown here for the bark beetle undoubtedly do not include all the insect and pathogen damage in Alaska's forests. There is little doubt however, the bark beetle is currently the most destructive agent, sometimes paving the way for other agents (fire, wind, other insects and pathogens).

Presence of bark beetles at the endemic level, below the present epidemic levels. Provides a food for birds and small mammals, and is an agent of death for overmature or stressed trees, like many other forces of change in a forest. In other words, in a managed forest ecosystem, provision must be made for a moderate amount of physical and biological damage. The damaging agents will be expected and tolerated, as vital parts of the ecosystem.

But, when the same agents reach epidemic, or spectacular levels, such as an uncontrolled forest fire, widespread storm damage, or quickly spreading insect or disease ruin, then forest managers, as a matter of procedure, must be ready to step in. This is particularly true when there are laws and regulations requiring action to prevent disruption of the ecosystem and loss of economic values.

Beginning in the early 1970's the incidence of bark beetle infestation, particularly on the Kenai Peninsula and the west side of Cook Inlet, began growing rapidly, to the point that bulletins were issued, newspaper articles written. During this period the State of Alaska awarded a timber salvage sale for beetle killed and threatened spruce in the Tyonek area on the west side of Cook Inlet.[27] Unfortunately, salvage and sanitation harvests were not initiated on the Kenai Peninsula; this inaction may have been associated with the changing land ownership patterns. Infestations on the Kenai Peninsula are on lands managed by USDA Forest Service, USDI National Wildlife Service, Alaska Department of Natural Resources Division of Lands/Division of Forestry and Division of Parks, Alaska Department of Fish and Game, Kenai Peninsula Borough, native regional and village corporations, and private individuals.

In the Copper River Basin, spruce beetle populations were also on the rise with the Teakle River drainage being particularly hit hard. In the mid to late 1980's the infestation exploded to cover a much larger acreage and lands were again managed by a variety of agencies/organizations: USDI Bureau of Land Management and National Park Service, Alaska Department of Natural Resources Division of Lands/Division of Forestry, native regional and village corporations, and private individuals.

Most of the current damage, reported 1989 through 1993, is in Southcentral Alaska (Kenai Peninsula Borough, Municipality of Anchorage, Matanuska-Susitna Borough) and in the central Copper River Valley, in the Chitna area. Tok and Haines in Southeast now report infestations.

The occurrences are on federal, state, municipality and private lands. The beetle does not recognize property lines. However, these areas, in the opinion of competent forest engineers, are all accessible for timber harvest and other forest management activities, over a reasonable period of time. Environmental considerations will dictate salvage decisions.

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27 Orr, David, 1994 Department of Commerce and Economic Development, Former State of Alaska Forester, 1973-1983 Toyonak Salvage Sale, 600 million board feet, on 200,000 acres with 90% regeneration failure. Personal communication.

Economics: Forest values of wildlife habitat, watershed, recreation, view sheds, and timber all devalue as the forest turns gray. Stream buffers along with upland watersheds provide the connection of forests and fish. Spruce trees killed by man or beetle remove the security and degrade its value to perform a protective function. The Alaska Department of Fish & Game frequently refer to this direct connection and importance function. More than one value declines with increased beetle activity. Therefore, capturing economic timber value to pay for the protection and enhancement of the forest is the challenge.

Market value: Recent increases in world wide demand increased the value of standing dead spruce[28] making removal economically feasible. A steep decline in tree value occurs after they die and it is obvious that early economic recovery will add more to the treasury for rehabilitation. Value is measured in industry specific terms such as of thousand board feet. A presentation in terms of Income per acre and per tree seems more easily understood.

Table [29] 1994 MARKET VALUES[30]

	Quality	Acre	Thousand	Tree
Healthy	Green, high	$900	$200	$6.00
	Green, low	$675	$150	$4.50
	Mixed,	$153	$34	$1.02
Dead	Dead, high	$68	$15	$0.45
	Dead, low	$45	$10	$0.30

Use of low value wood (dead trees) is the key. Circle DE Pacifica, a chipping company out of Homer, demonstrates economic feasibility daily by using low value wood from the Kenai Peninsula.

Non cash income: Timber owners (government and private) dictate conditions trees are removed from the forest. Some benefits are non cash. Large enough sales easily require removal companies to pay for road and bridge installations (removal when required), beautification projects such as the removal of undesirable dead trees, for improve view shed or habitat, and 100% reforestation. Construction of firebreaks and removal of fuel from the forests can be a non-cash benefit.

Economic multiplier: Economists estimate benefits using multipliers. Timber owners receiving cash pay for goods and services expanding the economy. The logger buys equipment, housing, services, etc. multiplying the economic impacts. One can easily see economists justifying a multiplier of gross revenues.

Salvageable commercial value of the already dead and dying trees rival that of salmon landings for the same period and is many times greater than the Alaska Permanent Fund dividends paid to state residents. The spruce bark beetle projected kill is more than 180 million trees in Alaska during 1994, more in 1995. Sale of the trees projected to die could bring $1 billion dollars to state treasury. The associated commerce multiplies opportunity lost. With active and timely management, these trees could be a net gain to the state. Without proactive management that includes the private sector, management of the epidemic will be a net drain on the states financial resources.

The Forest Health philosophy of ecosystem management involves the protection and wise use of all of the forest values to society. Management decisions are based on forests as a complete ecosystem, not just a supply of timber. Foresters must evaluate how a decision will affect: wildlife, fish, watersheds, access, views, recreation opportunities, site productivity, water quality, and a matrix of other values and considerations. Alaska's Forest Health Initiative sought solutions to the crisis that would recognize and enhance those values before taking action.

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28 Salvage of standing spruce can occur up to 10 years after death in these market conditions.

29 Packee, Edmond,Ph.D., 1994, University of Alaska Fairbanks. Personal communication.

30 The table is based on 4,500 mbf and discribe a range of recently reported data.

GOALS AND ACCOMPLISHMENTS

Charges for Forest Health Initiative by the Governor and Lt. Governor were:

1. Increase public awareness,
2. Build interagency cooperation and coordination,
3. Develop direction and statewide momentum, and
4. Recommend immediate and long range management responses to achieve control of our forest health crisis.

Professional foresters have documented the scientific basis for each proposed solution. Private citizens attended over 100 public meetings, contributing their thoughts, feelings, and concerns. Legislators, the press, educators, and politicians toured damaged forests and witnessed the crisis firsthand.

Canadian response to infestations is instructive to examine. It is only a matter of months from detection to salvage harvest. The Ministry of Forestry, Providence of British Columbia, strictly enforces salvage harvesting to prevent spread of beetle infestations. Normal timber and silviculture procedures have been shortened to deal with the emergency.[31]

The Forest Health Initiative has created a high level of public expectation and support. Responsible forest management requires immediate implementation. Management agreements must include federal, state and private foresters. The initiative has demonstrated, the importance, of the values being lost, clarified the opportunities, and provided information to decision makers.

Specific accomplishments and ongoing activities:

1. Raise public awareness of the spruce bark beetle problem.	*CONTINUING*
2. Secured funding, 1993 US Forest Service pest suppression.	*COMPLETED*
3. Publish - "Forest Health Plan for the Western Kenai Peninsula" by the Division of Forestry (Primary Author Forester Pete Buist).	*COMPLETED*
4. Promulgated an "emergency regulation" authorizing the State Division of Forestry to act more quickly in forest crises.[32]	*COMPLETED*
5. Facilitated "Forest Health Plan for the Western Kenai Peninsula" included in 1993 Five Year Kenai Kodiak Area Plan [33]	*COMPLETED*
6. Hired field silviculturalist (forest doctor) in DOF for site specific forest health prescriptions in central and south-central Alaska.	*COMPLETED*
7. Facilitated site specific ecosystem management by silvicultural prescriptive forest techniques.	*COMPLETED*
8. Contracted a "treatment team," (ADF&G & DNR)[34] to complete site specific prescriptions on Western Kenai Peninsula.	*ONGOING*
9. Complimented interagency cooperation,	*CONTINUING*

31 A 1992 personal visit to Prince George confirmed this policy.
32 11 AAC 71.010 TIMBER AND MATERIAL SALE OFFERING.
33 Principle author, Forester Pete Buist
34 ADF&G = Alaska Department of Fish and Game; DNR = Alaska Department of Natural Resources

10. Contracted for the Moose Pass Cooperative Project Plan with USFS for forest health treatment plan.	*INITIATED ONGOING*
11. Demonstrated silvicultural benefits to multiple land owners and users workshop *(55 people attended a 2 1/2 day field trip).*	*COMPLETED*
12. Supported spruce seed cone collection to protect seed source. (DOF to conduct cone collection, summer of 1993.) -	*COMPLETED*
13. Documented disturbance important for regeneration (summer logging) - *(see USFS Cooper landing example)*	*COMPLETED-ACCEPTED*
14 Evaluated impacts of spruce bark beetle on biodiversity. *(Beetle infestations are reducing habitat and biodiversity)*	*COMPLETED*
15. Recognition of emergency, secured national and international problem recognition with "International Panel Report"	*COMPLETED*

The Forest Health Initiative is a tribute to the Alaskan spirit and is an outstanding effort and accomplishment of thousands of Alaskans attempting to preserve a spruce component and sustainable yields of our forest lands. Contributions of time, knowledge and, leadership are key to the Initiative's success. The political leadership of Governor Hickel and Lt. Governor Coghill set this initiative in motion. Legislative funding support, federal priority funding, local government involvement, and extensive media coverage have led to this unique opportunity to move forward.

Documents submitted are a historic reference[35] to the complexity and hard work of many professionals required to accomplish the goals set out. Deserved accolades need to be awarded to a score of professionals for achievements that stand as a template for future actions. Private citizens, foresters, press, legislators, educators, politicians at all levels deserve high praise and credit for the project momentum. The names appearing herein are but a few now dealing with this emergency.

Adoption of policy recommendations by the International Panel and those contained herein should be high on the agenda of Alaska's leaders. An opportunity exists to preserve our forest values, restore forest health, diversify our economy and, build a stronger future for Alaska.

The Forest Health Initiative has armed leaders with knowledge and poised them for decisive action and developed public expectation. Alaskans expect, no, demand, protection of our forest resources as a part of the public trust. This trust requires managers and administrators to take immediate action. To realize the potential of the Alaskan forest resources we must act now. "The cost of doing nothing will far outweigh the funds expended on control, mitigation, salvage and restoration."

35 An Anthology of Forest Health is available.

SUSTAINING FOREST YIELDS

The State Constitution mandates that Alaska's forest be management for maximum sustained yield. The constitution sets the highest standards for resources managers. Specifically, Article VIII:

1. "Maximum use consistent with the public interest"[36]
2. "Utilization, development, and conservation of all natural resources belonging to the State, including land and waters, for the
3. "Maximum benefit of its people."[37]
4. "Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle,[38] subject to preferences among beneficial users."[39]

The question is, what yields are sustainable and how do we measure them? Measurement of sustained yields for maximum use includes a variety of considerations and measurements beyond board feet. Included are fish & wildlife carrying capacities, watershed productivity, recreation & view uses, and other measurable values. Timber is only one of the many important uses of our forests. The constitution recognizes that multiple use can occur and that they can compliment each other and are frequently of mutually benefit.

Foremost to maximizing "sustained yields" is a healthy and productive forest. Allowing resource waste and destruction by insect infestations and other destructive agents is environmentally, morally, and constitutionally unacceptable.

Removal of trees at these excessive rates by man or insects goes beyond sustainable levels. This is called "departure"[40] from sustained yield. Beetle epidemics are removing trees at excessive rates beyond sustainable levels. The Spruce bark beetle infestations intrude on all uses. Healthy forests require management of epidemics and disease. A return to acceptable sustained yield levels requires management's interruption of infestations.

> "The fish and wildlife resources of the region[41] currently support vital commercial fishing and guiding industries and contribute to support industries the growing tourism industry. Many residents of the region depend heavily on the resources for food and recreation, with dependence on fish..." "Long-term reductions in opportunities to harvest or enjoy fish and wildlife will also occur as a result of timber harvest" (or depletion by beetle kill). "Where habitat losses are significant, yields may likely be reduced to levels below which harvest of certain species can be sustained." Scheduled and completed timber harvest areas in the Tongass National Forest are smaller than the areas beetle have destroyed in central and south-central Alaska including the Chugach National Forest.[42] Fish and Game express ...." concern ...with respect to its ability to manage fish and wildlife "on the sustained yield basis," as required by the Alaska State

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36 State of Alaska Constitution , ARTICLE VIII, NATURAL RESOURCES, Section 1.

37 State of Alaska Constitution , ARTICLE VIII, NATURAL RESOURCES, Section 2.

38 Sustained yield is defined in many ways, economic and biological.

39 State of Alaska Constitution , ARTICLE VIII, NATURAL RESOURCES, Section 4.

40 Departure: A deviation or divergence, as from an established rule. The American Heritage Dictionary, 1991.

41 It should be noted, the Department of Fish and Game was speaking of the timber removal, similar to but, below the magnitude of the Chugach National Forest beetle kill, for the Tongass National Forest. It would be illogical and irresponsible to conclude otherwise that loss of millions of trees doesn't have similar negative ecosystem habitat impacts in this region.

42 Boughton, Jerry, US Forest Service, State and Private Forestry, Anchorage, 1993.

Constitution, and to 'manage, protect, maintain, improve, and extend the fish, game, and aquatic resources of the state' as required by state statute."[43]

Therefore, it is logical to conclude, failure to manage infested forests is contrary to the intent and meaning of both the State Constitution and Department of Fish and Game and the Department of Natural Resources statutory responsibilities.

The Division of Forestry is so concerned with maintenance of sustained yields that it mandates reforestation on .....

"state, municipal, and private forest land..... "to the fullest extent practicable, harvested forest land shall be reforested, natural and artificial, so as to result in a sustained yield of merchantable timber from that land...."[44]

The Commonwealth of Virginia in August 1993 declared a precedent setting "Natural Disaster" due to their Pine Bark Beetle infestations.[45] Alaska's spruce bark beetle infestations are much worse. The magnitude of our infestations and the cumulative effects are socially, economically, and politically a disaster. Dollars lost in opportunity costs from wasted timber salvage values amount to billions of dollars. Funds that could have complimented reforestation and other uses, provided, access also for recreation. As already discussed, insect driven sensitive and controlled logging creates animal habitat for a number of important species.

The public entrusted managers with timber resources to attain maximum use. "No action," wasting timber resource is unacceptable. It would be irresponsible not to stop excessive beetle tree kills, not to salvage timber, and not to use recovered capital for reforesting.

Failed environmental policies have not maintained forest health. Automatic fire fighting interrupted the natural systems. This eliminating a natural patchwork of healthy multi aged forests. Failure to actively control insect and disease by substituting harvests for fires further accelerates forest health decline. Naturally healthy forests are much less likely killed by beetles.

Departing back to green spruce forests maximizing uses and all of its values is the constitutional requirement. Managers must interrupt infestations with active forest management. It is critical to immediately use forest doctors (silviculturalist) writing prescriptions for forest health.

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43 Alaska Department of Fish and Game, Juneau, "Status of Measures to Protect Fish and Wildlife in the Tongass National Forest:" A report on Section 706(b) of the Alaska National Interest Lands Conservation Act, February 1986.

44 Forestry, Division of, department of Natural Resources, State of Alaska, "Alaska Forest Resources & Practices ACT, Sec. 141.17.060, page 4-5,1990

45 Wilder, Governor L. Douglas, August 23, 1993,"NATURAL DISASTER DUE TO PINE BARK BEETLE INFESTATION," Executive Memorandum 3-93, Commonwealth of Virginia, Office of the Governor, Richmond 23219.

A FOREST LAND EMERGENCY ?[46]

No matter what we do, trees will grow old and die. Killed by the spruce bark beetles that destroy the cambium (nutrient transporting) layer under the bark. Or, by fungus weakening the tree's structural integrity causing physical collapse, or by other pathogens that are endemic to the forest and whose roles it is to "crop the weak" and make way for the new and strong. Or more spectacularly, the trees will be fire killed, or taken down by wind, snow or ice.

The State's management effort must be aimed at protecting the forest, so growth and silviculture can be practiced in a healthy, not degenerative environment. Human expectations must be factored into any definition of "emergency" as it pertains to current forest events. This is why the concept of "Forest Health" has been developed. People, without fully understanding why, or without defining the term "forest health" are insisting the forest be healthy and productive over their lifetime. This is the origin of the principles of sustained yield and multiple use.

The value of the "green" forest for view sheds is very important to our society, which in many cases is alienated from many natural events, and which looks forward to opportunities to recreate within and view the forests in their healthy condition. People expect to see a forest in its health, not its dotage. Perhaps then, for the tourist industry, the deteriorating "view" of the forest can be considered an "emergency."

The high value of a forest that provides food and shelter for wildlife is important to the environment and our society. This means that forests must be made up of a mosaic of varying degrees of age classes and succession stages so that diverse species of wildlife can utilize the forest environment. Moose need young hardwoods for food, and older timber stands for shelter. Can the deteriorating condition of some forest stands be considered an "emergency" as the forest stand pertains to ungulate habitat? In my opinion, and that of reputable wildlife biologists, it should be. Martens require a mature forest with numerous finger openings, where they can catch squirrels in the timber and mice in the fields. Elimination of this habitat niche is an emergency to those animals relying upon it.

Mankind has grown dependent on the fiber from the forest. Homes, arts and crafts, paper products, etc. are derived from this wood fiber, but only when the fiber is strong and suitable for the various manufacturing techniques. Large quantities of dead trees standing in the forests, deteriorate the condition of wood, the primary component of a forest, (almost like piling paper money in the woods to watch it rot), this results in an emergency for the forest products industry.

Any observer of current Alaskan forest environment can readily determine that the forests of Alaska are "weighted heavily in favor of old age and physical decadence." While there is some diversity, there is also a predominance of over mature forest. This is only broken where fire, timber harvesting, or land clearing have occurred. Undoubtedly the beetle is a natural agent of forest change. In isolated occurrences the spruce bark beetle can be explained as "normal" conditions, and destructive agents within the forest are acting their roles as endemic elements of slow steady change. Today, however, the conditions in Alaska's spruce forests have deteriorated to the point where destructive agents are actually epidemic. It is at this point of physical threat from biological agents, i.e.: insects, that the responsible parties must decide whether the threat to forest integrity is a forest land emergency.

The history and practical application of forest estate legislation is a duty to protect, enhance, and use, the forests. They can only be fully used, over time, if maintained healthy. Not just trees, but all elements associated with the forests benefit if the forest ecosystems are managed for health. The Forest Health Initiative is essential to realize the values that society has come to expect of a forest, a forest which, left unmanaged, can go "into crisis."

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[46] Brady, Terry T., "Forest Land Emergency Report," 6/15/93, Contract with the Division of Forestry, Forest Health Initiative.

EXPERTS RECOMMEND CLEAR ACTION

"You can't see the forest for the trees." Familiarity with the on going beetle infestations slowed resource managers, policy makers, and the public from making urgent management decisions. The Forest Health Initiative contracted with second party experts for an objective evaluation.

All consulting foresters, experts, agree, there is a major problem in the forest and specific recommendations followed. The Forest Health Initiative entered into two small agreements (Blackstock & International Panel) to secure consulting forest expert opinions on future recommended actions. The contracted experts provided reports to the Division of Forestry for operational and policy.[47] Retired Canadian (British Columbia) Regional Forester Del Blackstock provided an operational evaluation and report. A three member "International Panel" noted a forest emergency and provide valuable recommendations below. Additionally, remarks by State Forester Tom Boutin speaking to the Exxon Valdez Trustee Council noted the Kenai Peninsula ecosystem was in crisis. Reports are available to the public through the Division of Forestry.

FORESTER BLACKSTOCK: In July 16, 1993, an experienced Canadian "beetle fighting forester," Del Blackstock joined the effort. He promised to be extremely valuable to the Division of Forestry. Mr. Blackstock and many Canadian foresters have dealt successfully with bark beetle infestations.. Foresters have managed spruce forests to prolong their life, protect the values they represent and salvage/harvest the timber values. Del Blackstock served the Canadian Government in British Colombia for 36 years as a forester and 17 of those dealing with the spruce bark beetle and resulting loss of values and fires.

During the summer of 1993, Mr. Blackstock visited Alaska. His evaluation from an operational "hands on" forester's point of view imparted to DOF foresters will make a major contribution. Those who met him appreciated his expertise and knowledge of day to day forest treatment for beetle control. The "Blackstock Report" with specific recommendations is available through the DOF. Suggestions are being implemented.

INTERNATIONAL PANEL: In August of 1993, extreme concerns state wide caused a third party evaluation of forest health to take place. Recommendations for constituting an international review panel came from John Sandor, Commissioner of the Department of Environmental Conservation, and, Anchorage Forester Terry Brady. The international panel specifically included Canadian input. Canada has similar forests and a history of successfully addressing beetle infestations. We were fortunate to have available such a distinguished group of professionals on such short notice! On-site evaluation took place August 18-20, 1993. Final written reports were completed on August 31, 1993.

Panel Members

A. F.L.C. Les Reed; Chief of the Canadian Forest Service (Retired) and Professor Emeritus, University British Columbia,

B. Jane Difley, President of the Society of American Foresters,

C. Dr. David Adams, Forest Health Professor University of Idaho.

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47 Reports acn be secured at the division of forestry Anchorage, Alaska.

Panel Recommendations: The International Panel confirmed the severity of the beetle infestation in field trips with the following recommendations:

1. Continue the Forest Health Initiative and
   a. Prepare an integrated strategic action plan for the entire state
   b. Treat the beetle epidemic as the emergency it truly is
   c. Establish explicit goals for forest health (sustained yield)
   d. Strengthen mechanisms for coordination
   e. Build constituency support, public education is imperative
   f. Examine the potential for various forms of revenue
   g. Review legislation and regulation
   h. Address information gaps
   i. Strengthen and activate the Board of Forestry
   j. Consider an additional Citizen's Forest Advisory Council which embraces more constituents

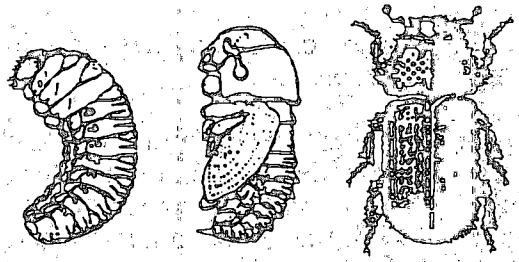
2. It is recommended that an initial budget for comprehensive implementation of the above is about $15 - 20 million annually. Current world demand would generate revenues to excess budget.

3. Additional professional staff are required to carry out a full program.

4 It would be risky, if not dangerous, to delay implementation of the foregoing agenda for forest health. Most important, the cost of doing nothing is far more expensive in resource lost.

EXXON VALDEZ OIL SPILL TRUSTEE COUNCIL: The Council focus on spill area habitat protection and parallel state Forest Health activity caused council member John Sandor to request a status report. State Forester, Tom Boutin, reported the ecosystem in crisis, millions of spruce trees killed in the spill area without replacement, or forest regeneration. Conversion to grasslands is occurring in many areas. Replacement vegetation is significantly changing the habitat and it's carrying capacity for many species. If we want to preserve the current condition action must be taken.

(Note: Entomology issues are recorded extensively under other references.)[45]



Spruce bark beetles

48 Linton, D.A., Safranyik, L., The spruce beetle, "Dendroctonus rufipennis (Kirby):" An Annotated Bibliography, 1885 - 1987 (Contains over 311 references), British Columbia, Canada 1988.
Note: This document is available through the Canadian Forest Service, Pacific Forestry Centre, 506 West Burnside Road, Victoria, B. C. V8Z 1M5

MOOSE PASS, COPPER RIVER, AND ANCHORAGE have followed the Western Kenai Peninsula in planning forest health restoration activity. Working Groups are generally formed to level of infestations determined, review and select the management options available: Management alternatives are:

A. No action, (No disturbance, no reforestation)
B. Prescribed fire, (Disturbance accelerates natural reforestation)
C. Salvage harvest (Disturbance accelerates natural reforestation) and,
D. Combinations of the above.

(NOTE: Pesticides and herbicides have proven ineffective world-wide as an exclusive agent for effective spruce bark beetles control in forest wide applications. Tree specific application for ornamental trees can be effective. Chemical attractants and repellents have been a successful part of control programs.)

WESTERN KENAI PENINSULA AREA: "The 1993 State of Alaska Insect Survey" conducted by the USDA Forest Service and shows dead and dying trees on more than 724,000 acres. It documented the highest number and intensity of beetle flights ever recorded on the North American Continent. The Kenai Peninsula has, regrettably, had this distinction for three consecutive years.

Public officials in the Kenai Peninsula Borough (KPB) have risen to the challenge lead by its Mayor Don Gilman. KPB interests include: fire, ecosystem change, habitat loss for wildlife, possible economic utilization of the dead trees, and reforestation. Active participation and involvement provide local community leadership to address the resource management problem.

Projects consist of evaluation of spruce bark beetle impacts, location, vegetation cover, topographical mapping, ownership determination, barrier identification, aerial photography, entomological estimates of future impacts from beetles, and development of site specific treatment plans. Projects continue on various levels in the Western Kenai Peninsula Area, Moose Pass, Copper River Area, and Anchorage.

Many community members are alarmed about the spruce bark beetle infestation and resulting spruce mortality, they have asked for state assistance. The Division of Forestry of the State of Alaska funded by the Legislative CIP (Capital Improvement Project) and the US Forest Service Diseases and Insect Suppression Funding.

MOOSE PASS: The State of Alaska Division of Forestry contracted with the US Forest Service to complete an environmental assessment of alternatives to deal with the beetle infestations in Moose Pass. Land ownership falls into generally three categories, federal, state, and private. Federal and state lands account for the greater percentage and are actively engaged in planning with a report due May of 1994. Following, state and federal decision makers will decide on a course of action. A working group is assisting in identifying issues.

COPPER RIVER AREA: The Division of Forestry has assemble a working group to identify the problem and arrive at a course of action.

ANCHORAGE: As a result of the Forest Health Initiative, Anchorage developed a Wildland Fire Management Plan. As a result of the Forest Health Initiative, Moose Pass is in the process of developing a wildland fire management plan. As a result of the Forest Health Initiative other communities are encouraged to minimize the danger caused by the spruce bark beetle infestations. Communities should follow Anchorage's lead, develop a wildland fire management plan, and comply with it to protect life and property.

FORESTRY ADOPTS SILVICULTURAL PLANNING

Site specific forest management planning by the State of Alaska required the Division of Forestry to recognized the need for a highly trained and specifically designated silviculturist. The Forest Health Initiative made possible hiring of the state's first field silviculturist to address the forest health. On September 1, 1993, the State of Alaska, Division of Forestry hired a US Forest Service professional silviculturist Tom Liebscher on an "Interagency Personal Agreement." Tom's contract is for a 24 month period with current funding for 12 months.

Field Silvicultural Prescriptions required the state to have Mr. Liebscher develop a process and form. Mr. Liebscher reviewed US and Canadian Forest Service. Borrowing from each to fit our needs, he developed a appropriate form and adopted it for state use. He immediately put it to work in the field making "Forest Health Prescriptions."

Forest prescriptions are much like a medical doctor's prescriptions. They include a broad range of forest ecosystem considerations. The desired future condition of our forests serves as a goal. He considers environment issues, social, and economic considerations before making a decision. A few of the considerations are infestation levels, species mix, views, wildlife, watersheds, stream set backs, habitat, access, hydrology, soil conditions, forest practices, and a host of other influences. Mr. Liebscher's work is an outstanding example of profession excellence. He is tasked with the creation of interagency coordination with the Department of Fish and Game Division of Habitat.

COOPERATING ORGANIZATIONS

The US Forest Service help was critical for both its expertise and funding. The US Forest Service "Cooper Landing Project," developed by team leaders Gene Lessard and Warren Oja acted as a model for the State to emulate. Implementation of decisions (salvage harvest and prescribed burning) from Chugach National Forest Ranger Duane Harp, have been successful.

The state greatly appreciates tireless support provided by USFS (silviculturist) Jerry Boughton. USFS Entomologist Ed Holston Ph.D. cooperatively with colleagues John Hart Ph.D., Skeeter Warner Ph.D., Roger Burnside (State Entomologist) and others working to develop alternative management strategies. Enie Lowell USFS organized a "Mill Recovery Study" to determine the salvage properties of dead and dying spruce and the peeling qualities of the mature birch.

The "Alaska Reforestation Council's" Executive Director, Earl Stephens Ph.D., arranged a unique three day silvicultural demonstration field trip. Interested members of the public, press, and professional foresters to understand the infestation and the observed varied silvicultural prescriptions. Participants observed the tragic loss of forest values first hand and discussed needed silvicultural treatments on each site.

The University of Alaska, Fairbanks School of Agricultural and Forestry contributions includes expert advise from Dr. Edwin Packee and Dean of the School of Forestry Jim Drew.

The Alaska Society of American Foresters conducted research for a position paper on "Forest Health" guiding foresters in addressing dramatic losses in central Alaska of old growth habitat.

The Alaska Science & Technology Foundation Executive Director John Siebert delivered support funding forestry grants. The detailed reports are available through the Foundation.[49]

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[49] ASTF Funded Small Grant Proposals

A. "Modified Double-Diffusion Preservative Treatment," total cost $33,000, ASTF funded $19,900, 12/3/92, report due 12/3/93

B. "Preserving Treating Alaska White Spruce," total cost $136,550, ASTF funded $61,250, 3/11/91 report due 3/11/93.

C. "A Mechanical Evaluation of Alaskan White Spruce: Engineering Design Values, By Dean Syta, completed November 9, 1993," total cost $73,366, ASTF funded $51,558,

WILDFIRE THREATS HAVE CHANGED

Fire managers who, each year, extinguish huge wildland fires acknowledge the increasing and complex fire risk from insect killed forests. Alaska's forests are wildland fire ecosystems. Spruce bark beetle infestations kill trees increasing fuels for fire. Dead trees on the forest's floor and ladder fuels to the upper branches challenge firefighters capacity.[50]

Following beetle kill, grass replaces the forest on many sites bring with it the potential to carry a fire rapidly throughout the forests. Grassland fires cause the majority of fatalities and property loss. Fortunately, in the summer "green up" reduces fire hazards. Fall drying again brings an increase in danger

Home owners, having watched flames consume homes and forests through their television sets, are receptive to discussions about "defensible space" around their homes. Homes with trees right against them are rarely salvageable in a wildfire. Homes with a cleared space have a fighting chance.

Increased wildland fire hazard increases with fuel loading of dead spruce. A catastrophic fire could consume a large percentage Anchorage hillside in one 8 hour period.[51] Potentially destroying property valued at $600,000,000.[52] also threatening lives much like the Oakland Malibu California wildland fire! California, preservationists blocked responsible forest/ grassland management to protect the "endangered" kangaroo rat. No action resulted in a huge fire destroying human habitat, animal habitat as well. Ironically, even the kangaroo rat lost!

Failure to implement Forest Health planning can result in a similar circumstance for Alaska. Spruce bark beetle infestations are changing half the forests spruce ecosystems to grasslands ecosystems. In the process, the beetle alters natural fire resistance of the spruce trees. Needles and branches accumulate on the dying forest floor. The amount of fuel, and the nature of the fuels, produce a more intense fire. Fire can deeply sear soil leaving it unproductive for years. Erosion will likely increase. Fuel loaded forests make many structures difficult to save.

Factors leading to the massive infestations and beetle population build up are complex. Uniformity of Alaska's forests in an older, unhealthy, "over mature state," in part result from management policies on fire, access and, uses. One significant contributor is the public land managers sociopolitical policy of wildland fire fighting. In Alaska fire fighters, until the last decade, were mandated to attack each wildland fire with all the government's resources.[53]

Virtual elimination of major wildland fires from forest ecosystems has been a major management force in an other wise "let nature take its course" land management policy. Recent modifications of fire policy accommodate significant wildland fuels burning in areas where minimal impacts or where beneficial wildlife results occur. Fire, while devastating and consuming as an event, is a regenerative ally to early successional forest. Periodic fires create a mosaic in the landscape of multi aged forests. Fire, in its regenerative role, clears the way for a new forest.

"Land managers, environmental groups, and local communities are increasingly concerned about the health of forests and the potential for major fires as fuels continue to accumulate. Forest Health in the west has reached a critical state. Catastrophic fires and insect and disease

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50 Initial attack forces eliminate fires before they grow out of control.

51 Worst case scenario, by John See Fire Behavior Analysis, Division of Forestry, State of Alaska, Responding Anchorage developed a wildland fire management plan, 1993.

52 Estimated by the Anchorage Office of Emergency Preparedness.

53 Historically, the first fire fighting organization was the federal BLM (Bureau of Land Management) and later its successor, the State Division of Forestry (since the early eighties).

epidemics are major concerns to western state foresters."[54] Alaska's spruce bark beetle infestation and spruce tree mortality are adding to fuel loading in our forests. Traditional literature predominantly recommends salvage harvest as the main management tool to control beetle infestations. Harvesting stands of overmature spruce by clear cutting is effective as a fire prevention measure when comprehensively done. Salvage of wind thrown trees and infested standing trees before the beetles emerge from them is important both in prevention and control.[55] US Forest Service "Western Forests Insects"(insect identification and management manual) clearly notes the increase in fire danger.

The beetle killed trees change the ecosystem increasing fire danger:

A. Beetle killed forests cause increased fuel loading,
B. Grass invades into the spruce forests following beetle kill,
C. Grass is a fuse to carry fire in spring and fall,
D. Grass/spruce forests have higher fine fuel loading than pure spruce,
E. Grasslands have a higher fine fuel loading than grass/spruce forests,
F. Grasslands with dead spruce have a higher fuel fine loading than healthy spruce stands and create an intense fire,
G. Other environmental issues:
    1. Beetle kill reverses oxygen production to consumption and production of carbon dioxide in decay,
    2. Increased watershed run off,
    3. Erosion is likely,..
    4. Spruce reforestation will not reoccur in the near future resulting from seed loss (Logically, dead spruce can't produce seed for replacement trees).

Anchorage's Infestation Caused Emergency Plan Creation. The Alaska's Emergency Preparedness Committee requested and received a briefing on the fire dangers resulting from the forest infestations. The Division of Forestry, Forest Health Project Director, Dan Golden in the spring of 1993, gave notice of the general bark beetle infestations increased of fire danger. Anchorage's Bob Stewart Director of Emergency Preparedness recognized potential high liability. Director Stewart requested and received assistance from the state and federal foresters to conduct a review of Anchorage's potential fire problems.

John See, State Fire Behavior Analyst, estimated that a wildland fire starting near Potter's Marsh during a dry summer when high winds were blowing could burn 30,000 acres of residential land in only 8 hours. The city estimated that all structures on the hillside were at risk. The value of the property at risk is over $600 million dollars. In addition countless lives are in jeopardy.

Director Stewart immediately notified Anchorage's Mayor, Tom Fink. Mobilizing, specially trained personnel, interagency drill conducted, and a future fire fighting plan in place. Anchorage has provided an example for the entire state.

CONCLUSION:

The retention of a major component of mature spruce in our forests, particularly in central and southcentral Alaska will require decisive action by resource managers. Recognition of: the magnitude of infestation; recognition of departure from a sustainable spruce habitat; recognition of drastic alteration of the ecosystems; recognition of reduction in forest wildlife carrying capacity; recognition of reduced recreational quality; and recognition of the fire danger increase with increased costs all dictate action. Acceptance and implementation of the "Timely Alternatives" and the "International Panel Recommendations" presented here offer a decisive path to improving our forest health.

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54 A White Paper, "Western Forest Health Recovery, Protection and Enhancement Initiative," US Forest Service, Rocky Mountain Region, Reply to M. Parsons: R02A, April 7, 1993.

55 Furniss, R. L., Western Forest Insects, U.S. Dept. of Agriculture, Forest Service, U.S. Govt. Print. Off., p. 359-361, 1978.

APPENDIX A.

KEY LAWS AFFECTING FORESTS

State of Alaska:

THE CONSTITUTION OF THE STATE OF ALASKA Article VIII - Natural Resources

Section 1 - Statement of Policy.
It is the policy of the State to encourage the settlement of its land and the development of its resources by making them available for maximum use consistent with the public interest.

Section 2 - General Authority.
The legislature shall provide for the utilization, development, and conservation of all natural resources belonging to the State, including land and waters, for the maximum benefit of the people.

Section 4 - Sustained Yield.
Fish, forests, wildlife, grasslands and all other replenish able resources belonging to the State shall be utilized, developed and maintained on the sustained yield principle, subject to preferences among beneficial uses.

STATUTES
AS 38.04.065. Land use planning and classification. (a) Except as provided in (d) and (h) of this section, the commissioner shall, with local governmental and public involvement Under AS 38.05.945, adopt, maintain, and where appropriate, revise regional land use plans that provide for the use and management of state owned land.

(b) In the adoption and revision of regional and site-specific land use plans, the commissioner shall

(1) use and observe the principles of multiple use and sustained yield:

(2) consider physical, economic, and social factors affecting the area and involve other agencies and the public in achieving a systematic interdisciplinary approach:

(3) give priority to planning and classification in areas of potential settlement, renewable and nonrenewable resources development, and critical environmental concern;

(4) rely, to the extent that it is available, on the inventory of the state land, its resources, and other values;

(5) consider present and potential uses of state land;

(6) consider supply, resources, and present and potential use of land under other ownership within the area of concern.

(7) plan for compatible surface and mineral land use classifications; and

(8) provide for meaningful participation in the planning process by affected local governments, state and federal agencies, adjacent landowners, and the general public.

NOTES TO DECISIONS

Mandate of section. -- When read in its entirety the meaning of this section is plain: it mandates a comprehensive, broad-scale planning process prior to site-specific planning and classification. Consequently, a decision of the state Department of Natural Resources to dispose of land in a lottery was invalid where the department failed to comply with the land use planning process mandated by the statute.[56,57]

AS 38.04.910. Definitions. In this chapter, unless the context otherwise requires.(5) "multiple use" means the management of state land and its various resource values so that it is used in combination that will best meet the present and future needs of the people of Alaska, making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; it includes

(A) the use of some land for less than all of the resources; and

(B) a combination of balanced and diverse resource uses that takes into account the short-term and long-term needs of present and future generations for renewable and nonrenewable resources, including, but not limited to recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific, and historic values;

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56 Alaska Survival v. State, Dep't of Natural Resources, 723 P. 2d 1281 (Alaska 1986).

57 Quoted in Southeast Alaska Conservation Council, Inc. v. State, 665 P.2d 544 (Alaska 1983).

(11) "sustained yield" means the achievement and maintenance in perpetuity of a high level of annual or regular periodic output of the various renewable resources of the state land consistent with multiple use;

NOTES TO DECISIONS

Sustained Yield Principle. -- The "sustained yield principle" as used in Alaska Constitution, Art. VIII, Section 4., accords with the definition set forth in paragraph (11) of this section, and the added language in the "sustained yield" definition as AS 41.17.950 that it "does not require that timber be harvested in a non declining yield basis over a rotation period" should be read as permitting timber cutting at a level that cannot be sustained over a forest rotation period only in unusual circumstances. [58]

AS 38.05.027. Cooperative resource management or development agreements. (a) Consistent with the authority of the commissioner under law, the commissioner, after determining that the agreement is in the best interests of the public and the state, may enter into cooperative resource management or development agreements with the federal government, a state agency, a village or municipality, or a person. Specific guidelines to protect the state and public interest shall be established, if necessary, by the commissioner before entering into an agreement under this section.

(b) a summary of agreements entered into under this section shall be submitted to the legislature within 30 days of the beginning of each regular session.

AS 38.05.112. Forest land use plans. (a) The department may not sell or harvest timber, except for isolated personal use timber harvest, until a site-specific forest land use plan has been adopted. A forest land use plan is required whether or not a regional or area land use plan under AS 38.04.065

(a) or a forest management plan under AS 41.17.230 has been adopted.

(b) The commissioner shall base a forest land use plan on the best available data, including information provided by other agencies describing the immediate and long-term effects of individual and collective forest activities on the timber base and on other resources and uses.

(c) In addition to the requirements of AS 38.04.065(b), a forest land use plan shall consider

(1) commercial timber harvesting and related activities;

(2) harvesting of forest products for commercial use;

(3) fish and wildlife habitat, including

(A) identification and protection of important wildlife habitat;

(B) retention of riparian, wetland, and ocean-shoreline vegetation critical for fish and wildlife habitat; and

(C) classification of water bodies according to physical characteristics;

(4) uses of forest land for non timber purposes, including

(A) recreation, tourism, and related activities;

(B) mining, mining claims, mineral leaseholds, and material extraction;

(C) uses of fish and wildlife;

(D) agriculture, including grazing, and

(E) other resources and uses appropriate to the area, including compatible traditional uses;

(5) soil characteristics and productivity;

(6) water quality; and

(7) watershed management.

(d) A management plan prepared by the commissioner must consider and permit the uses described in (c) of this section. If the commissioner finds that a permitted use is incompatible with one or more other uses in a portion of a state forest, the commissioner shall affirmatively state in the management plan that finding of incompatibility for the specific area where the incompatibility is anticipated to exist together with the reasons for each finding.

AS 38.05.113. Five-year sale schedule. (a) the department shall annually prepare a five-year schedule of timber sales planned on all land managed by the department. The schedule must be of sufficient specificity that it provides a basis for the department to allocate its resources in considering and designing sales and in conducting economic and environmental analyses. The schedule must inform the public and the timber products industry of long-term plans and provide a basis for public comment.

(b) Except as provided in (c) of this section, a proposed sale may not be held unless it has been included in the two five-year schedules preceding the sale. This requirement does not apply until one year after the first five-year schedule is prepared under this section.

(c) The department may adopt regulations exempting small and emergency sales from requirements of this section.

Note: Clearly, planning and classification will have to be accomplished before an emergency sale of timber may be held. The emergency regulation does not waive such requirement, though it does waive the requirements of AS 38.05.113 (a) and (b) concerning the five-year schedule.

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[58] Southeast Alaska Conservation Council, Inc. v. State, 6654 P. 2d 544 (Alaska 1983).

Literal reading of 11 AAC 70.10 (d) and AS 38.05.113 indicates in the emergency the requirement planning "must be of sufficient specificity that it provides a basis for the department to allocate its resources in considering and designing sales and in conducting economic and environmental analysis. The schedule must inform the public and the timber products industry of long-term plans and provide a basis for public comment." (AS 38.05.113 (c)) is waived.

However, there are no clear guidelines in the statutes (AS 38.04.065, AS 38.05.112 and AS 41.17.230) or regulation 11 AAC 55.040. CLASSIFICATION. as to the level of planning and the degree of classification required in an emergency. This seems to be an oversight resulting from the fact that neither the legislature, the administration(s), nor the courts, have yet fully addressed "emergencies" and that recent administrative attempts to do so are in early stages.

Thus relying on the statutes, regulations and the definition of emergency, there appears to be a logical level of planning and classification that will allow the use of emergency regulations when the forest is threatened. Further, as long as insect and disease epidemics (other destructive agents) are a "trigger" (analogous to fighting a forest fire) the division has greater latitude, is able to act without public notice each and every time there is an emergency, and is free to enter onto and control emergencies on private land. Also, as in the case of forest fires, insect and disease epidemics can be "battled" under inter-agency agreements.

Note the use of "epidemic" as defined earlier. An expert finding of an "epidemic" is critical where diseases and insects are concerned. Current physical evidence (burned timber, timber dead from flooding, etc.) to determine a catastrophe is easier when the destructive agent is sudden and physical.

Most forest insects and pathogens are "endemic" to a natural forest ecosystem, and each serves a specific purpose in the ecosystem. It would probably be impossible and certainly unwise, to eradicate an insect species or a disease causing fungi from the forest. Controlling and directing "endemic" conditions is part of "normal" forest management and opposed to "emergency" situations being addressed herein. There are times, when for various reasons an insect population or disease conditions becomes "epidemic" as defined. Then it is both professionally prudent and legally defensible to declare an "emergency" and take appropriate actions, just as it is when wildfire or other physical destructive event occurs.

AS 41 Chapter 15. Forests, Article 1. Protection of Forested Land.

AS 41.15.010, Intent. It is the intent of AS 41.15.010 -- 41.15.170 to provide protection, commensurate with the value of the resources at risk, for the natural resources and watersheds on land that is owned privately, by the state, or by a municipality.

AS 41.15.020. Regulations. The commissioner shall, by regulation, make provision for the protection of forested land in the state from fire and other destructive agents.

AS 41.15.030. Contracts for forest protection. (a) The commissioner may enter into necessary protection contracts.

AS 41.15.040. Right of entry to control and suppress fires. Upon approval by the commissioner or an authorized agent, employees of the division of lands, or any other agency authorized to prevent, control or suppress fires or destructive agents, and others assisting in the control or suppression of fires upon request of an officer or employee of the United States or the state may at any time enter upon any land, whether publicly or privately owned, for the purpose of preventing, suppressing or controlling forest fires and destructive agents.

AS 41 Chapter 17. Forest Resources and Practices

AS 41.17.010. Declaration of Intent. The legislature declares that

(1) the forest resources of Alaska are among the most valuable natural resources of the state, and furnish timber and wood products, fish and wildlife, tourism, outdoor recreation, water, soil, air, minerals and general health and welfare;

(3) the state has a fundamental obligation to ensure that management of forest resources guarantees perpetual supplies of renewable resources, provides nonrenewable resources in a manner consistent with that obligation, and serves the needs of all Alaska for the many products, benefits, and services obtained from them.

AS 41.17.082. Control of infestations and disease. (a) All forest clearing operations and silvicultural systems must be designed to reduce the likelihood of increased insect infestation and disease infestations that threaten forest resources.

(b) A forest landowner may not conduct or approve timber clearing activities that create conditions fostering outbreaks of infestation of infection that threaten forest resources on forest land belonging to another person. If the commissioner finds, after notice and hearing, that there has been a violation of this subsection, the commissioner may

(1) require the forest landowner, at that person's expense, to remove promptly cure the conditions fostering outbreaks of infestation or infection; and

(2) require the forest landowner, at that person's expense, to undertake environmentally sound, effective, and cost-efficient actions to control the infestation or infection in the immediate vicinity of the improper timber clearing activity.

(c) If a forest landowner does not comply with a final order of the commissioner under (b)(1) or (b)(2) of this section, the commissioner may enter onto the land and undertake the actions ordered and the landowner is liable for the cost of the actions. The commissioner shall deliver to the landowner an itemized statement of the expenses incurred.

(d) The commissioner may undertake surveys and appraisals to obtain data on regional insect infestations and disease conditions. Upon a determination that an areas is infested with forest insects or infected with diseases injurious to forest resources and that the infestation or infection threatens the forest land or timber of adjacent owners, the commissioner may establish the boundaries of an infestation or infection zone. The commissioner may enter into an agreement with an owner or with a government agency to control or suppress infestation or infection within the zone. Upon a determination by the commissioner that insect and disease control work within the zone is no longer necessary or feasible, the commissioner shall terminate the zone.

Sec. 41.17.950. Definitions. In this chapter, unless the context otherwise requires.

(8) "multiple use" means

(A) the management of all the various resources of forest land so that they are used in the combinations that will best meet the needs of the citizens of the state, making the most judicious use of the land for some or all of these resources or related values, benefits and services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions.

(B) that some land will be used for less than all of the resources; and

(C) harmonious and coordinated management of the various resources, each with the other, without significant impairment of the productivity of the land and water, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

(17) "sustained yield" means the achievement and maintenance in perpetuity of a high level annual or regular periodic output of the various renewable resources of forest land and water without significant impairment of the productivity of the land and water, but does not require that timber be harvested in a non-declining yield basis over a rotation period.

FOREST LAND EMERGENCY: An emergency, as it pertains to forest land conditions, is defined as (1) actual or imminent loss of the market value of timber that has been damaged by fire, insect infestation, other pest, disease, or an act of nature, with the biological destructive agents acting at the epidemic level;

(2) actual or imminent loss of the market value of timber that is threatened by insect infestation, other pest, or disease;

(3) the need to create fire breaks to protect natural resources, private and public real and personal property values, human life, or livestock life, or to avert actual or imminent economic loss;

(4) a requirement to reduce fuel-loading of the forest to protect natural resources, private and public real or personal property values, human life, or livestock life, or to avert an actual or imminent economic loss;

(5) a requirement to reduce the spread of insect infestation, the spread of other pests, or other destructive agents that in the expert opinion of the State Forester has reached or is threatening to reach epidemic levels, threatening the fulfillment of multiple use and sustained yield of the multitude of forest resources, defined as fish, forests, wildlife, and all other replenishable resources.[59]

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[59] Brady, Terry T., "Forest Land Emergency Report," 6/15/93, Contract with the Division of Forestry, Forest Health Initiative.

FEDERAL

Organic Administration Act of 1897 (as amended from time to time)
No national forest shall be established, except to improve and protect forests within the boundaries, for the purpose of securing favorable conditions of water flows, ..."
Weeks Law (Act of Mach 1, 1911 (36 Stat. 961-963) (amended))
Sec. 1. The consent of the Congress of the United States is hereby given to each of the several states of the Union to enter into any agreement or compact, not in conflict with any law of the United States, with any other State or States for the purpose of conserving the forests ....

Clarke-McNary Act (Act of June 7, 1924 (43 Stat. 653) (amended))
Sec. 1. and Sec. 2. (Pertains to cooperative fire prevention and suppression)

McSweeney-McNary Act (Act of May 22, 1928 (45 Stat. 699) (amended)
Sec. 1. The Secretary of Agriculture is hereby authorized and directed to conduct such investigations, experiments, tests as he may deem necessary under regulations 2 to 10, inclusive in order to determine, demonstrate, and promulgate the best methods of reforestation and of growing, managing and utilizing timber, forage, and other forest products, of maintaining favorable conditions of water flow and the prevention of erosion, of protecting timber and other forest growth from fire, insects, disease, or other harmful agencies, of obtaining the fullest and most effective use of forest lands, and to determine and promulgate the economic considerations which should underlie the establishment of sound policies for the management of forest land and the utilization of forest products: *Provided*, That in carrying out the provisions of this Act the Secretary of Agriculture may cooperate with individuals and public and private agencies, organizations and institutions ....

Sec. 3. (Relates to investigations of diseases of forest trees.)

Sec. 4. (Relates to investigations of forest insects, etc.)

Forest Pest Control Act (Act of June 25, 1947 (61 Stat. 177; 16 U.S.C. 594-1 to 594-5))

Sec. 1. In order to protect and preserve forest resources of the United States from ravages of bark beetles, defoliators, blights, wilts, and other destructive forest insect pests and diseases, and thereby enhance the growth and maintenance of forests, promote the stability of forest using industries and employment associated therewith, aid in fire control by reducing the menace created by dying and dead trees injured or killed by insects and disease, conserve forest cover on watersheds, and protect recreational and other values of the forests, it shall be the policy of the Government of the United States independently and through cooperation with the governments of States, Territories, and possessions, and private timber owners to prevent, retard, control, suppress, or eradicate incipient, potential, or emergency outbreaks of destructive insects and diseases on, or threatening, all forest lands irrespective of ownership.

APPENDIX B.

FEDERAL

Organic Administration Act of 1897 (as amended from time to time)
No national forest shall be established, except to improve and protect forests within the boundaries, for the purpose of securing favorable conditions of water flows, ..."
Weeks Law (Act of Mach 1, 1911 (36 Stat. 961-963) (amended))
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STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES

TONY KNOWLES, GOVERNOR

DIVISION OF FORESTRY

3601 "C" Street, Suite 1034
Anchorage, AK 99503-5937

File: 9-3185.5

May 1, 1995

re: 1994 Forest Insect and Disease Conditions Report & Survey Map publications
Form to request aerial surveys for summer, 1995

Friends:

Enclosed are two reports. The first report, produced jointly by the Alaska Department of Natural Resources and USDA Forest Service, summarizes the 1994 Alaska forest insect and disease surveys with a set of maps generated by a computerized Geographic Information System (GIS). The second publication, prepared by the USDA Forest Service, provides a more detailed summary of forest insect and disease conditions throughout Alaska compiled from aerial sketchmapping records and limited ground observations during the summer, 1994.

You are being sent this information about the statewide aerial survey because of your stated interest in forest land and resource management or as an interested landowner and/or resource manager with previous contact with the Alaska Division of Forestry or USDA Forest Service, Forest Health Management entomologists. The purpose of the statewide aerial survey is to (1) detect new insect and disease activity, (2) monitor ongoing outbreaks, and (3) alert resource managers and private landowners of insect/disease activity in their areas. In addition to the annual aerial surveys, Alaska Division of Forestry and USDA Forest Service entomologists are also available to assist with evaluations of surveyed outbreaks when requested.

Part of the organization for the annual statewide forest insect and disease survey is to obtain specific information from interested state, federal, and private landowners for including their forested lands in the survey. Should you wish to have your forested lands included or receive information about the surveys, you may contact one of the forest health management offices responsible for arranging the surveys. For this purpose, we have enclosed an aerial survey request form which should be completed and returned by June 15, 1995. Office addresses and phone numbers are included on the form. The 1995 aerial detection surveys will begin in mid-July.

Sincerely,

Roger Burnside, Insect & Disease Forester
Alaska Department of Natural Resources
Division of Forestry, State Office
Resources Section
ph: (907) 762-2107 or fax: 561-6659

Ed Holsten, Entomologist
USDA Forest Service, S&PF
Forest Health Management
3301 "C" Street, Suite 522
Anchorage, AK 99503
ph: (907) 271-2573 or fax: 271-2897

Enclosures (3)

1995 Annual Insect & Disease Detection Survey Request

Requestor:_____

General forest lands location (attach map or marked USGS Quad) *:

_____

_____

_____

* best if general area location is given, such as reference to river drainage, lake system, distance to nearest locale or town/village, etc.

Specific pest information requested (if known):

_____

_____

Contact Name/Phone #:_____

Best Time of Day to Contact:_____

Do we have your correct mailing address? (please include below):

_____

_____

_____

Aerial Survey Requests on Federal Land:
South-Central & Interior Alaska: contact Ed Holsten (E.Holsten:R10F04A), USDA Forest Service, State and Private Forestry, Forest Health Management, 3301 C Street, Suite 522, Anchorage, AK 99503-5937 ph: (907) 271-2573 or fax: 271-2897.
Southeast Alaska: contact Paul Hennon (P.Hennon:R10A), USDA Forest Service, State and Private Forestry, Forest Health Management, 2770 Sherwood Ave., Suite #2A, Juneau, AK 99801 - ph: (907) 586-7971 or fax: 586-7848.

Aerial Survey Requests on State or Private Land:
Statewide: contact Roger Burnside, Alaska Department of Natural Resources, Division of Forestry, Resources Section, 3601 C Street, Suite 1034, Anchorage, AK 99503-5937 - ph. (907) 762-2107 or 2127, or fax to 561-6659.